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J. W. DOUGLAS.

E. C. RYE, F.Z.S.

R. McLACHLAN, F.L.S.

H. T. STANTON, F.R.S.

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"Very close and diligent looking at living creatures, even through the best microscope, will leave room for new and contradictory discoveries."

"GEORGE ELIOT."

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P R E F A C E.

We take advantage of the conclusion of the Thirteenth Volume of this Magazine to address a few words to our readers.

From time to time we have heard it said, that there is in it sometimes a deficiency of communications interesting to specially British entomologists. The want, if such is found by some to exist, does not rest with us, for articles of this class have never been declined, provided they were of more than personal interest; and notes referring particularly to British entomology not only have had, but will have, special favour, and are particularly desired. The geographical and insular situation, as well as the climatic condition, of Britain, render all notices of its insect-products not only of local but of general zoological importance, because it is from the accumulation of such records that materials for general scientific deductions can be obtained; but it has always been our aim to make the Magazine something more than a register of transitory information. In both respects, we have reason to know the result is appreciated, both at home and abroad.

With regard to the financial position we have reason to be content. The large amount of small type used in each number, while it costs more than the large, enables us to give a greater amount of matter. There has never been any intention or desire to make the Magazine a means of pecuniary gain, and if a larger number of subscribers increase the fund for expenditure, it will be used for their general benefit by giving more illustrations or matter.

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ERRATA.

Page 12, line 2 from bottom, for "returning," read "retiring."	
" 41, " 4 " " for "this" read "his."	
" 87, lines 9 and 14 from bottom, for "compressum," read "compressa."	
" 133, line 9 from top, for "polyodon," read "polyodon."	
" " 11 " " for "remicolor," read "unicolor."	
" 169, Explanation of Fig. A, for (?) read (l).	
" 189, line 19 from top, for "last" read "lost."	
" 198, " 32 " " for "says:" read "lays."	
" 205, " 6 " " for "ANGOLA," read "DELAGOIA BAY."	
" " 7 " " add "DELAGOIA BAY AND" between "FROM" and " ZANZIBAR."	
" 211, " 5 " " dele "not."	
" 216, " 3 " bottom, for "Mimetra," read "Minetra."	

Entomologist's Monthly Magazine

VOLUME XIII.

ON A NEW SPECIES OF THE GENUS *ZELLERIA*.

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

Since the 29th November, 1873, when Mr. Barrett brought to me for determination a *Zelleria* from Paisley, which I could not recognise, I have had this insect on my mind.

That which has so long perplexed me, ought now to take its turn in puzzling others, and I therefore here give to the world all that I know on the subject.

On the 9th December, 1875, I made the following entry :

ZELLERIA FUSCA, *n. sp.* Exp. al. 6-7 lines.

Having seen simultaneously eleven specimens, nine of which I return this day to Sir Thomas Moncreiffe, I may thus describe it :

Allied to *Z. insignipennella*, but wants the rich reddish-ochreous tint of that species ; variable in colour from greyish-ochreous to dark fuscous : sometimes with a dark spot on the fold beyond the middle.

Tuft of the head ochreous or fuscous.

It will be seen from the above, that its characters are rather negative than positive ; and, when one reflects that some Entomologists to this day doubt whether *Z. insignipennella* be specifically distinct from *Z. hepariella* (through the kindness of Mr. Sang, of Darlington, I have in my collection a pair taken *in cop.* at Castle Eden Dene, September 27th 1866, of which the ♂ appears to be *Z. hepariella*, and the ♀ *Z. insignipennella*), one feels one is treading on very uncertain ground—since colouring only, as distinctive of a species with a high Northern range, we know from many analogous cases to be a veritable *ignis futuus*.

I will now endeavour to supply, as far as I can, from the letters before me, a history of the known specimens of this new species of *Zelleria*.

In March, 1874, I received from Sir Thomas Moncreiffe some insects for determination, amongst which I found two specimens of the *Zelleria*, which I had first seen the previous November from Paisley. I wrote at once for information respecting them, and was speedily favoured with the following reply to my queries :

“Moncreiffe House, Bridge of Earne,

“March 31st, 1874.

“The two specimens of the new *Zelleria* which I captured here were taken April 8th and May 22nd, 1873.

“The first was beat off a thorn tree in my shrubbery ; the second I took on a rocky face about 450 feet above the sea level, where no yew trees grow within a mile. There is, however, a very mixed vegetation in the locality, including ash, but not privet. Both specimens were taken in the day-time. I hear that the Paisley specimen was taken in that neighbourhood, in December.”

A year later I heard again of this insect :

“Moncreiffe House, Bridge of Earne,

“April 17th, 1875.

“I have lately taken two of the *Zelleria*, one beaten from sallow, the other off willow ; this latter specimen is a female, but I did not recognise it as this insect till after I had killed it, being different in appearance from any I had already taken. On consideration, I find that all that have been captured here were beat out of bushes in the neighbourhood of sallows, and as the sallow is not very plentiful with me, I have a notion that it may be the food-plant.”

In the course of the summer of 1875, Sir Thomas Moncreiffe brought up to London several specimens of this new *Zelleria* for examination, and wrote about them as follows :

“Moncreiffe House, Bridge of Earne,

“July 21st, 1875.

“The two ticketed specimens were taken by myself, in the spring. The others were captured by Mr. Herd, at this place, from September till May, and he told me the other day that he had taken two more the beginning of this month, or end of June, beaten out of willow.

“My darker specimen was beaten out of yew, with sallow and willow adjacent, and the lighter coloured specimen was beaten out of willow. If all are the same insect, the dates of capture are curious. The last week in June or first week in July can scarcely be the dates for hibernated specimens.

I now leave the matter in the hands of other observers, in the hope that before long the entire history of the species may be known.

Mountsfield, Lewisham, S.E. :

May 16th, 1876.

SUPPLEMENTARY NOTES ON THE LARVA, &c., OF *APATURA IRIS*.

BY W. BUCKLER.

In the 4th volume of this Magazine, at pages 85 to 87, is a description of the full-grown larva of this species, which I now propose to supplement with a further account *ab ovo*.

For the eggs, I have been indebted to the kindness of Mr. W. H. Harwood, of Colchester, and Mr. E. F. Bisshopp, of Ipswich, viz., a single egg from the former, received the 31st of last July, laid within the three or four previous days on the upper-side of a leaf of *Salix caprea*; and from the last named on the 1st of August, four eggs, laid July 29th on pieces of paper.

The egg, as may be supposed, is of a good size, its shape cylindrical, of about equal height and diameter, adhesively fixed in an upright position on its flat base, domed on the top, its surface strongly ribbed, the ribs varying in number from twelve to fourteen. All the eggs were alike in colour when I first received them, viz., of a yellowish olive-green, having near the base a zone of purplish-black, the green portion semi-translucent, the surface glistening; those laid on the paper began to change on the 4th of August, by displacement of the black zone and the appearance of a blackish spot within the centre; on the 5th, the whole top grew at first cloudy, then blackish, the lower part paler green than before, this, on the 6th, became still paler, and the ribs whitish, and on that day, about 7 o'clock in the evening, three eggs hatched, and the fourth at 10 o'clock. The egg from Colchester hatched three days later, after previously passing through similar changes.

When just hatched, the larva has a large rounded head, and two distinctly separated anal points; its colour light dirty greenish-yellow, with three faintly darker lines down the back, the head dark chocolate-brown.

The next day after hatching, each larva was resting on the tip of a leaf; each leaf thus tenanted showed that, at a little distance below the larva, a small portion had been eaten from its edge on one side, *quite through the whole substance*; the larvæ were now just one-eighth of an inch long, and on their rough granulous heads could be seen, with the aid of a lens, two large, somewhat bright, oval, smooth patches of paler colour, each with a central dark spot occupying the crown of the lobes, the body light yellowish-green, faintly showing a darker dorsal line and slanting side streaks.

I found the Colchester larva, when but five days old, lying dead where it had been feeding on the edge of a leaf, the cause of this mishap betrayed by the state of the food, which could not be changed the day before without risk, as three of the larvæ just a week old were fixed for moulting, each on a coating of silk, spun either on the glass cylinder, or on the side or tip of a sallow leaf; the other larva, not previously visible for a day or two, now made its appearance again, having already completed its first moult, furnished with remarkably long and stout horns, cleft at the dark reddish tips; this I noted as No. 1, a very lively and active little creature, roaming over the sallow leaves for an hour or two after its removal from the rest before establishing its footing on a leaf point.

On the tenth day, No. 2 on the cylinder, moulted; on the twelfth day, No. 3 on a leaf tip, had also moulted, both furnished with horns like No. 1. The remaining larva moulted on the thirteenth day, but without horns, the head being much the same as before, though the colouring of the body was changed like the others, viz., to a bright green, with yellowish sub-dorsal stripes on the six anterior segments, and yellow slanting lines along the sides, the points of the tail brought close together appearing very like one anal point, ringed with red; this hornless larva fed and seemed very lively and well up to the twenty-first day, when it spun a layer of silk on a leaf, on which it remained quietly for a couple of days, then at intervals struggling and contorting itself during two more, and, in course of the day following, it died with its front segments rigidly curved backward.

From the end of August my attention was devoted to the three survivors, of which No. 1 had moulted a second time on August 21st, a third time on the 28th, and a fourth time on September 5th, when it was a little over one inch in length; on the 11th, it fixed itself for its fifth moult on silk spun upon the glass cylinder, and measured then one and three-eighths of an inch in length; by the 21st, it had attained its greatest length of two inches, and was stout in proportion. From this date, although continuing to feed well, it appeared to be getting shorter by slow degrees, and the few scattered purplish-black points as usual appeared, and, by the 25th, had greatly increased, forming dark blotches on the back of the tenth, eleventh, and twelfth segments, the green general ground colour becoming paler; in the afternoon of this day, it left its favourite silk carpeted leaf, where latterly it always returned to rest after every meal made on other leaves, and took up a position on a stem, head downwards, the head and front segments hanging free, but in half-an-hour it removed to another stem where, in

a similar posture it remained for about the same space of time, but here, as previously, it seemed incommoded by too close proximity with other stems and leaves, for it again moved off and ascended to one of the upper leaves and crept beneath it, and there, after resting a few minutes, it began to spin a coating of silk, leisurely adding to it at intervals during the evening, and probably during the night, as I noticed next morning some stout threads had been spun from the foot-stalk of the leaf to the main stem, firmly securing the position of one to the other; the larva now remained quite still, its head and horns in line with the body towards the stem, and its tail a little way from the tip of the leaf, the back much arched, the anal pair of legs securely fixed in a pad of silk, and the first ventral pair clinging to the silken carpet which they dragged off a little from the leaf at the point of contact; the assimilation in colour to the under-side of a sallow leaf was very perfect.

Larva No. 2 completed its third moult on September 5th, then, seven-eighths of an inch long; after this, it was kept apart, feeding well, and attaining the length of about two inches by the 25th of the month; and on the 28th, had spun its carpet under a leaf, and secured itself similarly to the preceding.

Larva No. 3 moulted a second time on the 3rd of September, when its length was just half an inch; from this time it fed very sparingly, often changing its position as its food was changed, until the 25th of the month, when I found it was hibernating on the stem of a twig, the hinder half of its body enveloped in a mass of silk where it remained immovable; only by very gently touching its horns occasionally, as winter advanced, could I be sure it was alive.

Beyond keeping them in a room of which the window was closed only at night, I was unconscious of any thing I had done to stimulate premature development of the two larvæ which so rapidly attained full growth: certainly I attended to them carefully, and watched them with much interest, especially while feeding, an operation I noticed performed oftener by night than by day.

After moulting, the green colour of the larva was at first very pale, like the under-side of a sallow leaf, for a day or two, for which period it would remain on the under-side of a leaf, until its green colour had become brighter and darker, when it would again rest on the upper surface of the leaf; after the last moult, and sometimes before, each larva had a special leaf spun over the upper surface with silk, on which it rested in such a position that its head was facing the footstalk, and

bent down, so as almost to touch the leaf, the anterior legs drawn in close to the body; sometimes all the ventral legs, and sometimes only the third and fourth pair in addition to the anal pair, had a footing on the silk; when hungry, the larva would quit this, make a rapid meal, and return again to rest. Some leaves were so ravaged that only the midribs were left. Once I was rather surprised to see the second larva eat off a large strip from one side of its silk covered resting leaf, together with the silk on it, but leave the rest untouched.

Towards the end of September, a week of suddenly severe cold weather killed my two large larvæ just as they seemed about to pupate, and, unluckily, before I could remove them to a hothouse; and, before the year had ended, the third smaller larva, of which I had great hopes as being in a more natural state of hibernation, died also.

Emsworth: *April 3rd, 1876.*

DESCRIPTIONS OF HITHERTO UNCHARACTERIZED *PHYTOPHAGA*.

BY JOSEPH S. BALY, M.D., F.L.S.

(continued from Vol. xii, page 75.)

Fam. CRIOCERIDÆ.

LEMA EMARGINATA.

Oblonga, convexa, flava, nitida; ore, antennis, articulo basali excepto, pectore, abdominis basi et maculis, pedibusque nigris, femoribus tibiisque (basi et apice exceptis) flavis; thorace transverso, lateribus medio valde constrictis, ante apicem lateraliter productis; scutello apice emarginato; elytris profunde punctato-striatis, punctis ad apicem minus fortiter impressis; femoribus posticis modice incrassatis, muticis. Long. 3 $\frac{3}{4}$ lin.

Hab.: Cape of Good Hope; a single specimen.

Head smooth, impunctate, neck moderately constricted, front impressed on either side with an oblique groove; clypeus triangular, bordered on the sides by a deep groove; its lower half, together with the parts of the mouth, black; its surface sparingly clothed with sub-erect whitish hairs; antennæ robust, rather less than half the body in length, basal joints short, sub-globose, fulvous, its apex piceous, second very short, third and fourth equal, each one-half longer than the second, the remaining joints thickened, cylindrical, closely clothed with adpressed hairs. Thorax nearly one-fourth broader than long, sides deeply excavated in the middle, produced laterally in front, the produced portion obtuse; upper surface distinctly flattened on the disc, transversely sulcate in front of the base, the sulcation faint, ill-defined, impressed in the centre with a large fovea, surface smooth and shining, impressed in the middle with a broad longitudinal row of punctures; on

either side of the disc, just behind the anterior border, is a large shallow excavation. Scutellum sub-quadrate, its apex broadly emarginate. Elytra much broader than the thorax, punctate-striate, the punctures large, rotundate, deeply impressed. Hinder thighs distinctly thickened, unarmed. Abdomen shining, very sparingly clothed with short adpressed hairs, fulvous; nearly the whole of the basal segment, a small spot on either side of each of the three following segments, and a transverse stripe on the apical segment, black.

This species must be placed near *L. robusta*, Lac.

LEMA TRANSVERSO-NOTATA.

Sub-elongata, parallela, nigra, nitida; abdominis limbo, capite (antennis exceptis), thorace elytrisque rufo-fulvis, his regulariter punctato-striatis, utrinque punctis duobus parvis, prope medium transversim positis, nigris.

Long. 3½-4 lin.

Hab.: Guinea, Camaroons.

Vertex smooth, impunctate, neck constricted, front bordered on either side by the usual oblique groove, its surface thickened, impressed at its upper end with a deep fovea; inner orbit of the eye coarsely punctured; antennæ with the two lower joints rufo-fulvous, the rest black, with a faint steel-blue reflection, basal joints moderately thickened, the second short, ovate, the third and fourth equal, each twice the length of the second. Thorax sub-quadrate, sub-cylindrical, slightly flattened above; sides broadly and deeply constricted in the middle; upper surface smooth, impunctate, transversely sulcate just in front of the basal margin. Elytra much broader at the base than the thorax, sides parallel in front, their apex broadly rounded; above convex, very faintly transversely depressed; finely punctate-striate below the basilar space, the interspaces plane, impunctate; each elytron with two small roundish black spots placed transversely just before the middle of the disc, the first occupying the space between the fifth and sixth striae, the other situated near the outer border.

LEMA HAROLDI.

Oblonga, sub-cylindrica, rufo-fulva, nitida; pleuris, antennis (articulo basali excepto), pedibusque nigris, femoribus posticis subtus rufo-piceis; thorace sub-quadrate, sub-remote punctato, lateribus medio modice constrictis; elytris infra basin transversim depressis, basi distincte ad apicem tenuiter punctato-striatis, interspatiis planis, lævibus.

Long. 4 lin.

Hab.: Guinea, Camaroons.

Vertex smooth, impunctate, neck constricted; front obliquely sulcate on either side, impressed in the centre with an oblong fovea, clypeus triangular, bounded on either side by a deep groove, remotely punctured, sparingly clothed with adpressed fulvous hairs; orbit of eyes coarsely punctured, clothed with similar hairs. Antennæ half the length of the body, basal joints sub-globose, stained with piceous.

second short, third and fourth equal, each about one-half longer than the second, first joints obscure rufo-piceous, the two following also stained with piceous. Thorax sub-quadrata, slightly broader at the base, sides moderately constricted in the middle, rounded and converging at the apex; above sub-cylindrical, finely and sub-remotely punctured, the inner whole surface between the larger punctures, when viewed under a lens, is seen to be very minutely punctured. Scutellum oblong, narrowed from base to apex, the latter rounded. Elytra much broader than the thorax, sides parallel, the apex broadly rounded; above convex, transversely depressed below the basilar space, regularly punctate-striate, the punctures strongly impressed on the anterior half, much less so below the middle; interspaces plane. Hinder thighs unarmed.

This species, together with the preceding, ought to be placed close to *L. mitis*, Clark.

LEMA SAUNDERSI.

Sub-elongata, late fulva, nidida; antennis, pectore, abdomine, pedibusque nigris, femoribus (apice maculâque dorsali exceptis) fulvis; elytris leviter rugulosis, regulariter punctato-striatis, obscure metallico-iridibus aut cæruleis, limbo laterali vittâque sub-suturali, apice conjunctis, fulvis.

Long. 4-5 lin.

Hab.: Brazil (Rogers); two specimens, formerly in the collection of Mr. W. W. Saunders, after whom I have named this species.

Vertex smooth, impunctate; neck moderately constricted; front impressed on either side by an oblique groove; antennæ slender, the basal joints sub-globose, fulvous, stained above with piceous, second joint short, third twice the length of the second. Thorax slightly broader than long, sub-cylindrical, flattened above, sides deeply constricted in the middle; disc smooth and shining, a longitudinal stripe down the middle, together with a space on either side just behind the anterior angle, impressed with distinct punctures; on the medial line at some distance in front of the basal margin is a faint transverse depression, in the middle of which is placed a single deep fovea. Scutellum trigonate, its apex obtuse, and stained with nigro-piceous. Elytra much broader than the thorax, oblong, slightly dilated towards the apex, the latter broadly rounded; above convex, finely punctate-striate, the striae towards the apex nearly obsolete; general surface finely and rugosely strigose.

Nearly allied in size, form, and sculpturing to *L. apicalis*, Lac., but differing entirely in the pattern of its elytra.

LEMA BUCKLEYI.

Elongata, sub-cylindrica, pallide fulva: nitida, capite, pectore, tibiis tarsisque nigris, antennis fuscis, articulo primo picco, ultimis duobus sordide albidis, femoribus picco tinctis; elytris regulariter punctato-striatis, viridi-metallicis, fuscâ latâ prope medium apiceque fulvis.

Long. 3½-4 lin.

Hab.: Ecuador; collected by Mr. Buckley.

Neck constricted, shining, impunctate, its extreme base fulvous; front impressed on either side by a deep oblique groove, its apex also impressed with a short longitudinal line; clypeus sparingly clothed with sub-erect hairs; antennæ two-thirds the length of the body, slender, basal joints thickened, sub-globose, second very short, the third three times the length of the second, the fourth longer than the third; the first joint piceous, the second to the ninth fuscous, obscure fulvous beneath, the tenth and eleventh yellowish-white. Thorax slightly longer than broad, sub-cylindrical, sides deeply constricted in the middle; above transversely sulcate in front of the base, the sulcation broad, shallow, and ill-defined, a longitudinal space down the middle and another on either side just behind the anterior angle, finely but distinctly punctured. Scutellum black, oblong, its apex obtuse. Elytra broader than the thorax, sides parallel at the base, slightly dilated below the middle, the apex sub-acute rounded, above convex, faintly excavated on either side near the suture, just below the basilar space; humeral callus prominent; surface regularly punctate-striate, the ninth stria from the suture entire; interspaces plane, slightly convex towards the apex and on the sides.

LEMA RUFO-LIMBATA.

Robusta, rufo-picea, nitida; tarsis, tibiis anticis quatuor apice, antennisque (articulo primo fulvo excepto), nigro-piceis; elytris regulariter punctato-striatis, striâ nonâ medio rix interruptâ, flavis, utrinque (basi exceptâ) rufo-limbatis. Long. $3\frac{1}{2}$ lin.

Hab.: Parana.

Vertex finely but distinctly punctured; front with the usual oblique groove on either side, inner orbits of eyes coarsely punctured; clypeus triangular, coarsely but remotely punctured, sparingly clothed with sub-erect hairs; antennæ robust, rather longer than the head and thorax; basal joints sub-globose, the second very short. Thorax rather broader than long, sub-cylindrical, sides deeply constricted in the middle; upper surface transversely grooved in front of the basal margin, the sulcation faintly wrinkled; a longitudinal line on the middle of the disc and a space on either side just behind the anterior angle distinctly punctured, the basal margin indistinctly edged with rufous. Scutellum triangular, its apex truncate. Elytra much broader than the thorax, sub-quadrate oblong, convex, slightly flattened along the suture, not depressed below the basilar space, punctate-striate, the ninth stria from the suture slightly interrupted in its middle third, the punctures being there placed at irregular intervals; interspaces plane, moderate convex near the apex; each elytron with its entire margin (the middle of the basal border excepted) edged with bright rufous, the rufous border is nearly uniform in width during its whole extent, with the exception of the apex of each elytron, where it is dilated, and forms a triangular apical patch.

LEMA ARIADNE.

Sub-elongata, rufo-fulva, nitida, antennis pedibusque nigris; elytris

metallico-cæruleis, infra basin transversim excavatis, sat fortiter punctato-striatis, punctis ad apicem minus fortiter impressis, striâ nonâ medio interruptâ; interspatiis planis, ad apicem et ad latera vix convexis.

Var. A—Elytris basi maculâ rufo-fulvâ notatis.

B—Pectore abdomine nigris.

Long. 3½ lin.

Hab. : Para, Santarem.

Vertex smooth, impunctate, impressed in the middle with a longitudinal fovea bounded on either side by an oblique groove, its surface (seen under a lens) minutely but not closely punctured, sparingly clothed with short, fine hairs; clypeus impressed with a few deep punctures, clothed, as well as the inner orbit of the eyes, with hairs coarser than those on the front; antennæ two-thirds the length of the body, slender, basal joints incrassate, broadly ovate, second short, sub-ovate, third and fourth nearly equal, each about twice the length of the second, basal joints more or less stained with rufo-piceous. Thorax rather broader than long, sub-cylindrical, sides deeply constricted in the middle, upper surface transversely sulcate in front of the basal margin, the sulcation ill-defined, impressed in the middle with a single deep fovea; a longitudinal space occupying the middle of the disc, together with a patch on either side, just behind the anterior angle, distinctly punctured. Scutellum trigonate, its apex obtuse. Elytra much broader than the thorax, sides parallel; above convex, rather deeply excavated below the basilar space; the humeral callus prominent; surface rather strongly punctate-striate, the punctures finer and less deeply impressed posteriorly; interspaces plane, scarcely thickened towards the apex; on each elytron near its apex is a large shallow excavation. Body beneath clothed with short silky hairs.

(To be continued.)

The vernal broods of white butterflies in the Isle of Man.—A few remarks by Mr. Stainton in the E. M. M. for June, 1875, No. 133, p. 13, on the prior appearance of *Pieris rapæ* or *napi*, caused me to watch for, and capture, the first white butterflies which I saw on the wing here this spring. I did not see a specimen until April 13th, when I captured both *rapæ* and *napi*.

I had a number of pupæ of *P. rapæ* collected in March—the first of these emerged April 11th—but, having been kept in a conservatory, they would probably be slightly forced. It would thus appear that, in the Isle of Man, *rapæ* and *napi* appear simultaneously.

On the cliffs, where my walks have mostly been, *napi* is much the more abundant species. *Pieris brassicæ* made its first appearance April 24th. I have not yet seen *Anthracis cardamines*.—EDWIN BIRCHALL, Derby Square, Douglas, Isle of Man: May 12th, 1876.

The supposed new British species of Leucania.—I am sorry to say my supposed *Leucania* (vide vol. xii, p. 279) turns out to be a variety of *Nonagria lulosa*. I am indebted for this information to Dr. Staudinger of Dresden, who informs me the

aberration is occasionally met with on the continent. I can find no English specimen resembling mine.—BATTERSDELL GILL, M.D., 9, Cambridge Terrace, Regent's Park : 3rd May, 1876.

Food-plant of Agrotis agathina.—It may be remembered that I tried, through the pages of this journal, to obtain information touching the rearing of this beautiful moth. One collector in Yorkshire possesses the secret, but refuses to impart the same unless for money. Mr. Tugwell, of Greenwich, on the contrary, kindly informs me he feeds the larvæ on *Erica tetralix*, and succeeds in rearing the moth. This morning I took my sweeping-net into a low pine wood, with a carpeting of *Calluna vulgaris* and *Erica cinerea*. I soon filled my boxes with innumerable larvæ of *Agrotis porphyrea*, and many *A. agathina*, the latter being still mostly very small. I noticed, however, what may turn out to be valuable, and indeed the real secret of success in raising *agathina*, viz., that where the *Calluna* grew by itself, I found few or no *agathina* larvæ, but where *E. cinerea* occurred in large patches, I found them very frequent, sometimes as many as seven or eight being found at once in the net. Bearing this in mind, I intend, when the larvæ are full-grown in the end of May, to feed them exclusively on *Erica cinerea* and *tetralix*, and have great hopes of success.—G. NORMAN, Cluny Hill, Forres : 4th April, 1876.

Description of the larva, &c., of Anarta melanopa.—For eggs of this, and of the following species also, I am indebted to the kindness of Mr. J. T. Carrington, who sent them to me from Perthshire.

I received the eggs on June 4th, 1875; the larvæ hatched on the 10th; they soon began to feed on tender leaves of *Arbutus unedo*, or *Luzula pilosa*, sallow, flowers of *Helianthemum vulgare*, and on *Vaccinium vitis-idaea*, and by the 16th were growing and thriving well. By July 3rd they were three-quarters of an inch long, and feeding only on sallow, *Salix caprea* and *S. acuminata*, having gradually deserted the other food-plants supplied to them; those that now survived, some two or three only, continued to feed till after the middle of the month, and about the end of the third week in July turned to pupæ, one of them, without having attempted a cocoon, became a bare pupa on the surface of the soil; but as another entered the earth, and apparently formed a cocoon, we may suppose the latter would be the habit in a state of nature.

The egg is almost globular, the shell delicate, shining, with rather more than fifty ribs, the transverse reticulation shallow, the top a little puckered; colour when received, a delicate pink.

The newly-hatched larva with sixteen legs, but the ventral pair on seventh not serviceable, and those on eighth smaller than those on ninth and tenth; the usual warts small in size, and all placed on little eminences, and furnished with longish pale bristles; the colour semi-translucent whitish, but the back purplish, and the head pale brown, the warts black.

In about a week, the legs on the 8th became nearly as much developed as those on the ninth and tenth, and those on the 7th increased in size; the whole body greenish, the back became brownish with pale central stripe, also a wider pale sub-dorsal stripe with a brownish thread through it. In about another fortnight the length attained was three-quarters of an inch, the figure of the usual *Noctua* type.

tapering a little forwards from the 5th, and the 13th sloping rapidly; the skin soft and velvety; the ground colour deep purplish-pink, dorsal line ochreous-brown boldly outlined with blackish, but interrupted on the fore-part of each segment by a reddish-brown triangular mark; this triangle is met on either side by a thick black wedge-shaped mark, below which again comes the continuous bright yellowish-white sub-dorsal line; this line is thin on the thoracic segments, but beyond them widens in such a manner that the widest part of it on each segment is near the end of the above-mentioned black wedges, and the whole line is finely edged with black throughout; the side is similar in colour to the back, but very much obscured by dark reddish-brown freckles, and with a short blackish streak slanting downwards on each segment; the spiracles oval and blackish; the sub-spiracular stripe yellowish white suffused beneath each spiracle with red, and delicately freckled with red along the middle; the belly and legs dark purplish-brown, the head also of this colour, with darker reticulations.

After the final moult, the length became about seven-eighths of an inch, with the colouring much as before, except that the sub-dorsal line had become thinner, only just visible on the thoracic segments, and on the others much attenuated at each end, but still continuous. In about ten days from the final moult, the full length was attained of somewhat over one inch and a quarter, the figure being slender for a *Noctua*; the ventral legs now all of one size; the bulk uniform: in general effect the appearance was less dark than before, though the details still remained the same, only the pale sub-spiracular stripe had become still more obscured by red and brown freckles; the tubercular dots of the back not noticeable, being situate within the black wedges: the spiracles now ochreous-brown finely outlined with black, and each placed on an unfreckled spot of the paler ground colour; the belly mulberry colour; the whole surface velvety, except the head, which is hard and shining, and of a reddish-brown colour with darker reticulation, and a blackish streak down the front of each lobe.

The pupa, which lies exposed, is rather more than half an inch in length, smooth and rounded in figure, with the abdomen tapering off rather quickly, and ending in a blunt spine; very glossy, and in colour black, the segmental divisions being at first reddish.—J. HELLINS, Exeter: *February*, 1876.

Description of the larva, &c., of Anarta cordigera.—The eggs which I received from Mr. Carrington on June 5th, 1875, were laid on June 1st, and the larvæ hatched on the 12th; meanwhile I had received from Mr. Buckler another supply of eggs, or rather newly-hatched larvæ, on the 10th, which had been sent him by Dr. F. Buchanan White. The young larvæ ate at first *Luzula pilosa*, *Arbutus unedo*, and *Arbutus uva-ursi*, the last kindly supplied by Dr. White; but after a time they were quite content with young leaves of *A. unedo*, and preferred them to those of *A. uva-ursi*, although I had been at the trouble of obtaining a fine growing plant from Messrs. Veitch, of Chelsea, in order to give them fresh tender leaves.

Both broods of larvæ grew and kept pace with those of *melanopa*, by July 3rd having become nearly three-quarters of an inch long, and by the 16th being full-fed, and returning to earth about the 23rd.

The egg is about the size of that of *melanopa*, but not so globular; with about

forty shallow ribs, and with faint transverse reticulations; the shell shining; the colour when laid cream white; in a week becoming whitish with a faint reddish irregular ring and blotches.

The newly-hatched larva is of the same size as *melanopa*, but darker in colour, being pale dull purplish, with the head, collar, and anal plate shining blackish, the warts also blackish, distinct, and furnished with very short bristles, the ventral legs on the seventh and eighth small, and not useable. In about a week, the colour changed to pale greenish, except the back, which was brownish, with pale dorsal and sub-dorsal stripes, the head and warts still remaining blackish.

At the end of the third week from hatching, the larvæ were nearly three-quarters of an inch long, and all the ventral legs were used, those on the seventh and eighth, however, being still smaller than the others; the colour was now deep purplish-brown both above and below, with a white dorsal line, and a faint indication of a sub-dorsal line, but only on the second and thirteenth, the sub-spiracular stripe pale primrose-yellow; the whole skin soft and velvety; the head horny. In another week, and after the final moult, the length was nearly an inch; the purple-brown of the back now obscured by black, and on the sides freckled both with black and with paler brown; the dorsal whitish line thinner than before, and sometimes interrupted at the divisions by the ground colour, the sub-dorsal, though faint, now showing slightly all its course; the sub-spiracular stripe becomes brownish-ochreous and freckled with crimson-brown, the belly and legs dark purplish-brown; the head dark purplish-brown, with a blackish blotch on the corner of each lobe, hard and shining. At the end of the fifth week from hatching, the full length was attained of one inch and three-sixteenths; the figure slender for a *Noctua*; all the ventral legs about the same size; in the colouring there were two varieties at least, and perhaps, in a larger number of examples, more variation might have been observed; the lighter variety had the ground colour crimson-brown, all the details much as before, both the pale and the black freckles being more distinct; the darker variety became almost black, and had only a trace on the end of each segment of the dorsal and sub-dorsal lines; the sub-spiracular stripe was brown, and tinged with deep lurid red; the belly sooty-brown.

All the survivors of both broods, some four or five in number, spun up in long rounded earthen cocoons on the surface of the soil.

As a postscript to this and the preceding note, I would say, that from the information I have received from my friends, the natural food of *A. cordigera* must be *Arbutus uva-ursi*, and that of *A. melanopa* probably *Menziesia carulea*, but of this I am not sure; of course *Arbutus unedo* and *Salix caprea* are only substitute foods.—ID.

Description of the larva of Acidalia emarginata.—I have several times had the eggs of *Acidalia emarginata*, but it was not until last year that I succeeded in rearing the larvæ to maturity, the specimens being the result of a batch of eggs received from Mr. F. D. Wheeler, of Norwich, on the 29th July, 1874. The eggs are oblong-oval, and, when fresh, are orange colour, but, before hatching, change to purplish-red; this event took place the day following their arrival. The newly-emerged larva is olive-green, with wainscot-brown head. Being supplied with *Polygonum aviculare*,

they fed and grew slowly until hibernation, which portion of their existence extended over a long period, as they ceased feeding in the autumn, and did not re-commence until early in May following. By the middle of June, they were full-grown, and may be described as follows:—Length about three-quarters of an inch, and of average bulk in proportion; head about the same width as the second segment; it has the face rather flat, but the lobes rounded, and is notched on the crown. When viewed from above, the body seems flat, but seen from the side, the under surface is rounded; the 9th segment is the widest, and from it the rest gradually taper towards the head; the 10th, 11th, 12th, and 13th, are of about equal width: all these overlap considerably, thus rendering the divisions very distinct; this overlapping, too, makes the skin at the side appear as a conspicuous lateral ridge. The skin is tough, and has a rough appearance, owing to its being transversely ribbed throughout.

The ground colour is dirty ochreous, in some specimens strongly suffused with a dingy smoke colour; the head is of the same colour, and from it extends a pale dorsal line, this line being bordered, on each side of the 10th to 13th segments, with an irregular, broad, and very dark, stripe; on segments 2 to 5 these stripes are paler and narrower, whilst on segments 6, 7, 8, and 9, they become conspicuous black X-like marks; the side of the lateral ridges is tinged with reddish-ochreous, and there are various brown freckles between this and the dorsal line. The ventral surface is of the same tint as the ground of the dorsal surface, and is freckled with brown.

The larvæ began to spin loose cocoons, in the corners at the bottom of the cage, on the 21st June. The pupa is about three-eighths of an inch long, smooth and shining; the colour reddish-yellow, with the wing-cases greenish.

The first imago appeared on the 15th July, and was speedily followed by the remainder.—GEO. T. PORRITT, Huddersfield: *May 3rd*, 1876.

Natural History of Crambus tristellus.—On the 28th August, 1874, Mr. W. Robinson-Douglas kindly sent me a small batch of eggs of this species loose in a quill, which were the more welcome from the fact of my having obtained a batch the year before, but with no satisfactory result beyond learning something of the voracity of the larvæ, for whilst young they entirely killed a large pot of grass before the following spring, and when I looked for them had all escaped in quest of fresh pasture.

In order to prevent a similar failure, I this time provided several large pots of *Aira flexuosa* and *cæspitosa*, among which the newly-hatched larvæ were distributed on the 12th, 13th, and 14th September, and, beyond a little attention to the grass by occasional watering, they were not disturbed until April, 1875, when I began to search the remains of the grasses for the larvæ. Amongst the *A. cæspitosa* none could be found, only a number of quite small empty galleries, which had been abandoned at an early period, with but little damage to this grass, a proof of its unsuitability. Two pots of *A. flexuosa* had been so ravaged as to be destroyed, the lower parts of the dead grass had a number of silken cases or galleries, both little and big, spun amongst it and covered with frass, but no larva remained, and although several vigorous plants of *Luzula multiflora* were by chance still growing amidst the dead *A. flexuosa*, they had not kept the larvæ from wandering away, nor had they been eaten at all.

The third and largest pot of *A. flexuosa*, though greatly ravaged, still had a little of the grass alive, and here, amongst a great number of the silken galleries, I was glad to find four tenanted; one gallery was covered with dry frass, the other three partially protected externally with small particles of moss, some of which was growing in patches at the base of the grass; each was spun amongst the grass in a vertical position, the lower end rather over half an inch from the earth; the length of these galleries varied from three-quarters of an inch to one inch and a quarter: their shape a little inclining to fusiform, but yet rather irregular in figure, made of strong grey silk, and very smooth within. When removed to a fresh pot of *flexuosa* these larvæ fed well for a time, but early in June they deserted these dwellings and constructed little silken lined tunnels in the light soil amongst the upper parts of the grass roots, and therein, during July, they pupated. The moths appeared from August 1st to 11th.

The egg of *tristellus*—which, as far as the experience of these two batches enables me to speak, appears to be deposited free, and not attached by the moth to anything—is in size rather large for that of the moth, of a long elliptical shape, and ribbed longitudinally; when first laid, of a whitish straw colour, turning in about five days to buff, on the tenth day to light brown, from thence growing gradually to dark brown or dark red, and, within two days of hatching, to a dingy purplish tint. In this instance, the hatching continued at intervals from the sixteenth to the nineteenth day.

When first hatched, the larva is less than the sixteenth of an inch long, of a dingy pink colour, with large black head and plate on the second segment. Not having examined them till the following spring, I can give no account of the intermediate moults, but, towards the end of April in the following year, I found the smallest larva to be three-eighths of an inch, two others about half an inch, and the largest three-quarters of an inch, in length; the ground colour of the smallest pale pinkish-grey, the next sizes more strongly tinged with pink, and the largest a darker reddish-grey, the ground colour of each being paler on the hinder segments, and, by degrees, darker towards the head; the belly a little paler than the back. The conspicuous character of this genus—the dark shining spots—were, in the smallest example, lightish brown, and blackish-brown in the others; the anterior plate dingy brown in the smallest, and quite black in the largest, dorsally divided by a fine thread of greyish; the head of each was quite black, and the hinder plate of the ground colour. At the beginning of June, the larvæ, then full-grown, were all of about the same size, measuring three-quarters of an inch in length, and their skins changed to a light fawn colour and to light brown, and, as before, smooth without gloss, the head, plates, and spots only being glossy; the spots on the thoracic segments transversely oval and fusiform, on the back of the other segments the first pair transversely squarish-ovate, the second pair transversely linear; those along the sides longitudinally squarish-ovate; those situated behind and below the spiracles of the ground colour, but shining; the spiracles small, round, and black.

The pupa nearly half an inch in length, rather slender, with longish wing-covers, smooth and shining, of a light brown colour.—WILLIAM BUCKLER, Emsworth: April 3rd, 1876.

[The species of *Crambus* are generally looked upon as comparatively harmless insects, but, from the foregoing account, it is evident that *C. tristellus*, where it abounds, can be a destructive pest in grass lands.—EDS.]

Early appearance of Caloptria aspidiscana and Elachista subnigrella.—On the 6th inst., as it was fine and warm, I paid a visit to Grange, and took a female of *C. aspidiscana*. I had spent five hours without much result until 4 p.m., when, to my surprise, *Elachista subnigrella* turned up, and I succeeded in taking a score of specimens, but only one female among the lot. *Gracilaria auroguttella*, *Pancalia Leeuwenhoekella*, and a few *Lithocolletis*, made up my catch. Two days later, I again went prepared to fill some scores of boxes, but things had changed, and I had only four moths to set after spending a day and travelling seventy-two miles. A cold wind did all the mischief.—J. B. HODGKINSON, 15, Spring Bank, Preston: *May 11th*, 1876.

Note on sugaring.—In reply to Mr. Porritt, concerning my note on sugaring (Vol. xii, p. 207), I may state that the ivy was perfectly free from dew when I sugared it, and also, that no rain had fallen for some days previous. I may also state what I omitted to mention before, that I subsequently sugared several times, in the same manner and place, and invariably with the same result,—many insects at the sugar and very few at the ivy bloom. I do not think that sugaring has had the attention paid to it that it deserves. From accounts received from different quarters, ivy bloom does not seem to possess such great attraction for insects in Scotland, in some parts at least, but by making a series of trials of sugaring near ivy, next autumn, and, by noting down the results, I may obtain more decided evidence.—WM. SANDISON, Glasgow: *17th March*, 1876.

A strange hibernaculum.—While examining our one church bell on March 28th, I was surprised to find, in the interior, eight specimens of *Gonoptera libatrix* and three of *Vanessa urticae*. The bell is never rung mouth upwards, but even in ordinary chiming one would have thought the vibration must be too great to make such a situation at all desirable as winter quarters.—H. JENNER FURST, JUN., Hill Court, Gloucestershire: *April 3rd*, 1876.

Observations on the development, indoors, of hibernating pupæ of Lepidoptera.—The often inexplicable death of pupæ, when hibernating in the house, induced me to make close observation of the matter, in order to ascertain the cause of the great mortality. The number of pupæ which I collected for this purpose, in the autumn of 1872, amounted to several hundreds, and included most of the genera of the *Macrop-tera*. I put them, bedded on moss, in a large receptacle in the room, and moistened them with water from time to time. Treated in this manner, only one-half of the pupæ produced perfect insects; the other half became diseased, so that the segments of the abdomen gradually became contracted, movement became impossible, and thus the death of the pupæ ensued. In some other species, such as *Smerinthus ocellatus*, in consequence of being too little moistened, the pupa-case had become so hardened that the moth could not break through it, and died inside, although fully developed. These results showed me that pupæ kept indoors must be kept damper, and in the following year I made a renewed attempt with a number of pupæ equal to that of the foregoing year. At the end of December I brought them from a cold into a warm room, and sprinkled them with water daily, whereupon *Papilio Machaon* and others, which only wanted a short time for their perfect development, were influenced

to make an early appearance; whereas a large portion of the *Bombycidae* showed an aversion to direct contact with water, and an entirely negative result was demonstrated with this family.

On the other hand, the *Sphingidae*, in consequence of the sprinkling, showed great vivacity, and therefore led me to expect the best success. I continued to moisten them, yet, after six weeks, most of them had lost their liveliness, and only about two-thirds became developed. When I examined the undeveloped pupæ, I found they were covered with a thin, chalky scale, caused by the water; the insect inside was pretty well formed, but dead. This chalky deposit on the pupæ had excluded the air, and caused their death.

From this experience with pupæ hibernating in rooms it follows, that—firstly, continuous moisture is necessary to the production of perfect insects; secondly, the moisture must not be brought into direct contact with the pupæ: in a state of nature many insects know how to protect themselves therefrom by spinning coverings, by forming cells in the earth, &c.

These facts gave me the idea of constructing the apparatus described below, which has proved to be so practically serviceable, that even species difficult to rear, such as *Doritis Apollo*, &c., have developed most perfectly. I had also the pleasure of seeing that under my new treatment none of the pupæ suffered from the evils above mentioned.

I believe that the description of my apparatus will do many breeders a service, especially as the simplicity of the contrivance permits it to be easily obtained; and I cannot sufficiently commend the practical value of it.

Description.—The base consists of a round plate of strong zinc, with two vertical rims, an inch high, placed one within the other an inch apart, and soldered to the basal plate so that the outer one is water-tight. The inner rim must be perforated with small holes as close to the bottom as possible. The space inside the inner rim must be filled with fine sand, on which the pupæ should be laid. The space between the two rims is then filled with water, which finding its way through the holes in the inner rim to the sand, causes the necessary moisture. Over the whole is put a bell-shaped cover of wire-gauze which must fit tightly over the outer rim. In this receptacle the pupæ remain untouched, and receive fresh moisture, as above indicated, if required by the drying of the sand.—H. BACKHAUS, Leipsic. (Translated from the Stettiner entomologische Zeitung, xxxvii, 192, 1876).

The colony of American white ants at Vienna.—At page 16, vol. xi, of this Magazine, when noticing the fact of an African species of *Termitide* having acquired a (happily) temporary footing in the Museum at Kew, I alluded to the colony of the American *Termes flavipes* in the gardens of Schönbrunn at Vienna. According to a note by Dr. Brauer in a just-published work on the *Neuroptera* of Austria (in the "Festschrift" der zool.-bot. Gesellschaft in Wien, 1876), it appears that this colony has been destroyed by a clearing-out of the hot-house infested by it, after many years' existence. There seems, however, to be some idea that the species is found in Portugal. It can naturally endure the severity of a New York winter; so we may expect to hear of it from other parts of Europe.—R. McLACHLAN, Lewisham: *Sth April*, 1876.

We are requested to announce that Mr. A. H. Swinton, of Binfield House, Waterden Road, Guildford, is engaged upon a work "On the passions evinced by Insects," especially as indicated by the sounds known as insect-music, considered as instrumental and vocal. The work will also contain researches on the hearing-power of insects, and an appendix of the genera known or reputed to have the power of producing sound; and it will be illustrated by four plates and wood-cuts.—EDS.

The Doubleday collection.—We have been requested to insert the following letter:—

South Kensington Museum, London, S.W. :

7th day of April, 1876.

Sir,

Bethnal Green Branch Museum.

I beg to acknowledge receipt of a memorial, bearing date 18th March, 1876, signed by you and seven other gentlemen representing the Haggerston Entomological Society, the East London Entomological Society, the South London Entomological Society, and the West London Entomological Society, in reference to the Doubleday Collection of Lepidoptera which has been lent by the Trustees for exhibition in the Branch Museum at Bethnal Green.

I have the pleasure to acquaint you, that upon careful consideration of the arrangements necessary for the proper care of the collection, it has been decided to give full effect to the wishes which have been expressed on the part of the four Entomological Societies named.

A room will be specially provided, and an attendant will be in readiness to show the collection to such persons as may apply to the officer in charge for permission to inspect it.

I am, Sir,

Your obedient Servant,

RENCLIFFE OWEN,

J. A. CLARK, Esq.,

Director South Kensington.

11, Duncan Place, London Fields, Hackney, E.

Review.

MONOGRAPHIA LYGEIDARUM HUNGARIÆ AKIR MAGYAR TERMÉSZETTUDOMÁNYI TÁRSULAT MEGBIZÁSÁBÓL. Irta Dr. HORVÁTH. Budapest, 1875. 4to, pp. 1—109, and 1 plate.

In this work, the author has described the species of *Lygaidæ* (*Hemiptera-Heteroptera*) known by him to occur in Hungary, of which three are cited as new, namely, *Plinthis hungaricus*, *Pachymerus validus*, and *Emblethis ciliatus*. The number of species enumerated is 100, but doubtless, as collectors in Hungary have been few, there are more species yet to be discovered there. The coloured plate is well executed, and the three new species are figured thereon. Unfortunately for most Hemipterists, the work is written in the Hungarian language, but the diagnoses of the genera and species are in Latin, and, referring mainly to known forms, may suffice for practical purposes.

Where there is so much to commend—and pains have evidently been taken to

be right—it would appear invidious to advert to the revival of the generic names *Pachymerus*, *Platygaster*, and *Heterogaster*, which have long been disused on account of prior employment; the more especially, as the author has followed and not led the way: in this, as in other things, all will be set right eventually. We hail, in the person of the author, the rising of a new star in the east, which we hope may prove to be the nucleus of a new constellation, by the light of which the Insect-Fauna of Hungary, now imperfectly known, may be fully investigated.

ENTOMOLOGICAL SOCIETY OF LONDON: 3rd May, 1876.—Sir S. S. SAUNDERS, C.M.G., Vice-President, in the Chair.

Mons. Jules Lichtenstein, of Montpellier, was elected a Foreign Member.

The Rev. J. Hellins sent for exhibition various British *Lepidoptera* lately submitted to M. Guenée for his opinion and determination. The collection included a dark variety of *Acronyeta myricæ* from Mr. Birchall; certain *Acidaliæ* sent by Mr. Hellins and Mr. G. F. Mathew, apparently to be referred to *manconiata*; several extraordinary aberrations referred to *Melanippe rivata*, *Oporabia* sp.?, *Coremia ferrugata*, &c., from Mr. Dale and Mr. Mathew; an example of *Polia chi*, var. *olivacea*, from Major Hutchinson; several *Eupitheciæ* from Dr. Buchanan White, including the var. *oxydata* of *E. subfulvata*, and an insect which Dr. White proposed to name *septentrionata*, not known to M. Guenée; the most important of all was a *Noctua*, bearing some resemblance to *Xanthia circellaris* (*ferruginea*), not known to M. Guenée, taken at Queenstown, over bramble-blossoms, in July or August, 1872, by Mr. Mathew. Concerning this insect it was remarked, that it had been shewn to Dr. Staudinger by M. Guenée, and that it was also unknown to him as European.

Mr. Douglas exhibited one of the palm-nuts (fruit of *Phytelephas macrocarpa*) known as vegetable ivory (or, in the vernacular, as 'Coroza,' 'Corassa,' or 'Coruseo'), imported in this instance from Guyaquil, infested by the larva of a beetle allied to *Bruchus*, which occasioned considerable damage to cargoes of these nuts.

Mr. Distant exhibited a series of six examples of the butterfly *Ithomia Tutia*, Hewitson, from Costa Rica. These had been selected to shew the very considerable variation in markings to which the species is evidently liable. He also communicated remarks on the *Rhopalocera* of Costa Rica, as addenda to the paper by Messrs. Butler and Druce, published in the Proc. Zool. Soc. for 1874.

The Secretary read a communication from the Foreign Office, enclosing a letter from Her Majesty's Minister at Madrid, concerning the ravages of Locusts in Spain. In this letter it was announced that considerable apprehension existed in certain parts of Spain as to the probability of the crops being destroyed by these insects during the ensuing season, as vast numbers of young Locusts had appeared, and military aid had been ordered in the affected districts. More precise information as to the species of Locust indicated was considered desirable.

DESCRIPTIONS OF SOME NEW GENERA AND SPECIES OF NEW
ZEALAND COLEOPTERA.

BY D. SHARP, M.B.

Some years ago, I received from Mr. Lawson, of Scarborough, some beetles collected in New Zealand by his brother, Mr. Thomas Lawson, of Auckland; and, subsequently, some additional species, in which he thought I should be interested, were liberally placed at my disposal by him. Captain Thomas Broun, of Auckland (now of Tairua), shortly afterwards sent me a number of species, the greater part of which I was obliged to return to him without names; and, lately, this gentleman has continued his entomological researches, and has forwarded me from time to time a considerable number of interesting species, a large proportion of which are undescribed. I have also received from Henry Edwards, Esq., of San Francisco, some interesting species collected by him some years ago in New Zealand; and I may mention that Captain Hutton, of Dunedin, also forwarded me a lot of beetles from the southern parts of the islands, but these, to my great regret, were lost in the post.

I have thus had the opportunity of examining a pretty good number of beetles from this interesting part of the world; but I am sure that those I have seen form only a small portion of the existing forms, and I feel pretty confident that the New Zealand species of the Order will reach the number of two or three thousand.

I now propose describing a few forms, many of which are of considerable interest, from the impossibility of reconciling them even with the best and most recent classifications. It would of course be premature at present to attempt to pronounce an opinion on the New Zealand Coleopterous fauna as a whole, but it is already certain, that highly specialized forms are in less proportion to the little specialized forms than is the case in the Northern portions of the Old World. At the same time, such forms are by no means absent; for instance, several indigenous species of *Cvindela* have been found.

Most of the new genera to be now described are what are called synthetic forms, *i. e.*, forms in which the characters of what may be considered distinct groups are combined in one insect. These new genera are nine in number, *viz.*, 1 of *Catopidæ*, 1 of *Colydiidæ*, 3 of *Tenebrionidæ*, and 4 of *Chrysomelidæ*.

HYDROPHORUS WAKEFIELDI, *n. sp.*

Euscus. sub-opacus, pedibus testaceis, thorace lateribus, clytrisque

flavosignatis, crebre punctatus; thorace lateribus minus curvatis, antrorsum leviter angustatis.

Long. corp. $4\frac{1}{4}$ mm.

Mas, femoribus posterioribus apicem versus triangulariter dilatatis.

Head closely and rather finely punctured, blackish, with the clypeus reddish at the front margin. Antennæ yellow, joints 5–10 infusate, with their bases pale. Thorax blackish, with the sides broadly yellow, the hind angles are nearly rectangular, and the sides are but little curved, and distinctly narrowed towards the front, the anterior angles being greatly produced, the surface is finely, closely, and evenly punctured, the punctuation becoming more indistinct towards the sides. Elytra blackish, with yellow marks, very variable in extent, they are nearly dull, and are evenly and finely, but distinctly, punctured, and on the middle of each is a series of larger punctures, they are regularly curved towards the apex. Legs yellow, with the hind tarsi more or less infusate, the hind tibiæ also sometimes darker. The under-surface is fuscous, closely and evenly punctured. The prosternal process is elongate, and much compressed laterally: the fourth joint of the front tarsi is quite visible between the lobes of the third joint.

In the male, the middle tibiæ are slightly curved, and the femora of the hind legs are triangularly dilated, so as to form an acute angle on the hind margin near the apex.

Found at Canterbury by Mr. Wakefield, and given to me by Mr H. W. Bates.

OBS.—Structurally, this species seems much allied to our European *H. carinatus*, but the prosternal process is more compressed laterally.

HYDROPORUS DUPLEX, *n. sp.*

Fuscus, fere opacus, crebre punctatus, pedibus rufis, thoracis lateribus, elytrisque indistincte testaceo-signatis; thorace lateribus bene curvatis, antrorsum angustatis.

Long. corp. $4\frac{1}{2}$ — $4\frac{3}{4}$ mm.

This species is very similar to *H. Wakefieldi*, but is rather larger, and the sides of the thorax are more rounded and narrowed in front; the testaceous markings are very indistinct, and the elytra have some obscure longitudinal elevations, which render their surface a little uneven, and the hind legs are longer.

Apparently a common species in the province of Auckland; it has been sent me both by Messrs. Broun and Lawson.

OBS.—Until I had carefully examined this species, I considered it to be only a variety of *H. Wakefieldi*, and I have sent it under that name to one or two correspondents. However, notwithstanding that it is very closely allied to the Canterbury species, I do not now think it will prove a variety thereof.

CYCLONOTUM MARGINALE, *n. sp.*

Nigrum, nitidum, sat convexum, pedibus rufo-piccis, antennis pal-

pisque rufo-testaceis; crebre punctatum, elytris seriebus punctorum apicem versus profunde impressis; tarsi posterioribus brevibus, articulo basali 2° longitudine æquali.

Long. corp. 4½ mm.

Head closely and finely punctured, and also with some larger punctures, which are most numerous and distinct at the sides behind the eyes. Thorax short, of the form usual in *Cyclonotum*, black, with the margins rather more dilute in colour, rather closely and finely punctured, and rather shining. Elytra shining black, with the lateral margins pitchy, each with ten rows of coarse punctures, which are most deeply impressed towards the apex, the internal ones being quite obsolete at the base, the interstices are finely and sparingly punctured, the lateral margins much explanate. Prosternum with a large process which is acute at its apex, in the middle in front. Mesosternal process stout, triangular, but with the sides depressed, so that it appears almost linear. Middle of metasternum raised, the elevated part shining and sparingly punctured, limited by two lines converging towards the hind coxæ, the sides densely and finely punctured, and quite dull. Legs short, pitchy, becoming more dilute towards the tarsi; the inner (or upper) face of the hind tibia flat, shining, with a few fine punctures, without any striæ; basal joint of the hind tarsus quite equal to the 2nd in length (indeed, when fully exposed, it is a little longer), 3rd rather shorter than 2nd.

Sent from Auckland by Mr. Lawson.

This interesting species approaches in appearance to *Cyloma Lawsonus*; compared with our European *Cyclonota*, it is aberrant in several respects, but as the extra European allied species are numerous and but little known, it would be premature to make a new generic name for it.

METOPONCUS BROUNI, *n. sp.*

Elongatus, castaneus, nitidus, fere lævis, elytris fuscis basi dilutioribus, pedibus abdominisque basi testaceis. *Long. corp. 5—8 mm.*

Antennæ dark red, short and stout, 2nd joint short and stout, but larger than 3rd, 6-10 differing very little from one another, transverse, 11th rather paler than the preceding joints, and a good deal longer than the 10th. Head of a chestnut colour, with a very few, scattered, moderately large punctures, and also with some sparing very fine punctures, it is not much shining. Thorax longer than broad, a little narrowed towards the base, similar in colour to the head, appearing at first impunctate, but with a series of four or five extremely obsolete punctures on each side of the middle, the base with a very fine, short, channel in the middle. Elytra scarcely longer than the thorax, of a blackish colour, with the base reddish, impunctate. Hind-body with the two basal segments yellow, the following ones reddish, but each with a large dark mark across the middle, it is impunctate and shining. Under-side of head almost impunctate, and with a well marked lateral margin.

Numerous specimens of this insect have been sent me by Captain Broun, who informs me that it is found under the bark of decaying

logs of *Dammara australis*, in company with *Mitrastethus baridioides*, Redt., and *Xenocnema spinipes*, Woll. The species varies a good deal in size.

CAMIRUS,* *n. gen.* (*Catopidæ*).

Antennæ 11-articulatæ, apice leviter incrassatæ, articulo 8^o contiguus minore.

Palpi maxillares articulo ultimo magno, sub-securiformi.

Caput parvum, oculi prominuli, liberi.

Tibiæ pubescentes.

Maxillary palpi with the 2nd joint elongate and slender, 3rd not half so long as 2nd, 4th much dilated internally so as to be nearly securiform. Head small, not adapted in form to close the front of the thorax, the eyes very convex, almost hemispherical, their hind part free. Mesosternum large, slightly separating the middle coxæ, which are much immersed. Hind coxæ very nearly contiguous, inwardly broad, but pointed at their outer extremity, their trochanters rather large and adapted to the femora. Hind-body with five visible ventral segments.

The very anomalous insects for which I make this generic name, I associate with the *Catopidæ*, because they agree satisfactorily with those insects in the structure of the prothorax, though in other respects they are very anomalous. In many points, they approach the *Scydmanidæ*, and will probably ultimately be considered a distinct group, intermediate between the *Catopidæ* and *Scydmanidæ*. The two species are extremely dissimilar in appearance, and may ultimately be made distinct genera; but as they possess in common the above prominent characters, I associate them together for the present.

CAMIRUS THORACICUS, *n. sp.*

Minus convexus, niger, nitidus elytris hirsutis, antennis pedibusque rufis; thorace transversim sub-cordato, profunde canaliculato, punctis basalibus et lateralibus, paucisque discoidalibus magnis, elytris striatis, striis fortiter punctatis.

Long. corp. 3½ mm.

First joint of antennæ rather longer and stouter than 2nd, 2-4 differing but little from one another, 5 and 6 each a little shorter than its predecessor, 7th distinctly stouter than 6th and quite as long as it, 8th narrower and much shorter than the adjoining joints, 9th-11th similar to one another in breadth, and a little broader than the 7th, the 10th about as long as broad. Thorax broader than long, rounded at the sides, greatly narrowed towards the front, and sinuate behind the middle, so that the hind angles are well marked right angles, it is of a shining black colour, and bears a few hairs, has a very deep channel on the middle which does not reach quite to the front or base, a deep narrow basal fovea on each side, a series of coarse punctures (those towards the front finer) along the side margins, one or two

* Cam i-rus.—D. S.

other coarse basal punctures, and a few others, scattered on the surface. Scutellum moderately large. Elytra rather rounded at the shoulders, which are a good deal broader than the base of the thorax, rather densely clothed with a long, fine pubescence, and with eight rows of coarse punctures, which are placed in depressed, not well defined striæ. Legs red. Tarsi slender, basal joint of hind tarsus quite as long as the two following together, spurs of tibiæ minute.

Sent from Auckland by Mr. Lawson.

OBS.—I have at present before me only a single female of this very remarkable species, which is intermediate in appearance between *Seydmanus* and *Cutops*; I noted that a male which I formerly examined, had the two basal joints of the front tarsi dilated, and a minute supplemental apical segment to the hind body; my recollection on this latter point is not very trustworthy.

CAMIRUS CONVEXUS, n. sp.

Castaneus, nitidus, parvus aureo-pubescentis; thorace punctis basilibus 7; elytris stria suturali, punctisque humeralibus.

Long. corp. 2 $\frac{3}{4}$ mm.

Mas, tarsis anterioribus articulis duobus leviter dilatatis; abdomine segmento 5^o ventrali fortiter emarginato-reflexo.

Antennæ similarly formed to those of *C. thoracicus*, but rather less elongate. Thorax greatly narrower than the elytra, transversely convex, as well as depressed in front, the sides sinuate and contracted behind the middle, the hind angles rectangular but not well defined, it bears an irregular bright yellow pubescence, and is impunctate, except for a series of large punctures, about seven in number, along the base. Elytra of a shining chestnut colour, with a similar pubescence to that of the thorax, with a well marked sutural stria, and impunctate, except for some coarse punctures at the shoulders. In the male, the basal joints of the front and middle tarsi are distinctly dilated, and the apical ventral segment is very broadly emarginate, the margins of the cut away part much elevated.

We are indebted to Mr. Lawson also for this species.

OBS.—This insect has quite the facies of a *Eumicrus* (in the *Seydmanidæ*), and I had formerly referred it to that family; but the front coxal cavities, which are closed behind in the same manner as in *Cutops*, indicate that it cannot be classed with the *Seydmanidæ*. It is a remarkable fact that two insects, so distinct from other known forms, and so closely related *inter se*, as this species and *C. thoracicus* appear to be, should yet be so dissimilar in appearance from one another.

STERNAULAX LEVIS, n. sp.

Nigerrimus, nitidus; thorace margine laterali subtili integra, basi medio foveolato; elytris basi quadri-impressis, stria unica externa integra.

Long. corp. 7 $\frac{1}{2}$ mm.

Thorax with the lateral margin very fine, but distinct throughout, near the front angles it is more distinct than behind, parallel with it some fine punctures, which extend also part of the way along the base, where indeed they are coarser than at the sides. Elytra very smooth and shining, with four impressions at the base, from the outer one of which there starts a stria, which, though much sinuated and very near the side, reaches the apex and is there deeper than elsewhere; at the extremity of the elytra are three or four abbreviated striæ, the outer one forms the termination of the lateral stria just described, and the one next it is continued some distance forward, though extremely fine in the front part, and is widely separated from the external stria. From the first (internally) and third of the basal impressions, there proceeds an extremely fine, short needle-scratch; the one from the third impression runs very obliquely towards the external stria. Except for these marks, the elytra are quite smooth. The pygidium and propygidium are coarsely punctured.

Auckland; a single specimen sent by Mr. Lawson.

Obs.—The genus *Sternaular* consists of only two species, viz., *Sternaular zealandicus*, Marseul, and a Madagascar species; the present species must be closely allied to Marseul's *S. zealandicus*, but differs from his figure and description by the striation of the elytra, and the want of punctuation at their apex.

PLATYSOMA COGNATUM, *n. sp.*

Ob'ongo-oratum, sub-depressum, nigrum, nitidum, antennis tibiisque obscure rufis; prothorace elytrisque impunctatis, illis striis dorsalibus 3 profunde impressis, quartaque interna apicali abbreviata.

Long. corp. $3\frac{1}{2}$ mm.

Head with a deep and well-marked line between the antennæ. Thorax impunctate, with the lateral and front margins entire. Elytra with three deep, entire striæ, and an abbreviated one at the extremity on the inner side of these, impunctate. Pygidium and propygidium rather coarsely punctured. Front tibiæ with four, middle with three, hind with two, sharp teeth.

This species also is due to Mr. Lawson, who sent it from Auckland.

Obs.—This species is extremely closely allied to our European *P. frontale* and *P. depressum*, and in form is about intermediate between the two. It may, however, be readily distinguished from them by the denticles of the tibiæ, and the want of lateral punctuation on the thorax.

SAPRINUS PEDATOR, *n. sp.*

Augustulus, concolor, nigro-piceus, impunctatus; elytris stria suturali integra, striisque 5—6 basalibus abbreviatis; tibiis anterioribus edentatis, extus grosse ciliatis, intermediis et posterioribus dilatatis, extus grosse punctatis.

Long. corp. 4— $4\frac{1}{2}$ mm.

Antennæ pitchy. Mandibles greatly exposed. Head with a very deep arched

impression, extending across it at the base of the mandibles, and also with an arched impressed line connecting the posterior portions of the eyes. Thorax short, considerably rounded at the sides, impunctate. Elytra with a well-marked sutural stria, and with five or six oblique short basal striæ; impunctate. Pygidium impunctate. Front tibiæ reddish, broad, rounded externally, and toothless, but fringed with coarse parchment-like ciliæ. Middle and hind tibiæ much dilated, furnished externally with large deep pits, in each of which is placed a coarse cilia, these ciliæ on the middle tibiæ are moderately long, but those on the hind pair are very short. Hind femora much dilated. Basal ventral segment elongate, the others so reduced in the middle as to appear there only like approximate striæ.

This extraordinary species was sent me by Captain Broun, with the No. 188 attached, and the following information: "On sea beach, one found when about to fly from *Algæ* on 11th December, 1875; and on 9th January, 1876, four under decayed fish, and another amongst *Algæ*." The ventral segments (which, in the condition of repose, are, as I have described, completely retractile) appear to be very mobile, so as to be capable of great elongation.

SORONIA HÆSTRIX, *n. sp.*

Nigro rufoque variegata; suprâ tomentosa et setis erectis adspersa; prothorace lateribus undulatis. Long. corp. 3 mm.

Antennæ obscure reddish, 1st joint very broad and dilated, 2nd rather broader than the slender 3rd joint, 4 and 5 distinctly longer than the following, which are short and small, 9—11 forming a rather long club. Head blackish, dull, covered with tomentum, and with some erect setæ, the eyes bearing a patch of setæ. Thorax strongly transverse, the front margin sinuate on each side, the lateral margins waved so as to show three or four broad shallow emarginations, the base at the hind angles cut away (or suddenly narrowed), the hind angles sharply defined right angles; the colour is blackish with red marks at the sides, the surface being uneven, velvety, and bearing short black setæ. Elytra reddish, but rendered black by their clothing, which consists of a kind of tomentum, accumulated at some points into thicker patches, and bearing erect setæ, most of which are black, but those about the margins are paler. Legs reddish. Under-surface infuscate-red, passing into blackish about the middle.

Tairua; Captain Broun.

Obs.—Though this peculiar little insect bears at first sight but little resemblance to our European *Soronia*, I believe, from my examination, that they are its nearest allies; and do not detect any prominent structural characters to distinguish it. I anticipate, from the specimens before me, that the species varies a good deal in colour.

XENOSCELLIS PROLIXUS, *n. sp.*

Tarsis lotis, breviusculis, articulo quarto obtecto. Elongatus, depressus, fusco-ferrugineus, sat nitidus, tenuiter pubescens, antennis pedibusque crassiusculis; crebre punctatus. Long. corp. $4\frac{1}{2}$ — $5\frac{1}{2}$ mm.

Of peculiarly elongate, depressed, sub-parallel form. Antennæ stout, reddish, with the club more obscure; in structure like those of *Cryptophagus*, 1st joint almost globular, 2nd short and stout, 3rd not elongate, but longer than the contiguous joints, 4-8 similar to one another, bead-like, 9th and 10th transverse, 11th rather large. Head rather closely and coarsely punctured, the eyes but little prominent. Thorax distinctly longer than broad, nearly straight at the sides, very slightly narrowed behind, the side margin in front of the hind angles with a minute acute denticle, and the hind angle itself minutely acute; the surface is rather coarsely but not densely punctured, so that the interstices between the punctures are shining, it bears a fine and scanty pubescence, is flattened along the disc, and indistinctly bi-impressed. Elytra very elongate, bearing rows of distinct, but not very coarse punctures, the punctures bear a fine hair. Under-surface dark reddish, very finely and scantily pubescent. Legs stout, reddish; the tibiæ short, thickened towards their extremity, and curved; the tarsi short, the three basal joints short and stout, and very pubescent beneath, the 3rd joint deeply emarginate, so that the short and small 4th joint is entirely concealed, and can only be detected on a careful examination; 5th joint short.

Sent both from Auckland and Tairua by Messrs. Lawson and Broun, but only four or five specimens; Captain Broun's specimens were among some species forwarded to me as found on *Cyathea dealbata*.

OBS.—This remarkable species is, I have no doubt, correctly placed near Mr. Wollaston's *Xenoscelis deplanatus* (Canary Islands). In general structure it is very similar to that species, so that I have given it the same generic name, notwithstanding the difference in the tarsi.

RHIZONIUM, *n. gen.* (*Colydiidæ*).

Coxæ posteriores contiguæ.

Abdomen segmento basale secundo longiore.

Caput lateribus haud reflexis.

Antennæ 11-articulatæ, clara tri-articulatæ.

N.B.—*Ex affinitate Teredi et Orylami, sed primo visu Rhizophago simile.*

Antennæ short and stout, with the basal joint quite exposed, the club consisting of the transverse 9th and 10th joints and the narrower 11th joint. Last joint of maxillary palpi longer than the preceding. Eyes free and prominent. Front coxæ contiguous, middle and posterior nearly so. Metasternum elongate. First ventral segment of hind-body considerably longer than the following. Legs rather slender; the tarsi rather short and moderately stout, their basal joint not elongate.

OBS.—The insect for which I make this generic name, in its form and sculpture, so much resembles a *Rhizophagus*, that I omitted it in my paper on the New Zealand *Colydiidæ*, from having placed it on one

side (without examination) as an ally of that group of the *Nitidulidæ*. Its affinities, however, are certainly with *Teredus* and *Oxylæmus*, though the structure of its antennæ (which are not very dissimilar from those of *Aulonium*) readily distinguish it therefrom.

RHIZONIUM ANTIQUM. n. sp.

Sub-depressum, sat nitidum, fortiter punctatum, ferrugineum, nudum.
Long. corp. vix 2 mm.

Antennæ reddish, much shorter than head and thorax, rather stout; 1st and 2nd joints stout, not longer than broad, about equal to one another; 3—8 broad, very short, quite similar to one another; 9th and 10th rather strongly transverse, quite distinct from one another; 11th a good deal narrower than 10th, but longer than it. Head about as broad as the thorax, rather coarsely punctured, without any raised lateral margins. Thorax quadrate, about as long as broad, and about straight at the sides, the hind angles very indistinct on account of the curving of the base; the surface rather coarsely punctured. Elytra moderately closely, and coarsely punctured, the punctures arranged in rows, which, however, are not very distinct.

Four specimens of this interesting little species were sent me by Captain Brown among some insects found on *Cyathea dealbata* at Tairua.

TELMATOPHILUS DEPRESSUS, n. sp.

Colore variabilis, testaceus, vel fusco-testaceus, vel fere niger; depressus, nudus, sed minus nitidus; thorace parce subtiliterque punctato, lateribus sinuatis, angulis posterioribus rectis; elytris subtiliter punctato-striatis, punctis apice obsoletis.
Long. corp. 2 $\frac{2}{3}$ mm.

Antennæ yellow; 1st joint thicker and longer than 2nd; 3rd slightly longer than 2nd; 5th a good deal longer than either 4th or 6th; 7th also distinctly larger than the contiguous joints; 8th joint small; 9—11 of about the same width, forming an abrupt club, very loosely articulated; the 9th and 10th transverse. Head finely and sparingly punctured. Thorax considerably narrower than the elytra, rather strongly transverse, the sides somewhat sinuate behind the middle, the hind angles sharply marked and nearly rectangular, the surface dull, but only finely and sparingly punctured, transversely depressed in front of the base, and with a very minute basal impression on each side. Elytra elongate and flat, with rows of fine punctures, which become obsolete at the extremity. Legs yellow.

Probably common in the Auckland district.

Obs.—This species is very variable in colour. Its flattened form, destitute of pubescence, give it at first sight but little resemblance to our European *Telmatophili*; but, nevertheless, it possesses the structure of the tarsi highly developed after the manner of *Telmatophilus*. The figure in Du Val's *Genera des Col. d'Eur.* (pl. 52, f. 259b) of the tarsus of *Psemmacrus bipunctatus* is very like that of this species.

(To be continued.)

NATURAL HISTORY OF *LYCENA ARGIOIUS*.

BY WILLIAM BUCKLER.

I have long wished to work out the economy of this species, especially with regard to the question of a second brood, and at length, partly by the kind help of friends, and partly by a lucky find of my own, I have been able to settle my problem.

In the spring of 1862, I had a few eggs laid by a captured female on the footstalks of flowers of *Ilex aquifolium*; the larvæ hatched during the last two days of May, fed first on the flower-buds of holly, afterwards on the young green berries, and by June 29th, that is, about thirty days, had changed to pupæ; but, as no butterfly ever appeared from any of them, my attempt at that time came to an unsuccessful end.

Last year, I received on June 20th, two full-grown larvæ, feeding on tender young leaves of holly, and which had been taken by beating, a day or two previously, by Mr. G. F. Mathew, R.N.; one of them had already ceased to feed, and had changed colour; the other was still feeding well, and I watched it eating a large piece out of a fresh gathered tender leaf; the next day, this also rapidly changed colour, and on June 25th and 26th, both successively became pupæ: one fixed with its head downwards on the upper-side of a leaf, the other with its head upwards on the under-side. From the second of these two pupæ, after 18 days, there came a female butterfly, on July 14th; the first pupa remained over till May 25th, 1876, when it produced an ichneumon.

After this, on 5th August, I received from Mr. E. F. Bisshopp, of Ipswich, who had taken great pains to secure from female butterflies of the second or summer flight, a batch of seven or eight eggs, laid just beneath the flower heads of an umbel of *Hedera helix*; unfortunately, only two of them proved fertile, and I had the further misfortune to kill one of the larvæ, whilst changing its food, but in the very same process was afterwards lucky enough to find compensation for its loss. For, early in September, I found I had unconsciously gathered with a head of ivy flower buds, resting on one of the flowerstalks, a larva in its third moult: and, being thus led to look for more, I afterwards found two others in similar situations.

The dates for the changes of the larva, which I succeeded in carrying through from the egg, and which, from the first, ate tender ivy leaves rather than flowers, are as follows: hatched August 8th; moulted by the 12th, and a second time by the 16th, and a third time by the 20th; after that, I have recorded a moult between September

1st and 5th; by the 10th, it was mature, on the 13th it fixed itself for changing, and on the 17th, became a pupa; thus passing just forty days in the larva state; the butterfly, a male, appeared on 6th April, 1876; two hundred and two days having been passed in the pupa state,—perhaps its emergence had been hastened somewhat by being kept sheltered indoors.

In a general way, therefore, the year's history may be divided as follows: the first flight of the butterflies, end of April, and in May; larvæ hatched at the end of May, and feeding on holly flowers and young leaves, or on young ivy leaves through June (Mr. Harwood, of Colchester, informs me he has also found them on flowers of *Rhamnus frangula*); the second flight of butterflies in July; the second brood of larvæ feeding in August and September, on flower-buds and young leaves of ivy; the winter passed in the pupa state.

The egg of *Argiolus* is very much like that of *Alexis*, except that it is rather larger; being circular, flattened, and rather depressed in the centre; the whole surface—except just a central spot—overlaid with raised reticulation, with little knobs at the angles; the shell pale bluish-green, the raised reticulation whitish; the larva escapes by making a hole near the centre of the upper surface.

The young larva, in the spring, is something like that of a *Zygæna* in shape, plump, and hairy (as was noticed both by Mr. Hellins and myself), even while quitting the egg-shell, with a greenish-white body and dark head, and very slow in its movements; but the summer larva I found for the first few hours to be very active, walking about with almost a looping progression, and much more slender than that of any *Lycæna* at present observed; the head moderately large, rough and prominent, of a chocolate-brown colour; the body shining, very pale translucent-greenish, and apparently naked; and looking at this unusual form of a newly-hatched *Lycæna*, one tried to account for it from the heat of the weather, and by thinking that it was better fitted to pierce the hard buds of the ivy just formed, than if it were at first more the shape of its congeners. After the first moult, it became stouter in figure, pale ochreous-green in colour, and clothed with unusually long, whitish, soft, silky hairs, and was very sluggish, no longer differing from larvæ of the spring brood.

When about a fortnight old, it attains the length of $\frac{3}{16}$ inch, and becomes of the usual *Lycæna* shape, with smooth glistening skin, and colour similar to that of the ivy buds; in about three weeks, it is $\frac{5}{16}$ inch long, and stout in proportion, showing a paler streak on the

ridges of the back, thin double slanting lines on the sides, and a margin of yellowish-white along the sub-spiracular region. In about five weeks it is full-fed, and then reaches the length of $\frac{3}{8}$ inch, and sometimes more, when stretched out in crawling; the figure somewhat onisciform, the head very small and retractile into the second segment beneath; the second segment, which is the longest, is but slightly convex above, the others are arched on the back, the third, fourth, and fifth being the highest, and thence the others slope a very little to the tenth; these eight segments, from three to ten, are crested with two ridges of humps, between which lies the sunk dorsal space, broad and hollow on the third and fourth, and flattened and narrowing gradually to the tenth; on these segments the divisions are deeply cleft through the ridges—thus producing the appearance of humps; segments eleven, twelve, and thirteen are simply convex, and slope towards the anal end: the sides, although sloping outwards, become almost concave near the projecting rounded sub-spiracular ridge, which continues round the anal segment, and overlaps all the short legs; the belly is flattened.

In colour, there seem to be several varieties: one, a bright yellowish-green, with paler lines as above, the head purplish-brown, but looking almost black by contrast, and with an ochreous streak above the mouth and at the base of the papillæ, the spiracles round and flesh-coloured, the whole skin of the body velvety, with its surface thickly covered with yellowish warty granules, each bearing a minute whitish bristly hair.

Another variety, of the same yellowish-green ground-colour, has dashes of deep rose-pink on each humped ridge of the back and in the dorsal channel continued to the anal end, and an additional dash on each side of the fifth segment; along the sides, fine double lines of pale greenish-yellow, edged with darker, slanting backwards; the sub-spiracular ridge itself of a whitish-flesh colour, but deepening above and below with a narrow border of full rose-pink, which again melts into the green ground.

Another variation, which, from the too rapid development of the example exhibiting it, was but imperfectly noted, is of a very pretty mixture of green and black; the ground colour green, as before, a transverse bar of black across the middle of the second and the beginning of the third segments, a dorsal series of thick dashes from the third to the tenth, on the eleventh, a dash on either side enclosing the green ground as an interruption, with the dorsal marking again occurring on the

twelfth and thirteenth; on each ridge of the back, a row of roundish spots, and, a little lower on the side, a row of squarish spots, and, lower again, in the spiracular region, a row of roundish spots placed at the segmental divisions; on the fifth segment, the upper markings thicker and running together.

About four or five days before changing, the larva ceases to feed, becomes of a dingy olivaceous-pink or mouse colour, and spins a fine layer of silk as a foot-hold, and a stout thread as a cincture, crossing the front of the third segment, and strengthened near the base on either side by two other short threads joining it, and thus forming triple moorings.

In each instance, I found the operation of changing to a pupa had brought the cincture away from its resting place on the larva to below the thorax of the pupa, so that this thread, at first slanting forwards from the base over the larva, slanted now a little backwards over the pupa.

The pupa is about $\frac{5}{16}$ inch in length, and $\frac{3}{16}$ inch in width, of a dumpy figure, thickest at the middle of the abdomen, with the head and thorax rounded, and the latter very slightly keeled: a depression occurs between the thorax and abdomen, where the cincture passes and holds it secure; from thence, the abdomen swells out full and arched towards the bluntly rounded anal end; the wing-covers are long in proportion, but not at all projecting. In colour, it is pale brownish-ochreous, with a blackish-brown thin dorsal line marking the thoracic keel, and on the abdomen a series of rather blotchy arrow-head dorsal dashes, and a sub-dorsal series of larger dark brown blotches, that nearest the thorax made conspicuous by the segment next below being without one; the thorax is marked with oblique rows of brown freckles directed from the sides of the head towards the end of the keel at the depression; the eye-covers are blackish; the wing covers pale greyish with rays of brown freckles, and outlined with a thin brown edging, their surface smooth, rather more glistening than the other parts, which are thickly studded with fine, short, brownish bristles.

Emsworth: *June 12th, 1876.*

P.S.—It may be mentioned that eggs were laid during the last month by a female *Argiolus*, in captivity, on holly, and also on young shoots of ivy, and that both Mr. Hellins and I find that the larvæ eating ivy are more advanced than those feeding on holly.

LIST OF JAPANESE BUTTERFLIES.

BY THE REV. R. P. MURRAY, M.A.

It has occurred to me, from my own difficulties in investigating the Lepidopterous fauna of Japan, that a list of all such species of *Rhopalocera* as are known to me to have been recorded (rightly or wrongly) from that country, may be not altogether useless to other workers; and I have accordingly prepared the following, which must be considered as merely preliminary.

The authors to whom I am principally indebted are Motschoulsky, Ménétrics, De l'Orza, and Butler. I cannot help thinking that some few of the species have been recorded in error, and that a great deal of confusion exists in the synonymy of some genera.

Danaüs Chrysipus, L.; *Tytia*, Gray (this species extends from the Himalaya, through Mongolia, to Japan).

Debis Sicelis, Hew.; *Diana*, Butler (probably identical with the next species); *marginalis*, Motsch.; *Whiteleyi*, Butler (possibly a synonym of the next species); *Maacki*, Brem.

Neope Gaschkevitchi, Mén. (there is a second species belonging to this genus in Japan, but I am unwilling to describe it from the very worn specimen in my collection).

Satyrus Epimenides, Mén.; *Dejanira*, L.; *Deidamia*, Eversm.; *S.* (?) *Schrenki*, Mén.

Hipparchia Hyperanthus, L.; *Phædra*, L., *var. bipunctatus*, Motsch. *Mycalesis Gotama*, Moore; *Polydecta*, Cram. (quoted by De l'Orza, but the specimens should probably be referred to *M. Gotama*, Moore); *Perdiccas*, Hew.; *Nicotia*, Hew.

Ypthima Argus, Butler; *Baldus*, Don. (? = *Y. Argus*, Butler). *Cænonymphus Œdipus*, Fabr.; *Darus*, Fabr.

Triphysa nervosa, Motsch.

Argynnis Sagana, Doubl., Hew.; *Paphia*, L.; *Daphne*, W. V.; *Laodice*, Pall., *var. Japonica*, Mén.; *Niphe*, L.; *Ella*, Brem., ? = *A. Anadyomene*, Feld.; *Daphnis*, Cram. (this is a synonym of *A. Cybele*, Fabr., which is a N. American species. It is quoted with a query by Motschoulsky in his list of Japanese *Lepidoptera* in *Études Ent.*, ix, 1860); *Adippe*, L., *Nerippe*, Feld., *pallescens*, Butler (I cannot help thinking that these are all forms of one variable species); *Aglaia*, L.; *Selenis*, Eversm.; *Iuo*, Rott.

Melitæus Athalia, Rott. (*Phæbe*, W. V.); *Didyma*, Esp.; *Leucippe*, Schneid. (*Athalia*, Esp.); *Protomedia*, Mén.

Araschnia Burejana, Brem. (*strigosa*, Butler); *Prorsa*, L.

Vanessa c-aureum, L.; *c-album*, L.; *Progne*, Cram.; *Charonia*, Dr. (De l'Orza: probably in mistake for *V. Glauconia*); *Glauconia*, Motsch.; *Antiopa*, L.; *Io*, L.; *xanthomelas*, W. V.; *vau-album*, W. V. (De l'Orza: "intermediate between type and var. *V. j-album*, Boisd., Lec.").

Pyrameis indica, Herbst.; *cardui*, L.

Junonia Lemonias, L.; *Orithya*, L.

Hestina assimilis, L.

Euripus japonica, Feld. (*Diagoras*, Hew.); *Charonda*, Hew.

Limenitis Sibylla, L.; *Sydyi*, Led.; *Helmanni*, Led.; *Amphyssa*, Mén.

Neptis Sappho, Pall.; *Kämpferi*, De l'Orza; *aceris*, Lep., var. *Eurynome*, Westw.

Apatura Iris, L. (of very doubtful occurrence in Japan); *Ilia*, W. V.; *substituta*, Butler, *Here*, Feld., ? var. of *A. Ilia*.

Libythea Lepita, Moore.

Nemeobius Lucina, L. (quoted [in error?] by H. Pryer).

Miletus Hamada, Druce.

Chrysophanus Phlæas, L.

Lycæna Argiades, Pall.; *Argus*, L.; *Hellotia*, Mén.; *japonica*, Murray; *Argia*, Mén.; *Emelina*, De l'Orza; *Argiolus*, L. (= *L. Ladonides*, De l'Orza); *Pryeri*, Murray; *Lycormas*, Butler; *Arion*, L.; *Arcas*, Rott.; *Cyllarus*, Rott.; *Kazamoto*, Druce; *Euphemus*, Hübn.

Thecla spini, W. V.; *rubi*, L.; *cærulescens*, Motsch.

Dipsas Attilia, Brem.; *Taxila*, Brem.; *japonica*, Murray (? = *D. smaragdina*, Brem.); *orientalis*, Murray; *lutca*, Hew.; *sæpestriata*, Hew.; *arata*, Brem. (*Ichnographia*, Butler).

Satsuma ferrea, Butler.

Anops Phædrus, Fabr.

Amblypodia japonica, Murray.

Leucophasia amurensis, Mén.

Terias lata, Boisd.; *Heccabe*, L., var. *Brenda*, Doubl., Hew., ? var. *suava*, Boisd.; *Mandarina*, De l'Orza.

Pieris Daplidice, L.; *napi*, L. ("The Japanese form is one-third longer in expanse of wing than the average size of British specimens." Butler); *rapæ*, L.; *brassica*, L., and var. (?) *crucifera*, Boisd.; *Melete*, Mén.; *Aglaope*, Motsch.; *Megamera*, Butler; *cratægi*, L.

Gonepteryx rhamni, L. (probably Japanese specimens should be referred to the next form): *Aspasia*, Mén.

Colias viluensis, Mén.; *Erate*, Esp.; *Hyale*, L.; *Simoda*, De l'Orza; *pallens*, Butler, *poliographus*, Motsch. (I cannot help thinking that these are all forms of *C. Hyale*).

Anthocaris Scolymus, Butler.

Parnassius citrinarius, Motsch. (*glacialis*, Butler).

Papilio Polytes, L.; *Heleneus*, L.; *Dehaani*, Feld. (*japonica*, Butler): *Raddei*, Brem.; *Protenor*, Cram.; *Demetrius*, Cram.; *Alcinous*, Klug, and *var. Meneius*, Feld.; *Sarpedon*, L.; *Agamemnon*, L.; *Xuthus*, L.; *Xathulus*, Brem. (probably the spring brood of *P. Xuthus*); *Machaon*, L. (perhaps the Japanese specimens should be referred to *P. Machaon*, *var. Hippocrates*, Feld.).

Ismene Benjamini, Guér., *var. japonica*, Murray.

Pamphila guttata, Brem., Gray; *pellucida*, Murray; *varia*, Murray; *vitrea*, Murray; *flava*, Murray; *comma*, L.; *Sylvanus*, Esp.

Daimio Tethys, Mén.

Pyrgus maculatus, Brem., Gray.

Nisoniades montanus, Brem. (*rusticanus*, Butler).

Beckenham: June, 1876.

ASCALAPHUS KOLYVANENSIS VAR. *PONTICUS* (an spec. distincta?).

BY R. M'LACHLAN, F.L.S.

Some time ago, I received from Dr. Standinger a pair (♂ ♀) of an *Ascalaphus*, taken by him at Amasia (Asia Minor) during his sojourn there in 1875. These I had placed with *A. kolyvanensis*, of which I have many examples, from the Caucasus, Turkestan, &c.: but recently, upon re-arranging my collection, it became evident that this pair forms either a distinct local variety of *kolyvanensis*, or a good species. At present, I consider it better to adopt the former view, and describe it as:—

ASCALAPHUS KOLYVANENSIS, *var. PONTICUS*.

Alarum posticarum macula pallida apicalis hyalina (nec flavo-opaca), annulus niger apicalis suprâ incompletus.

The above brief diagnosis indicates the chief characters whereby this form differs from typical *kolyvanensis*:—that is to say, the black-ringed pale apical spot on the posterior wings is purely hyaline, instead of opaque yellow as is usual, and the ring itself is interrupted above, and thus incomplete. To these characters, might be added the form of the second (sub-apical) black spot in the anterior wings, which is irregularly quadrate, not concave on its outer margin, and with no extension towards the pterostigma: but, in a series of *kolyvanensis*, there are individuals in which this condition occasionally occurs.

In some respects this form is more distinct from *kolyranensis* than is *Macaronius*, for this latter appears in reality only distinguishable by the yellow-veined black spots in the anterior wings.

Dr. Staudinger informs me that the insect was tolerably common at Amasia, and all the individuals were of the form above indicated. The pair before me are fully coloured and perfectly mature.

I might add that the South Russian *pupillatus*, although allied, has a good structural difference in the post-stigmatal area (setting on one side the difference in markings), which is narrower, and with the cellules less distinctly triseriate.

It is, I think, evident that the gay species of the true genus *Ascalaphus* are subject to local variation, parallel to that which is so common in butterflies; and, as in the latter, it is imprudent to multiply species where there are no structural differences. For instance, *A. ictericus*, *corsicus*, and *siculus*, may be only local forms of one and the same; the two latter are, I think, surely specifically identical.

In conclusion, I take this opportunity of noting that a second example (♀) of my *A. syriacus* is in my collection, and presents the same differences from *lacteus* as does the type (♂) in the British Museum; and, as an addition to the original diagnosis (Journ. Linn. Soc., Zoology, xi, p. 274), it should be noticed that the posterior wings of *syriacus* are narrower (less triangular) than in *lacteus*. This ♀ is rather larger than the typical ♂.

Lewisham, London :

23rd May, 1876.

Diasemia literalis in South Wales.—On the 2nd inst., having business in the hilly eastern part of the county, I started, after a drive of fifteen miles, for a walk round the neighbouring country. A footpath from one main road to another lay partly across an extensive pasture, the greater part being grass land with an abundance of *Lotus corniculatus* and other wild flowers, but a portion of one side being sufficiently marshy to support a full growth of rushes. The sun being hot, *Thanaos Tages* and other common butterflies were flying in plenty; the two pretty *Euclidia* sprang up from my feet to settle again at a short distance, and on the marshy ground a few *Melitaa Artemis* were flying lazily about, or settling on the buttercup flowers. Not having seen the last named species alive for some years, it aroused a slight feeling of vexation that I should have left my net at home under the impression that the day's travelling would be quite enough for the day's length, without any collecting.

Leaving this ground, and crossing a rivulet, the footpath led across another pasture,—dry and hilly, with the shortest possible herbage; and here, when half-way up the slope, a small moth started from my feet, and settling again a yard or two

away, revealed to my astonished gaze the lovely form and exquisite markings of *Diasemia literalis*. I had never before seen it alive, and the mixture of feelings—delight at the sight of so lovely a rarity, and vexation at having no collecting apparatus except a score of pill-boxes—may possibly be imagined. However, the beauty was not disposed to fly far, and, by a little patience and manipulation, it proved possible not only to box it, but to secure a specimen in each of the pill-boxes that I fortunately had with me. The moths were not very plentiful, and appeared to be confined to the very short grass and herbage on the slope of the hill, where they remained at rest until disturbed, and then flew but a short distance, often not more than three or four yards. They flew readily when disturbed at any time in the earlier part of the afternoon, both in hot sunshine and under clouds, even in spite of a moderate breeze; but I could not see any which appeared to fly of their own accord, and am disposed to think that the time of flight is towards evening. I could see no particular indication of their food-plant, unless it is grass, upon which they generally settled, appearing more especially attached to spots which were covered with the leaves of a very short bluish or glaucous grass or *Luzula* which was not in flower. At the foot of the hill, where the herbage was more rank, not a specimen could be found; and it seemed wonderful that the delicate creatures should exclusively frequent a spot so devoid of shelter that even *Crambus pratellus* ignored it, and the only species that interrupted the search for *literalis* was an occasional *Dicrorampha plumbana*.

The next morning, with two of the youngsters, I started early for the thirty-six mile drive, armed with plenty of collecting apparatus; but the weather had changed at last, the long-wished-for rain had come, and at ten miles from home we encountered a storm which sent us home again without unnecessary loss of time, and when, three days later, the weather moderated sufficiently, we found *literalis* getting sadly worn,—which, considering its habitat, was not surprising.

I see that this species is not entirely new to Wales, a specimen having been taken six years ago at Langharne, in the adjoining county, at light (E. M. M., vol. vii, p. 234). This may throw some illumination on its time of flight, though not much, seeing that the *Pyraustæ* and *Eunychiæ* may occasionally be found in a similar situation.

As far as I can ascertain, *literalis* has been a rare insect for many years, the last important recorded capture that I can find being that by Mr. Reading (Intell., vol. ix, p. 18), who took two dozen specimens, on a sloping bank near Plymouth, sixteen years ago. I suppose it has disappeared from the ancient locality near Brockenhurst.—CHAS. G. BARRETT, Pembroke: 10th June, 1876.

P.S.—If any of my old friends and correspondents, who do not possess this species, will favour me with a line, I will endeavour to save them a type.

Captures of Lepidoptera in East Sussex.—On the 29th May, the Rev. T. W. Daltry, M.A., of Madeley, Mr. W. H. Tugwell, of Greenwich, and I, made a five days' excursion to East Sussex for the purpose of collecting *Lepidoptera*. Abbott's Wood and Eastbourne were the localities worked; and, considering the very cold weather there had been for some time previously, we were quite satisfied with the result of our expedition, over 100 species being observed, exclusive of *Micros*. My

own particular desire was to see alive the pretty *Agroteta nemoralis*; and, thanks to Mr. Tugwell, who knew the ground well, we were each enabled to take a series, though it was evidently very scarce compared with last year. Amongst the other species taken or observed, were the following: of *Diurni*, *Argynnis Euphrosyne* and *Selene*, in great abundance; plenty of hibernated *Gonepteryx rhamni*; *Syrichthys alveolus* was common in woods, as was also *Lycæna Adonis* on the cliffs at Eastbourne; *Vanessa polychloros*, *Io*, and *cardui*, with others, occurred less commonly. Of the *Bombyces*, *Lithosia aureola* and *Chelonia plantaginis* were common, and *Nola cristulalis*, *Chelonia villica*, *Orgyia pudibunda*, and others, were taken, as were also *Lithosia quadra* (?), *Pæcilocampa populi*, *Lasiocampa quercifolia*, &c., in the larval state. *Geometrae* were numerous, and included, in more or less plenty, *Epione advenaria*, *Venilia maculata*, *Tephrosia consouaria* and *punctulata*, *Ephyra porata*, *omicronaria*, *orbicularia*, and *pendularia*, *Acidalia subsericeata*, *Coremia temerata*, *Strenia clathrata*, *Numeria pulreraria*, *Fidonia atomaria* (very much larger, and the ♀ quite different in colour to northern specimens), *Aspilates strigillaria*, *Emmelesia affinitata*, *Eupithecia plumbeolata* and *dodoneata*, *Lobophora hexapterata*, *Melanippe hastata*, *Coremia ferrugata*, *Eubolia lineolata*, *Anailis plagiata*, &c., &c. *Platypteryx lacertula*, *falcula*, and *hamula*, represented their genus.

Owing to the almost complete failure of sugar (probably because of the cold, clear moonlight nights), but few *Noctuae* were taken; but those that did occur included *Cymatophora flavicornis* (larva), *Acronycta leporina*, *auricoma*, and *aceris*, *Xylophasia rurea* (var. *combusta*), *Apamea unanimitis*, *Tæniocampa miniosa* (larvæ on oak) and *cruda* (larva), *Tethea retusa*, larvæ on sallow, along with those of *Epunda viminalis*, *Agriopsis aprilina* (larva), *Hadena genista*, *Erastria fuscata*, *Amphipyra pyramidea*, *Phytometra anea*, &c., &c.

Herminia barbalis was a most abundant representative of the *Deltoides*; and the *Pyrales* included (besides *nemoralis*) *Pyrausta ostrinalis*, *Herbula cespitalis*, *Eumychia octomaculalis*, *Bolys flavalis* and *fuscalis*, &c. The *Crambites* were evidently not well out, as *Crambus chrysonuchellus* was the only species taken worth notice. We had no time to work specially for larvæ, or no doubt the list would have been greatly increased.—GEO. T. PORRITT, Huddersfield: June 9th, 1876.

Gelechia humeralis not uncommon in Perthshire.—Lately I received, in a box of insects for determination, from Sir Thomas Moncreiffe, five specimens of that variable species, *Gelechia humeralis*. Some of these specimens were so fine that I imagined they must have been taken before hibernation, and I therefore wrote at once for details, in hopes there might, perhaps, be some clue to the food of the larva of this insect.

Sir Thomas Moncreiffe replied: "The insect is very plentiful here. I have beaten it off every tree in the place, and it hibernates in numbers, in the thatch of an old summer house in my garden, appearing every fine winter's evening at dusk."

In a subsequent letter, he wrote: "I am afraid that I have no clue to the larval history of *G. humeralis*. Personally, I have either beat it off various trees, taken it in the neighbourhood of old thatch, or on the wing, but never on low plants or near the ground. I have taken it from August 10th to May 2nd. I have beat it off oak, birch, sycamore, poplar, &c., and it hibernates freely in the thatch (reed) of an old summer-house, and flies in winter and early spring at the *Cupressi*, along with the *Depressaria*. Of the five specimens I sent you" (and which Sir Thomas

Moncreiffe has very liberally added to my collection) "one was beaten from oak, "April 14th, 1875; one from pine, August 10th, 1875; one from poplar, August "21st, 1875; and two I took on the wing, on the hill behind my house, in a mixed "plantation, 500 or 600 feet above the sea level, on the 25th October last.

"When I said it was *very* plentiful here, I may have used a strong term, but I "may call it plentiful, as I have always looked upon it as rather a pest, allied in that "respect to *Cerostoma radiatella*, and I think, during hibernation, on a fine evening, "I could fill from 12 to 20 boxes easily, and in the autumn am constantly turning it "out of my net."

As I never yet had the pleasure of seeing the insect *in* my net, I can well concede the point that it must be really plentiful near Perth, and I trust that where it occurs so freely the larva will some day be found.—H. T. STAINTON, Mountsfield, Lewisham: May 19th, 1876.

Four species of Helophorus new to Britain.—It has been known, I think, for some time past, to most British Coleopterists, that a good deal of confusion has existed with respect to our native species of the genus *Helophorus*. I have lately been studying the group, and have enjoyed the great advantage of correspondence concerning it with Dr. C. G. Thomson, of Lund, in Sweden, who has kindly furnished me with types of several of his species, and has also examined several types which I submitted to him. I have now the pleasure of recording the addition of four species to our British list. Besides these, there is an insect in Mr. Rye's collection allied to (but I think distinct from) *ancipennis*, which I have not identified.

H. $\text{ÆQ}^{\text{U}}\text{ALIS}$, Thoms.—Allied to *aquaticus*, Linn.; smaller, darker in colour; the sides of the thorax are less rounded, and its surface is less closely granulose; the interstices between the striae on the elytra are narrower, the alternate interstices (especially near the margin) being hardly more elevated than the rest; the depression on the elytra behind the base (which is very evident in *aquaticus*) is hardly discernible; the 2nd joint (apparently the *first*, the real first being concealed) of the hind tarsi is a little longer, when compared with the 3rd joint, than in *aquaticus*; the apex of the last segment of the hind body is smooth on the under-side, whereas in *aquaticus* it is minutely serrated.

I have this insect only from Ireland. Mr. Rye has English specimens. It is probably in most collections, and not uncommon.

H. *PLANICOLLIS*, Thoms.—Allied to *ancipennis*, Thoms.; rather narrower, with the sides more parallel, the elytra being longer in proportion to the thorax; the thorax is (as the name implies) *flatter*, and is not longitudinally convex; it has, moreover, a very evident depression (almost a pit) just in front of the middle of the central channel; the femora are dusky black in the basal half (in *ancipennis* faintly darker at the *extreme* base); the punctures in the striae on the elytra are very evidently finer and closer, and the interstices are flatter, and a little narrower.

This species does not appear to be uncommon in the mountainous districts of Scotland and Ireland, but I have not seen English specimens. I have it from Shetland.

H. *BREVICOLLIS*, Thoms.—An interesting little species, 1 line in length, allied to *granularis*, but distinguished by good characters: the apical joint of the maxillary palpi is narrower and longer, with only the extreme apex faintly dusky; on the thorax the intermediate sulci are only slightly bent, and the external sulci are not

parallel with the margin; the elytra are narrower and more pointed at the apex, and have the sides more parallel; the punctures in the striæ on the elytra are evidently finer and closer, and the interstices between the striæ are much narrower and more elevated.

The only British exponents of this species that I have seen are two specimens which occurred to me last year at Killarney.

II. *STRIGIFRONS*, Thoms.—A well-marked species, placed by its author at the end of the genus. It has, I think, a facies peculiar to itself. Dr. Thomson distinguishes it briefly from several widely separated species; but from its size, colour, and sculpture, it is (I think) incapable of confusion with any British species except *æneipennis* and *planicollis*. From both these species it may be distinguished as follows:—it is, on the average, a little larger (though small examples occur); the elytra strike the eye at once as more suddenly and strongly dilated behind the shoulders; they have, moreover, a broad reflexed margin, the space beyond the last striæ being hardly, if at all, narrower than the widest interstice; the sides of the thorax are much more regularly rounded; the longitudinal forea on the base of the head (which in *æneipennis* and *planicollis* widens out forwards) is uniformly narrow; the intermediate sulci on the thorax are less angulated, and the interstices of the elytra are distinctly elevated, the alternate interstices more so than the rest (those between the 2nd and 3rd, and between the 4th and 5th, striæ are almost carinate). I notice also that the maxillary palpi are very long and massive. Besides the above distinctions, *strigifrons* differs from *planicollis* in having the punctures in the striæ on the elytra much larger and not so close, and the femora of almost uniform colour.

This insect appears to be not uncommon in Scotland and Ireland, but I have not seen English specimens. I have no doubt it exists as an enigma in most collections.

I may, perhaps, be permitted to add that I hope to publish a sketch of the genus *Helophorus* in my "Outline descriptions of British Coleoptera" in the "Scottish Naturalist" next October.—THOS. BLACKBURN, Greenhithe: June, 1876.

Note on an unrecorded British species of Helophorus.—To the difficulties in this puzzling genus above mentioned, I must add yet another, representing a very marked species certainly not included in those recorded or mentioned by my friend Mr. Blackburn, and several of which have been taken by Dr. Power at or near Woking some years ago. This insect seems, from description, to be not improbably the *laticollis* of Thomson: it is readily distinguishable by its thorax being as wide as the elytra, convex, with narrow and shallow sulci, of which the two on each side of the middle one are but very slightly flexuous, and the outer one is parallel to the margin; by its elytra being not dilated behind the middle, but thence narrowed towards the apex, with very strong, almost crenate, striæ, with narrow interstices; and by the long and sometimes entirely black apical joint of its maxillary palpi. It belongs to the "*æneipennis*" group, is $1\frac{1}{4}$ lines long, and has bluish-metallic head and thorax, dark brown elytra, and light brown legs.—E. C. RYE, 70, Charlewood Road, Putney, S.W.: June, 1876.

Notes on some species of Psyllidæ.—*Psylla visci* was described by Curtis in his "British Entomology," vol. xii, p. 565 (1835), where he says that he bred it in the middle of May from larvæ found on mistletoe at Roughton (near Bury St. Edmunds,

Suffolk). The species is also stated by Foerster, in the "Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande," Band v, 71, 4 (1848), to have been found on the mistletoe in Germany—the larva at Aachen, and the imago at Bergheim. In his work "Die Pflanzenfeinde aus der Klasse der Insecten," p. 293, Kaltenbach says he found the larvæ in March and April on the flowers of mistletoe, and that Herr Stollwerk took the imago on the same plant. I find no other notices of the insect, which is unknown to me, and as the mode of life has not been observed in detail, or at any rate not recorded, it would be of service to our native entomology if any one, who may have it in his power to get at the plant, would take the trouble to work up the life-history of *Psylla visci*. I believe all the species of *Psyllidæ* live for a considerable time in the perfect state, and so the month of July may not be too late to obtain the adult females and begin the work of investigation by observing the oviposition.

There are some other species of *Psyllidæ*, mostly first described by Foerster (*op. cit.*) as from England and Ireland, sent to him by Messrs. Walker and Haliday, but no precise locality, time of capture, or food-plant, is given (except the latter in two instances). Such are:—

Psylla viridula, Frst. (on nut-trees, Walker); *melanoneura*, Frst.; *costatopunctata*, Frst.; *picta*, Frst.; *aruginosa*, Frst.; *occulta*, Frst.

Trioxa galii, Frst. (on *Galium verum*, Haliday); *velutina*, Frst.; *abieticola*, Frst. (on spruce fir, and spindle-tree, Flor); *munda*, Frst. (on nettles, Flor).

Aphalara flavipennis, Frst.; *exilis*, Weber and Mohr (on *Rumex acetosella*, v. Heyden).

It is very desirable to re-find these in Britain; the time to obtain them in the adult state is from June to October, and, in looking for them, it is all but certain that other species, new to this country or to science, will be captured; the latter not improbably, because hitherto there have been very few collectors of *Psyllidæ* in particular. We know now about 40 native species; about 150 are recorded as European, but there are doubtless many more.

Some plants nourish more than one species of *Psyllidæ*, yet, as a rule, each species seems to be attached to the particular sort of plant (or allied plants) on which it stays; sometimes, however, they fly to others, and, of such as hibernate, many species are found together in autumn and spring among the foliage of fir trees. In the first instance, *Psyllidæ* may be expected to occur to collectors of insects of other Orders; but I hope that when an interest in them is awakened, and the fact known that the natural history of only a few species has been observed, they will be reared from the egg, and their development regarded by specialists, just as the *Lepidoptera* now are. In the imago-form, the *Psyllidæ* are easily taken from an umbrella or sweeping-net in small bottles containing a small portion of cut laurel-leaf, or chloroform, and are thus killed at once *in situ*, where they may remain for a day or two; they can then be set out on card with great facility. I would, at first, even excuse a Lepidopterist who would insist on pinning them, although by this treatment some of the markings on the thorax must be disfigured; by and by he would be converted to the method of fixing them on card by gum when he saw the manifest disadvantages of this plan in respect of the preservation and examination of his specimens. May I commend this neglected section of a neglected Order to the attention of some of our young Alexanders who are sighing for more worlds to conquer!

Among the species Foerster received from England, was *Psylla ulmi*, Linn., of which Linné, in the "Fauna Suecica," p. 262, says that it lives in the convoluted leaves of the small-leaved elm (*Ulmus campestris*), in company with *Aphides*. I have not found this species, but I do not believe it will be difficult to get.

The following species have not yet been found in Britain, but, their food-plants being common here, there is no reason why they should not enjoy, or endure, the hospitality of these islands.

Psylla (Chermes) cerastii is said by Linné (F. S., p. 262) to live on *Cerastium viscosum*, causing the terminal leaves to curve into monstrous ventricose forms. Dr. H. Loew, in the "Stettiner ent. Zeitung," viii, 344 (1847), described a *Psylla cerastii* as a new species, without referring to that of Linné of the same name; yet, although the food-plants are not the same, they are so nearly allied, and the appearances produced thereon are so similar, that the insects are probably the same species. Dr. Loew found his species at the end of June on *Cerastium vulgatum*. He says the deformation always exists at the end of a stalk, and consists in a shortening and thickening of the stem, and a diseased growth of the flower-portion: the calyx assumes a cap-like form, and is sometimes elongated nearly an inch; the flower-petals become foliaceous and green, are enlarged more or less, sometimes as much as four times their natural length, and take the most varied and irregular forms; the capsule swells into a bladder-shape, with an uneven surface, attains to three or four times its natural length, and the seeds within it shrivel. This remarkable malformation is caused by the broad, flat larvæ and pupæ of a *Psylla* which reside, either singly or several together, in the axils of the flower-buds, covered with white, flocky wool, which, however, does not adhere to their bodies. Then follows a minute description of the larva, pupa, and imago; and figures are given of the pupa and an upper-wing of the perfect insect.

Psylla ixophila, Frauenf., is said by Kaltenbach (*op. cit.*, p. 293) to have been found by him, in the pupa-state, at the end of April, and the adult insect was recognised as a species distinct from *P. visci*. This is worth investigation.

Trioxa flavipennis, Foerst., was found near Pressbaum, in June, 1872, by Dr. Franz Löw (Verh. z.-b. Ges. Wien, xxiii, 141), on *Hieracium pilosella*, and he describes and figures the pupa. In July, 1869, he had found what he considers to be the same species on *Lactuca muralis* (a plant of the same natural order as *Hieracium*, growing on old walls and dry banks).

In different foreign publications, are notices of the habitats of other *Psyllidæ*, but the foregoing examples may suffice at present as incentives to work in a field in which a rich harvest is to be gathered. J. W. DOUGLAS, Lee: 5th June, 1876.

POSTSCRIPT.—*Rhinocola aceris*, L. This, hitherto one of our rarest species of *Psyllidæ*, I found last evening in profusion on a maple (*Acer campestre*) growing in an exposed situation by the sallow-pit at Lee. I had previously thrashed many maples growing in sheltered places without getting the insect. Linné originally found the species on *Acer platanoides* (not British); but Foerster took it at Aachen on the maple. —*Id.*: 13th June.

A plague of spiders (*Lycosa saccula*). One sunny day towards the end of March, strolling through Onchan Bay, near Douglas, a singularly-marked stone—

spotted as I thought—caught my eye, and I stooped to pick it up; as I did so, the spots—in the shape of several black spiders, which were sunning themselves on the flat surface—instantly slipped round the edge of the stone and disappeared amongst the loose shingle with which the shore is there covered. Mr. Meade has kindly determined the species to be *Lycosa saccata*.

I soon saw that spiders of the same species were everywhere around, sitting motionless on the stones, as far as the eye could reach, giving them a speckled appearance, as if there had been a shower of ink.

Now, I don't like spiders; I have an inherited antipathy to the race, and always remember against them the poet's description:

————— “Where gloomily retired,
The villain spider lives, cunning and fierce,
Mixture abhorred!” *Thomson's Seasons.*

But I stood still to watch this—to me—novel sight, although feeling slightly uncomfortable at finding myself in so much bad company. They seemed (for spiders) in an amiable frame of mind, and, so long as their legs did not touch, to be indifferent to each other's presence; but the slightest contact was resented, and, when it occurred, one or other, without combat, instantly quitted the field and disappeared round the edge of the stone. I believe all these well-behaved spiders to have been males, exhibiting themselves with a view to matrimony; but how they settled questions of precedence, or the right to occupy particular stones, I could not ascertain.

Occasionally, however, a different scene presented itself—an apparently accidental collision of the legs of two spiders occurred, when the pair instantly grappled and rolled together over the edge of the stone in a black ball. The sexes of *Lycosa saccata* do not differ much in size or appearance, and I could not distinguish them at sight, but I have little doubt that these pairs were composed of male and female individuals. I tried to intercept the fall of several couples, but, owing to the rapidity of the action, and the awkwardness of the situation amongst loose shingle, I failed to do so, or to find them afterwards. What I saw may only have been innocent coyness on the part of the lady-spider, but it seemed hard on the gentleman to be seized by his bride on the wedding-day and compelled to jump over a precipice, even in her arms.

I am unable to say whether the female *Lycosa* is in the habit of reversing the parts in the story of the Arabian Nights' Entertainment, and with not merely doing what the Sultan only threatened, but with eating him afterwards; but I noticed a great many empty spider skins amongst the shingle, and thought the circumstance suspicious, and the lady comes into court with a damaged character.

See De Geer's observation quoted by Kirby and Spence, vol. i, 1818, p. 280, and Darwin's "Descent of Man," vol. i, p. 339, that he "saw a male spider in the midst of his preparatory caresses seized by the object of his attentions, enveloped by her in a web, and then devoured, a sight which, as he adds, filled him with horror and indignation."

The number of spiders was so prodigious that I tried to make a rough estimate of them: the shingle bank, over the whole of which they were scattered, is about 250 yards in length by twelve yards in width—and I am sure I do not over estimate the number of spiders at ten to the square foot—which would give 270,000 in all! and Onehan is only one amongst hundreds of similar bays round the Isle of Man.

I suppose it was no affair of mine, but I then began to consider how this multitude of carnivorous wretches was fed. *Lycosa saccata* is a hunting species of spider; each individual insists on killing his own meat, and, like all hunting tribes, whether of man or beast, is no doubt wasteful of it; it spins no web, has neither storehouse nor barn, and takes no thought of a cold joint for the morrow, as the web-making species obviously do; a fellow-creature must daily die that each *Lycosa* may dine.

The peaceful-looking bay, sleeping in the sunshine, was, in reality, a scene of ruthless slaughter, and multitudes of happy, innocent beings were there daily put to the most cruel of deaths that spiders might live.

In the contemplation of the state of incessant war which reigns throughout nature, there is much to give rise to painful thought. I cannot here pursue the subject without trespassing on ground forbidden in your pages, but it is worthy of careful and thoughtful reflection; and blessed is he who even then can satisfy himself that he understands it.—EDWIN BIRCHALL, Douglas, Isle of Man: *May 15th, 1876.*

Review.

DIE NEUROPTEREN EUROPAS, und insbesondere Oesterreichs, mit Rücksicht auf ihre geographische Verbreitung. F. BRAUER: Wien, 1876, 4to. Separat-Abdruck aus der Festschrift zur Feier des fünfundzwanzigjährigen Bestehens der k. k. zoolog.-botan. Gesellschaft in Wien, pp. 1—38 (or 265—300 of the entire work).

In this exceedingly useful work, Dr. Brauer (who may be termed one of the pioneers of modern Neuropterology) has brought together a List of all the described *Neuroptera* (in the Linnæan sense) of the European Fauna, with the recorded distribution of the various species. The term "European Fauna," as here applied, signifies in reality the Palearctic Division of the globe, in the system of ornithologists, and comprises all Northern and Central Asia, Northern Africa, &c., &c.; a vast district of ill-defined limits, but yet infinitely better adapted to the investigations of the philosophical naturalist than is the Europe of our maps and atlases.

In round numbers, 1000 species are indicated by name. Of these, probably at least 100 may be taken as only synonyms: in other cases also, several species may be included under one name, and there are a few omissions; so that 1000 may still be near the truth as to the species *known* to inhabit this faunistic division. In making a more minute examination of the materials as comprised in groups, families, or sub-orders, it is evident that the so-called Order has been unequally worked in its constituent parts. Possibly the *Odonata* are the best known of all, and that it will be difficult to add to the hundred (or thereabouts) of *actual* European Dragon-flies. The *Trichoptera* are now undergoing revision. The *Epheméridæ* have been revised up to a certain point. Other groups (more or less extensive) are tolerably well known. But there remain some in which little else than chaos still reigns supreme, and not the least important of these are the *Perlidæ*, the numerous species (with their possible local forms) of the genus *Heimerobius* as restricted, and the genus *Raphidia*. In fact, there is work enough for the concentrated energies of several entomologists. And it is additionally desirable that a thorough revision be made of almost all the European *Neuroptera*, because, on the other side of the Atlantic is a vast continent, with a fauna hardly to be grouped as forming a separate division from that

of the northern old-world, and which, in *Neuroptera*, is probably far more rich, and with numerous hard-working entomologists who naturally look to us of Europe for assistance.

We hail with great satisfaction this laborious work, which supplies a long-existing want. It forms part of a publication by the zoological and botanical Society of Vienna, in celebration of the 25th anniversary of its existence. A society so useful, and so flourishing, has just cause to be a little proud of such an event.

Obituary.

Edward Newman died at his residence at Peckham on June 12th, after a short but painful illness. He was born at Hampstead, on May 13th, 1801, so that he attained the ripe old age of 75, thanks to a naturally strong constitution and extremely regular and methodical habits. With the events of his early life we are not well informed; but, before his 30th year, he was engaged in business on his own account as a rope maker at Deptford. Having, however, relinquished this business, he became a partner in a printing business at Ratcliff Highway, which soon passed entirely into his hands, and was continued by him in Devonshire Street until a few years ago, when the management was taken by his surviving son. In 1832, he commenced the first of a series of *Natural History Journals*, in connection with which he became so well known, and which undoubtedly have contributed to no small extent to foster and further a taste for Natural History in this country. Many naturalists, now old men themselves—men who have acquired fame in various branches of natural science, can remember, when as mere boys, they tremblingly committed their first lucubrations to the tender mercies of the "Editor" of one or other of these journals. In 1832, Newman started, in conjunction with A. H. Davis, F. Walker, and Edward Doubleday, the "*Entomological Magazine*," which extended to 5 vols., and up to 1838. At about the same time, the Entomological Society was founded, and the Editors having failed in attempts to procure the memoirs read before the Society, for publication in their magazine, instead of in special "*Transactions*," it was probably found that there was not then room for two publications having so much in common, and the magazine ceased. In 1840, however, Newman started the "*Entomologist*," a monthly magazine at the price of sixpence, a bold stroke, which met with considerable success, and it was continued until the end of 1842, when it was announced that "the *Entomologist* under its present title will now cease;" and it was merged into its successor, the "*Zoologist*," which has continued uninterruptedly under his sole editorship from 1843 to the present time, a period of 33 years (a fact probably unprecedented in the annals of journalism), and presenting a vast accumulation of facts and observations on zoological subjects. Upon the announcement of the forthcoming appearance of our own Magazine in 1864, and after having made a naturally ineffectual attempt to obtain our printing, he revived the "*Entomologist*," which has continued up to now, Entomology having been divorced from other branches of Zoology in the pages of the "*Zoologist*," a step that we make bold to think did not act to the advantage of either journal. For some time, also, Newman was connected with the now defunct botanical magazine known as the "*Phytologist*." For a long time he was entomological editor of the "*Field*" newspaper; and also, for a short period, of a popular journal for young people, under the title of "*Young England*," though otherwise he had no interest in these publications.

We now turn to some of his most important special works. The first of these, published in 1832, was an essay intitled "Sphinx Vespiformis," an ingenious attempt to elevate the quinary system of classification enunciated by Macleay into a septenary arrangement, giving evidence of great originality, but, at the same time, very speculative in its nature. In 1835, he produced the "Grammar of Entomology," a popular exposition of the science, which, in 1841, was succeeded by a more extensive work under the title of "A familiar Introduction to the History of Insects," which again appeared in 1858 as "The Insect Hunters, or Entomology in verse," a very clever exposition of the first principles of Entomology, in the style of Longfellow's "Hiawatha." Two important works, also, are his "Natural History of British Butterflies," and "Natural History of British Moths" (the first appearing originally in "Young England"), and especially useful on account of the good and copious figures, though the letter-press is marred by a tendency to prejudices and crotchets, which, it is to be regretted, more or less characterizes all his writings, and some of which laid him open to the imputation that they were put prominently forward, more for the sake of creating controversy than from any thorough belief in them by their originator. In addition to these works, the series of pleasant and well-written "Letters of Rusticus" are supposed to have been by Newman, and the authorship was not disclaimed by him, though it is probable that he really acted more the rôle of editor than of author in this case, and that Dr. Kidd, of Godalming, was the real author.

To enumerate the special papers and notes by Newman spread through his journals, would require a volume. They are mostly entomological, but there are many on other branches of Natural History, for he was exceedingly versatile, and had an extensive knowledge of general natural science, not excepting Botany, especially ferns, on the British species of which he published a useful work, which has gone through several editions. In Ornithology, he edited Montagu's "Ornithological Dictionary."

During his long life, Newman made many friends, also, it is not to be denied, alienated some. He has gone from among us—let the past be forgotten! Let us remember only the abundant and indisputable good he has done in giving to aspirants in Zoology the opportunity of making known innumerable valuable observations that otherwise would have remained unnoticed. In the present rapidly advancing condition of Entomology as a science, it is impossible that there can ever be another Newman. He was elected a Fellow of the Linnean Society in 1833, and in 1853 and 1854 was President of the Entomological Society. Mr. Newman leaves a widow, one son, and two married daughters.

ENTOMOLOGICAL SOCIETY OF LONDON: 7th June, 1876.—Professor WESTWOOD, President, in the Chair.

The following gentlemen were elected Members:—Messrs. Alex. Augustus Berens, A. H. Swinton, and Charles Marcus Wakefield.

Mr. Douglas reverted to the exhibition made by him at the meeting on the 3rd May (*vide ante*, p. 19), of the palm nuts known as "vegetable ivory," attacked by a species of *Bruchidæ*. He read a letter from a friend concerning the damage done to the nuts by the beetle, and asking whether it commenced on board ship, or

before loading. It was suggested that the mischief was initiated by the parent beetle laying her eggs in the nuts when still in a green and soft state. Many larvæ infested each nut, reducing it to a rotten state. The metamorphosis took place in a cocoon inside the nut, and specimens of the beetle were shewn, proving to be a species of *Caryoborus*.

Mr. McLachlan, in connection with the above exhibition, placed before the meeting the nuts of another species of palm (*Copernicia cerifera*) from Rio, forwarded to him by Prof. Dyer, and likewise infested by a species of *Caryoborus* (alive when he received them), which, according to the British Museum collection, is *C. bactus*. In this case each nut served as food for only one larva, which bored in it a cylindrical hole of considerable size and depth.

Mr. E. A. Fitch exhibited seeds of a (probably) Leguminous plant from Egypt, forming an article of commerce, infested by a *Bruchus* to so great an extent that it was estimated that a loss of 50 per cent. was occasioned.

Prof. Westwood exhibited the larva of an Australian species of *Hepialus* (probably from Queensland) which had a long fungus, with four or five branches, growing out of the back of the neck and from the tail; also the pupa of a British *Noctua* with a fungus proceeding from the back of the neck.

Mr. Fryer exhibited a curious variety of one of our *Geometridæ*, believed to pertain to *Melanippe rivata*.

Mr. McLachlan, on behalf of Dr. Atherstone, of South Africa, exhibited sundry insects and insect-productions from that quarter. First, a couple of a very singular Orthopterous insect of considerable size (belonging to the *Acrydiidæ*), which, in colour, and in its granulated texture, so exactly mimics the sand of the districts in which it occurs as to render it almost impossible to detect it when quiescent. There was some doubt as to the species to which it should be referred, but it approached an insect noticed by Walker as *Trachyptera scutellaris*. Secondly, singular oval flattened cases (open at each end by a slit) from six to eight lines in length, formed of silk, to which was externally fixed a quantity of fine light brown sand. The cases were formed under stones in sandy districts, and were stated by Mr. C. O. Waterhouse to pertain to a beetle of the genus *Paralichas* (Fam. *Dascillidæ*). Lastly, the case of a species of *Geoticus*, of peculiar structure. The inner lining of the tube was composed of toughened silk as usual, but to this was attached externally a quantity of fine sand, and outside this a number of small angular pebbles, only the tail end having a few rather long twigs and pieces of grass-stem: thus, the case differed from those of most species, in which exclusively vegetable substances are attached externally: the addition of the pebbles made the case (which was nearly two inches in length) unusually heavy.

Professor Westwood read descriptions and exhibited drawings of two very singular forms of Coleopterous insects from Mr. A. R. Wallace's private collections. For the first, which belonged to the *Telephoridæ*, he proposed the generic term *Astychina*, remarkable for the form of the two terminal joints of the antennæ in one sex, which were modified into what appeared to be a prehensile apparatus. The other pertained to the *Cleridæ*, and was termed *Anisophyllus*, differing from all known beetles by the extremely elongated branch of the 9th joint of the antennæ.

Mr. Smith read "Descriptions of new species of Hymenopterous insects from New Zealand, collected by Mr. C. M. Wakefield." The number of known *Hymen-*

optera appeared to be about 48. One species of *Siricidæ*, one of *Tenthredinidæ* (our well-known *Blennocampa adumbrata*; probably = *B. cerasi*, Hutton), only five *Formicidæ*, no *Mutillidæ* nor wasps, only a few bees, and some *Evaniidæ*, &c.

Mr. J. S. Baly communicated "Descriptions of new genera and species of *Halticidæ*."

Dr. Sharp communicated a "Description of a new genus and some new species of *Staphylinidæ* from Mexico and Central America," collected by Mr. Salvin, Mr. Flohr, and Mr. Belt.

DESCRIPTIONS OF SOME NEW SPECIES OF *BUPRESTIDÆ*
BELONGING TO THE GENUS *LIUS*, H. DEYROLLE.

BY EDWARD SAUNDERS, F.L.S.

The types of the species here described are now in the collection of the British Museum.

I.—*Species elytris subrugosis.*

1. *CASTOR*, *sp. n.*

Obscure viridi-cyanus, capillis albidis brevissimis obsitus, capite cupreomicante splendidissimo. Caput læve, inter oculos valde et triangulariter excavatum. Thorax punctatus, brevis, lateribus rotundatis, basi utrinque sinuatâ, in media lobatâ. Scutellum parvum, læve. Elytra fortiter punctato-striata, subrugosa, humeris valde prominentibus, lateribus sub-rotundatis, postice attenuatis, apice rotundato minutissime denticulato. Subtus nitens, punctatus. Long. 2¼ lin.; lat. 1½ lin.

Hab.: Parana.

2. *POLLUX*, *sp. n.*

Obscure æneus, capillis albidis brevibus obsitus. Caput inter oculos excavatum, læve. Thorax sparse punctatus, lateribus rotundatis, basi bisinuatâ et in medio lobatâ. Scutellum parvum, læve. Elytra dense et rugositer punctata, humeris tuberculoque laterali prominentibus, lateribus sub-rotundatis, postice attenuatis, apice rotundato. Subtus lævis.

Hab.: Parana.

Long. 2 lin.; lat. 1 lin.

A L. Castore differt colore, præsertim capitis, capite minus excavato, et elytrorum rugositate.

II.—*Species elytris punctatis aut punctato-striatis.*

3. *ADONIS*, *sp. n.*

Cyanus; capite, thoracisque angulis anticis purpureis; subtus niger. Caput inter oculos excavatum, punctatum. Thorax glaber, minute punctatus, lateribus rotundatis, basi valde lobatâ. Scutellum parvum, læve.

Elytra sparsim minute punctata, punctisque majoribus in lineis dispositis notata, lateribus rotundatis, postice attenuatis, apice sub-rotundato denticulato. Long. 2 lin. ; lat. 1 lin.

Santarem ; H. W. Bates.

4. ARES, *sp. n.*

Cyaneus, subtus niger. Caput inter oculos valde excavatum, punctatum. Thorax glaber, minute punctatus, lateribus antice emarginatis, postice rotundatis, basi lobatá. Scutellum parvum læve. Elytra punctata, punctis in lineis dispositis, lateribus sub-rotundatis, postice attenuatis, apice sub-rotundato. Long. 2 lin. ; lat. $\frac{7}{8}$ lin.

Santarem, Ega, Para ; H. W. Bates.

A præcedente differt oculis magis prominentibus, capite inter illos magis excavato, elytrorum punctis, et formá angustiore.

5. TEREUS, *sp. n.*

Suprà viridi-cyaneus, subtus æneo-niger. Caput punctatum, inter oculos sulcatum. Thorax punctatus, lateribus sub-rectis, basi lobatá. Scutellum læve. Elytra striato-punctata, lateribus antice sub-rotundatis, postice ad apicem attenuatis, apice denticulato. Subtus punctatus.

A præcedente nec non congeneribus differt oculis non prominentibus, thoracis lateribus sub-rectis et formá sub-complanatá.

6. CYCNUS, *sp. n.*

Viridi-cyaneus, subtus cyaneo-niger. Caput punctatum, inter oculos late sulcatum. Thorax punctatus, præsertim prope angulos posticos, lateribus sub-rotundatis, basi in medio valde lobatá. Scutellum parvum læve. Elytra irregulariter sed ad basin valde striato-punctata, prope latera sub-undulata, lateribus rotundatis, postice attenuatis, apice denticulato. Subtus punctatus. Long. 2 lin. ; lat. $1\frac{1}{2}$ lin.

Hab. : Bahia.

Quam L. Ares major et multo latior ; differt etiam elytris punctato-striatis, lateribus undulatis, et colore sub-viridi.

7. HERCULES, *sp. n.*

Nigro-cyaneus, subtus concolor. Caput punctatum, inter oculos valde sulcatum. Thorax fortiter punctatus, lateribus prope angulos posticos rotundatis, basi in medio lobatá. Scutellum læve. Elytra striato-punctata, lateribus ante medium sub-rectis, deinde ad apicem attenuatis, apice rotundato. Subtus punctatus.

Hab. : Brazil.

Long. $2\frac{1}{2}$ lin. ; lat. $1\frac{1}{2}$ lin.

Maxima hujus generis species mihi cognita.

8. BACCHUS, *sp. n.*

Cyaneus, capite cupreo-splendente, subtus niger. Caput punctatum, inter oculos late sulcatum. Thorax punctatus, praesertim ad latera, his ante angulos posticos rotundatis, basi in medio lobatá. Scutellum laeve. Elytra punctata, punctis in lineis dispositis, lateribus antice sub-rotundatis, postice ad apicem attenuatis, apice rotundato denticulato. Subtus punctatus. Long. 2 lin.; lat. 1 lin.

Hab.: Ega, H. W. Bates.

Colore L. aculeato, L. & G., similis, sed forma angustiore, elytrisque haud striatis differt.

9. HELIOS, *sp. n.*

Aureo-cupreus, splendidissimus, capite, thorace, apiceque elytrorum aureis; subtus niger. Caput sparse punctatum, inter oculos sulcatum. Thorax punctatus, lateribus antice sub-rectis, prope angulos posticos rotundatis, basi in medio lobatá. Scutellum laeve. Elytra striato-punctata, lateribus antice sub-sinuatis, postice attenuatis; apice rotundato. Subtus punctatus. Long. 1 $\frac{7}{8}$ lin.; lat. 1 lin.

Hab.: Ega, H. W. Bates.

L. ignito, L. & G., affinis, sed valde distinctus.

10. OTUS, *sp. n.*

Caput, thorax et scutellum aenei, elytra cyanea, apice cupreo micante, subtus niger. Caput punctatum, inter oculos sulcatum. Thorax punctatus, margine anteriore angustá, lateribus antice emarginatis, ad angulos posticos rotundatis, basi lobatá. Scutellum parvum laeve. Elytra fortiter punctata, punctis in lineis dispositis, humeris valde prominentibus, lateribus antice sinuatis, postice ad apicem attenuatis, apice denticulato. Subtus punctatus. Long. 1 $\frac{1}{2}$ lin.; lat. $\frac{2}{3}$ lin.

Hab.: New Fribourg.

L. macrenti, L. & G., affinis, at thoracis et capitis colore, thorace punctato, formaque elytrorum distinctus.

11. EPHALTES, *sp. n.*

Caput thoraxque obscure aenei, elytra cyanea, subtus niger. Caput punctatum, inter oculos leviter depressum. Thorax sparsim punctatus, lateribus sub-rectis, basi lobatá. Scutellum laeve. Elytra striato-punctata, humeris tumidis, lateribus sub-rotundatis, ad apicem attenuatis, apice denticulato. Subtus punctatus. Long. 1 $\frac{1}{2}$ lin.; lat. $\frac{2}{3}$ lin.

Hab.: Brazil.

A præcedente capite vix sulcato, humeris vix prominentibus et elytrorum lateribus haud sinuatis differt.

12. HADES, *sp. n.*

Omnino cyaneo-niger. Caput tumidum, punctatum, inter oculos sulcatum. Thorax punctatus, lateribus antice sub-rectis, postice prope angulos leviter rotundatis, basi bisinuatâ et in medio lobatâ. Elytra striato-punctata, lateribus prope medium rotundatis, deinde ad apicem attenuatis, apice denticulato. Subtus punctatus.

Long. 2 lin.; lat. $\frac{7}{8}$ lin.

Hab.: Santarem. H. W. Bates, Brazil.

A congeneribus colore omnino cyaneo-nigro necnon capitis formâ differt.

2, Spencer Park, Wandsworth:

June, 1876.

DESCRIPTION OF A NEW SPECIES OF *ECTEMNORRHINUS* FROM
KERGUELEN LAND.

BY CHAS. O. WATERHOUSE.

ECTEMNORRHINUS EATONI, sp. n.

Pyriformis, convexiusculus, niger, parce brevissime viridi-griseo-pubescentis; capite rostroque longitudinaliter fortiter impressis, hoc brevi, apicem versùs haud angustato, antennis nigris; thorace capite paulo latiori, longitudine vix latiori, antice posticeque angustato, subtilissime coriáceo, subopaco, dorsim medio longitudinaliter carinato, postice utrinque obsolete tuberoso; elytris ad basim thorace paulo latioribus, postice bene ampliatis, dorsim depressiusculis, distincte striatis, striis lateralibus obsolete punctatis, interstitiis planis, transversim subtilissime strigosis; pedibus longis, femoribus basi piceis, medio inflatis, tibiis intermediis paulo curvatis.

Long. 2 $\frac{3}{4}$ lin., lat. 1 $\frac{1}{10}$ lin.

This species is most nearly allied to *E. brevis*, C. Waterh., but is much less short, and has the shoulders of the elytra effaced. The thorax is distinctly carinate above, the forehead and rostrum are deeply and broadly impressed, the antennæ are rather slender; the apex of each elytron is broadly and bluntly rounded, and rather expanded on the outer side (♀?); the femora are somewhat strongly inflated in the middle, the tarsi are rather narrower than in the other species of the genus, and the claw joint is very long.

NOTE.—I take this opportunity of correcting an unfortunate error into which I fell in describing the other species of Rhynchophorous *Coleoptera* from Kerguelen Land (Ent. Mo. Mag., 1875, Aug., p. 54). The species which I described as *Agonelytra longipennis* is the same as that described by my father some years ago under the name *Ectemnorrhinus viridis*, and placed in the vicinity of *Phyllobius*. In Lacordaire's 'Genera,' this genus, on account of the cylindrical structure of the abdomen, is placed near *Rhinomacer*, from which it differs in almost every other respect, and in the vicinity of which I did not for a moment think of looking for an insect with a well developed scape to the antennæ. Hence my error.

British Museum : 20th June, 1876.

NEW SPECIES OF LONGICORN COLEOPTERA FROM NEW ZEALAND.

BY H. W. BATES, F.L.S.

The following descriptions of nine new species of Longicorn *Coleoptera* from New Zealand raise to seventy the total number now known from these islands. Instead of having an extremely poor Coleopterous Fauna, as was originally supposed, it is becoming evident that, as far as concerns number of species, the country is not likely to fall far behind other insular regions of similar area and in similar latitudes. Many undescribed species of this family exist in private collections, and new species are continually arriving.

DIDYMOCANTRA EGROTA, *n. sp.*

Elongata, gracilis, omnino pallide testacea, sparsim setosa, antennis undique pilosis, articulis 3-7 sequentibus longitudine fere aequalibus; corpore supra grosse discrete punctato; thorace tuberculis duobus acutis lateralibus, anteriori minuto, instructo. Long. 3-5 lin.

Tairua, near Auckland (Capt. Broun).

Differs from the typical species in the proportions of the antennal joints 3-5; but agreeing in the double armature of the sides of the thorax: the 3rd to 7th joints are linear and nearly equal in length, the 4th being a little the shortest. The surface of the thorax is free from tubercles, and is covered with large punctures except along the dorsal line. The body is glabrous, except for the scattered long hairs; the antennæ are densely pilose.

ASTETHOLEA LEPTUROIDES, *n. sp.*

Elongata, fusco-castanea, palpis pedibusque flavotestaceis; suprâ lævis, glabra, sericeo-nitens; thoracis medio angulatim dilatato, elytris vix striatis, interstitiis nonnullis paulo elevatis. Long. 4 lin.

Canterbury (Mr. Wakefield).

Distinguished from *A. pauper* by its dark castaneous colour, and by the absence of distinct punctures on the elytra. The head is of the same rounded form, flattened in front and very broad between the eyes and base of antennæ; but the thorax is decidedly broader and perfectly smooth. The elytra have very shallow striæ without visible punctuation, and some of the interstices are elevated, but the apical portion is perfectly smooth.

XYLOTOLES BULLATUS (Sharp MS.), *n. sp.*

Elongatus, sub-cylindricus, cinereo subtiliter sparsim, elytris maculatim, vestitus; antennis pedibusque testaceo-viridibus; thoracis medio convexo; elytris basin versùs punctatis, tuberculo utrinque centro-basali elongato valde elevato; antennis infrâ sparsim setosis, articulis apice fuscescentibus. Long. 2 lin.

Tairua, near Auckland (Capt. Broun).

More slender in form than the typical species of the genus: the elytra have distinct shoulders, but are scarcely broader than the middle part of the thorax. The ashy vestiture appears to be very variable in pattern, in one of the specimens before me being arranged on the elytra in longitudinal rows of spots, and in another forming two ill-defined fasciæ, one before the middle, oblique, and the other sub-apical, transverse. The centro-basal tubercles are prominent and smooth.

XYLOTOLES PICTULUS, *n. sp.*

Angustus, subcylindricus, castaneus, nigro-plagiatus, nitidus, thoracis limbo maculisque utrinque elytrorum duabus albo-tomentosis; elytris humeris omnino rotundatis, apice conjunctim rotundatis, basi punctatis; femoribus tibiisque basi albo-testaceis. Long. 1 $\frac{3}{4}$ lin.

Tairua, near Auckland (Capt. Broun).

A small and very distinct species. Integument glabrous, shining castaneous with black clouds on disc of thorax, and in the middle, and towards the apex of the elytra; scattered white tomentum clothes the sides of the thorax and forms three streaks on the elytra, namely, two elongate at the base, and one curved towards the apex. The body is slightly convex, but the base of the elytra is much depressed. The elytra are not wider than the thorax, and the shoulders are rounded off; the base has a few punctures, and there is a line of the same on each

side extending beyond the middle. The antennæ are half as long again as the body, and reddish-testaceous. The legs are pale testaceous, with the club of the femora blackish, and the apex of the tibiæ dusky.

PSILOCNÆIA BROUNI (Sharp, MS.), *n. sp.*

Latiior, sublinearis, suprâ depressa; cinerea, subtus et elytrorum lateribus atrofuscis; thorace medio dilatato, elytris apice singulatim subacuminatis. Long. 3 lin.

Tairua, near Auckland (Capt. Broun).

Rather larger and broader than *P. linearis*; the thorax especially differing in being somewhat abruptly dilated in the middle. The elytra are considerably depressed behind the scutellar region, and at the apex are singly subacuminate, or, in other words, briefly and very obliquely truncate from the suture outwards. The upper edge of the dark fuscous lateral streak is very flexuous, and much darker in colour than the rest of the streak. The antennæ are palish testaceous, speckled with fuscous, and are ciliated beneath.

DISTERNA OBTUSIPENNIS, *n. sp.*

Elongato-trigona, atrofusca, cinereo tenuiter tomentosa; elytris basi elevatis, disco unicostatis, apice rotundatis, punctis magnis nonnullis lineatim digestis.

Long. 5-6 lin.

Canterbury (Mr. Wakefield).

Distinguished from all the Australian species of the genus by the broadly rounded apex of the elytra. It differs from most of the species also by the simply but strongly arched prosternum, the mesosternum retaining the usual form, namely, trapezoidal with vertical anterior face. The antennæ are blackish, with the bases of the joints 3-10 bluish-grey. The thorax is uneven, slightly tri-tuberculate on the disc, and armed on the sides with large tubercles ending in strong spines. The elytra rise abruptly at the base to a plane, greatly elevated above the thorax; their grey tomentum is spotted, and shows besides traces of two fasciæ of the dark ground colour. The legs are unicolorous, and clothed with long grey bristles, like the whole underside of the body. The upper surface has a more scanty clothing of erect bristles.

HYBOLASIVS PEDATOR (Sharp, MS.), *n. sp.*

Oblongus, fusco-piceus, macula laterali thoracis ponetuberculum, fasciaque mediana elytrorum cinereis; antennis longe ciliatis; thorace tuberculo magno conico laterali, atteris duobus disci minoribus; elytris passim punctatis, punctisque nonnullis majoribus sparsis.

Long, 3 lin. ♂ ♀.

. Tairua, near Auckland (Capt. Broun).

Differs from the typical species of the genus by its large, conical, thoracic, lateral tubercles not terminating in a spine. It may be readily distinguished by the rounded patch of light coloured tomentum on each side, covering the hinder part of the lateral tubercle, and extending towards the base. The dorsal thoracic tubercles are transversely placed and not much elevated. The elytra have large, obtuse, centro-basal tubercles; they are variously spotted with ashy tomentum, which condenses about the middle and forms a fascia; the scattered large punctures or foveæ about the disc and apex are a good distinguishing character. The antennæ in the males are one-third longer than the body, clothed with long hairs beneath, dark pitchy in colour, with the 3rd and 4th joints much elongated.

HYBOLASIUS WAKEFIELDI, n. sp.

Oblongus, brevis setosus, atro-fuscus, elytris ante medium cinereo-fasciatis, apicem versus fulvo-plagiatis; thorace tuberculo conico laterali, alterisque duobus disci transversis; antennis articulis basi pallide testaceis. Long. 3-3½ lin.

Canterbury (Mr. Wakefield).

The thorax has a small and conical lateral tubercle, not terminating in a spine, and on its disc two small glossy transverse tubercles; the sides are clothed with sparse cinereous pubescence. The elytra have distinct compressed centro-basal tubercles crested with bristles; they are more densely clothed with pubescence than in *II. pedator*, so that the punctuation is not conspicuous; behind the scutellar region is a broad, cinereous fascia, followed by an interrupted black belt, behind which is a large fulvous patch on the suture, and the disc behind has two or three raised lines. The whole insect is clothed with long grey hairs, especially conspicuous on the legs. The antennæ are ringed with pale testaceous, and their 3rd and 4th joints are only moderately elongated. The species has much the appearance of a *Pogonocheirus*, to which genus *Hybolasius*, as well as the Australian genus *Hebescesis*, is very closely allied.

HYBOLASIUS CRISTATELLUS, n. sp.

Minor, oblongus, longe setosus, fuscus, sparsim cinereo-pubescent, antennis pedibusque rufo-testaceis, illis articulis apice, his tibiis apice tarsisque nigris; elytris tuberculo centro-basali longe penicillato. Long. 1¼-2 lin.

Canterbury (Mr. Wakefield).

A small species; moderately convex and clothed with long, erect hairs, and irregular spots and patches of cinereous pubescence on a rufous-brown ground: in many examples the elytra behind appear more

rufous with indications of two black fasciæ. The thorax is cylindrical, with small, conical, obtuse, lateral tubercles. The centro-basal tubercles are conspicuous, owing to the long pencil of hairs with which they are crested. The legs are pale rufo-testaceous, clouded on the femora, and with the apex of the tibiæ and the tarsi black. The antennæ are slightly longer than the body, the 3rd and 4th joints considerably elongated, relatively; pale testaceous with the tips of the joints fuscous.

Bartholomew Road, Kentish Town:

July, 1876.

DESCRIPTION OF THREE NEW SPECIES OF *PAPILIO* FROM THE
COLLECTION OF Mr. HERBERT DRUCE.

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

PAPILIO TRAGICUS, *n. sp.*

Velvety-black above. *Primaries* with five narrow bands, the first near the base, whitish, the others pale green, the second widest, the fourth and fifth abbreviated, not extending below the median nervure; two series of pale green spots meeting at the external angle, the inner or discal series being formed of six large spots, the outer or sub-marginal series of eight liture; several scattered sub-costal small pale green spots. *Secondaries* with a tapering interno-basal whitish streak; a pale green band crossing the cell and terminating just below it; four pale green apical sub-marginal liture; two carmine liture placed obliquely near the anal angle; tail rather long, slender, tipped with white. *Body* of the normal coloration above. *Primaries* below black-brown, external area paler, the bands and spots as above, but less greenish; a series of large dark brown spots between the discal and sub-marginal series of greenish spots. *Secondaries* below pale brown; basal area covered with large black patches or spots, three of which above the cell (in an oblique series), one within the extremity of the cell, and one on the first median interspace, are bordered inwardly with carmine; two obliquely placed, white-edged, carmine liture; two sub-marginal series of large black spots; cilia varied with white; tail as above. *Body* below white, blackish at the sides, with three slender longitudinal ventral black lines. Expanse of wings, 3 inches, 6 lines.

Zambesi.

Most nearly allied to *P. Philolaus*.

PAPILIO AURIGER, *n. sp.*

Allied to *P. Ucalegon* of Hewitson: above, much blacker in colour; the transverse white band extending rather farther above the median vein; wings below altogether blacker, with no trace of the tawny colouring; basal area of secondaries black, with a spot of golden-yellow at the base. Expanse of wings, 3 inches, 10 lines.

Gaboon.

PAPILIO RHODIFER, *n. sp.*

Wings elongated. *Primaries* grey, the base and borders, the veins and internervular streaks, broadly black. *Secondaries* black; a broad band of white across the outer half of the cell, interrupted by a black spot filling up the end of the cell, and an oblique sub-costal bar; four externally excavated or sublunate spots near the outer margin, the first and second white, irrorated with grey, and rosy at their inferior extremities, the third and fourth bright red, irrorated with grey internally; tail spatulate (wanting in the type). *Body* black, front and sides of collar red; abdomen red with a decreasing series of dorsal black spots. *Primaries* below as above, excepting that the discal area is white instead of grey. *Secondaries* below as above, excepting that the sub-marginal spots are redder. *Body* below black, with the sides and the hind margins of the abdominal segments rose-red. Expanse of wings, 5 inches, 4 lines.

Andaman Islands.

Allied to *P. Doubledayi*.

British Museum: July 5th, 1876.

Note on Mr. Buxton's collections.—Mr. E. C. Buxton, who brought home a large number of specimens of the genus *Callosyne* (*Pierida*) from South Africa, was naturally anxious that some new species should be found amongst them.

He took them first to Mr. Labrey, who studied them carefully, but without success. He brought them to me for the same purpose, and with the same want of success. We could neither of us discover a new species. Mr. Buxton most generously wished me to incorporate them with my own collection, but I had no room for them. They are now at the British Museum, and in the care of Mr. Butler, who has discovered a multitude of new species.

I have just received a small collection of *Lycænida* from Singapore, kindly sent me by Mr. Buxton, which contains some of Mr. Wallace's rarest species in fine condition.—W. C. HEWITSON, Oatlands, Weybridge: July 6th, 1876.

A few remarks on some Swiss Lepidoptera.—For a brief time at the end of June and commencement of July, during the summers of 1872 and 1875, I was in

the Bernese Oberland : my health permitted me to do very little in Entomology, but it is perhaps a duty to record that little, and this leads me to send the following list of my captures with a few remarks on them to this Magazine.

Papilio Machaon and *Podalirius*, both tolerably frequent. One day I saw a fine ♀ *Podalirius* busily depositing eggs on a sloe bush.

Parnassius Apollo, common, especially so at Interlachen; the mode in which this insect folds its wings in complete repose is very peculiar, they are quite as much closed as in an ordinary *Geometra*.

Aporia crategi, most abundant.

Pieris brassicæ. *P. rapæ*. *P. napi*: above a certain elevation, the females of this species seemed to me to assume the form *bryoniæ* as their typical condition; about half-way between Frutigen and Kandersteg for example, the ♀ *napi* was no longer seen, but *bryoniæ* was abundant; at the Châlets of Spittelmat I caught a pair, the male was exactly similar to our spotless spring form, the female was a dark *bryoniæ*: nowhere did a dark male fall under my observation. These one-sided sexual varieties are certainly worth careful study; they have their parallel in the normal state of some insects,—thus no one could doubt that the males of *Oenieria dispar* and *O. detrita* were congeneric, yet how complete is the change in the female *dispar*; in some of the species of the genus *Anthocharis*, on the contrary, the ♂ alone deviates from the type. *P. Callidice*, Lämmeren glacier moraine.

Anthocharis cardamines and *Leucophasia sinapis*, both abundant.

Colias Hyale. *Gonepteryx rhamni*.

Thecla rubi. *Polyommatus Hippothöe* (L.), the specimens of this insect were small and rather dark, it occurred near Frutigen, near Thun, and again at the Giessbach.

Lycæna Egon, very plentiful. *L. Astrarche*: of this species, only one was taken between Frutigen and Kandersteg; its only red spots are the three nearest the anal angle of the inferior wing, it approaches, therefore, very nearly to the aberration *Allous*. *Lycæna Icarus*. *L. bellargus*. *L. minimus*, most abundant; at a small wet piece of moss by the path side, I counted, one hot day, fifty specimens, then, losing my reckoning, I gave up, but there must have been at least twice the number, all of this species within two or three square inches. *L. semiargus*, common. *L. Arion*.

Limenitis Sibylla, Giessbach, Interlachen.

Vanessa comma, one bad hibernated specimen at the Giessbach; the next day I found the curious larva on nettle at Spiez. *V. polychloros*, larvæ and pupæ abundant. *V. Io*, larvæ at Lucerne.

Melitæa Dietyana and *Athalia*.

Argynnis Euphrosyne. *A. Dia*. *A. Aglaia*.

Melanargia Galathea, very abundant everywhere in the low lands.

Erebia Medusa, the typical form of this insect occurred in a wood near Spiez. *E. GEME*: I had great opportunities of examining this insect, as it was abundant between Kandersteg and the Altels; my impression is that the higher the altitude (speaking in general terms) the darker the insect, but this, from my specimens being mixed, cannot be verified; the following forms may be noted:

1. Wings entirely black-brown, no ocelli. The darkest specimen has one faint red bordered ocellus on the reverse side of the inferior wing. Save in size and slightly in shape, these examples resemble *E. Manto* var. *Cæcilia* almost completely.

2. Wings black brown with two small ocelli, black, with white centres, in the upper wing, almost forming a double ocellus, a slight ring of red includes them both; the lower wing has one ocellus, the upper one in the band, this has also a very faint red border. These ocelli and their red margins are better marked on the inferior surface.

3. Wings dull brown with no black shade, the twin ocelli surrounded by a broader red margin; on the lower wing, three ocelli forming a band, each surrounded by a separate red margin. Judging from the short description in Mr. Kirby's "Manual," this seems to be the typical form. It was not, however, the most common.

4. Wings a dark rich umber-brown with a shade of black; upper wing with the twin ocelli in the usual place, and round them a somewhat quadrangular patch of red, below these another ocellus, also black, with a white eye, and with a faint margin of red around it; the lower wings with three ocelli, each in a red ring.

5. Similar to the last, but the red blotch in both the upper and under wings much larger, so that the patch containing the twin ocelli seems only separated from the red mark around the lower ocellus by a brown vein; and in the inferior wing, the red forms a submarginal band, divided into three parts by the veins. This form approaches *E. Stygne* very closely, which latter insect also seems to vary much; the brown is, however, richer and darker than in any specimen of *E. Stygne* that I have seen, the ocelli in the inferior wing of *Stygne* are larger and better marked, and also more visible on the under surface. In *E. melas* and *E. Nerine* the under surface of the upper wing is almost all red and not with a red blotch only as in *Eme* and *Stygne*. Probably the forms described as 4 and 5 are the ♂ var. *Hippomedusa* of Dr. Staudinger's Catalogue, which he places under *Medusa*, but adds, "potius ad *Emen* referenda."

Erebia lappona, common on the plain of the Spittelmat; its variation did not seem great. *E. athiops*, near Kandersteg. *E. Ligea*, common in all subalpine districts, as Interlachen. This insect has not the jumping flight of our *Janira*, as most *Erebiæ* seem to have, but rather the sailing flight of *Pararge Megera*.

Pararge Mæra, common; in alpine districts an aberration with one white eye-spot instead of two in the ocellus of the upper wing was frequent. *P. Hiera*, local, but where found abundant, in a sheltered opening in the wood by the Gemmi pass, with *Argynnis Euphrosyne*.

Epinephele Janira. *E. Hyperanthus*.

Ctenonympha Pamphilus. *C. Arcanius*, var. *Satyrium*, common near Kandersteg, but not unstable and showing no approach to the typical form, being in fact a variety and not an aberration.

Syrichthus Alceus. *S. malvæ* and aberration *Taras*.

Nisoniades Tages. *Hesperia Sylvanus*.

Sphinx ligustri, *Smerinthus populi*, Thun.

Macroglossa stellatarum, abundant. *M. bombyliiformis* (broad bordered), Giessbach.

Zygæna Erythrus. *Z. filipendulæ*.

Hylophila prasinana, near Thun.

Psyche plumistrella (?). *Epichnopteryx* sp., plains of Spittelmat.

Porthesia chryssorrhæa. *Bombyx rubi*, eggs, which developed larvæ of this species, on the Brienzer Grat.

Harpyia vinula, larvæ, Thun.

Bryophila raptacula, one specimen in the Hotel des trois Rois, at Basel.

Mamestra leucophava, one in the Bär Hotel, Mühlengen. *M. oleracea*, Interlachen.

Leucania comma, rather darker than usual, Kandersteg.

Cucullia verbasci, larvæ, at the Giessbach. *C. umbratica*, Interlachen.

Erastria deceptorica, wood at the bottom of the Stockhorn.

Prothymia viridaria, common on the plains of the Spittel matt.

Euclidia Mi, var. *litterata*, common on the mountains, the inferior surface of this variety is very beautiful, quite white with dark markings. *E. glyphica*, very abundant.

Acidalia perochraria, near Thun.

Veallia macularia.

Boarmia repandata, Giessbach.

Gnophos dilucidaria.

Psodos alpinata, *P. quadrifaria*, plains of the Spittel matt.

Ematurga atomaria. *Phasiane clathrata*.

Scoria lineata. The heavy *Lithosia*-like flight of this Geometer is very peculiar.

Minoa murinata. *Odezia atrata*, most abundant in the meadows.

Lobophora sexalisata, near Frutigen.

Cidaria viridaria. *C. turbata*, not rare near Kandersteg. How this splendid insect, with its feathered antennæ, could ever have been confounded by Stephens with *affinitata*, does indeed seem marvellous. *C. montanata*, var. *fuscomarginata*; the first specimen which was taken by me was a great puzzle, as it happened to be more than usually dark. *C. ferrugata*, Kandersteg, common. *C. suffumata*, common, rather high up on the Gemmi pass, but passing away at that time (end of June); it seemed there very unstable and no two specimens were alike, some approaching the var. *piceata*. *C. cæsiata*, upper part of Gemmi path. *C. tristata*. *C. albulata*. *C. luteata*. *C. oblitterata*. *C. bilineata*. *C. incultaria*, common near Kaadersteg. *C. literata*, near Kandersteg, two specimens, one in the Gemmi Hotel.

Eupithecia rectangulata, var. *nigrosericeata*. Some other *Eupithecie* were taken, but are not yet named.

Hercyna Schrankiana, *H. phrygialis*, plains of the Spittel matt.

Eurrhyppara urticata, Brienz.

Botys octomaculata. *B. cingulata*. Very curious to an English Entomologist is it to see such a number of black or nearly black *Lepidoptera*, as were to be met with in some alpine spots; in the plain near the Spittel matt châteaux for example, *Psyche plumistrella* and an *Epichnopteryx* were abundant, *Psodos alpinata* and *P. quadrifaria* were common, *Hercyna Schrankiana* and *H. phrygialis* were in swarms, and *Botys octomaculata* and *cingulata* occurred there also,—eight nearly black insects; the flowers, *Viola calcarata*, *Dryas octopetala*, and *Primula farinosa*, with the bright blue *Gentiana verna* and *acaulis*, formed a strange contrast to the funereal hues of the *Lepidoptera*; the height is about 5850 ft.

Botys cespitalis. *B. fuscalis*. *Diasemia litterata*.

Crambus uliginosellus, in a marsh near Thun. *C. pratellus*. *C. margaritellus*; this species of *Crambus* is common in Switzerland, I took it near Thun and again at the Giessbach. Some years ago, I took in the autumn, two specimens, just above Bowness, of exactly the colour of the Swiss examples; but, usually, the English

margaritellus has a much less orange hue. Near the Altels, I caught one specimen of a magnificent *Crambus*, rather larger than *latistrius* and with somewhat similar markings, but more of the colour of *piretellus*. The pill box containing it was, unfortunately, lost. *C. peritellus*, *Sciaphila Wahlbomiana*, *Cochylis legana*, *Penthina rufana*, *P. striana*, *P. olivana*, *P. lucunana*, *P. cespitana*.

Semasia aurana, particularly abundant near Lucerne in some meadows on the road to Alpnach. Every umbelliferous flower seemed to have one or more upon it; in some the spots were confluent, forming, I suppose, the aberration *aurantiana*, Kollar.

Steganoptycha fractifasciana. *S. quadrana*. *Phoxopteryx compta*. All these three were common on the plains of the Spittelmatz; *compta* was in swarms, and particularly partial to the flowers of *Dryas octopetala*.

Dichrorampha plumbana. *Tinea granella*.

Lumpronia prelatella, common in many places, especially at the Giessbach, where strawberry leaves showing the old marks of the larvæ were frequent. Mr. Stainton says of one taken in a fir wood at the base of the Gemmi, "a very curious specimen, "having the extra-costal spot (the penultimate one), larger than the normal one. In "specimens with the two spots, the outer one is usually much the larger."

Nemotois metallicus, near Frutigen, Lucerne, &c.

Hyponomeuta padella, Lucerne.

Plutella cruciferarum, on the very highest point of the Gemmi pass, flying about amongst *Biscutella lorigata* as comfortably as in an English turnip-field.

Gelechia distinctella (?), Gemmi.

Sophronia semicostella, between Mühlönen and Frutigen.

Hypercallia citrinalis, not rare in the path to the Rauft at the Giessbach.

Polygala chamæbuxus was especially abundant there at that time in fruit.

Glyphipteryx equitella, amongst *Sedum* at Interlachen

Coleophora ornatipennella, grassy meadow near Thun.

Elachista pollutella, on the plain by the chalets of Spittelmatz. This insect, which had never been taken in Switzerland before, was flying there as freely as *rufocinerea* might do in an English meadow, and also like it in the early twilight. I thought it at the time an Alpine form of *cygnipennella*.

Lithocolletis populifoliella, Thun, on *Populus canescens*.

Micropteryx Anderschella, common on umbelliferous flowers between Frutigen and Kandersteg. *M. aureatella*, in the fir-wood at the base of the Gemmi.

Platyptilia gomodactyla, amongst coltsfoot, near Frutigen.

Mimoseoptilus coprodactylus, common near Frutigen, and again at Kandersteg.

Aciptilia tetradactyla, near Frutigen, and again at the Giessbach.

The *Tortrices* in this list were kindly named for me by Mr. Barrett, and the *Tineina* by Mr. Stainton; it records altogether about three weeks of invalid work, and of course does not represent even the common insects which might be taken in that time; the weather was, also, in both cases, most unfavourable. There is one problem in Alpine Entomology to be solved, and that is how a simple pedestrian can bring back enough specimens for the use of himself and his friends; in many cases where insects were most abundant, a single pair were all I preserved.

In this list the names are those used in the Staudinger-Wocke Catalogue.—R. C. R. JORDAN, M.D., 35, Harborne Road, Edgbaston, Birmingham: July, 1876.

Further notes on Lycaena Argiolus.—By way of supplement to my account of this species in the last No., may be mentioned further variations of the larva, which occurred amongst a recent brood, reared from eggs, and since brought successfully through to the pupa state, both by Mr. Hellins and myself.

Several individuals were olive-green, strongly marked with crimson on the dorsal region and along the sides, and deeply suffused with this colour on the thoracic segments, while in the midst of this suffusion there appeared a pale yellowish-olive semi-lunar patch, situated transversely on the back at the hinder part of the second segment.

Another variety was coloured with deep rose-pink on the three thoracic and the last three segments, while the middle segments of the body were light green.

The plain green varieties included individuals of greenish-yellow and others olive-green.

Some further enlightenment as regards the food of this species has been given me by Mr. G. F. Mathew, R.N., who kindly informs me that, on the 22nd of last June, some flowers of *Escallonia* were brought to him to look at, when on one of them was detected a larva of *Argiolus*, about a quarter grown.

No doubt, other food also will be found to have nourished this species, and thus a good deal of the old puzzle as to the appearance of the butterfly in localities where no holly grew is done away with.—WILLIAM BUCKLER, Emsworth: July, 1876.

Description of the larva, &c., of Miana fasciuncula.—For many years, this larva eluded all my attempts to find it, until I was befriended by the chance visit of a female moth to a small pot of *Aira cespitosa*, which, for two years or more, had been standing in an upper window, generally open in fine weather; on this grass, she was obliging enough, some time in 1874, to deposit an egg, and in no other way could my good luck have occurred, as the pot of grass had not been used for anything during the year, but was kept in reserve against the possibility of being wanted at any time.

While watering the grass on the 23rd of April, 1875, I was surprised to see some of the blades much eaten, apparently by a lepidopterous larva; this set me searching, and at length I detected the larva cunningly hidden in the dry sheath of a stem which was drawn round it with a few threads just at the axil of a green blade, the greater part of the grass being dry; I saw at once this larva was that of a *Miana*, but one I had not before seen; and, as it seemed nearly full fed, I figured it next day, and tended it carefully.

It continued to feed very well till the 1st of May, and, on the 2nd, while about to supply earth to its cage, I found it had already spun itself up in a light silken cocoon, under three pieces of the grass, and attached firmly to the bottom of its cage. The moth, a male, emerged on June the 2nd.

The length of the larva was nearly $\frac{3}{4}$ of an inch; it was slender and cylindrical, though tapering from the third segment to the head, which is small and rather flattened, tapering also a little from the eleventh to the end of the thirteenth segment. The skin is of tough consistence, finely and conspicuously wrinkled transversely, and rather glistening; the shining head is of a light brown colour, darker brown at the mouth; there is a light brown shining plate on the second

segment and another on the anal flap; all the rest of the body having a ground colour of a pale and subdued flesh tint, rather inclining to greyish-ochreous; the dorsal stripe, of a darker tint of this colour, is well defined on either side by a stripe of the pale ground; next is a very broad stripe of pinkish-brown, followed by a narrow stripe of the pale ground, finely edged below with pinkish-brown; another narrow stripe of the pale ground follows, and then a stripe composed of faint freckles of pale pinkish-brown, beneath which come the black spiracles; on the sides of the second, third, and fourth segments are rather large brown, shining spots; the anterior legs are pinkish-brown, the other legs tipped with light brown; a fine soft hair proceeds from each of the brownish tubercular dots, which can only be seen with the aid of a strong lens.

The pupa skin is a little over $\frac{3}{8}$ -inch in length, stout in proportion, the head and thorax rounded, and of about uniform bulk to a little below the wing covers, the abdomen tapering from thence to the tip, which is furnished with two diverging curved points, and surrounded with a few minute bristles; the colour, mahogany-brown and glossy.—**II.**

Description of the larva of Nola albulalis.—Length half-an-inch when at rest, longer when crawling; width one-fourth the length, nearly uniform, thus giving the larva a short and stout appearance. Ground colour of two very distinct varieties: 1, pale yellowish-green; 2, bright orange. Tubercles six, raised, on each segment, forming two rows on the dorsal area and two rows on each side, usually of the ground colour, but an intermediate variety of the pale yellowish-green larva occurs with the tubercles orange; from each tubercle springs a tuft of long whitish hairs. Markings, confined to the dorsal area, consist of two rows of irregular black marks, which form, in some instances, well defined lines, and, in others, merely rows of dots, each row being placed between the dorsal and second row of tubercles; the 7th and 11th segments possess a black band, which joins the two rows of markings together. These markings vary much in distinctness. Food plant, the dewberry. The cocoon is fixed to a dried culm of grass or twig, and is formed of silk interspersed with portions of grass or bark, and closely resembles the substance to which it is affixed. The imago emerges in about three weeks after the cocoon is made.—**J. PLATT BARRETT, 34, Radnor Street, Peckham: July 12th, 1876.**

Note on the pendulum-action in flight of ♂ Hepialus humuli.—The following observation is a very curious and interesting one, but I can hardly believe that it has not been before placed upon record: if it have, this will be a confirmation; if not, further observations will no doubt be elicited. In crossing a meadow one evening, three weeks ago, I noticed *Hepialus humuli* ♂ swinging to and fro on the wing, as is its wont. I used to believe that the female moth was hidden where the male performed this at first sight meaningless operation; and I have frequently looked for her, as well as for the ♀ of *H. hectus*, the movement of the ♂ of which species is that of a much more accurate pendulum than in the case of *humuli*. But my search was always in vain, though I think I have more than once taken a pair of *hectus* *in cop.* on the same tuft of *Aira* over which another ♂ was oscillating. Remembering how I had formerly failed to discover the object of this steady to and fro movement,

I stood and looked at several of the moths (as one does sometimes at a difficult problem), and then observed that they occasionally shifted their ground a few feet, so that their senses must be very obtuse if all the attention they appear to give to one spot is required merely to discover that it is barren. Whilst so pondering, a heavy moth, careering along in the wild manner of *lupulinus* or *velleda*, actually "collided" with one of the ♂ *humuli*, or at least touched it and settled on the grass, about a foot in front of it. The ♂ *humuli* immediately followed, and was at once paired with the stranger, which proved to be *humuli* ♀. I looked out on several following evenings, to repeat the observation if possible, but failed to do so. Though this is a solitary observation, I entertain no doubt that the female moth searches for and finds (? selects) the male by sight, which gives a good reason for the conspicuous appearance of the latter sex, and an explanation of its remarkably small antennæ compared with those of the "sembling" *Bombyces*, in which the male finds the female by an antennal sense analogous to smell.—T. A. CHAPMAN, Hereford: *July*, 1876.

Another British example of Ebluea stachydalis.—Among the eight examples of presumed *E. sambucalis* in my collection, I find one to be *E. stachydalis*, as defined by Zeller, and of its specific distinctness from the former there can, I think, be no doubt. This was taken by myself, many years ago, but when and where I cannot say. In the days when I collected British *Lepidoptera*, I adopted the plan in vogue, then as now, among our Lepidopterists, of not labelling my captures. Possibly, in any case, there are few who would think it necessary to indicate the locality of *sambucalis*.—R. McLACHLAN, Lewisham: *June*, 1876.

Occurrence of Pachetra leucophaea near Ashford, Kent.—I wish to place upon record the occurrence of this species here. I have not seen any notice of recent captures, and believe a well authenticated British example is looked upon with considerable interest. On the 7th of last month, I accompanied some friends to a wood in this neighbourhood, where we were occupied principally botanically. Just as we were about to leave, I saw a moth on the trunk of a birch tree very near the ground, which I felt sure must be *Pachetra leucophaea*, and which I have since corroborated as that species. It is a ♀, in perfect condition. Of course I tried to obtain ova, supplying it with grasses, but to no purpose; probably it had not been long out.—WILLIAM R. JEFFREY, Ashford: *July 11th*, 1876.

Capture of Leucania vitellina in the New Forest.—A specimen of this insect was taken at sugar, in September last, in the New Forest, by Mr. George Tate, who, however, remained in perfect ignorance of the importance of his capture till the species was recognised by a London entomologist. It has now been transferred to my cabinet.—J. G. ROSS, Bathampton, near Bath: *17th July*, 1876.

Habits of Myrmedonia collaris.—Among numerous insects collected from the detritus of inundations, I saw a fine *Myrmedonia collaris*; and, fearing that it might be destroyed by contact with the other insects in my bottle, I put it into a vase where by chance were some small twigs from an ant's nest, and half-a-dozen vigorous ants. In an instant afterwards I saw it seize with its mandibles an ant

which had come within range, and, notwithstanding the desperate efforts of the poor creature, it was hurried off under the *débris* which covered the bottom of the vase. At this time I was obliged to cease my observation, but the next morning, I recovered my *Myrmedonia* in a very lively condition; and, on examining the *débris* in its prison, I saw two ant-corpses, both of which had the abdomen separated from the thorax.

An analogous fact was observed last year by M. Lueante, of Lectoure, with *Myrmedonia canaliculata*; and M. Léon Bleuse, of Limoges, has informed me that, when searching among detritus, he saw a *M. canaliculata* run after an ant, which, not having time to escape, was seized and carried off; but circumstances did not permit M. Bleuse to pursue his observations further.—LOTIS MESMIN, Poitiers (from the "Feuille des jeunes Naturalistes," July, 1876).

Capture of Tillus unifasciatus and Xylotrogus brunneus near London.—On the 9th of this month, I detected a specimen of *T. unifasciatus* on some new oak palings in this neighbourhood; on the following day I took another; and on the 12th two more, and lost another; on the 15th I missed another, as it fell amongst the long grass and escaped; on the 17th I took two more. *Lyctus canaliculatus* was very abundant, and amongst them I detected seven specimens of the rare *Xylotrogus brunneus*. Is anything known in what trees these three species feed, as they evidently only come to suck the new wood, and frequently fly on and off very rapidly, as I found, to my misfortune? As the locality is close at hand, I visit the spot daily, morning and afternoon, but most have occurred in the morning. Although I have been on the look out for both these species for the last thirty-five years, I never took them before.—SAMUEL STEVENS, Loanda, Beulah Hill, Upper Norwood: July, 1876.

Coleoptera in the Isle of Man.—During June I noticed the following species here:—*Melolontha hippocastani*, *Cetonia ænea* and *aurata*. The two first-named have not, I think, been previously recorded as occurring in the Isle of Man, and the triad struck me as rather curiously illustrative of the connection, geographically and otherwise, of this island with the surrounding kingdoms.

Melolontha hippocastani is common in Ireland, but not, I think, either in England or Scotland. *Cetonia ænea* is as yet only found in Scotland, I believe. *C. aurata* is a very abundant English insect; but of rare occurrence, so far as my experience goes, in either Ireland or Scotland.

It has been said, in explanation of the well-known heraldic bearings of the Island (three legs joined at the thighs), that they represent the Manks with the toe of one foot spurning Ireland, the spur on the heel of the second kicking at Scotland, and the knee of the third leg bowing to England.—EDWIN BIRCHALL, Douglas, Isle of Man: July 10th, 1876.

Occurrence of Dichroosectus rufipennis.—Whilst searching for *Psyllida* on the 26th inst., I was much pleased to find this insect somewhat common on fir trees (*Pinus sylvestris*) at Eltham. I have hitherto considered it to be one of our scarce species, having only met with it on one or two occasions, and then sparingly. From what I could observe, it seemed to me to be mostly attached to the *green* cones.

The specimens captured were very tender, as though having just changed to the perfect form, and, confirming this supposition, the pupæ were in my net in some numbers.—JOHN SCOTT, 1, St. Mildred Terrace, Burnt Ash Hill, Lee, S.E.: *June 30th*, 1876.

Capture of Aphalara nervosa, Först.—This is an addition of some importance to the list of British *Psyllidæ*, which will very shortly be published in the Transactions of the Entomological Society; it is the species to which I there refer when comparing differences with my new *A. radiata*. I happened to see a single specimen taken by Mr. Douglas, who informed me he had recently beaten it from *Achillea millefolium* at Bromley. As soon as an opportunity occurred, I set to work in search of it, and, in one locality near here, I found it on the *Achillea* in profusion. A complete description of it, and other species yet undescribed, will shortly follow in an appendix to the paper alluded to; but, for the sake of aiding others to recognise the creature, I give a brief diagnosis. Entire insect green; elytra clear, transparent; nerves next the apex more or less broadly margined with brown or black.—LD., *June 30th*, 1876.

Diagnoses of certain species of Psyllidæ which may be expected to occur in Britain.—As the season is not yet too far advanced to look for many of the species belonging to this group which we know are natives, neither is it too late to try and add those of which I here give short descriptions, and which ought to be found in this country.

TRIOZA JUNIPERI, Meyer-Dür.—Vermilion. *Face*: lobes short, reddish-yellow. *Antennæ*: 1st and 2nd joints reddish, 3rd to 8th white or reddish-white, 9th brown, 10th black. *Elytra* pale testaceous, apex somewhat obtuse, nerves more or less red. *Legs* reddish-yellow.

This is a small species, and, as its name indicates, is to be found on the juniper. Perhaps those who may be “beating about the bush” for insects of other orders, would keep an eye open for this little beauty. I have a pair named by the author, who thinks that, from the shortness of the antennæ and the blunted apex of the elytra, it, with one or two others, ought to form a new genus, an idea which I cannot endorse.

RHINOCOLA SPECIOSA, Flor.—*Head* yellow, minutely and sparingly punctured with dark brown. *Antennæ* pale yellow, two terminal joints black. *Pronotum* dark brown. *Elytra* whitish, scarcely transparent, more or less thickly punctured with dark brown, the puncturing more or less confluent, and almost forming three transverse bands, placed one across the apex of the outer basal cell, another across the middle of the disc, and a third next the apex, first and last darkest; *clavus* with two patches along the dorsal nerve, and the apex of the inner basal cell punctured with dark brown. *Wings* milk-white, dorsal margin next the base punctured with dark brown. *Legs* pale yellow. *Thighs* more or less brownish or black. *Abdomen*: above, black, two or three of the segments narrowly margined with yellow.

The colour of and characters on the elytra bear a somewhat rough resemblance to those of *Aphalara exilis*; but the difference in form, and the stigma always con-

stant in *Rhinocola*, at once show their distinctness. According to Dr. Flor, to whom I am indebted for specimens, this species is not uncommon from June to August on dry hilly places, on heath.

APHALARA AFFINIS, Zett.—Deep black, dull. *Head* with scarcely discernible punctures. *Antennæ* yellowish-white, two basal and two apical joints black, apex of 2nd joint sometimes whitish. *Pronotum* much deflected; *mesonotum* on the sides at the base of the elytra generally yellow, brownish-yellow, or brownish-red, seldom black. *Elytra* almost clear transparent, with a very faint yellowish or yellowish-brown shade, sometimes darker at the apex than at the base; nerves clear, fine; nerve adjoining the apex of the clavus with a black spot at the dorsal margin. *Legs* yellowish-white; *coxæ*, *fulcra*, and *thighs*, brown or black, apex of the latter yellow. *Abdomen* black; genitalia of both sexes as in *A. polygoni*.

Found, Dr. Flor says, on moory meadows, also on *Pinus Abies*, from June to September. This is a species I do not possess, and the tree named, to which a large number of individuals of the various genera seem to be attached, I have rarely had an opportunity of searching.

APHALARA ARTEMISIE, Först.—Clear green; *mesonotum* sometimes with reddish-yellow streaks. *Antennæ* dusky yellow or green, 4—7 sometimes brown at the apex, 8th at apex, and 9 and 10 entirely, black; 1st and 2nd joints underneath frequently brown. *Elytra* white, almost transparent, with very minute black punctures frequently confluent, and sometimes so thickly disposed as to render the disc opaque. *Legs* green.

Förster says he received six ♀ from Dr. Scholz with the remark that he found them on sandy places at the base of *Artemisia campestris*, a rare plant in this country, and, according to Babington, only found on sandy heaths in Norfolk and Suffolk. Flor states that with him the insect was very common on dry mountain meadows and heath, as well as on *Artemisia*, from June to August. I only know this species from the descriptions of the authors cited; but it seems to me, from the latter's observation, that we ought to get it here. I shall be glad to see or hear of examples of any of the foregoing having been found, to enable me to add them to the continuation of my paper on the group.—*Id.*: July 5th, 1876.

Notes on some species of Psyllidæ.—Under this heading (p. 42 *ante*) I cited Kaltenbach with respect to *Psylla ixophila*, "Frauenfeld." I could not find the name at the reference given to the "Verhandlungen," and the volume has no index of species; but I have since discovered that Kaltenbach was trebly wrong. First, he puts "*exophila*" instead of "*ixophila*" (the latter and correct name, however, is in the Index of his book); secondly, he has "Frauenfeld" instead of "F. Löw," as the author of the specific name; thirdly, he has "Verhandl. k. k. z.-b. Ges. Wien, 1862, p. 100"—the last should be "105." Dr. Franz Löw there described the pupa and imago, and figures are given on a plate. Of the pupa he found a single example only, at Vienna, 28th April, on a leaf of mistletoe, and it remained perfectly stationary thereon for eight days, when the imago was developed. He believes it is not the *P. visci* of Curtis, but his opinion that it is distinct is mainly founded

upon the insufficiency of Curtis's description (leider zu kurz beschriebenen). After all, therefore, there may be but one species, and, as I said before, the matter requires investigation. If the month of July should be too late to obtain examples matured in May, an examination of the mistletoe in August may possibly result in finding that there is a summer generation from which the spring brood comes.

Psylla sylvicola.—Under this name, M. Lethierry, in 1874 (Hém. Nord, p. 90), described a good and distinct species found in France and also in Britain. Herr v. Frauenfeld having long since described a *Psylla sylvicola* in the Verhandl. z.-b. Ges. Wien, xi, 170 (1861), it appears at first sight that M. Lethierry's specific name must be changed; but it may be retained, because v. Frauenfeld's species belongs to the genus *Trioxa* (cf. F. Löw, Verhandl. z.-b. Ges. xii, 107). It was found abundant on *Senecio nemorensis*, Lin., growing in the high woods of the Alpeck mountains, and is described as being one of the smallest of the *Psyllidæ*, only 1 mm. long, entirely pale yellow, except the prominent black eyes, the antennæ brown beyond the 5th joint, and the nerves of the transparent wings yellowish-brown.

Among the species which I noted (p. 41 *ante*) as desirable to re-find in this country were *Aphalara exilis*, Weber and Mohr, and *Aphalara flavipennis*, Först. I find that the former has been taken in some numbers by Dr. Power, and that the latter is accounted to be a synonym of *A. picta*, Zett., but it has been rare with us hitherto, and is still worth looking for. It is said to occur commonly in meadows on the continent, but the food plant is unknown.—J. W. DOUGLAS, Lec: *July 10th, 1876.*

ENTOMOLOGICAL SOCIETY OF LONDON: *5th July, 1876.*—Professor WESTWOOD, President, in the Chair.

Mr. Douglas exhibited the following *Psyllidæ* taken in the month of June, near Lee:—*Psylla* sp.?, possibly *betula*, Lin., Flor, on birch trees. *P. spartiophila*, Först., on broom bushes. *Aphalara renosa*, Först., new to the British fauna, now first identified as living on *Achillea millefolium*, it having only been taken casually by Foerster and Flor. *Rhinocola aceris*, Lin., on maples. *R. ericæ*, Curt., on heather.

The President said, with reference to this exhibition, he was glad to see that attention was directed to the interesting but neglected *Psyllidæ*.

The President exhibited a number of insects of several orders, delicately displayed and mounted on slides for microscopic purposes by Mr. Enoch. Also some flower-stems of horse-chestnut, each with a longitudinal incision and eaten hollow by some insect, somewhat after the manner in which terminal shoots of fir trees are eaten out by the larvæ of *Retinia turionella*; and he was desirous of finding out what insect was the depredator, no means of identifying it remaining in the stems. He also exhibited specimens of *Coccus camellia*, a scale insect, the females of which he had first described long since in the 'Gardeners' Chronicle,' and which were found on a young *Camellia* in his greenhouse. The females are of a flattened oval form, and emit a quantity of white waxy matter from the extremity of the body, which secretion is gradually pushed backward till it extends nearly half-an-inch, and has quite the appearance of the excrement of a small bird; the eggs are deposited within the secretion. The males had not been observed. He also exhibited a

number of specimens of a closely allied species, which he had recently received from the Rev. T. A. Preston, of Marlborough College, the females of which secreted the white waxy matter in the same manner as the former species. These specimens were found on the leaves of a *Euphorbia* forwarded to Mr. Preston from Kew, and on them were also found a considerable number of small semi-transparent oval scales, from the posterior extremity of which were protruded two very short white delicate filaments, which the Professor immediately recognised as the extremities of the two caudal setæ of the male *Cocci*, which had not then made their escape from their strange puparium; this they do backwards from beneath the hinder extremity of the scale, a mode of exit of the imago quite unique in the insect world, the wings being thrown, by the backward motion of the male, over its head! He also exhibited a drawing of the male and anatomical details magnified, and proposed the name of *Coccus euphorbiæ* for the species.

The President drew attention to the following works :*

“Pinacographia. Illustrations of more than 1000 species of North-West European Ichneumonidæ sensu Linnaeano.” 4to. By S. C. Snellen van Vollenhoven. 2 parts, each with five coloured plates.

“Schetsen ten Gebruike bij de Studie der Hymenoptera.” Oblong folio. By the same author. Part 1, Ichneumoniden; part 2, Braconiden; part 3, Pteromalinen; part 4, Proctotrupiden. Fourteen plates. Professor Westwood observed as follows:

“Entomologists are under great obligations to Dr. Vollenhoven for the excellent materials, contained in the two works mentioned above, towards the knowledge of the difficult tribes of the *Ichneumonidæ* and other minute groups of parasitic *Hymenoptera*. The second of these works consists of nearly 350 outline figures of the genera of these insects, published at a very low rate; whilst the first of them consists of coloured figures of a great number of species of various genera belonging to the same families, all the species of which were arranged by Linnaeus under the generic name of *Ichneumon*. The outline figures are either copied from the most reliable works, such as those of Curtis, &c., or are original; whilst the coloured figures are entirely original, and worthy of Dr. Vollenhoven’s well-known artistic talent. In many cases, the portions of the body exhibiting characteristic specific distinctions of the different insects are only represented, accompanied, however, by a number of full figures of other species. It is to be hoped that the author will meet with sufficient encouragement to induce him to continue his work.”

Mr. Stevens exhibited a remarkable variety of *Coremia fluctuata* from Sevenoaks, on which all the ordinary markings were scarcely visible; *Coremia ligustraria* from Croydon; and, from the chalk hills in that neighbourhood, two examples of *Lycæna Thetis (Adonis)*, presenting small black spots on the posterior margin of the upper wings, a very uncommon aberration, and constituting, he thought, a local variety.

The following Memoirs were communicated:—Descriptions of a new genus and some new species of *Halticinae*: by J. S. Baly, F.L.S. Descriptions of new genera and species of *Tenthredinidæ*, chiefly from the East Indies, in the collection of the British Museum: by P. Cameron.

The second part of the “Transactions” for 1876 was on the table.

* See Zoological Record, ix, 1872, x, 1873, and xi, 1874.

DESCRIPTIONS OF SOME NEW GENERA AND SPECIES OF NEW
ZEALAND COLEOPTERA.

BY D. SHARP, M.B.

(continued from page 28.)

TELMATOPHILUS NITENS, *n. sp.*

Colore variabilis; rufo-testaceus, elytris plus minusve infuscatis, maculis pallidis magnis quatuor: convexus, nitidus, fere nudus; thorace sat fortiter punctato; elytris minus subtiliter punctato-striatis, punctis apice obsolete. Long. corp. 2—2½ mm.

This species, though closely allied to *T. depressus*, is very distinct therefrom, by its more convex form, and stronger punctuation; it has also the legs and antennæ rather shorter and stouter. The colour is very variable, being sometimes reddish-yellow, with a dark band across the middle of the elytra, leaving a pale humeral, and apical spot on each; this dark colour extends sometimes so as to occupy entirely the elytra; and the prothorax is also, in such specimens, so much infuscate as to be nearly black.

Also a common species, I believe, about Auckland.

APHODIUS DISTANS, *n. sp.*

Angustulus, parallelus, sat convexus, nudus, nigro-piceus, antennis pedibusque dilutioribus; capite mutico; prothorace transverso, elytris latiore, basi crebre fortiter, punctato, punctis anterioribus magis sparsis; elytris crenato-striatis, humeris acute tuberculatis. Long. corp. 4¾ mm.

Head very convex, finely punctured without any traces of tubercles; clypeus much emarginate. Thorax greatly broader than long, in front a good deal broader than the elytra, narrowed to the base, which is as broad as the elytra; the surface is without depressions, but bears irregularly-distributed coarse punctures, which, on the middle of the front part, are almost absent. Elytra with nine striae, each of which is punctured with large, but rather distant, punctures, and also with a series of punctures along the lateral margin. The scutellum is elongate and narrow. The middle coxæ are widely separated; the basal joint on the hind tarsus is as long as the hind spur.

Two individuals sent from Tairua by Captain Broun; they are no doubt the two sexes, for in one of them the pygidium is a good deal more inflexed, and the apical ventral segment shorter in the middle, than in the other.

APHODIUS SUSPECTUS, *n. sp.*

Angustulus, parallelus, sat convexus, nudus, piceus, nitidus; prothorace transversim quadrato, elytrorum latitudinè, fortiter punctato; elytris fortiter striato-punctatis, humeris haud acutis.

Long. corp. 4¼ mm.

Very closely allied to *A. distans*, but rather smaller and shorter, and with the thorax less transverse; the striae of the elytra are a good deal deeper, and their punctures are nearer to one another. Besides these slighter characters, the two species present some more important distinctions. The legs in *A. suspectus* are shorter, and the long spur of the hind tibiae reaches as far as the apex of the 2nd tarsal joint; the shoulders of the elytra are not acute, and the middle coxæ are not so widely separated.

An individual of this species was sent me some years ago by Mr. Edwards of San Francisco, with the No. 1709 attached.

OBS.—This species and the preceding, though allied to the genera *Saprosites*, *Euparia*, and *Atenius*, will not at present satisfactorily accord with any of them. I think, however, for the present, they may be best placed in *Saprosites*, which is rather vaguely characterized by Redtenbacher. The *Oxyomus excavatus* of White is from his description probably a species allied to these two; it is not applicable to a *Proctophanes*, to which genus it is referred in Harold's Catalogue; a species of which genus occurs, however, in New Zealand. I have a third species allied to *A. distans* and *A. suspectus*, but much smaller and more deeply striated, which I suspect to be White's species; it is similar in size and form to our *Aphodius casus* (*Psummobius*), but is a little broader, and has the angles of the elytra very acute. According to Captain Broun it is found in the wood of *Sophora tetraptera*.*

APHODIUS BROUNI, n. sp.

Nigricans, convexus, minus elongatus, subopacus; antennis pedibusque dilutioribus; thorace transverso, angulis posterioribus fere nullis, crebre irregulariter punctato; elytris striatis, striis apice profundioribus, minus distincte punctatis.

Long. corp. 3¼ mm.

Head impunctate except on the extreme vertex, quite without elevations; clypeus emarginate. Thorax strongly transverse, rather wider than the elytra, the front angles rounded and a little produced, the hind angles extremely indistinct and obtuse; the surface bears numerous rather deep, but not very coarse, punctures, which are irregularly distributed, and nearly wanting about the front; the surface is rather dull. The elytra are rather short, and bear each nine somewhat deep, but rather fine, striae; they are deepest on the deflexed portion: the punctures these striae bear are only indistinct; the surface is dull, but the interstices are not punctured. The legs are short, the tibiae stout, the long spur on the hind ones reaching nearly to the apex of the 2nd joint. The mesosternum is densely and finely rugose so as to be very dull; the space between the middle legs is carinate.

* Since the above was in print, I have received from Mr. Pascoe a specimen of what appears to me to be a third species of this group; it is very closely allied to *A. suspectus*, but is considerably larger, the punctures of the thorax are rather more numerous, and the striae of the elytra, as also their punctures, are somewhat finer, so that the interstices are broader; the following diagnosis will characterize it:—

APHODIUS PASCOEI, n. sp.

Angustatus, parallelus, nigricans, nitidus; prothorace transversim quadrato, elytrorum latitudine, fortiter punctato; elytris striato punctatis, interstitiis latis, hamis prominulis, cæcatis.

Long. corp. 5¼ mm. D. S.

Sent by Mr. Edwards and Captain Broun; Mr. Edwards' specimen with the No. 1708; some of Captain Broun's individuals were indicated as found in the wood of *Sophora tetraptera*.

OBS.—This species is rather smaller than our European *A. biguttatus*, and somewhat similar in form thereto; I think it may be placed in Harold's genus *Atænius*; in many respects it resembles *A. distans* and its allies, but is very readily distinguished from them by the rugose mesosternum. It varies in colour, the elytra being sometimes obscure red.

PYRONOTA.

Only one New Zealand species (*Melolontha festiva*, Fab.) of this genus is at present recognised; the *P. refulgens*, Bois., which is in the Munich Catalogue referred to New Zealand, being, according to Burmeister and Lacordaire, an inhabitant of New Guinea; while *Melolontha lata*, Fab., is generally considered to be a mere variety of *M. festiva*. Though I cannot speak positively as to this latter point (having only one specimen which I can consider to be Fabricius' *M. lata*), yet I am able to say that several species exist in New Zealand closely allied to one another, and I think I distinguish four distinct forms.

1. The form which is commonest in collections is, I believe, Fabricius' *M. festiva*; it is sent commonly from Auckland, and is 8 or 9 mm. in length; it is above of a beautiful pale green, somewhat metallic colour, has a well-marked stripe on the middle of the thorax and along the suture of the elytra, of a fuscous colour, and a rather paler stripe near the lateral margin of each wing case; the under-side is reddish, the legs and antennæ yellow, the club of the latter black. In the male, the club of the antennæ is about three-eighths of a line in length; the front tibiæ are broad and curved, and their apex (or apical tooth) is broad and much turned outwards; the basal joint of the tarsus very long, and inserted far up the tibia.

2. PYRONOTA EDWARDSI, n. sp.

Supra minus late viridis, cupreo-fusco refulgens, subtus fusca; sine lineis obscurioribus, sed sutura cupreo refulgente.

Long. corp. $6\frac{1}{2}$ —8 mm.

Mas, tibiis anterioribus angustulis, rectis.

This form differs from *Melolontha festiva* by its more obscure colour, comparatively rather shorter and broader form, by the absence of stripe on the thorax, and by the metallic suture, and absence of the intra-marginal lateral stripe of the elytra; and by the differences in the male characters. In that sex the club of the antenna is rather longer than in *M. festiva*; the front tibia is more slender, and is straight; the apical tooth is slender and very little directed outwards; the basal joint of the tarsus is short, and inserted near the apex of the tibia.

The only specimens I have seen of this species are fourteen in number, and were sent me, with other interesting New Zealand insects, by Henry Edwards, Esq., of San Francisco, after whom I have named the species. These specimens vary very little *inter se*, and the male characters are exactly similar in the four specimens of that sex.

3. PYRONOTA SOBRINA, *n. sp.*

Suprà opalescens, subtus rufescens, thorace vitta dorsali elytrisque sutura fuscis. Long. corp. $6\frac{1}{2}$ —7 mm.

Mas, tibiis anterioribus latiusculis, rectis.

This species is of a peculiar opalescent colour; and is readily distinguished from the two species I have already named by the structure of the male tibiæ and tarsi, which, in some respects, are intermediate between those of the other two species. In that sex the club of the antenna is rather long; the front tibiæ are short, but rather broad: they are very little curved; the basal joint of the tarsus is rather short, and inserted at a moderate distance from the extremity.

Three male individuals labelled "Taranaki," and bearing the No. 1977, were sent me by Mr. Edwards, and are the only specimens I have seen. In one of them the thoracic stripe is very indistinct, but the intra-marginal elytral stripe is pretty distinct, though it is nearly absent in the other two. The male characters are quite similar in the three specimens.

4. PYRONOTA MUNDA, *n. sp.*

Supra læte viridis, fere unicolor, elytrorum lateribus apicem versus plus minusve fluorescentibus. Long. corp. 9—10 mm.

*Mas, antennarum clava elongata; tibiis tarsisque anterioribus fere ut in *M. festiva*, Fab., sed adhuc magis elongatis.*

This form is very close to *M. festiva*, but is rather more elongate, and is of a beautiful almost unicolorous green on the upper surface, and the club of the antennæ in the male is distinctly longer, and the tibiæ and tarsi are a little longer.

I received this species from Mr. Edwards, but only two males and a female; and I have also an individual from another source in my collection.

MENIMUS,* *nov. gen.* (*Tenebrionidarum*).

Antennæ breves, crassæ, clavate, 10-articulatæ.

Oculi parvi, vel minuti.

Tarsi subtus longius setosi, posteriores articulo basali haud elongato.

Last joint of maxillary palpi securiform. Eyes small, or very minute. Thorax strongly margined at the sides, and with the hind angle very accurately adapted to the lateral margin of the elytra. Prosternum with a process projecting backwards, and meeting the front of the metasternum, there being no process of the mesosternum to receive it. Middle and hind coxæ slightly separated. Epipleuræ of elytra rather broad, and accurately fitted to the sides of the breast and hind-body. Tibiæ rather slender, unarmed, the apical spurs minute. Tarsi moderately long and slender, furnished beneath with rather long but scanty hairs, the basal joint of the hind tarsi stout or moderately long.

This genus seems to me to find a fitting place in the *Diaperides* of Lacordaire, near *Diaperis* and *Scaphidema*, from both of which the characters above mentioned readily distinguish it. I sent some specimens to Mr. F. Bates, who returned them as quite unknown, and expressed a doubt as to whether they belonged to the *Heteromera*; I think, however, that when he has an opportunity of examining the characters, he will probably be of my opinion.

MENIMUS BATESI, *n. sp.*

Oralis, sat convexus, sat nitidus, nudus, piceus, antennis pedibusque rufis; vage punctatus; oculis mediocribus; tarsorum posteriorum articulo basali sequentibus duobus aequali. Long. corp. $4\frac{1}{2}$ mm.; lat. $2\frac{1}{4}$ mm.

Antennæ 1 mm. in length, reddish, stout, much thickened to the extremity, basal joint much concealed by the side of the head, and projecting but little beyond it, 2nd and 3rd joints short, 4th, 5th, and 6th short, not so long as broad, 7th broader than 6th, 8-10 forming a loosely articulated club, the 8th and 9th transverse, the 10th scarcely so broad as they are, rounded, and about as long as broad. Head distinctly and moderately sparingly punctured, not much shining. Thorax rather strongly transverse, the sides considerably narrowed towards the front, but scarcely curved, the surface rather shining, and finely and sparingly punctured. Scutellum short and broad, finely punctured. Elytra pitehy, with the extremity paler, rather finely and not closely punctured, the punctuation irregular, but sometimes forming the rudiments of striae.

I have three specimens of this species, which were sent from Auckland by Mr. Lawson, and, I believe, other individuals were received by his brother. I think I also received the species from Captain Broun, and returned it to him as unknown to me. I have named this species in honour of Mr. F. Bates, to whom I am indebted for some information on New Zealand *Heteromera*.

MENIMUS CRASSUS, *n. sp.*

Breviter oralis, sat nitidus, nudus, nigro-piceus, elytrorum apice, antennis, pedibusque dilutioribus: vage punctatus, elytris parcius subpunctato-striatis. Long. corp. 3 mm.

Closely allied to *M. Batesi*, but much smaller, and with the elytra shorter and more convex, and their punctuation more sparing, and more distinctly arranged in lines; the general characters are, however, very similar to those of the larger species.

This species was also sent by Mr. Lawson, from Auckland.

MENIMUS CÆCUS, *n. sp.*

Oblongo-ovalis, sat convexus, nitidus, nudus, elytris tantum obsolete punctatis; oculis minutis: prosterni processu apice depressiusculo, minus producto. *Long. corp. 2½ mm.*

At first sight, this would be thought a pale form of *M. crassus*, but examination shows it to be very different. The head is distinctly punctured, but the thorax is shining and impunctate, and the sculpture of the elytra consists only of some rows of very obsolete punctures. The form of the prosternal process and the abortive eyes will readily lead to the recognition of this species.

Four specimens were recently sent me from Tairua by Captain Broun.

ARTHOPUS,* *nov. gen. (Tenebrionidarum).*

Antennæ 11-articulatæ, clara triarticulata.

Palpi maxillares articulo ultimo haud incrassato, quam 3° duplo longiore.

Tarsi subtus parce pilosi.

Facies fere generis Phyllodectæ (Phytophagarum).

Antennæ with the three apical joints thickened so as to form an elongate club. Maxillary palpi with their basal joint very small, 2nd short, slender at the base, broad at the extremity, 3rd slightly shorter than 2nd, about as long as broad, 4th joint about as broad as 3rd, quite twice as long as it, rather thicker in the middle than at the apex. Head rather small, inserted in the thorax as far as the prominent eyes, which are somewhat oval in form; insertion of antennæ not concealed, and quite contiguous with the eye. Front coxæ rather widely separated, the process between them not prolonged behind. Middle coxæ hardly more distant than the front pair, their trochantins visible; suture between meso- and metasterna very evident, extending just between the middle parts of the coxæ, the mesosternum in front of it obliquely declivous. Metasternum moderately long; hind coxæ separated by an almost pointed process, which projects a good way into a notch at the extremity of the metasternum. Hind body rather elongate. Epipleuræ of elytra rather narrow, except at the shoulders, but very accurately applied to the sides of the body. Tibiæ quite unarmed, and only a little incrassate at the apex: the tarsi simple on all the legs; furnished beneath with a fine but scanty pile; they are slender and of the same

width throughout all their length; the front and middle pair with the three intermediate joints very similar to one another, the basal joint longer than the 2nd; hind tarsi with the basal joint rather long, a little longer than the two following together, the second slightly longer than the 3rd, the last joint rather shorter than the other three together.

I sent a specimen of this insect to Mr. F. Bates, who returned it as quite unknown to him, and doubted whether it belonged to the *Tenebrionidae*. It undoubtedly must be classed in that family, however, but I cannot indicate its exact position: I think it should be near the *Helopides*.

ARTHOPUS BROUNI, *n. sp.*

Oblongus, sub-parallelus, transversim convexus, nudus, nitidus, niger, supra viridi-æneus; clytris fortiter punctato-striatis, punctis apice obsolete.
Long. corp. 5—6 mm.

Antennæ rather longer than head and thorax, black, 1st joint moderately stout, 2nd not very short, 3rd elongate, 4th—8th each a little longer than its predecessor, 8th rather longer than broad, but scarcely thicker than the 3rd, 9—11 forming a long loosely jointed club, the 9th greatly broader than the 8th, quite as long as broad, 10th transverse, 11th obtuse, large, larger than any of the other joints. Thorax broader than long, rather narrower than the elytra, the sides sharply margined, the hind angles almost rectangular, the basal margin obsolete and quite wanting on the middle part, which is a good deal lobed; the surface is sparingly and somewhat finely but very regularly punctured. Scutellum rather small, acuminate, impunctate. Elytra with rows of rather coarse, somewhat distant punctures, which become obsolete at the apex; they are broadest at their base, and gradually and slightly narrowed towards the apex. Under-surface and legs deep black. Sides of the prosternum with rather distant, peculiar, raised punctures; sides of the metasternum with coarse, impressed punctures. Hind body shining, and impunctate.

Sent from Tairua by Captain Broun recently, but only three mutilated individuals. I hope the arrival of other specimens will enable such an examination to be made as will settle the affinities of the species.

LORELUS,* *nov. gen. (Tenebrionidarum).*

Mentum parvum; palpi omnes conspicui.

Coxæ intermediae parvæ, trochantinis nullis.

Tarsi articulo penultimo sub-lobato.

Antennæ 11-jointed, with the three apical joints a little thicker than the others; their insertion very near the eye, which is moderately broad and not emarginate. Mentum quite minute, leaving exposed the base of the maxillæ; the process sup-

porting it also very small. Last joint of maxillary palpi securiform. Front coxæ round, small and deeply embedded, separated by a narrow process, the apex of which is depressed and does not project behind. Middle coxæ small, deeply embedded, separated by a process of the flat mesosternum, outside each the mesosternum and metasternum meet together, and there is no trace of a trochantin. Metasternum rather long. Hind coxæ separated by an obtuse, not very broad projection of the 1st ventral segment. Hind body rather elongate. Epipleuræ narrow. Tibiæ quite unarmed and rather slender, their apices narrow, and not in the least thickened, but even rather more slender than the portion just above them. Penultimate joint of the tarsi excavate above, so that the apical joint is inserted at the upper side of its base; they are densely clothed beneath with a fine pile; the basal joint of the hind ones quite as long as the two following together.

This appears to be an extremely anomalous genus; it would appear that it cannot be satisfactorily placed in any of Lacordaire's groups; the structure of the coxæ would cause it to be referred to the first division of the *Tenebrionidæ* in his arrangement; but the structure of the tarsi is nearer to that of *Læna* and *Adelium*. I sent specimens to Mr. Bates, who returned them as unknown to him, and doubted their being *Tenebrionidæ*; of this, however, an examination leaves me no doubt.

LORELUS PRISCUS, *n. sp.*

Sat depressus, elongatus, nudus, ferrugineus vel piccus, crebre sat fortiter punctatus; thorace elytris multo angustiore, sub-quadrato, antice truncato.
Long. corp. 4—5 mm.

Antennæ reddish, shorter than head and thorax, rather stout; 1st joint short and stout, its insertion not visible from above, 3rd joint not elongate, but longer than any of the others, 4th rather longer than broad, 5th—8th each with the breadth differing but little from the length, 9th and 10th distinctly thickened and rather transverse, 11th rather large, even a little broader than 10th. Head narrower than the thorax, and not immersed in it up to the eyes, it is closely and moderately coarsely punctured, and the sides are a little thickened over the insertion of the antennæ. Thorax about as long as broad, distinctly narrowed towards the base, the front angles not prominent, and about right angles, the hind angles minutely prominent, the base not in the least lobed in the middle, its punctuation like that of the head. Scutellum rather short and broad, not punctured. Elytra evenly covered with rather coarse and close punctures, the punctures distinct at the apex, but not so coarse there as elsewhere.

I have received this species both from Captain Broun and Mr. Lawson; and believe it to be common in the Northern island; several individuals of it were included in a lot of beetles sent home by Captain Broun as found on one of the tree-ferns, *Cyathea dealbata*.

(To be continued.)

DESCRIPTION OF A NEW GENUS OF ANISOTOMIDÆ.

BY D. SHARP, M.B.

DIETTA, *nov. gen. Anisotomidarum.**Frons emarginata, clypeo membranaceo.**Antennæ clavâ latâ 4-articulatâ.**Coxæ intermediæ valde distantes.*

Mandibles elongate (quite as long as the width of the head between the eyes), the left obsoletely, the right distinctly, toothed below the middle. Superior lobe of maxilla elongate and slender, with long hairs on the inner side; first joint of maxillary palpi very indistinct, 2nd rather long, 3rd a good deal shorter than 2nd, 4th quite as long as 2nd, not thickened. Mentum large, horny, forming a short broad triangle, beyond which projects the small ligula, surmounted by two minute paraglossæ; the labial palpi very exposed, elongate and slender, 2nd joint shorter than either the 1st or 3rd, which are about equal in length. Front of the head rather strongly margined and forming a curve, in front of which is the membranaceous clypeus, to the anterior margin of which is attached the large membranaceous labrum, this being indistinctly bilobed. Antennæ short, ten-jointed, the last four joints forming an extremely broad and abrupt club, the 10th or terminal joint being only about half as broad as the 7th; the 7th joint is not closely applied to the 8th, so that it is possible there may be a minute joint concealed between them, in which case the antennæ would possess the normal number of eleven joints. Pronotum oblong, but slightly narrowed towards the front, the sides and front margined, the base not margined but rounded. Prosternum excessively reduced. Front coxæ large, elongate, vertical, quite exposed, contiguous; side piece of the prothorax produced behind the coxæ, but extremely slender, so as to be only a spine,—the two not meeting in the middle. Middle coxæ large, partly exerted, separated by a very broad space, the suture between the meso- and meta-sterna straight and very conspicuous. Hind coxæ large, contiguous, forming a large plate. Hind-body with five visible segments. All the tibiæ thick, and armed with closely set spines and hairs; the front tarsi four-jointed, the middle and hind ones almost certainly five-jointed, but the basal joint is concealed by the broad apex of the tibia and its hairs and spines.

The interesting insect I here describe should be placed in or near the *Anisotomides*, from all the known members of which group it differs strikingly by the membranaceous clypeus, the very distant intermediate coxæ, and the absence of the small intermediate claval joint characteristic of the family: the structure of the hind coxæ and trochanters is, however, quite that of *Anisotoma cinnamomea*.

DIETTA SPERATA, *n. sp.*

Oblongo-ovalis, rufescens, nitida, capite obsolete punctato, oculis magnis, convexis: prothorace sparsim obsolete punctato, sed punctis ba-

salibus seriatis, distinctis, aliisque fere irregulariter sparsis; scutello crebre fortiter punctato; elytris sat fortiter punctato-striatis, versus apicem setis erectis paucis; epipleuris setulosis; abdomine pubescente, crebre punctato, sub-opaco. Long. 6 mm.

I have no doubt the individual described is a male; the front tarsi are quite simple, the apex of the hind trochanters forms a curved tooth, and the hind margin of the posterior femur shows also a slender curved spine on the middle.

Found in N. W. Australia by Mr. Duboulay, and placed in Mr. Saunders' collection among the *Bolboceri*, to which insects, the short antennæ with broad club, give it at first sight some resemblance.

Thornhill: August 15th, 1876.

DIAGNOSES OF UNDESCRIBED SPECIES OF *PHYTOPHAGA*.

BY JOSEPH S. BALY, M.D., F.L.S.

HORATOPYGA ORNATA.

Late orata, valde convexa, rufo-picea, nitida, genibus, tibiis, tarsis antennisque piceis; thorace tenuiter punctulato, ad latera leviter excavato, lateribus ampliato-rotundatis, basi constrictis; elytris confuse seriatim punctulatis, violaceis, singulatim pustulis novem,—2, 1, 3, 2, 1, dispositis,—fulvis, ornatis. Long. 4 lin.

Hab.: Guinea, Camaroons.

HORATOPYGA SAUNDERSI.

Orata, convexa, rufo-fulva, nitida, thorace irregulariter punctato, ad latera foreolato-punctatis, lateribus leviter rotundatis, ad apicem angustatis; angulis anticis obtusis; elytris picco-æneis, sat fortiter punctato-striatis, striis ad latera confusis. Long. 2 lin.

Hab.: Algoa Bay.

HORATOPYGA SEJUNCTA.

Orata, convexa, rufo-fulva, nitida; capite sat fortiter punctato; thorace ad latera varioloso, disco tenuiter sub-remote punctato, lateribus a basi ad apicem rotundato-angustatis; angulis anticis sub-acutis; elytris nigro-piceis, regulariter punctato-striatis. Long. 2 lin.

Hab.: South Africa. Graham's Town.

CARYSTEA MICANS.

Elongata, parallela, convexa, picco-fulva, æneo-micans, pedibus antennisque fulvis, his extrorsum fuscis; capite lato, plano, crebre fortiter punctato; thorace elytris æquilato, lateribus rectis, ad apicem rotundato-angustatis; dorso transversim convexo, ad latera varioloso, disco minus remote punctato; elytris viridi-æneis, fortiter punctato-striatis, interspatiis transversim rugulosis.

Long. 2 lin.

Hab.: Western Australia, Champion Bay.

DISONYCHA ORNATA.

Sub-elongata, modice convexa, dorso explanata, flava, nitida, rittâ verticali, antennis, thoracis maculâ parvâ oblongâ ante basin, tibiis (dorso excepto) tarsisque nigris, thorace transverso, ante basin et ad latera excavato, angulis posticis lateraliter productis; elytris oblongis, infra basin transversim depressis, impunctatis, cyaneis, flaro-limbatis.

Long. 3½ lin.

Hab.: Pebas, Upper Amazons.

SEBETHE QUADRIPUSTULATA.

Orata, convexa, fulva, nitida, antennis (basi exceptâ) elytrisque nigris, his rix punctulatis, singulatim pustulis duabus magnis, unâ prope medium, sub-rotundatâ, alterâ ante apicem sub-trigonatâ, fulvis, ornatis.

Long. 2 lin.

Hab.: Java.

HERMEOPHAGA TRICOLOR.

Anguste oblonga, convexa, nigra, nitida, capite thoraceque rufo-fulvis, antennis (basi piceâ exceptâ) oculisque nigris; thorace lateribus marginatis, medio obtuse angulatis, angulo antico obtuse truncato, lateraliter paullo producto, elytris distincte punctulatis, metallico-cæruleis.

Long. 2½ lin.

Hab.: Brazil.

HERMEOPHAGA VENTRALIS.

Anguste oblonga, convexa, rufo-fulva, nitida, femoribus posticis, oculis antennarumque articulis intermediis nigris, tibiis tarsisque piceis; thoracis lateribus fere rectis, parallelis, medio obsolete angulatis, angulo antico obtuse truncato, lateraliter distincte producto; elytris viridi-cyaneis, distincte punctulatis.

Long. 1½ lin.

Hab.: Para.

LACTICA FULVIPES.

Anguste oblongo-orata, convexa, nigra, nitida, pedibus fulvis, antennarum articulo basali et quatuor ultimis sordide albidis; thorace impunctato, sulco basali profunde impresso; elytris sub lente tenuissime punctulatis, infra basin transversim depressis, nigro-cyaneis; callo humerali prominulo. Long. $\frac{1}{4}$ lin.

Hab.: Pebas, Upper Amazons.

LACTICA BINOTATA.

Orata, convexa, lactea, nitida, antennis, femoribus dorso, tibiis tarsisque nigris; thorace elytrisque impunctatis, illo sulco basali medio fere obsoleto, utrinque profunde impresso, his infra basin haud depressis, singulatim prope medium puncto nigro notatis. Long. 2 lin.

Hab.: Mexico, Teapa.

LACTICA SELLATA.

Orata, convexa, lactea, nitida, pedibus antennisque nigris; thorace impunctato, sulco basali profunde impresso; elytris sub lente tenuissime punctulatis, plagâ magnâ communi a basi ad medium extensâ, nigrâ, ornatis. Long. $2\frac{1}{2}$ lin.

Hab.: Para.

LACTICA NIGRIPENNIS.

Elongato-orata, convexa, lactea, nitida, antennis (basi fulvâ exceptâ) nigris, pedibus fulvis, femoribus dorso ad apicem, tibiis quatuor anticis totis, posticis dorso tarsisque nigris; elytris impunctatis, nigris, vertice lævi, medio forcâ magnâ impresso; thoracis sulco basali profunde impresso; oculis rotundato-oratis, intus leviter sinuatis. Long. $2\frac{2}{3}$ lin.

Hab.: Para.

LACTICA APICICORNIS.

Anguste orata, convexa, pallide flava, nitida, capite nigro, antennarum articulis ultimis quatuor albidis, tarsis quatuor anticis nigro-piceis; thorace impunctato, sulco basali profunde impresso; elytris infra basin transversim depressis, sub lente vix punctulatis, obscure metallico-cæruleis, oculis oblongis, intus leviter sinuatis. Long. $2\frac{2}{3}$ lin.

Hab.: Amazons.

LACTICA SUBNITIDA.

Elongata, fuba, subnitida, oculis, antennis, tibiis tarsisque nigris;

thorace lateribus, basi rectis, ante medium paullo convergentibus, sulco basali medio obsoleto, utrinque profunde impresso; elytris parallelis, infra basin haud depressis, sub lente tenuiter punctulatis; encarpis trigonatis, contiguis.

Long. 4 lin.

Hab.: Para.

ENNEAMERA THORACICA.

Anguste orata, nigra, nitida, antennarum basi thoraceque fulvopiceis; elytris obscure metallico-cæruleis, eridenter crebre punctulatis.

Var. A. Thoracis disco nigro.

Long. 2 lin.

Hab.: Manilla, collected by the late H. Cuming.

ENNEAMERA LIMBATA.

Late rotundato-orata, modice convexa, fulva, nitida, femoribus posticis (basi exceptâ), vertice, antennis extrorsum, oculis, pectoreque nigris; thorace rufo-fulvo, maculis quatuor, transversim dispositis, piceis; elytris cyaneis vel cæruleis, anguste flavo-limbatis; femoribus anticis abdomineque plerumque piceo-tinctis.

Var. A. Thoracis maculis obsoletis.

B. Thoracis elytrisque obscure fulvis, his postice piceis, flavo-limbatis.

Long. 2¼ lin.

Hab.: Menado, Tondano.

ENNEAMERA FULVIVENTRIS.

Oblongo-orata, convexa, nigro-ænea aut nigro-cærulea, nitida, abdomine fulvo, elytris sub lente tenuissime punctulatis.

Long. 1⅔–2 lin.

Hab.: Amboyna, Menado, collected by Mr. Wallace.

ENNEAMERA AUSTRALIS.

Orata, convexa, nitida, nigro-ænea, antennis (basi piceâ exceptâ) nigris; subtus nigra, tibiis tarsisque piceis; abdomine piceo-marginato; elytris impunctatis.

Var. A. Abdomine toto fulvo.

Long. 2¼ lin.

Hab.: West Australia, Rockhampton.

Warwick: 7th July, 1876.

DESCRIPTIONS OF THREE NEW SPECIES OF EUROPEAN
HEMIPTERA-HOMOPTERA.

BY JOHN SCOTT.

Amongst the few species which I had put on one side as doubtful or undescribed species, collected by the Rev. T. A. Marshall in his travels abroad, I have now the pleasure to describe the three following, which I believe to be entirely new to science. My reason for this belief is that they were returned to me from the Continent, whither I had sent them for comparison with the collections and drawings of the late Dr. Fieber, as entirely unknown.

GNATHODUS ROSEUS.

Reddish-pink. *Elytra*: anterior margin and nerves very pale straw-yellow; 1st apical cell next the anterior margin deep fuscous.

Head—*crown* testaceous-yellow, slightly reddish in the middle. *Face* reddish-pink, with a narrow, longitudinal, yellowish line down each side of the centre, united towards the lower margin; frons broadly pale yellow. *Antenna* pale yellow; *setæ* brown.

Thorax—*pronotum* pale testaceous-yellow; disc more or less reddish-pink; near the anterior margin two small punctures placed one on each side of the centre. *Scutellum* pale testaceous-yellow, with a slight reddish-pink tinge next the base; basal angles with a dark triangular patch and two small punctures between them above the transverse channel. *Elytra* reddish-pink; anterior margin, as far as the 1st nerve, very pale straw-yellow; nerves fine, pale straw-yellow, exterior margin of the 1st nerve next, and at, the apex narrowly margined with dark fuscous; apical cells pale; 1st, next the anterior margin, dark fuscous; appendix dark fuscous. *Wings* somewhat fuscous, apex of the anterior margin darker; nerves blackish. *Legs* dusky reddish-pink. *Tibiae*: 3rd pair fuscous or brownish-red, base pale; spines brown, paler next the base, each set in a black puncture. *Tarsi*: 3rd pair pale fuscous.

Abdomen: above dark pink, sides broadly, and a narrow dorsal line, pale yellow.

Length, $1\frac{1}{2}$ line.

The only other European species known to me is the *G. punctatus*, Thunb., with which the above cannot be confounded, as that insect is pale green and spotted with black.

Two or three examples from Corsica.

THAMNOTETTIX RUBRIVENOSA.

Whitish or yellowish-white with a reddish-tinge. *Elytra* spotted with brown, somewhat similar to *Deltocephalus sabulicola*; nerves, especially in the ♀, bright red.

Head carmine-red. *Crown* with a narrow yellow central line not reaching to the base, near to which latter is a shallow fovea on each side having a minute black spot in the middle; on either side of the anterior margin is a short, somewhat comma-shaped, yellow streak, or frequently only a spot; frons carmine-red with a more or less decided yellow, cruciform character in the middle. *Face* more or less dark brown, with a yellow, longitudinal, central line joined to that on the frons, and gradually widening until it reaches the apex; on each side about six transverse, narrow, yellow lines, the two upper ones generally joined exteriorly. *Clypeus* yellow. *Cheeks* yellow. *Antennæ*: 1st joint yellow, 2nd brownish, apex narrowly yellow; *setæ* brown.

Thorax—*pronotum* broad, with a reddish tinge, anterior margin and a narrow longitudinal line, yellow; on each side of the latter in front a short black streak, and behind each eye a small black spot. *Scutellum* yellow, basal angles more or less red; transverse channel and a short line at each extremity forming a Γ -shaped character, blackish. *Elytra* whitish or yellowish-white with a reddish tinge. *Clavus*: nerves red; apex of the area enclosed by the axillary and anal nerves, and a streak in the middle, brown; apex and an oblong spot nearly in the centre of the area brown. *Corium*: nerves red; ante-apical area next the claval suture brown; apex of the exterior nerve of the adjoining ante-apical area on each side more or less broadly margined with brown, upper transverse nerve and an oblong spot above the middle of the area, brown; nerves of the apical areas dark brown, areas more or less fuscous. *Sternum* black, exterior margin of the segments broadly, posterior margin narrowly, yellow. *Legs* pale yellow. *Thighs*: all the pairs with a very short black streak, or one or two minute spots on the inside at the apex. *Tibiæ*: all the pairs narrowly brown down the interior margin, or sometimes the 1st and 2nd only spotted; 3rd pair: spines pale brown set in dark brown punctures.

Abdomen: above black; posterior margin of the segments narrowly yellow; side margins narrowly rosy.

♀. All the characters as in the other sex, except that the nerves of the elytra are of a brighter red, and give to the insect a much more rosy appearance.

Length, $1\frac{1}{2}$ line.

Habitat: Corsica.

PHLEPSIUS FILIGRANUS.

White. *Elytra*: nerves very pale brownish-yellow, minutely and irregularly spotted with dark brown; disc with very fine transverse reticulations.

Head—*crown* yellowish-white with a somewhat indistinct pale central line, and a small black spot in front on each side of the apex. *Face* very faintly brownish with a narrow, longitudinal, central line, and several transverse ones, yellowish. *Eyes* somewhat reddish. *Antennæ* pale yellowish; *setæ*, towards the apex, brown.

Thorax—*pronotum* very faintly brownish, round the anterior margin pale yellowish; disc irrorated with white, and with a central longitudinal line of the same colour. *Scutellum* yellowish-white, with a darker triangular patch at each basal angle.

Elytra white. *Clavus*: nerves very pale brownish-yellow, disc between the latter sparingly but finely reticulated transversely with dark brown, sometimes occurring as minute spots; apex dark brown. *Corium*: nerves very pale brownish-yellow, minutely but irregularly spotted with dark brown; disc finely reticulated transversely with dark brown, areas here and there with a few minute dark brown spots in irregular clusters. *Sternum* pale yellowish. *Mesosternum* posteriorly spotted with very pale brown. *Legs* pale yellowish. *Tibiae*: 3rd pair; spines pale, each set in a dark brown puncture. *Tarsi*: 3rd pair faintly brownish. *Claws* brown.

Abdomen: underneath pale yellow; posterior margin of the segments next the connexivum finely reddish-brown. Length, 2 lines.

A single ♂ example labelled Nimes.

Lee: July 11th, 1876.

BRITISH HEMIPTERA-HETEROPTERA—ADDITIONAL SPECIES.

BY O. M. REUTER (HELSINGFÖES).

PLESIODEMA, Reut.*

Body sub-elongate, finely pale pubescent, not covered with a short, deciduous, scale-like pubescence. Head, across the eyes, about half as wide as the width of the basal margin of the pronotum, inclined, shining. Neck without a carina. Clypeus slender, very little prominent, its base in the intermedian line of the eyes. Eyes granulated, touching the anterior margin of the pronotum. Antennæ inserted near the apex of the inner ocular margin; 1st joint not exceeding the apex of the clypeus, 2nd joint as long as 3rd and 4th. Rostrum a little exceeding the posterior coxæ; 1st joint reaching to the middle of the xyphus, 3rd and 4th joints thin. The throat very short. Pronotum, between the basal angles, twice as wide as long, disc very slightly convex, shining, the calli distinct, the side margins and the basal margin nearly straight. Scutellum with the base not covered. Hemelytra developed, membrane with two cells. Wing-cells with a hook-like nerve. Xyphus of the prosternum very convex. Thighs not incrassated, not spotted. Tibiæ with thin, concolorous spines. 3rd joint of the tarsi as long as 1st and 2nd together. Terebra of the ♀ long.

P. PINETELLUM, Zett.

Capsus pinetellus, Zett., Ins. Lap.; Kirschb., Rh. Wiesb.; Flor, Rh. Livl. *Agalliastes lugubris*, Fieb., Eur. Hem. *Plagiognathus pallidipennis*, J. Sahlb., Not. F. et Fl. Fenn. *Plesiodema pinetellum*, Reut., Rev. Crit. Caps.

♂ and ♀ discolorous.

* Gen. Cimic. Eur.; p. 45.

♂ black-brown, clothed with very short grey hairs. Antennæ dark luteous; 2nd joint incrassated and compressed; hemelytra much longer than the abdomen, fuscous, cuneus, and the cubital nerve of the corium brownish-ochreous, the base of the cuneus pale; cell-nerves brownish-testaceous, a little spot below the apex of the cuneus transparent; legs dark luteo-testaceous; tarsi brownish.

♀ brownish-testaceous, clothed with grey hairs. Antennæ thin, slightly luteous; hemelytra testaceous, apex of embolium and the cuneus sub-ochreous, cuneus pale at the base; cell-nerves of the membrane slightly testaceous, cells and a little spot below the apex of the cuneus pale; legs testaceous, tarsi brownish.

Length, $2\frac{1}{4}$ — $3\frac{1}{3}$ mm.

On *Pinus sylvestris*, near Perth (Hill of Moncrieff); ten specimens taken by myself, the 30th June.

PSALLUS DIMINUTUS, Kirschb.

Capsus diminutus, Kirschb., Rh. Wiesb. *Psallus diminutus*, Fieb., Eur. Hem.; Reut., Hem. Gymn. Sc. et Fenn., I.

Yellowish, covered with deciduous golden hairs intermixed with black; antennæ and legs pale testaceous; the 2nd joint of the antennæ almost longer than the last two, the 4th joint about one-third shorter than the 3rd; thighs spotted with black; tibiæ with black spots and rather strong black spines; hemelytra posteriorly bright orange-red, cuneus red, base and apex white; membrane dusky, nerves pale yellowish, the outer cell-nerve whitish; inner cell at the base, and a spot below the apex of the cuneus, clear; head between the eyes, $\frac{1}{2}$ — $\frac{3}{4}$ (♂) or twice (♀) as wide as the width of the eye; genital segment of the ♂ not carinated. Allied to *P. varians*, H.-Sch., but smaller, differing in the structure of the head and of the antennæ, also by the uncarinated genital segment of the ♂. Length, $3\frac{1}{2}$ — $4\frac{1}{2}$ mm.

This species is not uncommon on oaks near Cluny Hill, Forres, where many specimens were taken by Mr. Geo. Norman and myself.

TEMNOSTETHUS NIGRICORNIS, Zett.

Anthocoris nigricornis, Zett., Ins. Lap. *Temnostethus pinicola*, Frey, Mitth. schweiz. ent. Ges. *Temnostethus nigricornis*, Reut., Öfv. Vet. Ak. Förh., 1871.

Black, shining; antennæ entirely black, 2nd joint a little longer than the 3rd and 4th together; rostrum reaching nearly to the middle of the mesosternum, dark piceous; pronotum with the side margins distinctly sinuate, the transverse channel of the disc deep, the base largely emarginate; hemelytra developed, brown, cuneus blackish-brown, membrane blackish, the basal half whitish; thighs piceous; tibiæ and tarsi dark ferruginous.

Length, $3\frac{1}{2}$ mm.

One specimen, taken by myself, on *Pinus sylvestris*, near Perth (Hill of Moncrieff), the 30th June.

Lerwick, Shetland, July 11th; and Forres, August 4th, 1876.

Note on Agalliaestes Wilkinsoni, Doug. & Scott.—On the 30th June, I found, near Perth, a little macropterous Hemipteron, which belongs to the genus *Agalliaestes*. It is very different from *A. pulicarius*, Fall., having entirely brown antennæ and testaceous tibiæ without black spots, and resembles the macropterous form of *A. saltitans*, Fall., but is not metallic shining, has unicolorous elytra, and much paler antennæ. I think that this insect is the (till now unknown) macropterous form of *A. Wilkinsoni*, Doug. & Scott. The body is black, shining, clothed with fine, pale, adpressed hairs; the posterior margin of the vertex is sharp, the front convex; the antennæ are pale brownish, the first joint at the base blackish, the second joint shorter than the width of the head; the basal margin of the pronotum is nearly one-half wider than the head, and largely emarginate, the calli very distinct; hemelytra clothed with longer pale hairs, half of the membrane exceeding the apex of the abdomen, cell-nerves whitish; thighs brown, testaceous at the apex; tibiæ testaceous, with fine spine-like black hairs; tarsi brownish.—O. M. REUTER, Lerwick, Shetland: July 11th, 1876.

Note on a variety of Megalocera (Trigonotylus) ruficornis, Fall.—In the "Scottish Naturalist," vol. i, p. 261, Dr. Buchanan White gave us a list of the Scottish species of *Miris*, and mentions the protective mimicry of *M. holsatus*, *laevigatus*, and *calcaratus*, which have a green form when the grass is green and juicy, and an ochreous form when their food plant is getting dry and yellowish; whereas *M. ruficornis* has not an ochreous autumnal form. But this insect offers another example of protective mimicry. It is commonly darker green, with the antennæ red, and with brownish stripes on the pronotum and scutellum. During an excursion I made with Mr. Norman to the Culbin Sands near Forres, I found *M. ruficornis* very abundant on *Psamma arenaria*, but all the many hundred specimens which we saw were more robust and larger than the usual form; their colour was bright green (almost "glaucovirescens"), in accordance with the colour of the food plant; the brownish stripes almost invisible; the first two joints of the antennæ were also green, the third green only towards the apex, and the fourth entirely pale testaceous. It is curious that this insect, which typically lives in damp places, is larger on these dry sand hills.—ID., Forres: August 4th, 1876.

A phase in the history of Ampulex compressum, the destroyer of the common Cockroach.—On June 1st, 1876, a general holiday, called "Dushohara," I went for a day's collecting in the jungly ground about Pultah, near Barrackpore, and, on visiting a favourite spot, an old peepul-tree by a tank, that I have known for the last three years to be the chosen haunt of several species of *Hymenoptera*, and especially of the common, but beautiful, wasp *Ampulex compressum*, and the ant *Pseudomyrma bicolor*, I was surprised to find an unusual commotion, or, as the natives would express it, "tumasha," going on between the above-mentioned species; all over the trunk of the tree were couples engaged in a series of struggles or wrestling matches—wasp *versus* ant—and so many individuals were occupied in this way, and their actions were so rapid, that for some time I could make little out of their proceedings; so, picking out a single wasp low down on the trunk, and in an easy situation for observation, I sat myself down to watch her movements. She was apparently keeping guard over a small piece of smooth bark, about eighteen inches in diameter, and in

E. M. M. 24

evidently a thorough "Who'll tread on the tail of my coat" spirit. Presently, a worker of *P. bicolor* took up the challenge, and trespassed on the sacred ring: down came the wasp to the attack, and the ant, nothing loath, met her half way; then commenced a series of manœuvres on the part of the wasp to get her favourite hold, dodging round and round the ant to get either above or behind, the ant trying to frustrate these attempts by turning also, and always presenting its strong mandibles to its opponent; the wasp, however, soon proved too quick, for, seizing the ant with its jaws well round the waist, with a quick movement of the head, she jerked it a clear foot off the tree; another and another ant would be treated in the same way. Sometimes two ants together would appear in the "ring," and then the wasp would retreat, or a single ant would take up a position for a time on the confines of the ring, and protected by a little ledge of bark, and where the wasp would not venture to attack, but the place of vantage was no sooner vacated, than, after the usual fighting for the "hold," the ant was treated to the inevitable "back-fall." During the time I watched the tree, I saw at least twenty ants "thrown," but not one wasp "tackled." What was most curious was the fact that all this appeared to go on without the least ill-feeling between the contending parties, and a careful examination of the defeated ants showed them to be none the worse for their falls. I watched several on their reaching the ground, they seemed to be a little bewildered, but soon recovering themselves, made for the tree again, two, in particular, in the most plucky manner, went straight for the spot from which they had been hurled and tried another "bout" with the old opponent. A sporting friend with me was immensely pleased with the whole proceedings, which re-called visions of wrestling matches equally well conducted at the Agricultural Hall, Islington; and he was willing to back the "dark blues" for any odds. I cannot in any way account for this great Wrestling Meeting, unless I credit these two species with a true love of sport. The ants were not swarming, there were not any larvæ or pupæ to be carried off, or nests to be plundered (as in the case of *Polistes hebraeus* and *Ecophylla smaragdina*, mentioned by the late Mr. Horne, in his Notes on Hymenoptera of the N. W. Provinces). I have visited the tree continually for the last three years, but have never seen anything of the kind going on before. I have also been to the tree since the first of June, but though both these species were there in great numbers, nothing unusual went on, the wasps leaving the ants alone, and *vice versa*; if any peculiarity in their behaviour could be noticed, it was a steady and polite resolution to avoid one another.—G. A. JAMES ROTHNEY, Barrackpore, Bengal: *June 12th, 1876.*

Occurrence of Vespa crabro in the north.—In the course of a few days spent in the West Highlands, I made no entomological observations worth noting, except that on July 21st, I saw a fine large hornet, and I am under the impression that it was a ♀, near the head of Glen Coe, though I did not capture it. It sailed steadily within a foot of me, and I saw it as clearly as if it were in a drawer, and the hornet is an insect with which I am very familiar. On July 20th, I saw *Erebia Cassiope* plentifully on Ben Nevis. *Scopula alpinalis* was abundant on many mountain slopes.—T. A. CHAPMAN, Hereford: *July 29th, 1876.*

On preserving Dragon-flies.—I believe there is, at present, no generally known method of satisfactorily preserving the colours of Dragon-flies; in fact, Mr.

McLachlan tells us that we are to reach a certain point of perfection and then stop. I have tried a method with very good results. The method is precisely that laid down in the "Entomologist" of last month for *Macro-Lepidoptera*, viz., skinning the bodies and filling them with plaster of Paris until thoroughly dry. I have preserved some of the yellow-marked species, which have retained their colour as perfectly as they were when alive, and I intend to try it on other species as soon as I can get them, but this is a bad district for this order of insects.—S. L. MOSLEY, Almondbury Bank, Huddersfield: *July, 1876.*

[I see no objection to the proposed method, supposing the insects to be set on short pins, so that the bodies touch the paper (an undesirable condition otherwise). If on long pins and set high, it appears to me that the weight of the filled body would materially increase the risk of breakage. But I scarcely understand what is meant by "skinning." If, in addition to disembowelling, the inner lining membrane of the abdomen be also removed, breakage (at all times difficult to avoid) becomes nearly inevitable. Without wishing to discourage our correspondent's endeavours to preserve the beauty of these insects, I should like to compare some of these prepared specimens this time next year with others then newly caught. A correspondent (Mr. T. D. Gibson-Carmichael) recently made to me a very useful suggestion, viz., that the insects should not be killed until 24 hours (or thereabouts) after being captured, so that time be allowed for the contents of the intestines to pass away naturally; but this is of comparatively little service with females full of ova. In unprepared examples of *Anax*, *Æschna*, &c., the female always loses its colour more than the male, owing to the decomposition of the ova.—R. McLACHLAN].

Notes from Lourenço Marques, South Africa.—We got here safely yesterday. Spent a week at Durban (Natal) waiting for the coasting steamer to this. In that week we collected a box full of butterflies, and I see a good many about here though it is winter. I believe this will be better than Angola for butterflies—at all events, the coast region. We have several species that we never saw on the west coast; we shall send a case with what we may have collected by the next steamer, which will leave this in about three weeks. We like the place very much—very pretty country covered with grass, bush, and small trees, and the harbour is simply magnificent. It is no doubt destined to be *the* port of the whole of South Africa.—J. J. MONTEIRO (in a letter to Mr. Rutherford), Lourenço Marques: *June 18th, 1876.*

Observation on Mr. Hewitson's note respecting Mr. Buxton's Collection of orange-tipped Butterflies.—Much as I appreciate the kind intention of my esteemed friend Mr. Hewitson, in commending my acumen as superior to his own and that of Mr. Labrey, I cannot unblushingly accept the full measure of praise bestowed upon me by the renowned Lepidopterist.

It is indeed a fact that, with the help of the National and other collections, I was successful in discovering the limits of each link of the continuous series of species composing the genus, and consequently I was enabled to determine eighteen of the forms in Mr. Buxton's fine series to be new species (two of them previously in the Museum collection), but I was not able to discover a multitude.

I think, if it be not presumptuous to offer a suggestion to a friend so much my senior, that possibly Mr. Hewitson's inability to discern the novelties in Mr. Buxton's

boxes may be accounted for by his unwillingness at all times to define what is meant by the term "species."—ARTHUR G. BUTLER, 10, Avington Grove, Penge: *August*, 1876.

Pachnobia alpina, Westwood, = *hyperborea*, Zetterstedt.—When I was in London last May, Mr. McLachlan had the kindness to show me the type of *P. alpina*, taken by Mr. Douglas in 1839 on Cairn Gowr in Perthshire, at an elevation of 3000 feet. The only mention of it that I have seen is in Stainton's Manual of British Butterflies and Moths, vol. i, p. 241. The species is described in Westwood and Humphrey's British Moths (1843 or 1845), and I shall be glad have the exact citation, as Stainton unfortunately gives no authors' names. I recognised at first sight that *P. alpina* is the same species as the *Agrotis hyperborea* of my large Catalogue (1871, No. 1098). Zetterstedt described it in his *Insecta Lapponica*, in 1840 (p. 938) as *Hadena hyperborea*. The type of *P. alpina* is possibly a little darker than specimens from Lapland, but it is old, and even the Lapland individuals show aberrations. In 1860, I took this insect (in company with my friend Dr. Woeke) not unfrequently in Finnmark (Norwegian Lapland), in July, and we found pupæ and also larvæ at the end of May in moss. I detailed the account in the *Stettiner entomologische Zeitung*, 1861, p. 361. Since then, the species has been found on the Dovrefjeld in the centre of Norway, on the Riesengebirge (Silesia), and on the Alps of Switzerland and Tyrol. On the Alps of Carinthia it has a reddish (instead of bluish) coloration, and this form was described by Hering as *carnica*, and by Herrich-Schäffer as *glacialis*. This is certainly only a local form of *hyperborea*. I saw, in the Museum at Pesth, a specimen taken by the younger Frivaldsky in the Carpathian Mountains, which is intermediate between the two forms. The reddish *Agrotis subrosea*, Steph., becomes blue (var. *subcærulea*, Stgr.) in the north of Russia. The Scotch *Pachnobia alpina* must take the older name of *hyperborea*, Zett., and the species has a wide distribution on the Continent.—O. STAUDINGER, Blasewitz, Dresden: *August*, 1876.

[This insect was described and figured (the figure tolerably good) in Humphrey and Westwood's British Moths as *Agrotis alpina*, vol. i, p. 118, pl. xxiii, fig. 13 (1843). In the first edition of Doubleday's Catalogue (this portion published in November, 1847), it appears as "*Tæniocampa hyperborea*, Dalman?" with the synonym "*alpina*, Westwood." In the edition of 1873, it is called "*Pachnobia alpina*," with the synonym of "*carnica*, Heer," and no longer any mention of "*hyperborea*." In this latter edition, Doubleday more or less followed Guenée, as a reference to the "*Noctuérites*," vol. i, p. 342, of the latter author, shows. The name *hyperborea* is attributable to Zetterstedt, who adopted Dabnan's MS. name. The name *carnica* is due to Hering, not Heer, as said by Guenée and adopted by Doubleday.—Eds.].

Natural History of Cymatophora ocellaris.—On the 28th of May, 1874, Mr. J. E. Fletcher, of Worcester, very kindly sent me a dozen eggs of this species which had been laid the 23rd and 26th of May: he found the ♀ moths, although impregnated, very unwilling to deposit in captivity, and at last they chose to lay their eggs singly, or in little groups of two or three together, on paper rather than on the twigs of poplar, with which they had been supplied; the hour of laying was after dusk in the evening; one moth lived eleven days after pairing, and then died without laying an egg.

In its general figure, the egg is semi-spherical, convex above and flattish beneath, its surface very finely reticulated; creamy-white in colour, with the margin at the base of the shell colourless and pellucid in contrast to the opacity of the rest, over which the shell is glistening. On the evening of the 1st of June, without the eggs showing any previous change of colour, the larvæ began to hatch, four of them within half an hour of dusk, the others in course of the night; the young larvæ were nearly one-eighth of an inch long, of a pale pellucid-straw colour, inclining a little to greenish, the segmental folds showing pale yellow; by June 5th, they were three-sixteenths of an inch long, and one or two had, by this time, united the poplar leaves by short, thick, silken attachments, and they were all feeding on the green cuticle. By the 12th, the most forward were half an inch in length, and others about three-eighths, these last showed a black dot on each side of the second segment, while those half an inch long had a black dot on each side of the second, third, fourth, eleventh, and twelfth segments; the head buff colour, and body of greenish-buff, with a broad green velvety interior showing through the semi-transparent skin; up to this time, they had been eating away the cuticle from both upper- and under-sides of the leaves fastened by detached threads one upon the other; henceforward, they began and continued to eat quite through the substance of the leaves from the edges, but each larva was always concealed between two leaves united by a couple of strong, broad based, short, stud-like fastenings of white silk; in this retreat, when not feeding, the larva reposes with its body curved round;—and here, also, when the time for a moult approaches, it lies in a close coil, its head resting on the middle of one side of the body.

Particularly noticing a larva, which moulted on June 27th, I observed the body to be very soft and delicate, velvety in appearance, of a pale buff tint; the head of pale honey-yellow, rather glistening, with black ocelli, and black on each side the mouth; two black dots, one above the other, on the side of the second and third segments, and one on the fourth, another also on the twelfth segment. After the last moult, when the larvæ measured full an inch long, their heads were pale brownish-orange, broadly marked with black at the sides of the mouth, and round the papillæ, the skin of the body still soft in texture, without the least gloss excepting a narrow shining plate behind the head, which is slightly glistening, and the anal flap and legs; the colour of the body delicate greyish-green, showing through a pale buff skin, the dorsal vessel seen pulsating distinctly, the spiracles flesh colour, and the colouring along their region pale yellowish, the black dots just as before.

By the 4th of July, two larvæ had spun up, the two others were still feeding the rest having died off one at a time at different stages, probably from being so often interrupted by my investigations. Even at the last, when mature, the habit of the larva is still to lie curled round, with its head inwards, and towards, or in contact with, the seventh or eighth segment of its body; I found also that when turned out from its domicile between two leaves, the larva, when placed on a fresh leaf and another laid over, would quickly spin new fastenings, but it was not easy to watch its proceedings, for, when I raised the upper leaf, but a very little, in order to peep, the larva would directly strengthen and shorten the silk stud that I had probably stretched; and it did so by taking the middle or thinnest part between its two front legs, and pulling it inwards towards its body, and holding it there dexterously, whilst it spun shorter threads in a moment or two to the surface of the leaves, bring-

ing them into close contact ; after having thus fortified itself, it would at once curl round into its favourite position, and go to sleep until roused again on another side in the same manner, when it would repeat the operations for its security, and shut out further observation.

Three moths were bred, viz. : two on the 6th, and one on the 9th of June, 1875.

The full-grown larva, while crawling, measured from one and three-eighths to one and a half inches in length, moderately stout in proportion, cylindrical, tapering very little anteriorly near the broad head, and a little on the two hinder segments ; in point of colour the head is now orange-ochreous, barred on either side the mouth with black as far as the ocelli, which are included, and with black square marks surrounding the pale antennal papillæ, its surface a little granulous and shining ; the skin of the body beautifully soft and smooth, without gloss, excepting a narrow, shining, very pale greyish plate on the second segment, and on the anal tip ; all the legs are shining ; its colouring above on the back very faint yellowish, most tenderly tinged with greyish, changing almost imperceptibly to primrose-yellow along the spiracular region, and again below to the same delicate tint as the back ; a very faint glaucous pulsating vessel shows partially through the dorsal region ; on each side of the front margin of the second segment are three black spots, on the side of the third segment two black spots one above the other, and on the side of the fourth segment one black spot, and one black spot on each side of the twelfth segment ; the spiracles are pale flesh colour, the tubercular dots whity-brown, which, together with their short and fine single hairs, can only be discerned with a good lens.

The cocoon is placed in a hollow cave contrived by spinning several leaves together at their edges, and is composed first of an open net-work of coarse silk of a deep brownish-red colour, the meshes of which are at first, when wet, quite regular and symmetrical in some parts, and very flexible (at which time the pale skin of the larva is seen through them) ; but these soon contract, and are enveloped by the closing up of the leafy surroundings : when the cocoon is opened and divested of the leaves, it is a remarkable specimen of reticulation ; the outer foundation oval in form, three-fourths of an inch long, is made, as I have said, with very stout threads, leaving large meshes of oval, pear-like, and angular shapes, filled with a very tangled layer of much finer silk, reminding one of the smaller vessels of a skeletonized leaf. The pupa measures five-eighths of an inch in length, thick and dumpy in form and proportion, the surface roughened, except in the abdominal divisions, by minute pits, and on the wing-covers and thorax by corrugations ; the abdomen ending with two converging spines, their tops re-curved, crossing each other, and a few recurved short bristles round the abdominal tip : the colour black, the abdominal divisions dark purplish dull red, the other parts a trifle glistening.—WILLIAM BUCKLER, Emsworth ; *July 10th, 1876.*

Sesia philanthiformis in South Wales.—The receipt of some tufts of thrift containing larvæ of *Sesia philanthiformis* from the Isle of Man, with some hints as to its habits, from my friend Mr. Birchall, set me looking for this pretty little clearing on the rocks of the Pembrokeshire coast.

But these rocks are more suited for the investigations of birds than of featherless bipeds, and in most places an effective examination is impossible. Therefore, I was well pleased when, about a fortnight ago, I happened on a bit of coast in which a

steep slope covered with grass, flowers, and dwarf furze extends down to some grand terraces of sea beaten rock, accessible with little difficulty. Here I soon found traces of *philanthiformis*, and, before long, had the pleasure of seeing a specimen sunning itself on the bare limestone rock. In this case, seeing was not catching; but a couple of specimens were soon after secured, and some pupæ found, from several of which the moths have since emerged.

As usual, the pupæ were only to be found in stunted plants growing in chinks of the rocks, within reach of the sea spray. The larva, after hollowing out the main stem of the plant, forms a silken tubular cocoon within it. On emerging, the pupa skin is drawn out on the top of the dead plant.—CHAS. G. BARRETT, Pembroke: 15th July, 1876.

Note on Ebulea stachydalis.—Strange to say, *Ebulea stachydalis* has totally failed to re-appear in the locality in which I took my specimen last year, but for this there is compensation in the fortunate discovery of the species within a few hundred yards of home. A large patch of the ill-smelling *Stachys sylvatica* grows on some rough ground by the railway, and scattered plants along the neighbouring ditches, and here I have been able to secure some fine examples.

A more intimate acquaintance with the species reveals the unexpected fact, that when alive it is *not* strikingly like *sambucalis*, but from its shorter, squarer fore-wings, its darker colour and square discal spot, is actually far more likely to be mistaken, when flying, for *Scopula olivalis*. In habit, it closely agrees with *verbas-calis*, fluttering close among its food-plant when disturbed, and ereeping under and hiding itself among the plants as quickly as possible. Probably its sluggish and secret habits have had much to do with its having been so long overlooked in this country, but it may, probably, also prove to be very local. I have searched the *Stachys* in various places for twenty miles, but without again meeting with the insect. Moreover, it appears to be, here, utterly regardless of the facilities for its spread and increase afforded by the luxuriant abundance of *Parietaria officinalis* on every old wall in the neighbourhood.—the only Lepidopterous insect attached to this plant being apparently *Xytopoda Fabriciana*.

As *stachydalis* is by no means over, I still hope to find it in other localities.—
ID.

Diasemia literalis.—Mr. Barrett's note on this species incites me to put on record all I know about it, merely, however, as confirmatory of what he has said, for I can give but very little additional information.

The only specimen I ever met with myself, I took one evening between 9 and 10 o'clock, at a lamp in a Railway Station, situated in a valley of the best land in this county, with rich pasturage and great elm trees, but with hills of poorer land not very far off. Mr. Norcombe, who was quick of eye and light of foot, for one or two seasons took several specimens on the wing, early in the evening on the slopes of a very steep rough field in this neighbourhood; I have not been able to visit it for years, but I remember the soil was very poor and hard, and the herbage scanty: he used to stand so as to get them in sight against the sky, and I fancy they did not fly very much above the grass flower heads. On consulting the *Intelligencer*, vol. iv, p. 157, I see Mr. Norcombe's captures in 1858 must have been made at the very end of July. — J. HELLINS, Exeter: July 8th, 1876.

Description of the pupa of Nola albulalis.—A note on the pupa of *Nola albulalis* will perhaps not be out of place, as supplementary to Mr. J. P. Barrett's description of the larva in this month's (August) E. M. M.

When full grown, the larva wanders from the food plant and crawls up a culm of dry grass, or a withered twig, and spins a cocoon as described by Mr. Barrett. The pupa is about half-an-inch in length, cylindrical, and of nearly uniform width throughout, tapering a little towards the anal extremity. The head is bluntly rounded, the eye- and antenna-cases prominent. Colour of the dorsal surface deep reddish-brown, becoming gradually darker towards the head, which is nearly black; abdominal divisions rather paler than the ground colour. Ventral surface paler brown, the eye-cases black, and the antenna-cases margined all round with black.—G. T. PORRITT, Huddersfield: *August 10th, 1876.*

Early hibernation of butterflies.—In the "Petites Nouvelles Entomologiques,"* some remarks have lately been made on the early period at which some of the *Vanessæ* commence their hibernation. There is at present in the house here striking evidence of this. Some weeks ago, between two and three dozen individuals of *Vanessa urticae* took up their abode in a moderately dark part of an upstairs passage, where they remain packed together in little bundles of four or five individuals quite motionless, and this, although during the past week we have experienced the hottest weather recollected in this part of the country. These individuals, unless turned out by the housemaid's broom (as I hope they will not be), will remain in their positions till some warmer temperature than is usual at that period, occurs in or about March, when they will commence to flit about and make their way to the windows to seek an escape. This year I have noticed very many more individuals than usual of this species in the house.—D. SHARP, Eccles, Thornhill: *August 15th, 1876.*

Reviews.

EIGHTH ANNUAL REPORT ON THE NOXIOUS, BENEFICIAL, AND OTHER INSECTS OF THE STATE OF MISSOURI: by CHARLES V. RILEY, State Entomologist. Jefferson City, 1876, pp. 1—185.

It has long been to us an annual pleasure to receive and notice Mr. Riley's valuable Reports. That now before us, though probably not so diversified in its contents as some of the others, fully supports his reputation as a careful and conscientious observer, and as a capital artist on wood. The volume is principally occupied by extended information on well-known insect pests, such as the Colorado Potato Beetle, the Army Worm, the Rocky Mountain Locust, and the Phylloxera. Among the "innocuous" insects is a detailed and illustrated account of the anomalous "Yucca-borer" (*Megathymus yuccæ*), which Mr. Riley brings very powerful evidence to prove is really a Butterfly, although he considers it may represent a remnant of a more ancient synthetic type between the *Castniæ* and *Hesperidæ*. On some points our author does, we think, jump too hastily (or by prejudice) at conclusions, and we utterly fail to see the force of his foot-note at p. 31, regarding the genital parts in *Lepidoptera*—if he will carry his avowed "limited examinations" somewhat further (say, for instance, among the *Pyralidæ*), we feel sure he will change his opinion. One thing we regret exceedingly, but the author has only developed, not initiated, a vicious practice. We allude to the strained efforts to give "English" names to

* *Vide* also Ent. Mo. Mag., vol. ii. p. 190.—Eds.

everything. Opening the Volume by chance at p. 54, we found *Pezomachus minimus* styled the "Diminished *Pezomachus*," and *Ophion purgatus* the "Purged *Ophion*." If the agriculturalists like this sort of thing, we pity them.

PROCEEDINGS OF THE NATURAL HISTORY SOCIETY OF GLASGOW: vol. ii, pt. ii. Glasgow: published by the Society, 1876.

The commercial capital of Scotland (in which the British Association is about to hold its 46th Meeting) has often been taunted with being too exclusively devoted to the "science" of money-making to be able to pay any serious attention to matters that do not produce any vision of "bawbees." Has not our faithful "Punch" recently presented us with a still more highly coloured picture of Scottish character in the shape of a fly-fishing laird, who, having hooked an enormous fish, would be "gay and glad" if he saw his "twa and saxpenny flee" out of its mouth! The young Society issuing these Proceedings shows that the great city of the west has in it a goodly number of hard working naturalists who love Nature for her own sake, and its publications are of a kind that will not permit of their being considered only as the productions of a local body, and of local interest. On the contrary, these Proceedings will rank with those of acknowledged scientific Societies. Almost every branch of Natural History is represented, and the authors are in many cases men who have attained distinction outside local considerations. We notice no less than thirteen entomological articles, principally by Mr. P. Cameron and Mr. T. Chapman, most of them of considerable value, and many of those by Mr. Cameron, on Scottish saw-flies and allied families, must be consulted by all workers on European *Hymenoptera*.

ENTOMOLOGICAL SOCIETY OF LONDON: August 2nd, 1876.—Sir S. S. SAUNDERS, C.M.G., Vice-President, in the Chair.

The following were elected Members of the Society: Harold Swale, Esq., of St. George's Road, Pimlico, and Thomas Stanton Hillman, Esq., of Ringmer, Lewes.

Mr. McLachlan exhibited a series of thirteen examples of a dragon-fly (*Diplax meridionalis*, Selys) recently taken by him in the Alps of Dauphiné in France, between Grenoble and Briançon (the exact locality being near the village of La Grave, at the base of the "Aiguille du Midi"), remarkable for the extent to which nearly all were infested by the red parasite described by De Geer as *Acarus libellulae** (perhaps a species of *Trombidium*). Of the thirteen examples, captured casually, only one was free from parasites, the number of these on the others being respectively 7, 8, 9, 15, 17, 19, 28, 47, 51, 73, 96, and 111, or a total of 481 on twelve individuals. They were firmly fixed on the nervures towards, and at, the base of the wing, and almost (but not quite) invariably on the under-side, and whatever might be the number on any particular dragon-fly, it was always divided nearly symmetrically on the two sides of the insect, those much infested having a very pretty appearance, from the wings appearing as if spotted with blood-red. It appeared to him that the *Acari* must attain their position by climbing up the legs of the dragon-fly when at rest, possibly at night, and they probably did not quit it till the insect died, or perhaps died with it, so firmly were they fixed. He remarked that the history of these *Acari* was involved in much obscurity, for it appeared by no means certain that all those

* These *Acari* must not be confounded with the species infesting *Geotrupes*, *Bombas*, &c., &c. The latter forms another group of *Acari*: they roam freely over the body of the insect, though evidently preferring certain positions, no doubt partly attributable to the fact that, in these positions, they are not so liable to be dislodged. The *Acarus* of the dragon-fly, on the contrary, probably never quits the position taken up, and is a "tick," speaking broadly. The idea that *Acari* make use of insects merely as locomotive engines to convey them from one locality to another is a very old one, and has often been suggested, but, as it seems to me, without the slightest foundation in truth.—R. McL.

existing could ever gain access to dragon-flies, just as in the case of the bed-bug and the human flea, where there must be myriads that never have an opportunity of tasting human blood. He further noticed that at the Meeting for August 1, 1864, he exhibited a dragon-fly from Montpellier, similarly attacked, and it was recorded as *Diplax striolata* (Tr. Ent. Soc., 2nd ser., vol. ii proc., p. 36). This was an error, the insect being *D. meridionalis*, which seemed peculiarly subject to attack.

Mr. S. Stevens exhibited *Tillus unifasciatus*, *Xylotrogus brunneus*, &c., recently taken by him on new oak fences at Norwood, rare insects, and not taken near London for many years (*vide* E. M. M., Aug., 1876, p. 65).

Mr. Forbes exhibited an example of *Quedius dilatatus* (a parasite in hornets' nests), taken by him at sugar in the New Forest.

Mr. Champion exhibited *Harpalus 4-punctatus*, *Dendrophagus crenatus*, *Leptura sanguinolenta* ♀, *Amara alpina*, *Cryptophagus parallelus*, and *Omosita depressa*, all from Aviemore, Invernesshire.

Mr. Grut, with reference to the communication from the Foreign Office, read at the Meeting on the 3rd May (E. M. M., vol. xiii, p. 19), read a further official communication from our Minister at Madrid, respecting the ravages of locusts in Spain, accompanied by examples of the insects, which prove to be *Decticus albifrons*, Fab., and also a multitude of curved earthen tubes filled with the eggs (these tubes were innocently described in the official letter as "chrysalids," each giving birth to a large number of insects!).

The Rev. R. P. Murray forwarded a paper from Mr. W. H. Mislin, of Brisbane, containing descriptions of Diurnal *Lepidoptera* from Queensland.

Mr. E. Saunders read the concluding portion of his Synopsis of British *Hemiptera-Heteroptera*.

Mr. Smith read Notes on *Nematus gallicola*, the gall maker on the leaves of species of *Salix*, of which the ♂ had apparently not hitherto been observed. From 500 or 600 galls collected in 1875 he had obtained multitudes of females and two males; a similar attempt in 1876 had resulted in one male. He was of opinion that by persevering from season to season, it was possible to obtain the male of this, and of other allied species of which this sex is practically unknown, though these might occur at rare intervals, the female being capable of continuing the species without (of necessity) immediate male influence. And he argued from this that the long-sought male of *Cynips* may some day be found (especially by collecting the galls early in the year). He expressed his belief that the late Mr. Walsh had proved beyond question the breeding of a male *Cynips* in America; nevertheless, some Members present thought there was still an amount of obscurity concerning the precise generic rank of the presumed male *Cynips*.

Professor Westwood sent drawings and descriptions of a Lepidopterous insect belonging to the *Bombycidae*, parasitic upon *Fulgora canelaria*, and described as *Epipyrops anomala*. The notes concerning this extraordinary instance of parasitism were communicated to him (with specimens) twenty-six years ago by Mr. J. C. Bowering, from Hong Kong. The larvæ were found attached to the dorsal surface of the *Fulgora*, and as they grew had a cottony covering, which also occurred in the pupa state (a period very variable in duration). The whole circumstantial evidence tended to prove that it was upon the waxy secretion of the *Fulgora* that the larva fed, and that of this the cocoon of the pupa was formed. The general appearance and structure of the imago induced Prof. Westwood to place the insect in the family *Arctiidae* as an aberrant form. [This very extraordinary insect was noticed by Prof. Westwood at the Meeting of the British Association at Oxford in 1860, and an account of it, under the name of "*Epipyrops anomala*, Bowering," appears in the Report (the 30th) of that Meeting, p. 124, 1861.—Eds.]

DESCRIPTIONS OF SOME NEW GENERA AND SPECIES OF NEW
ZEALAND COLEOPTERA.

BY D. SHARP, M.B.

(concluded from page 77.)

ANCISTROPTERUS BROUNI, *n. sp.*

Rufus, nitidus, nudus, fortiter punctatus; elytris humeris extrorsum prominulis, pone medium tuberculis duobus obtusis.

Long. corp. (rostro incl.) $7\frac{1}{2}$ mm.

Red, obscurely tinged with a darker colour; head and rostrum rather closely punctured. Thorax about as long as it is broad at the base, much narrowed to the front, rather distinctly but not densely punctured. Elytra with rows of coarse punctures, with the shoulder directed outward as a broad short process: on each, just behind the middle, close to the suture, is an obtuse elevation with a very minute pencil of hairs on its summit; these tubercles are laterally compressed, and separated only by a narrow space.

This fine and very distinct species was recently sent from Tairua by Captain Broun, but only a single individual. I have, with much pleasure, named it in honour of its discoverer. The specimen is, I have no doubt, a male.

OBS.—The genus *Ancistropterus* was unknown to Lacordaire, and appears to me to be very closely allied to *Scolopterus* as limited by him and Mr. Pascoe, but is readily enough distinguished by the convex eyes.

ANCISTROPTERUS MUNDUS, *n. sp.*

Rufus, vel nigricans, subnudus; capite thoraceque dense punctatis, fere opacis; elytris striato-punctatis, nitidis, postice declivis, humeris muticis.

Long. corp. (rostro incl.) $5\frac{1}{2}$ mm.

Rostrum and head densely punctured, eyes very convex. Thorax small, about as long as broad, much narrowed in front, a little constricted just behind the anterior margin, very closely and somewhat coarsely punctured, with a line of scanty, easily removed, pale scales along the middle. Elytra with the shoulders well marked, but not prolonged, their basal portion flattened, and so forming a sort of angle with the depressed apical portion; they are furnished with rows of punctures, which, though rather fine at the base, become deepened into striæ on the middle, and the interstices near the suture are more elevated on this part; they are shining, but furnished with a few setæ and scales along their sutural portion.

Also sent by Captain Broun with the preceding and *A. quadrispinosus*, White; so that we may hope that other species of this remarkable genus will be brought to light.

STEPHANORHYNCHUS LAWSONI, *n. sp.*

Angustus, fuscus, tomento obscuro, griseo vel ochraceo, vestitus;

vertice sub-inflato, æquali; elytris medio tuberculis elevatis duobus, alterisque minoribus ante apicem. Long. corp. $4\frac{1}{2}$ — $5\frac{1}{2}$ mm.

Clothed with a sub-variegate pubescence, which in character is intermediate between scales and hairs. Rostrum scarcely so long as the head, eyes very prominent, the space between them obscurely sulcate, the vertex behind the eyes somewhat swollen, but even and without prominences. Thorax conical, elongate, very narrow in front, and considerably constricted. Elytra rather long and narrow; on the middle near the suture each has a rather long elevation, which is laterally compressed, and midway between this and the apex is a much smaller tubercle. Legs slender, shaped as in *S. curvipes*, White, but the four front femora without teeth.

I have received this curious species sparingly, both from Mr. Lawson and Captain Broun.

N.B.—I am not acquainted with the species of *Stephanorhynchus* just described by Mr. Pascoe, but a specimen of the present insect which I sent to him was remarked on as "very distinct."

ALEMA,* *nov. gen. (Chrysomelidarum).*

Caput exsertum, ore haud inflexo.

Antennæ filiformes, ad insertionem approximatae.

Thorax coleopteris duplo angustior, lateribus vix marginatis.

Femora posteriora incrassata.

Acetabula antica oclusa.

Antennæ 11-jointed, inserted near one another on the middle of the head. Thorax scarcely broader than the head, quadrate, but constricted behind the middle, almost unmarginated at the sides. Elytra without epipleuræ. All the coxæ but slightly separated; there is no projection of the process between the front ones. The legs are rather long and slender, the tibiæ without spurs or grooves; the first joint of the tarsi twice as long as the 2nd, 3rd much broader than the others, bilobed, 4th rather short, not so long as the basal joint. Hind-body with five visible ventral segments, 1st large, as long as the three following together, the three following about similar to one another, and not abbreviated along their middle, except that in the males, the 4th segment is shorter in the middle than at the sides; 5th rather large.

I shall not attempt to decide on the exact affinities of this anomalous little insect, for no one but an entomologist who is well acquainted with all the details of structure of the *Phytophaga* could, I am sure, do so satisfactorily. I think, however, it would be most correctly placed as indicating a separate tribe of Chapuis' *Eupodes*, connecting that Section with the *Halticidæ* of the Section *Cycliques*. It is clearly a highly important synthetic form.

ALEMA PARADOXA, *n. sp.*

Ferruginea, nitida, nuda, antennis pedibusque dilutioribus; elytris striatis, striis fortiter punctatis. Long. corp. $2\frac{1}{2}$ —3 mm.

Variat, elytris plus minusve fusco-signatis.

First joint of antennæ considerably thicker than the following joints, 2nd rather shorter than 1st, and considerably stouter than 3rd, and also considerably longer than it, 4th longer than 3rd, 4—11 all slender and elongate, but the apical joints are larger than the intermediate, 11th longer than 10th. Head with the eyes rather large, the space between them elevated, and longitudinally divided down the middle. Thorax almost impunctate. Elytra with ten rows of coarse punctures, the interstices between them being slightly elevated, especially behind. The extremity of the pygidium slightly projecting beyond the elytra; under-surface almost impunctate.

This species has been sent me both from Auckland by Mr. Lawson and from Tairua by Captain Broun; the latter gentleman indicated some of his specimens as being found on one of the tree ferns (*Cyathea dealbata*).

ARNOMUS,* *nov. gen.* (*Chrysomelidarum*).

Coxæ anteriores distantes.

Antennæ elongatæ, filiformes, basi distantes.

Caput subinsertum, oculis integris.

Elytra ampla, thorace latiora, pygidium obtectentia.

Scutellum conspicuum, parvum.

The interesting insect for which I propose this generic name, is somewhat allied to *Stylosomus*; and would apparently, in Chapuis' arrangement, indicate a fresh group, allied to the *Stylosomites*, and placed at the beginning of the *Cryptocephalides*. It differs from *Stylosomus*, by the widely separated coxæ, by the ample elytra which give the insect a different form, and by the visible scutellum. The group *Stylosomites* consists of the single Mediterranean genus *Stylosomus*, and by altering its formula somewhat, the New Zealand genus might be included in it.

ARNOMUS BROUNI, *n. sp.*

Ferrugineus, capite pectoreque æneis, antennis apice fuscis; dense punctatus. Long. corp. $2\frac{1}{2}$ —3 mm.

Fem. abdomine apice fovea magnâ.

Antennæ rather long, slender, the four or five basal joints reddish, the others infusate. Head brassy-green, very densely punctured. Thorax very transverse, but a good deal narrower than the elytra, reddish, more or less tinged with brassy, extremely densely and rather finely punctured, the interstices being excessively small; the sides and base finely margined. Scutellum small, black and impunctate. Elytra very densely and rather coarsely punctured, with a small but distinct, shining, humeral callus. Legs elongate, red, the tarsi moderately stout and long.

* Ar-nō-mus, — D. S.

The species apparently varies a good deal in colour; especially as to the extent and distinctness of the brassy tinge.

Five specimens of this very interesting species have been recently sent me from Tairua by Captain Broun, whose persevering researches are bringing to light a remarkable number of important New Zealand insects, and in whose honour I have named it.

APHILON,* *nov. gen.* (*Chrysomelidarum*).

Corpus latum, sub-hemisphericum.

Coxæ omnes distantes.

Acetabula antica aperta.

Elytrorum epipleura lata.

Antennæ 11-jointed, with the last four joints considerably thickened, widely separated at their point of insertion, this being just at the inner and front part of the eye, which is small, but convex and nearly semicircular. Thorax finely margined at the sides. Anterior coxal cavities small, obliquely oval, very widely separated, and also far distant from the sides. Mesosternum excessively short, forming a mere band, placed just on the same level with the metasternum, so that the very widely separated middle coxæ almost touch the front coxæ. Hind coxæ deeply imbedded, very widely separated, conical in form. Five ventral segments of the hind-body are visible, the first as long as the three following together, 2nd, 3rd, and 4th narrow, just similar to one another, of just the same width at the sides as in the middle; 5th elongate. Pygidium covered. Elytra with their epipleura very broad, and closely adapted to the sides of the body. Scutellum not visible. Tarsi all 4-jointed, moderately slender, basal joint considerably longer than the 2nd, 3rd truly bilobed, with the lobes narrow, 4th joint rather longer than the basal joint, the claws small and simple.

This most anomalous little creature, I think would be best placed among the *Phytophages*, Section III, *Cycliques*, Chapuis; in which section, however, it must apparently form a distinct tribe. Notwithstanding two or three days spent in investigating it, and searching for its allies, I am quite unable to discover that it has any described near relatives.

APHILON ENIGMA, *n. sp.*

Latum, convexum, nudum, supra æneum, subtus fusco-æneum, antennis pedibusque testaceis; fere læve, prothorace basi medio fortiter punctato.

Long. corp. 2 mm., lat. 1½ mm.

Antennæ yellow, not quite reaching the back of the thorax, 1st joint rather large, 2nd stouter than, but not so long as, the 3rd; 4th, 5th, and 6th small, 7th broader than the preceding one, 8th, 9th, and 10th transverse, 11th elongate, longer than the two preceding together. Head very small in proportion to the rest of the insect. Thorax strongly transverse, continuing the outline of the elytra without

interruption, its base very closely applied to the base of the elytra, considerably narrowed towards the front, the sides are quite smooth and shining, but on the extreme base in the middle, is a series of closely placed large punctures, and in front of these the surface is sparingly punctured. Elytra shining, brassy, without sculpture or any striæ. Under-surface also shining and impunctate, but the apical ventral segment alutaceous and sub-opaque. Legs clear yellow, the tibiæ short, but distinctly longer than the tarsi, the front and middle pair slightly angulated externally about the middle.

A single specimen of this curiosity has been sent from Auckland by Mr. Lawson; I hope the reception of other specimens may enable me to make known its characters in a more complete manner. On commencing my examination of it, I supposed it would prove allied to the *Erotylidæ*, but I do not now think this is likely to prove the case.

PENITICUS,* *nov. gen.* (*Chrysomelidarum*).

Corpus breve, convexum.

Thorax lateribus marginatis et sinuatis, angulis posterioribus minute prominulis, basi truncato.

Elytra ad angulos humerales pliculis elevatis.

Pedes crassiusculi, tarsorum unguiculis basi appendiculatis.

Head deflexed, inserted as far as the back of the eyes, which are convex. Front coxæ rather widely separated, the central part of the prosternum only half as long as the sides of the thorax. Middle coxæ rather widely separated; metasternum very short; hind coxæ only a little more distant from one another than the front ones are; in form they are rather short and transverse. Fourth ventral segment abbreviated in the middle, 5th short and indistinct. Elytra convex and bulged, rather produced at the extremity, near the rounded and indistinct humeral angles, with some short longitudinal elevations or folds. Legs rather short and stout, the tibiæ without grooves or notches; the claws of the tarsi thick at their base, so as to appear appendiculate.

These curious insects, from the structure of their tarsi and general characters, must no doubt be classified in the *Eumolpides*, but I fail to discover in Chapuis' work any near ally for them; and must leave their exact position doubtful for the present. The species appear to be extremely rare, only one or two of each having as yet been found.

PENITICUS SUFFUSUS, *n. sp.*

Fuscus, nitidus, antennis pedibusque dilutioribus, fere testaceis; prothorace parce minus distincte punctato, maculis pallidioribus vagis; elytris parce irregulariter punctatis, apice et pliculis humeralibus testaceis.

Long. corp. 5 mm.

Antennæ reddish, 3 mm. in length, 2nd joint much shorter than the others, so

that it is scarcely longer than broad, 11th shorter than 3rd, 11th joint elongate, longer than the 10th. Head rather broad, indistinctly punctured. Thorax rather large, broader than long, the sides much broadest in the middle, and narrowed to the base, so that the outline of the insect is much interrupted in the middle, the front angles greatly deflexed but rather acute, the hind angles with a minute sharp projection; it is shining and quite free from pubescence, almost of a puce colour, with paler indistinct spaces, only sparingly punctured. Elytra sparingly and irregularly punctured. Legs yellowish.

Auckland: sent by Mr. Lawson. Captain Brown has also recently sent me a specimen which may be a female variety of the Auckland species: it is rather smaller and narrower, the surface is more distinctly punctured, the colour rather darker, and all the tarsi a good deal more slender. Captain Brown's specimen was numbered 244, and was found on the 16th January, in the Hikuwai forest.

PENNYCUS ANTIQUS, n. sp.

Euscus, vix a neo-nicans: antennis rufis, pedibus testaceis: elytris humeris apiceque dilatationibus, fere punctato-striatis, pliculis elongatis.

Long. corp. 1½ mm.

Very similar to *P. signatus*, but rather smaller and narrower, with the sculpture of the upper surface more distinct and regular. The thorax is sparingly, but distinctly, and rather deeply punctured. The elytra are rather irregularly punctured, but the punctures are almost arranged in rows, and the humeral folds are elongate and take the form of elevated interstices on the basal portion of the elytra.

A single individual was sent me some time ago from Tairua by Captain Brown. It is no doubt a male: the fourth abdominal segment is completely abbreviated in the middle, and the apical dorsal segment much inflexed, so that the form of the hind body is nearly, if not quite, that of the Section *Cryptosomus* of Chapuis, rather than that of the "*Cyrtiques*" to which the *Eumolpides* belong in his classification.

Thorahill, Dumfriesshire:

May, 1876.

DESCRIPTIONS OF NEW HEMIPTERA-HETEROPTERA.

BY EDWARD SAUNDERS, F.L.S.

BEVYTIS SETIFENNIS.

Testaceus, punctatus, capitulis processu hirsuto, antice rotundato, antenna cum articulo apicali nigro, thoracis carinis valde elevatis, antice valde productis: basi anguste sinuati. Elytris valde costatis, apice

fusco, clavi costâ et corii costâ interiori setosis, membranâ magnâ, apice late rotundato, striis quatuor intercostalibus fuscis ornatâ; pedibus testaceis, concoloribus, tarsorum apicibus nigris. B. montivago affinis sed antennarum articulis multo brevioribus et elytrorum carinis setulosis mox distinguendus.

Long. 2 $\frac{3}{4}$ lin.

Malta. J. J. Walker.

LYGÆOSOMA LOWNII.

Sanguineum, capite thoraceque capillis longis vestitis, hoc formâ subtrapezoidali, basi maculis duabus nigris ornatâ; scutello nigro, apice sanguineo; elytris sanguineis, albido pilosis, immaculatis, membranâ fuscâ, angulo interiore basali maculaque discoïdali rotundatâ nireis; antennis nigro-fuscis, hirsutis, articulo apicali dilutiore, pedibus nigris, hirsutis; abdomine rufo, piloso, lateribus nigro maculatis, segmento anali nigro.

Long. 2 $\frac{1}{2}$ lin.

Galilee. B. Lowne.

ISCHNODEMUS CHAMPIONI. - ♂

I. sabuleti affinis, sed magis elongatus, capitis lateribus ante oculos utrinque fortius et sub-acute tuberculatis; thorace longiore, purum convexo, antice attenuato; capite thoraceque nigris, rugoso-punctatis, sub-pilosis, hoc margine basali fere rectâ, sub-elevatâ, testaceâ, lævigatâ; scutello nigro, punctato, lineâ basali sub-elevatâ nitidâ; elytris brachypteris, pallidis, venis fusco-testaceis; abdomine nigro-fusco, subtilissime piloso; pedibus testaceis, femoribus basi late nigris; antennis nigris, validis.

Long. 2 lin.

Cephalonia. J. J. Walker.

GALEATUS SCROPHICUS.

Caput nigro-fuscum, spinis quinque antennisque testaceis; thoracis lateribus diaphanis, valde explanatis, rotundatis et sub-elevatis, costis quatuor instructis; marginibus antea valde angulatis, postice angulis sub-rotundatis, disco nigro-fusco, carinis tribus diaphanis, valde elevatis, quarum media altissima et vesiculis duabus reticulatis fumosis inflatis instructa, anterior major valde inflata et sub-rotundata, antea modice attenuata, posterior minor sub-compressa; elytra diaphana, reticulata, lateribus explanatis, marginibus prope basin valde angulatis, apice late rotundatis, cellulis discalibus elevatis; pedibus testaceis, abdomine subtus nigro-fusco.

Long. 1 $\frac{1}{2}$ lin.

Point Scropha. J. J. Walker.

DESCRIPTION OF A NEW SPECIES OF EUROPEAN HEMIPTERA—
HETEROPTERA.

BY JOHN SCOTT.

DERFOCORIS (CALOCORIS) ZELLERI.

Black, somewhat dull. *Pronotum* and *elytra* margined with orange-red or red; *cuneus* orange-red or red.

Head black. *Crown* with fine transverse furrows on each side. *Eyes* black, posteriorly with a more or less distinct orange-yellow line. *Antennæ* black; 3rd and 4th joints pitchy-brown, the former narrowly yellow at the base.

Thorax—*pronotum* black, very finely wrinkled transversely, sparingly clothed with short, fine pale adpressed hairs, sparingly intermixed with black, which are best observable on the margins; down the middle, a more or less distinct, narrow, reddish line extending from behind the callosities to the posterior margin; lateral margins orange-red or red, very narrowly so at the anterior margin, the colour becoming wider as it curves round the outer margin of the callosities, from below which to the posterior margin it continues of an almost equal width. *Scutellum* black, apex broadly orange-red or red, not reaching to the side margins. *Elytra* black; anterior margin broadly orange or red, not reaching to the apex; base very narrowly blackish; *cuneus* orange-red or red, with a few short black hairs; apex very narrowly black; *membrane* dark fuscous-brown, with a broad darker streak extending from the apex of the cuneus to the apex of the anterior margin; nerves dark brown. *Sternum* black; *pro-* and *mesosternum* margined exteriorly with yellow round the base of the legs, connected by a broad yellow streak along the anterior portion of the latter; *metasternum* reddish posteriorly; orifice of the odoriferous sac broadly margined with yellow. *Legs* black; *tibiæ* somewhat dusky yellow, base broadly, apex more narrowly, black; *tarsi* and *claws* black.

Abdomen black; on the under-side the margins of the segments with a triangular red patch, and on each side in a line with the base of the legs a broad, red, longitudinal streak; genital segments of the ♂ with a large red patch on each side.

Long. 3½ lines.

At first sight, one is reminded of *Lopus gothicus* by the markings on the above insect, but the differences in the shape of the head and pronotum alone, at once separate it from that genus. Its true place appears to be near *D. marginellus*, from which it may be distinguished by the absence of the yellow collar and broadly yellow claval suture. On the last named also, the yellow anterior margin of the elytra is continued to the apex, the cuneus is without a black apex, and the legs are red.

In the collections of Messrs. Douglas & Saunders, and in my own.

The specimens, taken at Palermo, were received from Professor Zeller

DESCRIPTIONS OF THREE NEW SPECIES OF *HEMIPTERA*-
HETEROPTERA FROM NEW ZEALAND.

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

For the following and other species of *Hemiptera*, I am indebted to Captain Broun.

PLOCIMERUS DOUGLASI, *n. sp.*

Ferrugineo-nigricans, capillis pallidis parce vestitus; antennis, tuberculis antenniferis ad apicem, pronoti lobi postici angulis lateralibus hemelytris, rostro pedibusque plus minus flarescentibus; antennarum articuli primi dimidio basali et apice, articuli secundi apice, articuli tertii basi apiceque, hemelytrorum punctis maculisque, annulo latissimo in medio femorum anticorum, annulo lato apicem versus femorum intermediarum posteriorumque, necnon apicibus tiliarum omnium, tarsorum articulis tertiis unguiculisque, nigricantibus aut ferrugineo-nigricantibus; membrana hand abbreviata, brunneo-fusco-variegata, venis nonnullis albicantibus; antennarum articulo tertio leviter incrassato.

Long. 5—5½ mm.

♂. *Tibiis anticis subtus pone medium dente acuto armatis, apicem versus compresso-incrassatis.*

Patria: Nova Zelandia. (*In museo auctoris.*)

Head black, finely punctured, clothed with pale yellow hairs. Antennæ brownish-yellow with paler hairs: 1st joint, basal half and apex narrowly brownish; 2nd joint rather darker at extreme apex; 3rd joint fuscous at base and apex, slightly incrassated upwards; 4th broken off. Antenniferous tubercle yellowish at apex. Eyes and ocelli reddish-brown. Rostrum yellowish-brown, 1st joint fuscous at base and apex. Pronotum with a few long pale hairs, dull reddish-black, somewhat darker at the sides and in the middle; strongly constricted, the anterior lobe about twice as long as posterior and somewhat globose; posterior lobe strongly punctured, the posterior two-thirds of the side margins pale yellow, interrupted at the outer angle by reddish-black; hind margin slightly sinuate above the scutellum. Scutellum dull blackish, reddish on each side of the centre of the disc, strongly punctured. Sternum reddish-black. Coxæ blackish; trochanters yellowish; anterior femora shining black, broadly yellow at base, and narrowly at apex, armed below near apex with two strong and some smaller teeth. Anterior tibiae of the ♂ with a tooth beyond the middle below, and flatly incrassated upwards towards the apex. Intermediate and hind femora yellow, with a broad reddish-black band near the apex; all the tibiae and tarsi yellow, with the apices of the tibiae fuscous, and the 3rd joints of the tarsi and claws reddish-fuscous. Elytra yellowish, with a few long pale hairs. Clavus with the three rows of punctures reddish-black. Corium with reddish-black punctures, and with a small spot near the base (sometimes almost obsolete), a larger square one about the middle of the anterior margin, a still larger triangular one filling up the anterior apical angle, and an irregular streak enclosing the inner apical angle, reddish-black. Membrane variegated with brownish-fuscous; some of the

veins yellowish-white. Ventral surface of hind-body broadly black in the middle, and reddish at the sides in the ♂; reddish or yellowish-brown with a black band on each side of the middle in the ♀.

Varies in the intensity of the markings.

This species appears to be somewhat allied to *P. tumens*, Stål.

ANEURUS BROUNI, *n. sp.*

A. lævi affinis, sed minor et angustior. Caput comparate haud minus, processu apicali minus producto, tuberculis antenniferis apice extus distincte acuminatis; antennæ articulo primo pyriformi, apice truncato, primo et secundo fere æquilongis. Pronoti marginibus lateralibus postice minus rotundatis, antice minus sinuatis, disco minus transverse depresso. Segmenti genitalis maris tuberculis duplo majoribus.

Long. 3½—4 mm.

Patria: Nova Zelandia. (In museo auctoris.)

Allied to *A. lævis* (as is also *A. australicus*, Stål) and agreeing with it in colour (reddish-brown), but smaller and narrower. Apical process of the head less produced and more triangular. The antenniferous tubercles with a distinct forward prolongation on the outer side of the apex. First joint of the antennæ pyriform and truncate at the apex, about the same length as the 2nd; 3rd and 4th joints broken off in my specimens. Side margins of the pronotum less sinuate in front and less rounded behind; hind margin rather straighter; transverse depression of the disc less apparent. The tubercles on each side of the base of the genital segment of the ♂ (viewed from above) more than twice as long as in *A. lævis*. The specimens being carded, I cannot see the under-side in either the ♂ or ♀, but in the latter the 1st genital segment, viewed from above, appear to have a projecting ridge at each corner of the hind margin.

SALDA AUSTRALIS, *n. sp.*

Nigra, sub-nitida, pube griseo-brunnecâ capillis aureis paucis intermixtis, vestita. Labro in medio, maculis duabus parvis inter oculos et ocellos, macula sub-rotunda apicem versus clavi, maculis septem parvis corii, tibiisque, obscure flavescentibus. Antennis sub-nigris, capillis griseo-brunneis vestitis; articuli primi et tertii apicali dimidio, articuli secundi apicali quinto, rufo-brunneis. Femoribus sub-nigris, ad basin et prope apicem, subtusque marginibus dimidii basalis, flavescentibus; tibiis obscure flavis, spinis capillisque fuscis instructis, basi apiceque fuscis; tarsis brunneo-flavis. Pronoti tertio posteriore scutelloque sub-rugulosis. Membrana areolis quatuor instructa, obscure flavo-brunnea, interius ad basin late fusco-brunnea; venis fuscis, maculis ad interiorem venæ primæ exterioris, et utrinque ad basin venæ secundæ, pallidis. Long. 4½ mm.

Patria: Nova Zelandia. (In museo auctoris.)

Elliptic-oblong, black, slightly shining; head, pronotum, and elytra with close short, dark greyish-brown pubescence, and a few golden hairs. Head black, centre of labrum and a small spot on a tubercle to the inside and close to each eye, dull yellow. Eyes dark brown, ocelli reddish-brown. Antennæ (with greyish-brown hairs) blackish, apical half of 1st and 3rd joints and apical fifth of 2nd reddish-brown; 4th joint broken off. Pronotum short, trapeziform; sides straight, reflexed; the callosity occupying the anterior two-thirds, and bounded behind by a furrow, which is more strongly marked at the side margins; the callosity has a central fovea and an obscurer one on each side. Inside each hind angle is a small callosity. Scutellum with a broad, shallow, sub-quadrate excavation on the disc before the transverse furrow; scutellum and posterior third of the pronotum sub-rugulose. Femora blackish-brown, the base, a broad ring near the apex, and the margins of the basal half below, brownish-yellow. Tibiæ dull yellow, fuscous at base and apex, and with fuscous hairs and spines. Tarsi yellowish-brown. Elytra dull black, with obscure yellowish-brown spots; clavus with a roundish one on the apical half; corium with two small ones on the disc, two on the membrane suture, a streak inside the costal margin near the tip, a smaller spot inside that, and another streak opposite it on the outside of the central vein; anterior margin of the corium somewhat flatly reflexed for two-thirds its length from the base. Membrane with four cells, dusky yellowish-brown, broadly clouded with fuscous at the base of the inner margin; veins fuscous; a pale spot to the inside of the outermost vein, and a more indistinct one on each side of the origin of the next vein; a blackish spot between the anterior margin and the apical two-thirds of the outermost vein.

I would take this opportunity of asking for contributions of *Hemiptera* from any part of the world, and will gladly furnish hints and instructions for their collection and preservation. *Hemiptera* may be preserved sufficiently well in alcohol, if care be taken that the bottle is *always kept completely full of fluid*. If the insects do not fill the bottle the remaining space may be filled with crumpled pieces of paper to prevent shaking as much as possible, in case the spirit evaporate during transit.

Perth: August 28th, 1876.

A foreign visitor (Danais Archippus).—I have much pleasure in recording the capture of a fine butterfly, which does not appear in the ordinary British Fauna. For some time past, the small Scabious (*S. succisa*) has been in full bloom, making large patches of deep blue by the sides of our woods and out-of-the-way corners of meadows, and this bloom has been very freely frequented by hordes of butterflies, more numerous in point of numbers and varied in their species than I have often seen, thus,—*L. Alexis*, *P. phloas*, *V. Atalanta*, *Io* and *urticae*, *G. rhanni*, and the whites have been in great abundance; and *C. cardui*, *Colias Edusa*, and *A. Paphia* have shown up occasionally in all their gorgeous beauty. On the 6th September, my gardener's son, J. Stafford, a lad of 14 years old, on going to a favourite patch of this Scabious, at once saw this magnificent visitor. It was sitting on a bloom

opening and shutting its wings, and flitting in enjoyment of the shelter and the sunshine, from flower to flower. He took the insect to his father, who brought it to me—and I saw it still alive. It is a fine fresh specimen, and has not flown much.

The locality is two and a-half miles from Neath as the crow flies. Ships laden with timber and other merchandise come up to Neath, and the inference is, that the pupa may have come thus imported, although it is marvellous that the insect could have flown so far without more injury to its freshness.

The nearest houses, excepting four cottages of mine, are half-a-mile distant, and all enquiry fails to discover any one who could, by any possibility, have imported the insect.—JOHN T. D. LLEWELYN, Ymysygerwn, Neath: *September 13th, 1876.*

[Mr. Llewelyn accompanied the above account by a pen-and-ink sketch, and excellent description of this magnificent butterfly, and the identity of his insect with *D. Archippus* is certain. The larva feeds upon species of *Asclepias*. The insect occurs in America from Canada to the Amazons, and is generally very common. Within a few years, it has spread over the Islands of the Pacific to Queensland and New Guinea, in consequence (probably) of being introduced, in the first instance, with its food plant. The number of vessels passing up the Bristol and St. George's Channels, from all ports of America, is very great: so that the chance importation of a pupa (or even of a perfect insect) is by no means unlikely. Large butterflies are often captured at sea, many miles from land, with but few signs of wear and tear, if the weather be fine.—EDS.]

Capture of Pieris Daplidice near Southend, Essex.—On the 11th August, I caught a female of this scarce species flying near a lucerne-field, about ten minutes' walk from the railway station at Southend.—V. E. L. YOUNG, 38, Limes Grove, Lewisham: *16th September, 1876.*

[I have seen this insect, and certify to its authenticity.—J. W. D.]

Notes on Lepidoptera from North Wales.—In the first week of this month, I captured by gas light in Pwllheli, North Wales, a very small (though good) specimen of *Bryophila glandifera*. I believe this is the first record of its occurrence in North Wales. I also captured, in the boggy neighbourhood of Penrhyn Dudriath, Festiniog Railway, *Ephyra porata* (common), *Anaitis plagiata* (common), *Argynnis Adippe*, and a beautiful variety of *Lomaspilis marginata*, front wings similar to No. 3 engraving in Newman's British Moths, but with a sepia-brown border on the underwings.—SAMUEL D. BAIRSTOW, Woodland Mount, Huddersfield: *Aug. 26th, 1876.*

Eupithecia subciliata in Yorkshire.—At an excursion made by the joint Natural History Societies of Leeds, York, Richmond, and Huddersfield to Boroughbridge and Aldborough on the 7th of August last, several specimens of *Eupithecia subciliata* were taken on or about maple bushes by various Members. Has the species ever been recorded from Yorkshire before?—GEO. T. PORRITT, Huddersfield: *September 4th, 1876.*

Capture of Catocala fraxini.—On September 4th, I took a specimen of this rarity, at sugar, in the Vicarage garden here.—A. H. EVANS, Scremerston Vicarage, Berwick.

Capture of Cidaria reticulata.—Yesterday I took a specimen of this insect at Windermere. In 1856, the late T. H. Allis and I took several specimens; but since then, though I have gone every year in search of it, I had not met with it till now, an interval of 20 years. I must have gone at least fifty jounries, and it is over fifty miles to the lake side, and then I have to row a mile across the lake, so that this specimen has been hard earned. The *Impatiens noli-me-tangere*, which is said to be its food-plant, I have this time found in plenty. A week or two ago, I found on the *Impatiens* a queer larva, which puzzled Mr. Buckler; but he now thinks it is that of *Hadena rectilinea*. Perhaps, as there is bilberry near, the parent moth dropped her eggs just where she alighted.—J. B. HODGKINSON, 15, Sprink Bank, Preston: August 10th, 1876.

Capture of a black variety of Orthosia suspecta, Hübn.—Near Dunkeld, on the 26th August, I beat out of a Scotch fir tree a black moth, which I could not recognise, but Dr. F. Buchanan White, who was present, thought it might possibly be *Orthosia suspecta*; this suspicion is proved to have been correct, for a careful investigation and comparison with ordinary examples have satisfied Mr. McLachlan and me that my capture is a female of this species. The head, thorax, abdomen, and fore-wings are soot-black, the form of the stigmata on the latter being traceable by a delicate whitish outline; the lower wings are fuscous; the antennæ are black, with white annulations on the basal portion. This capture is worth notice, for, as far as I can discover, melanism in this species has not been observed or recorded.—J. W. DOUGLAS, Lee: 11th September, 1876.

Notes on the larva, &c., of Agrotis hyperborea, Zett. (Pachnobia alpina, Westw.).
—We found the larvæ of this species at the end of May in fir-woods under moss, in places where *Vaccinium myrtillus* especially grew. All appeared to enter the pupa state, although those which we found first rambled about briskly after being disturbed. Length, 30 mm. Head yellowish, marbled with brown, with two brown lines in front. The 1st segment has a very slightly horny shield, divided in the middle by a whitish line, which is also apparent on the following five or six segments. Body reddish-grey, strongly sprinkled with black points. Above on each side a paler line, which inwardly, at the beginning of each segment, has a shorter black streak, the individual streaks separated by a lighter reddish spot. The last two black streaks on segment 11 converge hindwardly. The horny ring round the spiracles is shining black. Forelegs yellowish, brownish at the tips. Abdominal legs whitish. The larva makes for itself a loose cocoon in the moss, wherein it remains for about three or four weeks as a pupa. The latter is 17—18 mm. long, chestnut-brown, and the not very strong, even “cremaster,” has four spines, curved at the end, to which the larva skin remains hanging. I obtained, in the beginning of August, a number of young larvæ from the egg, which all ate *Vaccinium myrtillus* eagerly. They grew very little, and at the beginning of winter were still very small, only 6—8 mm. long. Unfortunately all died in the winter. Unless they grow more speedily in the north, it appears to me almost necessary that they must hibernate twice, for, at the end of May, when we found them full grown, it was still very cold, and their food-plant not yet in leaf, so that it was impossible they could have eaten much that spring. As confirmation of my opinion, we found also, at the end of June, several small

larvæ, which, however, perished, and it might be that their growth had been arrested through illness.—O. STAUDINGER (Translated from the Stettiner entomol. Zeitung, 1861, pp. 362, 363).

[We have thought that the above translated extract from Drs. Staudinger and Woeke's "Journey in Finmark," although published so long ago, may not be without interest at the present time. Mr. Meek sent, for our examination, a series of ten Scotch examples of *P. alpina*, and five from Finmark, received by him from Dr. Staudinger. These latter are remarkably constant, and the ground colour of the fore-wings may be called ashy-grey. The Scotch examples, on the contrary, are very variable, only one resembling the forms from Finmark; no two are alike, and, although a trace of the ashy ground colour usually remains, it is overpowered by brown or blackish suffusion, always, however, leaving the characteristic orbicular and reniform stigmata distinct, and sometimes filled in with reddish. One ♀, in particular, is a very beautiful insect, having a blueish-grey ground with dark black transverse lines, and longitudinal lines of black and blueish-grey, with a broad central black suffusion. Altogether, these insects fully bear out the character for variability that has caused Scotch *Lepidoptera* to be so much desired by continental entomologists.—EDS.]

Description of the larva of Herminia grisealis.—It is with great satisfaction I record my thanks to the Rev. Bernard Smith for his kindness in sending me this long desired larva, and enabling me to complete my figures of the genus; and, as no account of the larva has appeared since 1867, when *barbalis* was, by mistake, described for this species in No. 37 of "The Entomologist," at pages 223-4, I venture to think the following description may perhaps be acceptable.

The larva, found feeding on oak, I received September 15th, 1875, and for two days it continued to feed, and then spun a thin web of whitish-grey silk, which held the upper surface of the leaf folded together at the ends, and the sides also drawn together a little, so as to form a hollow in the middle of the leaf, wherein, on the 19th of September, it changed to a pupa, from which the moth, a male, came forth on 5th of June, 1876.

The full-grown larva is from one-half to five-eighths of an inch in length, the globular head smaller than the second segment, and this a little less than the other segments, which are in proportion moderately stout and cylindrical, the last segment tapering a very little. As to colour, the head is darkish brown, reticulated with darker, and without any gloss; on the second segment is a small, semi-lunar, dark brown, velvety plate, dorsally divided by a line of the general ground colour of the rest of the body, which is a dingy pinkish-grey, faintly freckled with darker; the dorsal stripe not very visible till the 5th segment, where it commences, and continues to be conspicuously broad and blackish, being rather widened in the middle of each segment, and becoming narrower on the two last segments; the sub-dorsal line is darker than the ground colour, and a little broken in character; the tubercular dots small and blackish, each in a ring of unfreckled ground colour, and bearing a fine hair; a broken line of darkish freckles runs along the spiracular region; the spiracles themselves black and roundish; the unfreckled belly a little paler than the back; the anterior legs tipped with black, the others with brown; just before spinning, the general colouring is more pink.

The pupa is about three-eighths of an inch in length, moderately stout, offering no conspicuous points of form or outline, very glossy and of a very deep chestnut-brown colour, paler at the abdominal divisions, and attached to the web by the tip of the tail, which is furnished with two central bristle-like spikes recurved at their extremities, and near their base surrounded with three or four others very much shorter and extremely fine.—WM. BUCKLER, Emsworth: *July 31st*, 1876.

Description of the larva of Cryptoblabes bistriga.—For this larva hitherto I believe unknown, I am indebted to the Rev. Bernard Smith, of Marlow, who kindly sent me, on the 12th of September, 1875, an example, then no more than a quarter of an inch long, within a folded oak-leaf: the leaf was, for a great portion of it, quite skeletonized, and the larva afterwards reduced other oak-leaves to a similar condition by eating holes through the substance between the veins, always keeping the sides of the leaf folded to within a quarter of an inch of each other by means of a quantity of lightly spun web; I noticed it was the upper surface that was generally thus folded together, though once the under surface was similarly treated for a residence.

The movement of the larva when walking is a short and jerky advance, with a slight pause after every step.

On the 23rd, it appeared to be full-fed, when I secured a figure of it, and the description which follows, and towards the end of the month it spun itself up in a brownish web, half an inch long, at the bottom of its cage, and the moth appeared in the evening of June 4th, 1876.

The full-grown larva is nearly five-eighths of an inch in length, moderately slender and cylindrical, though tapering a little from the third segment to the head, and a little more from the eleventh to the small anal tip, the segments well divided and sub-divided by a transverse wrinkle on each, the spiracular region much puckered, the ventral and anal legs fairly developed, but placed well beneath the body.

In colour, the head and back are lightish brown, marbled with rather a deeper tint of brown, the dorsal line yet deeper, the sub-dorsal line blackish-brown, followed by a line of the light brown colour, then by a broadish stripe of blackish-brown, and beneath this a broad band of cream colour having a brown line running through the middle of it; the belly and legs drab, which deepens under the thoracic segments to blackish-brown; the spiracles light brown and not easily seen; the small tubercular dots black, each bearing a fine hair; an ocellated spot of brown, with a black centre and a long hair, on either side of the third and twelfth segments.

The pupa, nearly four lines in length, is rather slender and of the usual shape, the surface of the abdomen slightly punctated, though smooth at the divisions; the tip ending with two curled-topped spines, the minute spiracles rather prominent and black, all the rest being of a dark reddish-brown and shining.—*Id.*: *August 1st*, 1876.

Coleoptera at Aviemore, Inverness-shire, in July, 1876.—During three weeks' stay at Aviemore in July last, I found a few interesting and rare species of *Coleoptera*, the majority of which, as might be expected, were similar to those found there by me in 1874, and recorded in *E. M. M.*, xi, p. 64; still, a few species occurred that I had not then met with. The period of my visit this year being a fortnight later than in 1874, many moss and wood frequenting species did not put in an appearance, others that were very common in 1874 were very rare on this occasion.

I note below a few of the more interesting species that fell to my lot, avoiding, as much as possible, those previously recorded by me from this locality:—*Harpalus 4-punctatus*, Dej., sparingly under stones on the summit of a mountain, in company with *Miscodera*, *Tarus vaporariorum*, and other mountain species, and such commoners as *Harpalus latus*, *Calathus cistelooides*, *Olisthopus*, &c.; *Amara alpina*, one ♀ example of the reddish variety occurred in moss, and within a few yards of the spot where I captured it in 1874; *Staphylinus fulvipes*, one example under bark; *Tachinus elongatus*, a single specimen in the road; *Homalium brevicorne* and *pineti*, rarely, under fir bark; *Epuræa neglecta*, one example beaten from dead fir tops; *Omosita depressa*, not uncommon about the desiccated carcase of a sheep; *Dendrophagus crenatus*, rarely, under the bark of the Scotch fir, the head quarters of this species seemed to be in the glens, where large numbers of young firs are blown down and killed yearly by the wind; *Cryptophagus parallelus*, Bris., commonly, in company with *Tomicus bidens*, *acuminatus*, &c., by beating the dead fir tops left by the woodmen; *Atomaria badia*, one example crawling on a freshly cut log at the sawpit; *Corticaria serrata*, rarely, by beating dead fir tops; *Trichius fasciatus*, rarely, on *Orchis* flowers in the afternoon; *Melanotus castanipes*, sparingly, under fir bark and on the wing; *Salpingus ater*, rarely, in the dead fir tops; *Abdera triguttata* and *Zilora ferruginea*, both these species were very rare this year, though common enough in 1874; *Otiorhynchus maurus*, occasionally in abundance crawling on the roads; *Magdalinus duplicatus*, one example beaten from the Scotch fir, in company with *Brachonyx indigena*, which latter was very rare this time; *Astinomus ædilis*, common in the larva and pupa state under fir bark, though only two imagos occurred. *Leptura sanguinolenta*: I captured a ♀ example of this rare species running on a fir log, one of many barked by me; I am not aware of this species having been captured for many years in this country. There can, I think, be no doubt regarding the origin of this example, as it occurred in one of the wildest localities I ever visited.—G. C. CHAMPION, 274, Walworth Road, London, S.E.: Sept. 1st, 1876.

Hemiptera at Aviemore.—*Lygus rugicollis*, common on *Myrica gale*; *Plesiodema pinetellum*, Zett., two examples beaten from the Scotch fir (this species is recorded as British by Dr. O. M. Renter, in the September No. of this Magazine); *Salda morio* and *conspicua*, Doug. & Scott, one example of each on the banks of a mountain loch; *Hydrometra Costæ*, not uncommon in the mountain lochs; *Corixa Wollastoni*, in similar localities to the preceding.—ID.

Recent captures of Hemiptera:—

Phytocoris pini, Kirschb. Common on Scotch fir-trees near Perth and Dunkeld in August.

Tinicephalus obsoletus, D. and S. Common on farze about Edinburgh, in August, but only females, the males having become defunct by lapse of time.

Acompcoris alpinus, Reut. ? On Scotch fir-trees at Dunkeld, August 26th (*vide* E. M. M., xii, 249).

Liburnia Douglasi, Scott. I took two examples of this rarity among the roots of rushes at Folkestone Warren, on the 5th inst.

Tettigometra impressopunctata, Duf. A single example out of a tuft of *Teucrium scorodonia* at Folkestone Warren, Aug. 29th, but, although I sought assiduously, I

could not get another: it may be that I had not found the proper habitat, or that the time was too late in the year. This is the third recorded British habitat of this scarce species, the others being Milford and the Isle of Wight.

Eupteryx signatipennis, Boh. Common on *Spiraea ulmaria*, near Morningside, Edinburgh, August 16th. It was only on the *Spiraea* growing in sheltered places that the *Eupteryx* was to be found.

Eupteryx notatus, Curt. Not uncommon among the herbage at Folkestone Warren, Aug. 30th, but, on account of its minuteness and activity, not easy to see and difficult to catch.

Dicranoneura citrinella, Zett., and *Eupteryx stachydearum*, Hdy., both abundant on *Teucrium scorodonia* near Edinburgh, and at Folkestone, in August.—J. W. DOUGLAS, Lec: September 16th, 1876.

Captures of rare Coleoptera, Hemiptera, and Hymenoptera, at Chobham; including an Odynerus new to Britain.—During this season, I have collected a good deal in the neighbourhood of Chobham, especially on the large tract of common to the north, known as Chobham Common, and, so far as I know, there are few localities better worth visiting, especially for those interested in the *Hymenoptera* and *Hemiptera*.

Below I give a list of the rarer species that I have found. The *Hymenoptera* were kindly named for me by Mr. F. Smith.

COLEOPTERA.

Harpalus discoideus, two, under stones on Chobham Common; *Anisodaetylus atricornis*, one, on the heaths; *Pterostichus lepidus*, occasionally; *Amara consularis*, one, under a stone; *Stenolophus brunnipes*, several, by evening sweeping, also in *Sphagnum*; these agree exactly with continental specimens of *brunnipes*, although it is quite possible that they may be only dark forms of *dorsalis*; *Homalota scapularis*, by sweeping, one specimen; *Gymnusa brevicollis*, in *Sphagnum*, several; *Lamprinus saginatus*, by sweeping, one specimen; *Philonthus nigrita*, in *Sphagnum*, several; *Lithocharis obsoleta*, by sweeping; *Bledius fracticornis*, in damp places; *Byrrhus murinus*, in a sand-pit; *Corymbites quercus*, by sweeping; *Sericosomus brunneus*, by sweeping; *Cardiophorus asellus*, at the roots of rushes; *Dryophilus anobioides*, by sweeping; *Meloe brevicollis*, crawling on the ground on the common; *Cistela ceramboides*, by beating a hedgerow; *Orchestes iota*, on *Myrica Gale*, not rare; *Tomieus dispar*, by evening sweeping.

HEMIPTERA.

Gnathoconus picipes, one specimen, on the heath; *Coryzus maculatus*, one specimen, off *Myrica Gale*; *Plociomerus luridus*, very rarely, in very wet *Sphagnum* on the Common; *Calocoris ticinensis*, common, by sweeping in marshy places; *Systellonotus triguttatus*, occasionally; *Chlamydatus pygmaeus* = *Tytthus insignis*, D. and S., one specimen, by sweeping rushes, but, unfortunately, not secured: I have subsequently found it abundantly at the roots of rushes on Wimbledon Common; *Macrocotenus tanacetii*, ♂ & ♀ on tansy, the ♂ I believe has not been discovered before; *Nabis Poweri*, frequent at the roots of rushes in Gracious Pond; *Nabis flavomarginatus*, one developed and several undeveloped specimens found with *N. Poweri*; *Acanthia hirandinis*, commonly on the window-sills, &c., of a house at Chobham, round which were numerous martin's nests.

HYMENOPTERA.

Tapinoma erraticum, on the common; *Ceropales variegata*, one, by sweeping; *Miscophus bicolor*, ♂, one, by sweeping; *Astata stigma*, ♂, two, on a sandy spot on Chobham Common: this is, I believe, the first record of the capture of the ♂ in this country; *Andrena fucata*, two ♀, at flowers; *Andrena costana*, one ♂, by sweeping; *Odynerus reniformis*,* Gmel., new to Britain, one specimen, ♂, but the exact locality not noted: I am indebted to Mr. Fredk. Smith for the discovery of this novelty amongst my captures; *Elampus Panzeri*, three, on rushes, by sweeping.—E. SAUNDERS, Wandsworth: September, 1876.

Note on parasitic Acari.—In the report of the proceedings of the Entomological Society given in your last number (September), there is an interesting account by Mr. McLachlan of some dragon-flies infested by red mites. He remarks that the history of these *Acari* is involved in much obscurity, as it is difficult to understand how they could all find access to dragon-flies if the parasite be necessarily limited to one group of insects, as its specific name of *libellulæ* would indicate.

Is it not probable that various insects, and even other allied animals, as Arachnidans, may be infested by the same mite?

The *Phalangiidae*, or harvest-men, are frequently found with a number of little bright red *Acari*, fixed to their long legs and bodies.† These have been named *Trombidium phalangii*, Dugès, others are termed *Tr. culicis*, *Tr. aphidis*, *Tr. libellulæ*, respectively, from the insects upon which they have been found; while another is designated *Tr. parasiticum*, because it has been met with upon various kinds of insects. These little parasites require more careful examination, for, according to Paul Gervais,‡ they vary in form if they are more or less distended with nourishment.

Dugès, who paid some attention to these Arachnidans, says,|| that all these parasitic kinds are only immature forms of mites, which, in their mature states, live a free and independent life. The parasites have only six legs, while all the perfect animals have eight. He more especially studied the history of the *Tromb. phalangii*, and says, that when full grown, these larvæ (?) detach themselves from their victim, fall to the ground, bury or hide themselves, and turn into smooth oval pupæ (?), like minute reddish-yellow eggs. They remain in this state, he says, for twenty days, and then emerge in the form of red, velvety, eight-legged mites, with free active movements. Numbers of these pretty little *Trombidii* may be found in moss and other situations, and it is a very interesting fact (if it can be fully proved) that they are all parasitic in their larva-state.—R. H. MEADE, Bradford: September 16th, 1876.

* Description of *Odynerus reniformis*, ♂, translated from Saussure "Guêpes Solit.," p. 227.—♂. Clypeus bidentate, yellow, as well as the mandibles: the under-side of the antennæ yellowish, the spot under the wing, and that of the metathorax, very small or absent, the 6th abdominal segment with its band shortened at the sides. Legs almost entirely yellow, intermediate coxæ with a yellow spine. The ♀ is apparently very like the ♀ of *spinipes*, but differs by the yellow line of the clypeus, and the spots of the metathorax.

There is a good figure of the ♀ in Saussure, pl. xx, fig. 1. The ♂ may at once be known by the simple intermediate femora, and the long yellow spines on the intermediate coxæ.—E. S.

† See Monograph on the British species of *Phalangiidae*, by R. H. Meade, in Annals and Magazine of Natural History. Second Series, vol. xv, p. 393.

‡ Walckenaer, Insectes aptères. Vol. iii, p. 181.

|| See Ann. des Sci. Nat. Series I, vol. i, p. 36.

Review.

A MONOGRAPH OF THE GEOMETRID MOTHS OR PHALENIDE OF THE UNITED STATES. By A. S. PACKARD, JUN., M.D., Washington: 1876. 4to, pp. 598, and 13 plates. (Forms Vol. x of Hayden's Report of the Geological Survey of the Territories).

Probably, this bulky volume is one of the most important that has ever been published on any family of *Lepidoptera*, and we regret that any remarks of ours can only do scant justice to the author, for a complete analysis would occupy many pages. It commences by an enumeration of the various sources whence the materials have been derived; then follows an exceedingly useful and critical examination of the different classifications of the group, from the 10th edition of the "Systema Naturæ" to the present time. To this succeeds an examination of the differential characters, and a very copious and careful exposition of the external anatomy, comparative and otherwise. This we regard as the most valuable portion of the whole work. Dr. Packard is evidently not one of those Lepidopterists who are afraid to "destroy" their insects by denuding the wings and bodies: in other words, he acts the rôle of comparative zoologist and not of collector. Plates i to vii are entirely occupied by admirably executed figures of anatomical detail. A few words on mimicry and terminology complete this introductory portion of the book. The purely systematic portion occupies the greater part of the remainder; finishing by interesting details on comparative geographical distribution. The plates of the insects, drawn by Mr. Trouvelot, are beautiful specimens of lithographic engraving, and when we state that some of the plates have nearly 100 figures on each, some idea will be gained of the enormous number of species represented. And neither care nor expense has been spared. Wherever it was desirable, extraneous aid has been sought, as, for instance, in the case of some of Walker's types in the British Museum, of which the author has had figures drawn by an artist in England, and sent out. Although the title somewhat erroneously states that the work represents the *Geometridæ* of the United States, it in reality includes the whole of America north of Mexico and the West Indies, and between 300 and 400 species are described and figured, though the estimated number of those existing is about 1000 (800 are included by Staudinger in the European Fauna). In glancing over the plates, one cannot help being struck by the great resemblance of many of the figures to those of European forms, and in fact, a large proportion of the genera are European. A not inconsiderable number of species (including some very familiar to English entomologists) are common to Europe and America, but more especially confined to those of northern distribution. Eighteen species are given as occurring both in temperate America and Europe. Another feature is the occurrence in the Pacific slope of forms similar to those of western Europe, but not eastern America, nor eastern Asia, a fact already sufficiently proved in other groups and orders of insects. Our author is a rigid adherent to the rule of priority, and from this cause the generic nomenclature is not in many cases the same as that now used in Europe, principally arising from the contested right of certain Hübnerian names. On one point we are at issue with Dr. Packard, and with many American entomologists. We allude to the practice of putting his own name after that of a species, when placed by him in a genus other than that adopted by previous writers. We fail to see the necessity of

this, and suggest that each species described in the book, whatever author's name it may bear after it, is in reality attributable to Packard, the authors' names being only required in the synonymy and bibliography.

Let us hope that this volume may be followed by others on the *Noctuae*, *Pyralidæ*, &c., &c., of North America, and that these groups may find authors and artists as competent and painstaking as Dr. Packard and Mr. Trouvelot.

The sequential arrangement of the genera is somewhat novel, commencing with *Eupithecia* and ending with *Eugonia* (*Ennomos*), *Selenia* and Drepanoid forms. With regard to Walker's catalogues, Dr. Packard could not have spoken more to the point than when he alludes to them as having "only brought maledictions on the head of the amiable but uncritical author."

Obituary.

Trorey Blackmore died at his residence, at Wandsworth, on the 3rd September, at the early age of 41. Several of his brothers and sisters, and his father, were carried off by consumption, and to this disease he himself succumbed. In his early years, he was at school at Epping, and used to visit the late Mr. Doubleday, to whose influence may perhaps be attributed the taste for Entomology that afterwards developed so strongly in him. Some years ago, the state of his health caused him to winter in Morocco, and this part of Africa he afterwards almost annually visited, devoting himself to a study of the Insect Fauna of the country, and making many and valuable discoveries, some of which are recorded in this Magazine. During last winter, he remained at home, and appeared to have so far recovered that we were scarcely prepared to hear of his death. Up to the last, he was engaged in writing a series of articles on insects injurious to cereals, some of which have already appeared in a journal devoted to the interests of the corn trade. Although naturally of a quiet and reserved disposition, he was full of wit and humour among his intimate friends, and his loss is deeply felt by them. In 1864, he was elected a Member of the Entomological Society of London.

Edwin Brown. In the death of this gentleman (which occurred suddenly from apoplexy, at Tenby, on the 1st September, at the age of 57), the naturalists of the Midland Counties, and especially of Burton-on-Trent, have sustained a great loss; as have his numerous friends in all parts,—for there are many who have spent pleasant days with him, and enjoyed his hospitality at Burton. His knowledge in all departments of Natural History was most extensive, and in a large room adjoining (and connected with) his residence, he had enormous stores of treasures, geological, zoological, and botanical, British and exotic. At the time of his death he was Manager of the Burton, Uttoxeter, and Ashbourn Union Bank, a position he had held for 25 of the 42 years during which he had been connected with the Bank, in Burton, where he was universally respected. He published little, yet, as long ago as 1812, a notice from his pen appeared in the "Annals." In 1863, he furnished the entomological portion of Sir Oswald Moseley's Natural History of Tutbury; especially valuable for a memoir on the anomalous genus *Acentropus*, of which he had discovered the larva some years previously, proving the insect to be Lepidopterous. Latterly, he had devoted himself to the study of *Carabidæ*, of which he had amassed a large and valuable collection: and a paper by him, on some Australian species, appeared

in the "Transactions" of the Entomological Society, which he joined in 1849. Only a few months ago, Mr. Brown lost his wife, after a long and painful illness, and, from all we can learn, this calamity tended to hasten his own death. We believe that his extensive library and collections will be sold; but we should rejoice to hear of their remaining in Burton, to which town they would be invaluable, as more than the nucleus of a Natural History Museum and Library.

ENTOMOLOGICAL SOCIETY OF LONDON: *September 6th, 1876.*—J. JENNER WEIR, Esq., F.L.S., in the Chair.

E. Boscher, Esq., of Bellevue House, Twickenham, was elected a Member.

Mr. E. Saunders exhibited sundry rare species of *Hymenoptera*, *Hemiptera*, &c., chiefly from Chobham, including a new species of *Odynerus* [see p. 114], *Astata stigma* ♂, and *Acanthia hirundinis*, of which bug he had taken many examples on a window-sill in the vicinity of nests of *Hirundo urbana*.

Mr. F. Smith exhibited a series of 60 bred examples of *Cræsus septentrionalis*, bred from larvæ on alder, found near Sidmouth. He also mentioned that Miss M. Pasley had recently found *Mutilla europæa* parasitic in the nests of *Bombus muscorum*, in Hampshire. A day or two before receiving this information, Professor Brandt, of St. Petersburg, had told him that he had found the species in the nests of the same bee, and this was the first instance, to his knowledge, of the insect being found parasitic in the nests of a surface-building *Bombus*.

Mr. Weir mentioned that he had recently been annoyed by the "harvest bug" (*Leptus autumnalis*) when on a visit to the South Downs, to such an extent, that there were as many as 80 on each foot. Some discussion ensued as to the best means of cure, and Mr. F. Smith said he had found almost immediate relief from a dose of "flour of sulphur," taken internally. Mr. Weir exhibited an example of *Lycæna Icarus* recently sent to him, with an appendage between the antennæ, which looked like the theca of some large moss, and he could not account for its being so attached. Mr. F. Smith noticed that the larvæ of *Pygæra bucephala* had recently proved very destructive to sweet chestnut.

With reference to an exhibition by Prof. Westwood (at the meeting held on July 5th; *vide ante*, p. 68) of twigs of horse-chestnut, apparently attacked by the larvæ of some moth, Mr. Stainton communicated a letter recently received from Sir Thos. Monerieffe, accompanied by twigs attacked in precisely the same manner: it was stated that this was the work of squirrels, and Sir T. Monerieffe said he had seen these animals at work splitting the twigs, in order to feed on the pith.

Prof. Westwood sent a communication to the effect that two Orthopterous insects, *Meconema varium* and *Xiphidium clypeatum* had been regularly taken on a pear tree in his garden at Oxford for five or six years. Mr. McLachlan remarked that *M. varium* was common round London, and regularly visited the sugared trees of Lepidopterists.

Mr. F. Smith read descriptions of three additional species of *Formicidæ* from New Zealand, sent to him by Dr. Sharp, since his paper on Mr. Wakefield's New Zealand ants had been read. Two of the species pertained to the genera *Amblyopone* and *Ponera*, new to the Fauna.

Dr. Sharp communicated a list of localities for Amazonian *Staphylinidæ*, discovered by Dr. Trail, the descriptions of which appeared in his work on the *Staphylinidæ* of the Amazons Valley.

Prof. Westwood communicated "Nota Dipterologicæ," Nos. ii and iii; the first treating on the genus *Systropus*, with the economy of one species noticed; the second on *Acroceridæ*.

DESCRIPTIONS OF NEW *CUCUJIDÆ* AND *CLERIDÆ*.

BY CHAS. O. WATERHOUSE.

CUCUJIDÆ.

HECTARTHURUM.

I have had occasion to examine the numerous specimens of this genus in the British Museum, but I regret to say with no very satisfactory results. Among them, however, I find a few tolerably well-defined species, which are at present undescribed, and of which I subjoin diagnoses. The species may be tabulated as follows; it being understood that the *humeral stria* reaches from the shoulder nearly to the apex; the *dorsal stria* is close to the humeral stria, but nearer to the suture; the *lateral stria* is midway between the humeral stria and the margin. All the species have a *sutural stria* which joins the *marginal stria* at the apex.

I. Antennæ with the 3rd to 10th joints notched at their apex below.

A. Elytra with humeral stria only well-defined.

a. Femora and apical spot to the elytra red (W. Africa).

Thorax distinctly broader in front *gigas*, Fab.

Thorax very little " " " *curtipes*, Newm.

b. Uniform black, narrow (Java) *bistriatum*, Cast.

B. Elytra with humeral stria, and a very short dorsal stria.

a. Frontal furrows closed in front; channel on the under-side of the head near the base of the antennæ turned away from the eye posteriorly (India) *depressum*, Sm.

b. Frontal furrows more or less open in front; channel below the head extended to the eye.

* Elytra with fine lateral stria (E. Indies) *brevifossum*, Newm.

** Elytra with abbreviated lateral stria at base (Australia)..... *australicum*, sp. n.

*** Elytra without lateral stria (Australia) *cylindricum*, Sm.

C. Elytra with humeral and dorsal striae nearly entire.

a. Thoracic striae interrupted posteriorly.

* Elytra with one sutural stria.

† Clypeus with central shallow impression not bounded on each side by a distinct ridge (Indies).

§ Body convex.

Elytra with very short lateral stria *trigeminum*, Newm.

Elytra without lateral stria *sociale*, sp. n.

§§ Body very depressed *dejectum*, sp. n.

†† Clypeus with impression bounded on each side by a distinct ridge (Natal) *simplex*, Murr.

** Elytra with a second sutural stria.

† Thorax without discoidal impressions *quadrilineatum*, Sm.

†† Thorax with two short discoidal impressions. *gemelliparum*, Newm.

b. Thoracic stria entire; elytra with two sutural striae.

Uniform black; sub-depressed *uniforme*, sp. n.

Elytra pitchy-red; cylindrical..... *semifuscum*, Newm.

II. Antennae with the 3rd to 10th joints coriaceous below and fringed with hair.

Elytra with humeral and lateral striae entire, dorsal

stria short *penicillatum*, sp. n.

NOTE.—*H. heros*, Fab., and *rufipenne*, Fab., are unknown to me, and I have not been able to see the description of *H. latum*, Grouvelle.

H. GIGAS and H. CURTIPES.

These two species are extremely close, but I think certainly distinct. The one which I believe to be *gigas* is a little broader and less convex than *curtipes*, and has the thorax a little broader in front.

H. BREVIFOSSUM.

This species seems to vary from four lines to eight lines in length. Specimens in the British Museum collection are from India, Java (type), Borneo. From these I have separated as varieties a series which appear rather narrower and more elongate, and have the antennae a trifle more slender. They come from Siam, Tenasserim, Birma, Timor, and the Philippines, with a doubtful one from Amboyna. They measure from three to seven and a half lines in length, the extremes being both from the Philippines.

A single specimen from West Australia (four lines), I am unable to separate from this species.

HECTARTHURUM AUSTRALICUM, sp. n.

Entirely black, rather broad, and very slightly convex. Thorax in front very nearly as broad as the length; lateral striae distinct, entire. Elytra with the humeral stria entire, the dorsal and lateral striae very short. ♂.

Hab.: North Australia.

Brit. Mus.

This species differs from *H. cylindricum* in being relatively broader, and in having the thorax more distinctly broader in front; in *H. cylindricum* the sides of the thorax are nearly parallel in front, and the elytra have no lateral stria.

HECTARTHURUM SOCIALE, sp. n.

Thorax with the lateral stria interrupted behind. Elytra with the humeral and dorsal striae well marked and nearly entire; no lateral stria. Femora pitchy. ♂.

Long. 9¼ lin.

Hab.: New Guinea (Wallace).

Brit. Mus.

Var. minor, ♀.

Long. 4½—5 lin.

Hab.: Java, Philippines.

Brit. Mus.

HECTARTHURUM DEJECTUM, *sp. n.*

Very depressed and rather broad. Uniform black. Lateral stria of thorax interrupted behind. Elytra with the humeral and dorsal striæ well defined; lateral stria absent. ♀. Long. $6\frac{1}{2}$ lin., lat. 2 lin.

This species is separated from *H. sociale* on account of its depressed form; the thorax is, moreover, more regularly widened in front. The joints of the antennæ, seen from below, are a little elongate, and the triangular notch on the 7th to 10th joints is very large and opaque.

Hab. : Batehian.

Brit. Mus.

NOTE.—*H. trigeminum*, *sociale*, and *dejectum* have no fovea in the centre of the posterior margin of the thorax.

HECTARTHURUM GEMELLIPARUM, Newm.

Mr. Murray seems to have overlooked the description of this species, and has evidently re-described it under the name of *H. Smithii*.

HECTARTHURUM UNIFORME, *sp. n.*

Rather depressed. Thorax with the lateral stria entire; no central fovea to the posterior margin. Elytra with a second sutural stria, and the humeral stria entire; the dorsal stria well marked, but slightly abbreviated behind; the lateral stria is faintly indicated. The antennæ are very long (♀), the 3rd to 10th joints are a little elongate (especially the 5th and 6th), and are oval in their lateral outline, the 11th joint is elongate and arched. Long. 5 and $6\frac{1}{2}$ lines.

This species has the triangular notch at the apex of the antennal joints below, very small and almost reduced to a puncture.

Hab. : South India.

Brit. Mus.

HECTARTHURUM PENICILLATUM, *sp. n.*

Nigrum, nitidum, depressum; antennis longis, subtus rugulosis et penicillatis; elytris stria humerali haud abbreviata, dorsali brevi, laterali (haud bene impressa) apicem attingenti. Long. $8\frac{1}{4}$ — $9\frac{1}{4}$ lin.

Head with a slight obtuse tubercle immediately above the clypeal impression. Antennæ longer than the head and thorax together, the 3rd to 10th joints compressed and narrowed at their base, these joints more or less coriaceous below and fringed with stiff ferruginous hairs. Thorax with the lateral stria very slightly impressed behind. Elytra with one sutural stria; the humeral and lateral striæ entire (the latter very lightly impressed), the dorsal stria much abbreviated.

Hab. : Abyssinia.

Brit. Mus.

This species somewhat resembles *H. brevifossum*; it is rather broader and more depressed, and is at once separated from all the species of the genus by the structure of the antennæ, which may possibly necessitate the formation of a new genus for its reception.

ANCISTRIA TARSALIS, *sp. n.*

Elongata, cylindrica, nigra, nitida; capite utrinque evidenter punctato, punctis elongatis obliquis; thorace sat crebre evidenter punctato; elytris apice retuso; tarsorum anteriorum articulo primo gracili, tibiâ longiori. Long. $4\frac{1}{2}$ lin., lat. $\frac{3}{8}$ lin.

Closely resembles *A. retusa*, but is much longer and narrower. The punctures at the side of the head above the eye are elongate, oblique, and almost confluent. The thorax is relatively longer and the punctuation rather less strong, moderately close. The apex of the elytra is hollowed out in the same manner, but the apex of each elytron is somewhat acuminate. The basal joint of the anterior tibiæ is remarkably long and slender, longer than the tibia, about equal in length to the following joints taken together.

Hab.: Java (Bowring).

Brit. Mus.

HEMIPEPLUS, Latr. (1825), 1829.

Ochrosanis Dohrni, Pascoe, 1866, = *hemipterus*, Dej., MS.

The type of *Hemipeplus* is now in Mr. Janson's collection, I have carefully examined it, and am convinced that the shortness of the elytra is only accidental; it agrees in all other respects with a specimen in the British Museum, which I have determined to be *Ochrosanis Dohrni*, Pascoe. Length $4\frac{1}{2}$ lin. The Museum example measures barely 4 lines, but it agrees perfectly with Mr. Pascoe's figure and description.

Dr. Le Conte suggests (Proc. Ac. Phil., 1873, p. 328) that *Ochrosanis Dohrni* is his *Hemipeplus marginipennis* (which only measures $\frac{2}{10}$ inch). The form of the thorax is, however, quite different in the two insects.

HEMIPEPLUS (NEMICELUS) MARGINIPENNIS, Dej.

The Dejeanian specimen of this species is now in Mr. Janson's collection. The following diagnosis is drawn up from a specimen in the National collection, agreeing perfectly with Dejean's.

Valde elongatus et depressus, parallelus, testaceus, nitidus; capite cum oculis thorace paulo latiori, pone oculos subito angustato; thorace latitudine $\frac{1}{3}$ longiori, lateribus antice rotundatis, postice sub-sinuatis, pone medium angustato, fovea utrinque prope basin impresso; elytris punctulatis, margine laterali infuscato. Long. 3 lin.

Hab.: Florida.

My object in describing this is, that I believe it to be quite distinct from the species described under the same name by Dr. Le Conte, which he says is two-tenths of an inch in length, and of which there

are specimens named by Dr. Le Conte in the British Museum (from Florida), which only measure two-twelfths of an inch. The small specimens differ from the large one above described, in having the eyes less prominent; the head not immediately narrowed behind the eyes, but having, as it were, rectangular checks; the sides of the elytra less suddenly deflexed, and the deflexed portion not bounded above by a fine carina.

In the event of the larger insect proving to be distinct from that described by Dr. Le Conte, it may be convenient to designate it *Dejeanii*.

I think that the following synonyms will be found correct:—

CRYPTAMORPHA, Woll., 1854.

Pseudophanus, Le C., 1859.

Parabrantes, Redt., 1867.

1. *Desjardinsii*, Guér. (*Psammæcus*), 1844.

suturalis, White (*Dendrophagus*), 1846.

musæ, Woll. (*Cryptamorpha*), 1854.

signatus, Le C. (*Pseudophanus*), 1859.

fasciatus, Redt. (*Telephanus*), 1867.

2. *brevicornis*, White (*Dendrophagus*), 1846.

silvanoides, Redt. (*Parabrantes*), 1867.

? *umbrinus*, Smith (*Dendroph.*), 1851 (immature).

With regard to *Telephanus fasciatus*, Redt., it must be observed that I have placed it in the above synonyms with some hesitation. Redtenbacher was well aware that *Telephanus* should have securiform palpi, which his *T. fasciatus* would not, if the above synonymy be correct. On the other hand, he mentions the longitudinal furrows on the head, a character well marked in *Cryptamorpha*, but not existing in any *Telephanus* with which I am acquainted.

CRYPTAMORPHA FASCIATA, Woll., Ent. Mo. Mag., 1874.

The description of this species agree perfectly with the type of *Monotoma concinnula*, Walker, 1859. There are numerous specimens of this insect in the Museum collection from Ceylon, Hong Kong, and single examples from Java and Sierra Leone.

I had formerly placed this insect with doubt with *Telephanus*; it, however, has not the palpi securiform (as they are in all the above described species), and it is, therefore, better associated with *Cryptamorpha*, although I much object to placing it in this genus, as it wants the strong longitudinal furrows on each side of the head, which is a feature in the genus.

CRYPTAMORPHA TRIGUTTATA, *sp. n.*

Elongata, sat depressa, testacea, nitida, breviter pubescens; capite triangulari, subtiliter coriuceo, fronte utrinque longitudinaliter canaliculata; thorace capite paululo angustiori, latitudine paulo longiori, crebre fortiter punctato, lateribus fere parallelis, ante basin paulo sinuatis, nigris; elytris thorace $\frac{1}{3}$ latioribus et $2\frac{1}{2}$ longioribus, fortiter striato-punctatis, sat parallelis, ad apicem rotundato-angustatis, maculis tribus nigris notatis; antennarum articulis 9 et 10 femoribusque piceis.

Long. $1\frac{1}{2}$ lin., *lat. vix.* $\frac{1}{2}$ lin.

This species, which appears to me to belong undoubtedly to this genus, has the antennæ rather long and hirsute, scarcely thickened at the apex; the head has the usual strong furrow on each side, and outside this an oblique furrow running towards the eye. Thorax a little narrowed at its base, but with the sides sub-parallel, or only very slightly arcuate, and all the angles obtuse. Each elytron has a small round black spot on the disc behind the middle, and an elongate spot on the suture near the apex.

Hab.: S. Australia.

Brit. Mus.

TELEPHANUS PICTUS, *sp. n.*

Obscure piceus, sub-nitidus, flavo-pubescens; antennis testaceis, articulis 7—10 infuscatis; capite crebre fortiter punctato, oculis prominulis; thorace capite (cum oculis) haud angustiori, latitudine paululo breviori, postice regulariter angustato, crebre fortiter punctato, lateribus rectis, breviter 5 vel 6 denticulatis; angulis anticis rotundatis; elytris thorace vix duplo latioribus et triplo longioribus, fortiter striato-punctatis, lateribus leviter arcuatis, singulo elythro maculis duabus rotundatis flavis notato; pedibus pallide testaceis.

Long. $1\frac{3}{4}$ lin., *lat.* $\frac{2}{3}$ lin.

The punctuation of the head and thorax is very strong, but the punctures, although close, are not confluent. Each elytron has two large pale spots.

Hab.: Borneo (Wallace).

Brit. Mus.

TELEPHANUS SPINICOLLIS, *sp. n.*

Elongato-ovalis, sub-nitidus, flavo-pubescens, rufo-piceus; antennis articulis (8 vel) 9 et 10 nigris, capite confertim fortiter punctato; thorace capite paulo latiori, longitudine $\frac{1}{3}$ latiori, nigro, confertim sat fortiter punctato, postice angustato, angulis anticis rotundatis, lateribus vix arcuatis, breviter 6 vel 7 acute spinulosis; elytris thorace $\frac{1}{4}$ latioribus et $2\frac{2}{3}$ longioribus, fortiter striato-punctatis, lateribus bene arcuatis, nigris, fascia lata prope basin maculaque suturali, sub-apicali, rufo-piceis.

Long. $1\frac{1}{2}$ lin., *lat.* $\frac{2}{3}$ lin.

Relatively shorter and broader than the preceding. The punctuation of the head and thorax is rather strong and very close, having a tendency to be confluent, that on the head longitudinally, on the thorax transversely. The thorax is distinctly transverse, margined in front. The elytra are rather strongly arcuate at the sides, and are relatively shorter than in the preceding species.

Hab.: Aru (Wallace).

Brit. Mus.

TELEPHANUS FELIX, *sp. n.*

Elongato-ovalis, nitidus, pubescens; antennis obscure testaceis, articulis (6 vel) 7-9 piceis, 10 et 11 albidis; capite piceo, crebre distincte punctato; thorace capite paululo latiori, longitudine $\frac{1}{3}$ latiori, postice angustato, piceo, crebre fortiter punctato, antice arcuato, haud marginato, angulis anticis rotundatis breviter tri-tuberculatis, lateribus ante medium rotundatis, postice fere rectis; elytris fortiter lineato-punctatis, thorace $\frac{1}{4}$ latioribus et $2\frac{1}{2}$ longioribus, pone medium arcuatim attenuatis, testaceis, fascia dentata pone medium apiceque nigris; pedibus testaceis.

Long. $1\frac{1}{3}$ lin., *lat.* $\frac{1}{2}$ lin.

The punctuation of the head and thorax is very distinct and very close. The thorax is considerably narrowed behind, the sides are not denticulate, but there are two or three minute tubercles at the anterior angles; the margins are slightly impressed above. The elytra are rather short and broad, narrowed only behind the middle.

Hab.: Ceylon.

Rather a short, broad species, having the elytra broad at the base and somewhat suddenly narrowed behind the middle.

TELEPHANUS INCOMMODUS, Walker.

Cucujus? incommodus, Walker, 1859.

This is very close to *T. felix* above described. It differs in being entirely testaceous except the 7th to 10th joints of the antennæ which are pitchy; there are also slight traces of fuscous at the apex of the elytra. The thorax is somewhat narrowed posteriorly, the sides nearly straight posteriorly, and furnished with five very small teeth.

Hab.: Ceylon.

Brit. Mus.

The type is immature, and in a very injured condition.

TELEPHANUS TRIMACULATUS, Mots., 1858.

I think *Psammæcus trimaculatus*, Mots., should be associated with the above species, and it appears to me that *T. incommodus* may be only a variety of it. Upon a close examination, there appears to be a trace of a spot on the middle of the elytra in Mr. Walker's type.

Hab.: Ceylon.

TELEPHANUS CRUCIGER, *sp. n.*

Testaceus, brevis, nitidus, pubescens; antennis corpore paulo brevioribus, articulis 7-10 infuscatis; capite sat crebre evidenter punctato; thorace capite paulo latiori, longitudine $\frac{1}{3}$ latiori, convexo, crebre fortiter punctato, angulis rotundatis, lateribus arcuatim rotundatis, evidenter quinque-dentatis; elytris thorace $\frac{1}{4}$ latioribus, brevibus, ad apicem arcuatim rotundatis, fortiter striato-punctatis, basi vix infuscatis, fascia undulata maculaque sub-apicali suturali nigris.

Long. $1\frac{1}{3}$ *lin.*, *lat.* $\frac{3}{8}$ *lin.*

A short broad species, differing from all the preceding in not having the thorax more narrowed behind than in front. The elytra are about one-fourth longer than broad, not distinctly rounded at the sides.

Hab. : Dorey, New Guinea (Wallace).

Brit. Mus.

Two examples from Siam only differ from the above in wanting the apical spot to the elytra. The elytra appear a trifle longer, but I prefer considering this a mere variety, at least for the present.

TELEPHANUS ANTENNATUS, *sp. n.*

Testaceus, brevis; antennis corpore haud brevioribus, unicoloribus; thorace transverso, ad basin paulo angustiori, lateribus evidenter quinque-denticulatis, denticulis duobus anterioribus brevibus; elytris fascia undulata maculaque suturali sub-apicali nigris. Long. $1\frac{1}{4}$ *lin.*, *lat.* $\frac{3}{8}$ *lin.*

Closely resembles *T. cruciger*, but differs in having the antennæ as long as the whole body and unicolorous. The thorax is a little narrowed behind, with five teeth at the side, the two anterior approximate and very small.

Hab. : Dorey, New Guinea (Wallace).

Brit. Mus.

CLERIDÆ.

SISYRNOPHORUS, *g. n.*

General form somewhat that of *Epilachna*, but with the head and thorax narrower. Very convex, pubescent. Antennæ about as long as the head and thorax together, slightly thickening from the 5th joint to the apex. Eyes reniform, not prominent. Thorax very convex, straight in front, entirely rounded behind (resembling a horse's hoof, with the rounded part contiguous to the base of the scutellum). Elytra ample, twice as broad as the thorax, nearly circular in outline, emarginate-truncate at their extreme base.

Closely allied to *Allochotes* (Westw., Trans. Ent. Soc., 1875), and separated from that genus on account of the form of the thorax.

SISYRNOPHORUS MACULATUS, sp. n.

Testaceo-ferrugineus, convexus, nitidus, pubescens; thorace maculis tribus, scutello, elytrisque maculis rotundatis octo, nigris.

Long. 4 lin., lat. 3¼ lin.

Head sub-rotundate, not very convex, with fine punctures not thickly scattered over the surface; eyes moderately large, but not prominent; antennæ with the 5th joint scarcely as broad as long, the 6th to 10th joints very gradually a little shorter and stouter. Thorax distinctly broader than the head, very convex, finely and moderately thickly punctured, one-fifth broader than long, very gently narrowed in front, entirely rounded behind, finely margined, the anterior angles a little less than right angles; a discoidal spot and a smaller spot on each side black. Elytra twice as broad as the thorax, about as long as broad, very convex and ample, broadest across the middle, gently rounded at the sides and apex; each elytron arched and gently sinuous at the base, with four rather large round black spots, one humeral, one marginal, and two near the suture.

Head and thorax sub-retractile.

Hab. : Philippine Islands.

Brit. Mus.

SISYRNOPHORUS BOWRINGII, sp. n.

Fulvo-testaceus, nitidus, longe pubescens.

Long. 2 lin., lat. 1⅔ lin.

Head not thickly, and very finely, punctured. Thorax very convex, extremely finely and not thickly punctured, very slightly narrowed in front, entirely rounded and margined behind, anterior angles a little less than right angles, blunted. Elytra very convex, nearly circular in outline, slightly truncate at their base, each elytron arched at its base, with the surface moderately thickly and very distinctly punctured.

Hab. : Penang (J. C. Bowring, Esq.).

Brit. Mus.

British Museum : *September 6th, 1876.*

DESCRIPTIONS OF HITHERTO UNCHARACTERIZED PHYTOPHAGA.

BY JOSEPH S. BALY, F.L.S.

(continued from page 10.)

Fam. HISPIDÆ.

CALLISPA ELEGANS.

Oblongo-orata, subdepressa, rufo-fulva, nitida, antennis nigris; elytris sat fortiter punctato-striatis, striis apicem versus tenuiter punctatis; plagâ magnâ late cyanâ, partem dimidiam posticam fere amplectente, ornatis.

Long. 2 lin.

Hab. : Sumatra, Pulo Penang.

Antennæ half the length of the body, entirely black. Thorax twice as broad as long, sides straight and parallel in the ♂, slightly converging from base to apex in

the ♀, suddenly rounded and converging at the extreme apex in both sexes; anterior angles very obtuse, ill-defined, hinder angles rectangular; upper surface longitudinally excavated on either side, surface of the excavations deeply variolose-punctate; disc smooth, remotely punctured, the punctures arranged in irregular longitudinal rows. Elytra broader than the thorax, oblong, their apices broadly rounded; above strongly punctate-striate, the punctures finer and less deeply impressed towards the apex; the hinder half of the elytra covered with a large, common, cyaneous patch, usually abbreviated on the extreme lateral and apical margins, but sometimes extended, so as to entirely cover the former.

CALLISPA AFRICANA.

Elongata, subdepressa, picea, nitida, antennis nigris, articulis intermediis piceis, thorace, abdomine, femoribus, tibiisque obscure flavis; thorace varioloso-punctato, medio utrinque transversim excavato; elytris sat fortiter punctato-striatis, fusco-violaceis, metallico-nitentibus.

Long. 2 lin.

Hab.: Banks of the Niger.

Vertex smooth, its hinder portion impressed with a few fine variolose punctures; antennæ not half the length of the body, slender, slightly thickened towards the apex, four or five intermediate joints pitchy, the rest black, second joint rather longer than the first, the third equal in length to the two preceding united. Thorax twice as broad as long, sides parallel at the extreme base, thence rounded and converging to the apex, anterior angles produced, acute; above, depressed, excavated across the middle on either side, leaving a narrow ill-defined central ridge; at the base, just in front of the scutellum, is a smaller depression; surface impressed with large round variolose punctures. Elytra scarcely broader than the thorax, parallel, their apices regularly rounded.

HISPOPRIA TERMINALIS.

Oblongo-elongatula, depressa, fulva, nitida, genibus tarsisque piceis, antennis elytrorumque dimidio postico nigris. Long. 4½ lin.

Hab.: Mindanao.

Head finely rugose-punctate, neck shining, impunctate, transversely impressed behind the eyes; antennæ half the length of the body, entirely black. Thorax about one-third as broad again as long, sides straight and very slightly diverging from the base to before the middle, thence obliquely converging to the apex, the outer margin irregularly dentate; above, flattened, sub-cylindrical at the extreme apex, disc covered with large round shallow punctures, the apex, together with a longitudinal space on the middle of the disc, free from punctures. Scutellum oblong-ovate, sinuate on the sides, the apex obtusely rounded. Elytra narrowly oblong, sides parallel, here and there faintly notched, sub-acutely rounded at the apex, each elytron with its extreme apex emarginate, and the sutural angle armed with a small acute tooth; upper surface deeply and regularly punctate-striate, interspaces minutely granulose, plane, slightly thickened on the outer disc and towards

the apex. Anterior pair of thighs thickened, armed beneath with a strong tooth; anterior tibiæ curved, gradually thickened from base to apex, the latter produced inwardly into a strong spine.

PROMECOTHECA CALLOSA.

Elongata, subcylindrica, nigra, nitida, elytris fulvis, profunde foveolato-striatis; thorace basi strangulato, utrinque in callum obtusum magnum producto. Long. $4\frac{1}{2}$ lin.

Hab.: Australia, Port Essington.

Vertex smooth, impunctate; antennæ slender, more than half the length of the body. Thorax longer than broad, subcylindrical, strangulated posteriorly, produced on either side into a large obtuse callosity, basal margin impressed with a deep transverse groove; disc smooth and shining, nearly impunctate, only a few minute punctures being visible on the sides in front, on the lateral callosities. Scutellum triangular, excavated near the apex, the latter truncate. Elytra broader than the thorax, parallel, obliquely rounded at the apex, the apices conjoined obtusely angulate; upper surface deeply foveolate-striate, clothed at the apex with a few coarse hairs. Four hinder thighs armed beneath with a stout spine near the apex.

DOWNESIA STRIGICOLLIS.

Filiformis, subcylindrica, nigra, subnitida, suprâ sub-opaca, abdomine flavo; thorace subquadrato, disco utrinque oblique deflexo, longitudinaliter sulcato-strigoso; elytris elongatis, profunde punctato-striatis, singulatim tricarinatis, carinis duabus internis medio fere obsoletis. Long. $2\frac{1}{2}$ lin.

Hab.: Cochin China.

Face distinctly punctured between the eyes, vertex smooth, impunctate. Thorax rather longer than broad, subquadrate, sides parallel, very slightly dilated at the base, notched at the hinder angle, the latter armed with a fine lateral tooth; anterior angles nearly rectangular, their apices obtuse; basal margin impressed with a deep transverse groove, apical border sub-cylindrical, impressed with a single row of punctures; disc divided on the medial line into two oblique planes, the surfaces of which are closely covered with slightly oblique longitudinal grooved strigæ; these planes meet at an angle on the middle of the disc, and form at the point of junction a distinct ridge which extends longitudinally for the whole length of the thorax. Scutellum small, triangular. Elytra scarcely broader than the thorax, parallel, very slightly dilated behind the middle, apices obtusely rounded, each emarginate at the sutural angle, apical margin very finely serrulate; above deeply punctate-striate, each elytron with three elevated carinæ, the two inner only visible at the base and apex, apex of suture also carinate, interspaces each with a single row of punctures, hinder half of the second, together with the whole extent of the third, impressed with a second row. Tibiæ thickened, anterior pair with the upper edge notched, compressed and dilated at the base.

PRIONISPA GEMMATA.

Cuneiformis, subdepressa, pallide picea, nitida, pedibus pallide fulvis; suprè metallico-viridis, antennis pallide piceis; thorace crebre foveolato; elytris profunde foveolato-striatis, ad apicem costis nonnullis instructis, late (basi exceptâ) piceo-limbatis. Long. 2 lin.

Hab.: Batchian.

Front produced between the antennæ into an angular projection, lower portion of vertex coarsely punctured, eyes bordered above by a distinct groove. Thorax subcylindrical, scarcely broader than long, sides straight and parallel, notched at base and apex, anterior angles armed with an obtuse tooth; disc closely covered with large round foveate punctures, their interspaces granulose; on the medial line is a longitudinal groove. Scutellum narrowly oblong, its apex obtuse. Elytra much broader at the base than the thorax, oblong, gradually dilated from base to apex, the latter truncate, its outer angle produced laterally into a large, flat, triangular, obtuse spine, upper surface depressed along the inner disc, the humeral callus laterally prominent; flattened surface bounded on its middle third by a large oblong excavation, the inner edge of which is costate; apex of elytron with several short longitudinal costæ; surface regularly and deeply foveolate-punctate; interspaces finely granulose-punctate, those on the outer disc thickened and subcostate; surface of excavation smooth and shining, not granulose, more or less tinged with golden. Anterior pair of tibiæ armed with a short spine within, near the apex.

Dr. Chapuis has described two species of this genus; one, *P. nitida*, from Java, has been previously characterized by Guérin under the name of *Hispa sexspinosa*.

GONOPHORA CHAPUISI.

Elongata, postice vix ampliata, dorso depresso, fulva, nitida, antennis elytrisq. pone medium nigris; thorace ante basin transversim excavato, disco lævi, medio longitudinaliter sulcato, utrinque foveis nonnullis magnis impresso; elytris profunde punctato-striatis, interstitiis alternis elevato-costatis. Long. 2½ lin.

Hab.: Philippine Islands.

Antennæ slender, three-fourths the length of the body, two lower joints short, equal in length, the basal one sub-globose, piceous; third joint nearly as long as the two preceding united, the fourth about equal in length to the third. Thorax broader than long, sides nearly parallel at the base, rounded in the middle, converging and slightly sinuate at the apex; above, convex, deeply and broadly excavated transversely at the base; disc smooth, impressed in the middle with a short longitudinal groove, and on either side with several deep foveate punctures. Elytra broader than the thorax, very slightly increasing in width towards the apex, the latter regularly rounded, lateral margin minutely serrulate; upper surface deeply and strongly punctate-striate, the suture and each alternate interspace strongly costate, the third costa less elevated than the rest, and obliterated for a great portion of its length; interstices between the punctures transversely costulate.

Warwick: September, 1876.

ON CERTAIN BRITISH HEMIPTERA-HOMOPTERA.

Description of a species of the Genus LIBURNIA new to Great Britain.

BY JOHN SCOTT.

LIBURNIA FLAVEOLA.

Delphax flaveola, Flor., Rhyn. Livl., ii, 72, 19; Kirschb., Cicad., 33, 31, ♀.

♀ Undeveloped.

Yellow or somewhat ferruginous.

Head—*crown* more or less ferruginous, foveæ shallow, but distinct. *Face* more or less ferruginous; central longitudinal keel acute; disc on either side of the keel, flattish concave. *Clypeus* more or less ferruginous. *Eyes* brown. *Antennæ* brown; 1st and 2nd joints yellow or ferruginous. *Ocelli* black. *Rostrum*—apex black.

Thorax—*pronotum* and *scutellum* yellow or inclined to ferruginous. *Elytra* pale yellow, transparent, about one-half the length of the abdomen, apex broadly rounded. *Legs* yellow. *Claws* dark brown.

Abdomen yellow or ferruginous.

♀ Developed.

Elytra pale, transparent; nerves pale, finely granulated. *Membrane*: marginal and inner nerves slightly brownish. All the other characters as in the undeveloped form. Length, $1\frac{1}{4}$ line under., $1\frac{1}{2}$ dev.

Most nearly allied to *L. straminea*, Stål, a species not yet ascertained to be British. The distinction between the two insects is easiest to be observed by the examination and comparison of the genitalia of the ♂.

Two specimens captured by Dr. Power, on Barnes Common, in July last.

Loc: August 19th, 1876.

ON MELANISM.

BY EDWIN BIRCHALL, F.L.S.

It is well known that specimens of many *Lepidoptera* from the Highlands of Scotland vary widely from English examples of the same species, and that the variation is usually towards a darker coloration; that there is, in short, a tendency to the production of melanic varieties, and that in some cases a dark variety has completely supplanted the lighter coloured type; but, so far as I know, no satisfactory explanation of these facts has been suggested, none at least which covers the whole ground. It has been said that the production of

melanic varieties in Scotland is caused by the existence of iron in the soil in large quantities, by the excessive moisture of the climate, or by the absence of sunshine; as a matter of fact, I do not know that there are any large deposits of iron ore in the Highlands, and even supposing any or all of the suggested explanations to be coincident with the existence of melanism, it is still needful to show their connexion with it as cause and effect, which has not been attempted.

It must further be noted, that melanic varieties of *Lepidoptera* occur very commonly in Ireland, the Isle of Man, Durham, South Lancashire, and the West Riding of Yorkshire, under various conditions of climate and soil.

Near Leeds, *Aplecta nebulosa* and *Xylophasia polyodon* are often perfectly black, and the "black pepper" (*Biston betularia*) is as well known in the woods as its namesake is in the store-room.

Near Manchester, the melanic variety of *Biston betularia* has become very common of late years, and threatens to supplant the typical form. I quote the following from a note in Newman's "Entomologist," vol. ii, p. 150, by the late R. S. Edleston:—"Some sixteen years ago, the 'Negro' aberration of this common species was almost unknown. Last year, I obtained the eggs of a female of the common form, which had been crossed with a 'Negro' male; the larvæ I fed on willow, and had this year some remarkably pretty aberrations, the connecting link between the 'Negro' and the usual form, but far before either as regards beauty. I placed some of the virgin females in my garden, in order to attract the males, and was not a little surprised to find that most of the visitors were the 'Negro' aberration; if this goes on for a few years, the original type of *A. betularia* will be extinct in the locality."

In all the districts I have named, besides the tendency to the production of melanic forms, we may also notice the existence of a very meagre Lepidopterous fauna; and, although from our ignorance of the conditions which are of most importance to any animal, it is hazardous to try to point out the special circumstances which prevent its spread or check its fertility, perhaps the following may be suggested as not improbably amongst the causes at work in limiting the numbers of *Lepidoptera* in Scotland, Ireland, the Isle of Man, and the North of England:—The peculiarities of the climate of Ireland, and the Isle of Man being deficient sunshine, excessive moisture, and almost entire absence of frost, it may be suggested that, under such conditions, the hibernation of larvæ and the sleep of pupæ are incomplete, and that damp and mould make many victims. Over wide districts of

Yorkshire, Lancashire, and Durham—those very districts where melanism especially occurs—the air is polluted by mephitic exhalations from furnaces and chemical works, the sun is obscured by clouds of coal smoke, and the vegetation defiled and destroyed by deposits of soot; in some of the worst districts, such as St. Helen's and Bradford, *Lepidoptera* scarcely exist at all. In the Highlands of Scotland, although the air be purity, and the sunshine brightness, the long, cold, wet winter and the late spring can hardly fail to check the multiplication of those forms of life which have their metropolis in warmer southern lands.

Now, Mr. Darwin has shewn us that great constitutional differences both in animals and plants are correlated with differences of colour, and he gives many curious and interesting examples proving that black and dark coloured animals escape many diseases, are less liable to the attacks of parasites, and will stand changes of temperature which prove fatal to the lighter coloured varieties (“Animals and plants under domestication, vol. ii, chap. 21 and 25).

I will further quote a passage from Mr. A. R. Wallace's recent address to the Biological section of the British Association at Glasgow: “Few, if any, wild animals are wholly white, the head, the face, or at least the muzzle or the nose are generally black, and there is reason to believe that dark pigment is essential to good hearing, as it certainly is to perfect vision.

“If the prevalence of white coloration is generally accompanied with some deficiency in the acuteness of the most important senses, this colour becomes doubly dangerous; for it not only renders its possessor more conspicuous to its enemies, but at the same time makes it less ready in detecting the presence of danger.

“Hence also is a reason why Albinism, although freely occurring in captivity, never maintains itself in a wild state, while *Melanism* does.

“In the xanthochroic races of man, we find a high development of intellect, accompanied by a slight deficiency in the acuteness of the senses, as compared with the darker forms.”

As it thus appears certain that greater strength of constitution, and more powerful and acute perceptive faculties are, from some yet unknown cause, associated with dark colours in the *Vertebrata*, may we not presume that insects are subject to the same law, and that dark varieties of *Lepidoptera* are able to spread and increase under adverse conditions, whilst the lighter coloured types fail to do so, and are consequently eliminated in the struggle for life, and that the occurrence of melanic forms may be thus reasonably explained as a simple case of the “survival of the fittest?”

In conclusion, I will mention a few of the species of which melanic varieties occur in the northern and western parts of the British Islands:—*Hepialus humuli* (var. *hethlandica*, H.-S., 781), *Aretia fuliginosa*, *Odonestis potatoaria*, *Crocallis elinguraria*, *Biston hirtaria*, *Biston betularia*, *Phigalia pilosaria*, *Thera juniperata*, *Hypsipetes elutata*, *Larentia cæsiata* (var. *glaciata*, H.-S., 2646), *Melanthia rubiginata*, *Melanippe tristata*, *Melanippe fluctuata*, *Cidaria russata*, *Cidaria suffumata* (var. *piccata*, H.-S., 2635), *Cymatophora duplaris*, *Cymatophora diluta*, *Leucania pudorina*, *Xylophasia poloyodon*, *Agrotis lucerneæ* (var. *latens*, Guen., i, 305), *Noctua xanthographa*, *Triphæna orbona* (var. *Curtisii*), *Orthosia suspecta*, *Cirrhædia xerampelina* (var. *renicolor*, Guen., i, p. 402), *Dianthæcia carpophaga*, *Dianthæcia capsophila* (? melanic var. of *carpophaga*), *Dianthæcia Barrettii* (? melanic var. of *conspersa*), *Dianthæcia cæsia*, *Polia chi* (var. *olivacea*, Guen., ii, 35), *Epunda lutulenta* (var. *lucneburgensis*, Guen., ii, p. 45), *Aplecta occulta*, *Aplecta nebulosa*.

Douglas, Isle of Man: October, 1876.

DESCRIPTION OF THE LARVÆ AND HABITS OF *EBULEA*
STACHYDALIS AND *SAMBUCALIS*.

BY WILLIAM BUCKLER.

For my justification in now publishing what follows, I must refer to Vol. xii of this Magazine, pp. 158 & 159, and to p. 93 of the current Vol.; and I think I can so refer with confidence.

On the 11th of last September, whilst gathering some *Angelica sylvestris*, I accidentally fell into a deep ditch, and whilst there made acquaintance with a large plant of *Stachys sylvatica*, the leaves of which bore unmistakable marks of the work of some sort of larva; this incited me to pull up the plant, and on examination I found thereon five larvæ of a Pyraloid form. Remembering what I had read of the new *Ebulea*, I formed hopes immediately that I had taken its larva, and further investigation with the help of books and figures, turned my hopes into such certainty as can exist, until the moths have been bred.

Further search in more ditches was rewarded by the capture of several other examples of the larva, and after that I set to work to get *sambucalis* in the same stage for comparison, and I took five and twenty of this species also. And I may say briefly at once, that although at first sight the two larvæ are not unlike, they possess ample and satisfactory points of distinctness; *sambucalis* is longer in proportion to its stoutness than *stachydalis*, it is not so glass-like in appearance, and it has always on the third segment, and often on the fourth also, a black lateral spot, which is wanting in *stachydalis*. I now proceed to give other points at greater length below.

E. stachydalis. The larva lives in a sort of tube, formed either by turning down the tip of a leaf, and folding it closely on to the under surface with a quantity of silk, or else by drawing together a fold of the under surface, and covering it over with a *thick* silken web, in either case leaving an opening at each end; in such a retreat, it seems to live quietly by day, and comes out at night to feed on the remaining portions of the same leaf; so that as it grows it must move from leaf to leaf. I think I found most of the larvæ low down on the plants of *Stachys*, for though I found several webs on the upper leaves, they were generally empty. The larva eats large holes quite through the substance of the leaf, thus giving conspicuous marks of its presence, and leaving the ribs and the margin untouched: when full-fed, it quits the plant in search of a suitable hiding-place, in which to spin its cocoon for passing the winter.

The smallest larva I chanced to meet with, was about $\frac{3}{8}$ inch long, and possessing all the characters of those more mature. The full grown larva is about $\frac{5}{8}$ inch in length, with the true *Pyralis* contour, thickest in the middle of the body, the segments well defined and plump, especially on the belly, and on the back sub-divided by a transverse wrinkle, the head small, and projecting forwards in a line with the body, the ventral legs slender, furnished with rather spreading hooked feet, the anal pair extended behind the body. In colour, the head is whitish with the least possible flesh tinge, the mouth brownish, the ocelli blackish, the second segment whitish with a triangular broadish spot behind of bright transparent green; from this starts the conspicuous dorsal stripe of the same colour, more or less dark, of uniform width to near the anal extremity, where it narrows a little by degrees and is seen to be pulsating; on either side of this, is a broad rather ragged edged stripe, quite attenuated anteriorly and a little posteriorly, of *pure opaque white*, bearing a few minute freckles transversely near the front of each segment; the *segmental folds pure white*; below on the side is an uniformly broadish stripe of transparent green, darker in some parts than in others, and along its lower edge the tracheal thread of whitish can be seen beneath the skin, on which are the small round black spiracles; the belly and legs are pale, the former of a semi-pellucid faint greenish tint, yet withal having a most delicate flesh tinge, the latter pellucid; the tubercular warts are raised, their centres green and glittering, each bearing a fine hair; *the whole skin of the larva is lustrous as the clearest glass.*

When full-fed, it by degrees loses all its previous details of

colouring and texture, until it becomes uniformly *like polished white ivory*, and, after remaining a few days in this state, begins to spin its cocoon.

By the 25th of September, all my larvæ had spun themselves up in strong and closely woven silken cocoons, transparent at first, but as soon as they were made thicker, changing to a flesh colour, and in course of a week to pale brownish.

Guenée (viii, p. 364) says of this species, "Elle est bien dis-tincte de la *sambucalis*, quoiqu'en dise Duponchel. Sa chenille vit "sur la Pariétaire, et aussi sur le *Stachys sylvestris*, au dire de Germar, "qui la décrit ainsi: *Larva obesa, rugosa, glabra, sub-pellucida, alba, "habitat in foliis Stachys sylvestris contortis:*" but it seems to me this description by Germar does not suit the larva until it is about to spin.

E. sambucalis. When setting myself to look for this species, I first tried the tall bushes, with stiff leaves, but meeting with no success on them, I then tried some young growth of *Sambucus nigra* a foot or two high, and soon found several larvæ, each of them lying under a whitish silken web spun on the under surface of a leaf, and causing a narrow fold, which though slight was perceptible even on the upper surface; when the leaf was turned up, the larva was seen lying in the hollow, covered with this semi-transparent screen of silk, open at each end, and from this at night it would emerge to feed on other parts of the leaf. The smallest example I found was from three-eighths to half-an-inch long, and very slender, of a pale watery greenish tint, having a deeper green dorsal stripe, bordered on each side with a stripe of faint semi-opaque whitish-grey, all the rest of the body rather translucent.

The full grown larva is $\frac{3}{4}$ to $\frac{7}{8}$ inch in length, of slender proportions, fusiform, the head in line with the body, the segments sub-divided by a wrinkle on the back of each, while on the belly they are plump and well divided; all the legs slender, the anal pair extended behind the body. In colour, the head is of a pale semi-pellucid watery greenish tint, having a faint tinge of flesh colour, the second segment similar, but with a broad dorsal triangular mark behind, of a bright and full semi-transparent green, from which the dorsal pulsating stripe of the same colour proceeds; on either side of this, is a wider stripe, though much attenuated in front and a little behind, of *semi-opaque whitish-green*, having a few small green freckles transversely near the front of each segment; the *segmental folds yellowish*; below, is an equally wide stripe of the full semi-transparent green, somewhat softened above

and also below where the small round black spiracles occur; the belly and legs are of the same semi-pellucid pale watery greenish tint as the head; the tubercular warts have a small green central eminence emitting a fine hair: *on the front of the third and fourth segments on either side is a velvety black spot*; a few individuals occur, in which these spots are almost obsolete or absent on the fourth segment: the skin on the head and on the plate of the second segment is like shining glass, but on all the rest of the body it is like *ground glass*.

When full-fed, the details of colouring fade gradually away, and the larva changes to a *pale pink hue*, and then spins itself up in a cocoon of whitish silk, which soon turns rather brown.

Emsworth: *October 7th, 1876.*

A new habitat of Velleius dilatatus.—In the “Petites Nouvelles Entomologiques” of August 15th, is the following note by M. Viturat, which may be of service to English Coleopterists.

“During nearly ten years that I have given attention to *Coleoptera*, I have, on every practicable occasion, sought, but in vain, in the nests of wasps and hornets for *Velleius dilatatus*, which all entomological works state lives exclusively with these *Hymenoptera*; but, on the 27th July, I found a whole family of this species in the trunk of a tree. This was an oak, with a hollow of about two décimètres diameter, situate half a mètre above the ground, which appeared to have been the abode of squirrels or rats during the winter, and was filled with the excrement of these animals, and fine black earth arising from the decomposition of the wood. The tree did not appear to have been inhabited by hornets, at least, for a long time, judging by the aspect of its interior; when I examined it, I first saw a *Velleius*, which I thought was *Staphylinus olens*, and which ran out of sight; I then took out a handful of the matter which was in the tree, without paying any particular attention to its contents, when I found that I was bitten, until blood came, by a *Velleius dilatatus*, which, notwithstanding its small mandibles, grips harder than the above-named *Staphylinus*. Having been thus brought to notice the cause of my wound, I carefully collected for examination, with all the avidity of an ardent naturalist, all the *débris* which remained in the interior of the trunk, and my labour was fully recompensed by the capture of five other examples of *Velleius*; hence I conclude that these insects do not live exclusively with *Hymenoptera*, and that the search for them in places like that I have mentioned might help to diminish their rarity.”

I may add, that at least two examples of *Velleius dilatatus* were taken in this country by the late Charles Turner, in the burrows of *Cossus ligniperda* in a tree (E. M. M., iii, 96), and the connection of the beetle with *Cossus*-trees has of course long been known to French collectors.—J. W. DOUGLAS, *Leo: September 11th, 1876.*

[I once took more than a dozen of the allied *Quedius truncicola* at Mickleham, in a rotten tree, as above described. On habits and economy of *Velleius*, see A. Rouget, *Mém. Ac. Dijon*, 3me. série, i, pp. 201–229.—E. C. R.]

Note on Lyctus brunneus found in London.—In the year 1862, on a small log of wood with the bark on, imported into the London Docks from Swan River as a sample, I found five beetles, of a species which has recently been identified as *Lyctus brunneus* by Dr. Sharp, who informs me that he has specimens of it from New Zealand, France, and Britain, and that it is recorded from Woodlark Island.—*Id.* : 10th October, 1876.

Note on Corixa vernicosa, Wallengr., and C. Douglasi (Fieb.).—A renewed investigation of a typical example of *Corixa vernicosa*, kindly sent to me by Pastor Wallengren, of Farhult, Sweden, and comparison therewith of specimens of *C. Douglasi*, including several recently taken by Dr. Reuter in Scotland, have convinced me that both names refer to one species. The majority of the British individuals differ from the Scandinavian type before me in having the yellow lines on the corium somewhat closer together, and the posterior lines shorter, thereby leaving the characteristic black space at the inner angle larger. The synonymy will therefore be :

Corixa vernicosa, Walleng., Öfr. K. Vet. Ak. Förh., 145, 7 (1854) ; J. Sahlb., Not. Fenn., xiv, 285, 8 (1875).

Corixa Douglasi (Fieb.), Doug. & Scott, Brit. Hem., i, 612, 18 (1865).
—*Id.* : 11th October, 1876.

Notes on some additional species of Psyllidæ new to Britain.—It is interesting to find that this group still furnishes fresh representatives in different genera, and as no doubt many others will be added, I at present merely give a list of the additions.

Psylla crataegi, Scop., not common on hawthorn in August. *P. costalis*, Flor., on hawthorn in August, in company with *P. mali*, from which it may be separated by the green costal nerve and shorter elytra. *P. stenolabis*, Fr. Löw, a single ♂ beaten from an oak tree in this neighbourhood, was kindly named for me by the author, to whom I had sent it for identification. It is described by him in the "Petites Nouvelles Entomologiques," for September 1st, 1876. *P. pyricola*, Först., taken by Mr. Douglas on pear trees in Scotland, not uncommon in August ; I have previously considered this species to be only a variety of *P. pyri*, L., not having before seen examples, and believing that the short diagnosis of Förster referred to it. The elytra are shorter and yellower than in the last named, and without the black marks between the nerves. *P. pyrisuga*, Först. ?, and *P. peregrina*, Först. ? : I have as yet only females of these two, which Dr. Fr. Löw agrees with me in believing may prove to be the species to which they are referred.

I have also two other undetermined species of *Psylla* which are evidently new, one of them allied to *P. flavopunctata*, Flor.

Trioza abdominalis, Flor. I have seen what I believe to be a ♂ & ♀ of this species, taken by Dr. F. Buchanan White in Scotland on pines ; it is about the size of *T. galii* ; ♂ black, with short yellowish elytra blunt at the apex, and with a green abdomen ; ♀ orange-red, with paler longitudinal streaks on the mesonotum, abdomen coloured as in the other sex : Flor appears to have seen only three males, the female being unknown to him. *T. abieticola*, Först. : this may be considered as good as a new species, as Förster had only seen a single ♀, sent to him by Mr. Walker when he made his description ; I have, however, met with it in great abundance on Purley

Downs in August last, both on the spindle tree (*Euonymus europæus*) and the buckthorn (*Rhamnus catharticus*): Dr. F. Löw considers this species to be the *P. rhamnii*, Schrank, and so describes it.—JOHN SCOTT, 1, St. Mildred's Terrace, Brouley Road, Lee, S.E.: 9th October, 1876.

Strange habit of an Orthopterous insect.—I yesterday saw a large grasshopper or locust, busily engaged feeding on some horse-dung in my drive. It was 3 inches long, of a dark yellow bronze colour, greenish at the head. I watched it for some minutes, before attempting to catch it, in which I failed, as it flew away into the grass. I came back in an hour's time, and there it was again, busily employed on the manure for the second time. Again it escaped me, though I once got my hat over it on the grass. Its flight against the wind was only a few yards; but with the wind it flew some forty yards after I missed it. I have never seen one of this size in this country, and cannot understand its being twice on the same spot, if it were not a manure-feeder.—C. F. THRUSTON, Talgarth Hall, Machynlleth: 18th September, 1876.

[The description points to *Pachytylus migratorius* or *cinerascens*, or *Acrydium peregrinum*, all feeders on growing vegetable matter. A very slightly digested meal of fresh grass may possibly have induced the insect to act in opposition to the known habits of its group.—EDS.]

Pieris Daphnidice at Folkestone.—On the 21st August, I took a female *Pieris Daphnidice*, unfortunately much worn, on the Downs near Folkestone. The insect, once seen on the wing, cannot afterwards be easily passed by as one of the common species of *Pieris*; its flight is a slow steady one, and it continually settles on flowers; it is not so strong on the wing as *A. cardamines*, but more so than *L. sinapis*.—THOS. H. BRIGGS, Lincoln's Inn: 2nd October, 1876.

Note on the larva of Lycæna Argiolus.—I think it may be interesting to mention that during last month (August, 1876) Mr. Hellins obtained a number of eggs, and sent a portion of them to me, and that all the larvæ, on hatching, were found to be exactly like those of the spring brood, in being furnished with hairs, and in moving slowly. Unfortunately, the ichneumon which I bred in the spring got damaged before Mr. Marshall saw it; so, although he can refer it to the genus *Limmeria*, he is not able to identify the species.—WM. BUCKLER, Emsworth: Sept. 22nd, 1876.

Acherontia Atropos and Sphinx convolvuli at Exeter.—I have taken *A. Atropos* and *S. convolvuli* in the prison grounds here. *Colias Edusa* has been common in some places.—J. HELLINS, Chaplain's House, County Jail, Exeter: 27th Sept., 1876.

Occurrence of Charocampa nerii at Hemel Hempstead. I have just seen a specimen of *C. nerii* (the Oleander Hawk), taken by a gardener on the 15th of October, in a garden near here, in the Alma Road. It is now in the possession of — Pitts, Esq., House Surgeon at the Infirmary of Hemel Hempstead. B. PIFFARD, Hill House, Hemel Hempstead, Herts: October, 1876.

Capture of Deiopeia pulchella.—This morning I had the good fortune to capture a very perfect specimen of the "Crimson-speckled Footman" here. I found it among some grass near the Martello Tower.—N. FENWICK HELE, West Hill, Aldeburgh: 14th October, 1876.

Deiopeia pulchella at Bournemouth.—A week ago, my brother knocked down a moth at Bournemouth, which he brought home to me with a damaged hind-wing. It turns out to be *Deiopeia pulchella*.—E. L. WALSH, Pembroke House, Clifton, Bristol: 16th October, 1876.

Captures of rare Noctuae in the Isle of Wight.—During a recent stay of a little more than a fortnight in the Isle of Wight, we took a few fine specimens of *Leucania albipuncta*, besides three *Triphæna subsequa*; and, amongst other *Noctuae*, *Helio-phobus hispidus*, *Aporophila australis*, *Luperina cæspitis*, and *Agrotis saucia* and *obelisca*.

Mr. H. Rogers, of Freshwater, gave us a "private view" of a fine specimen of *Noctua flammatra*, then only half dried upon the setting board, which he had recently captured, also of a specimen of *Hadena peregrina*, and of two specimens of *Laphygma exigua*, all three of which were also taken by him this season.

The number of moths which came to sugar during the period of our stay was very small, and the attendance rather select than numerous.—J. B. BLACKBURN, Bron Seiriol, Bexley Heath; C. J. BUCKMASTER, Southfields, Wandsworth, S.W.: 20th September, 1876.

List of Lepidoptera captured at Rannoch in July, 1876.—On the 10th of July last, Mr. Nelson M. Richardson and I started for three weeks' collecting in this famous locality. Our trip having been successful, it occurred to me that a detailed account of our captures might not be without interest to those who, like myself, had no previous knowledge of that neighbourhood. Thanks to the kindness of my friends, Mrs. Hutchinson, Mr. C. G. Barrett, and Dr. Gill, we were not unfurnished with information, but I fear that this advantage was more than counterbalanced by want of experience in the work; my own attention having, for the last four or five years, been devoted almost entirely to the Cambridgeshire and Norfolk *fens*, even *wood*, not to say *mountain*, collecting is quite strange to me. Consequently the following list is hardly a fair representation of what might be expected by more experienced collectors; in the 'Micros' especially, our ignorance of many of the best species has made our catch meagre in comparison to what it might have been. It is only fair, however, to state that we did not spare for work; throughout our stay, every night one of us worked the highest accessible mountain peaks, while the other collected over the lower slopes or in the Black Wood. This high mountain work is very severe; the climb, which when unencumbered is a pleasure, becomes toilsome in the extreme, when burdened with a weight of apparatus and the clothing which is absolutely necessary. As soon as darkness comes on, the cold grows so intense, that, in spite of the warmest wraps, it taxes one's endurance to the utmost to last out till the morning permits a descent. During all our stay, Mr. Richardson had only *one* night, and I not even one, when there was not a gale of wind blowing at this elevation: often we were enveloped in clouds, when not an insect was to be seen; and once I lost myself in a dense sea of mist, and wandered about all night, not knowing where I was, till I caught a distant glimpse of the loch in the morning light, while the clouds lifted for a moment or two. As a rule, we passed the night thus, seeing perhaps one insect, or not even that, but everything we did get was rare; the only exception being a worn out *H. adusta*, which had somehow found its way to an elevation of 2500 ft. Of course, this work rendered it impossible to do much *day* collecting, especially as part of our time was occupied in reading mathematics; hence our take of butterflies was very small. The list is as follows:—

Argynnis Euphrosyne, not uncommon. — *Erebia Cassiope*, locally common on the hills; *Blandina*, at Pitlochrie, just coming out. — *Chortobius Davus*, more general than *Cassiope*; *Pamphilus*, common along roads. — *Lycæna Alexis*, common along roads.

Hepialus hectus; *velleda*, not common.

Metrocampa margaritaria, swarming. — *Ellopiæ fasciaria*. — *Boarmia repandata*: no vars. occurred. — *Dasydia obfuscata*, comes to light. — *Acidalia fumata*. — *Fidonia atomaria*; *piniaria*; *pinetaria*, the ♀ flies very little. — *Larentia didymata*, the dark form; *cæsiata*, abundant at all levels; *salicata*, two only, both over 2000 ft. up; *pectinataria*, a pest on the hill sides; *olivata*, Pitlochrie. — *Emmelesia affinitata*; *albulata*; *taniata*, Pitlochrie; *ericetata*, on the hill sides; *blandiata*. — *Eupithecia satyrata*, var. *callunaria*; *castigata*; *trisignata?* and *vigaureata?* these specimens being much worn, their nomenclature is not so certain as might be desired; *nanata*. — *Thera firmata*. — *Hysipetes elutata*, one only! — *Melanthia ocellata*, a pest on the hills. — *Melanippe tristata*; *subtristata*; *montanata*, a pest high up the mountains. — *Coremia munitata*. — *Phibalapteryx lignata*, meadows at Kinloch. — *Cidaria corylata*, a beautiful var., milk-white with dark border; *russata*, several dark vars. but none very striking; *populata*, abundant, a few nearly black. — *Eubolia palumbaria*; *lineolata*. — *Anaitis plagiata*, high up on the hills.

Notodonta camelina, very dark.

Cymatophora duplaris, dark, but not much more so than the Norfolk *fen* type. — *Acronycta menyanthidis* and *myricæ*, just over. — *Leucania impura*, the ordinary type. — *Xylophasia rurea*; *lithoxylea*; *polyodon*, abundant, dark specimens not uncommon, but very few black. — *Charæas graminis*. — *Miana arcuosa*. — *Celæna Haworthi*. — *Curadrina cubicularis*. — *Rusina tenebrosa*, very dark. — *Agrotis porphyrea*. — *Tryphæna orbona* and *pronuba*, not common! — *Noctua augur*, slightly dark, but less so than the *fen* type; *plecta*, slightly dark; *brunnea*; *festiva*, very abundant toward the end of July (out of a large number brought home, a fair sprinkling occurs of the so-called species, *conflua*, with every conceivable intermediate form: they all run a little smaller than southern specimens); *baja*; *sobrina*, we found this species generally from 700 to 900 ft. elevation, but not higher; and, as far as we could judge from the two or three nights of our stay during which it was out, it came pretty freely to sugar; both these facts seem contrary to the alleged experience of former collectors; *neglecta*, a single specimen at the end of our time, a very curious form, red, but much larger and paler than the red specimens in my cabinet, and with a pale blotch at the base of the front wings; *xanthographa*, just appearing. — *Pachnobia alpina*, this insect occurs sparingly over the tops of the highest hills: we obtained one or two at rest on the rocks by day, and others by netting at night. Sugar we only tried once, and found it totally unprofitable, though probably a longer trial might have altered the case. It is very wild and strong on the wing, and from this fact, joined to the almost constant wind-storms, soon becomes worn and damaged, so that only two or three of those we took are really perfect. I believe the number taken in Scotland to have been very far below Mr. Birchall's estimate, but there can be no doubt that (in common with almost all our rarities) it only wanted working for. When a species can be referred to a definite locality, those who carefully and persistently work that locality, with

due attention to the probable habits of the insect sought, *must*, sooner or later, turn it up. In the present instance, however, the work is unusually severe. I can give no clue to the food-plant: the insects occurred on the most barren peaks, the only constant herbage being heath and a woolly kind of moss, in which we found two pupa cases, from one of which the moth had just emerged, and was sitting close by. — *Euplexia lucipara*. — *Aplecta occulta*, not rare, one specimen almost as light as two southern types in my cabinet, taken near Ipswich; *nebulosa*; *tincta*. — *Hadena adusta*, common, but worn out; *pisi*; *contigua* and *rectilinea*, apparently all but over. — *Plusia v-aureum*. — *Mania typica*. — *Stilbia anomala*, one fine var., smoky-black without markings. — *Phytometra ænea*.

Scopula alpinalis, sparingly distributed over all the hills; *lutealis*, Struan. — *Pionea forficalis*. — *Eudorea scotica*, a single specimen; *muralis*; *atomalis* = *dispunctella*, not uncommon on heath. — *Crambus pratellus*; *ericellus*; *margari-tellus*; *tristellus*, *inquinatellus* and *culmellus*, fully as plentiful as in the south. *Phycis carbonariella*, out of burnt heath.

Tortrix ribeana; *viburnana*; *Forsterana*, small Scotch form. — *Amphysa Gerningana*. — *Penthina prælongana*; *ochromelana* = *dimidiana*. — *Pardia tripunctana*. — *Sericoris conchana*, common at Kinloch; *lacunana*; *urticana*, white Scotch form; *Daleana*, not uncommon in the Black Wood; *irriguana*, high up. — *Mixodia Schulziana*, not uncommon on the lill tops; *palustrana*; *rubiginosana* = *Bouchardana*. — *Sciaphila sinuana*, on a mountain side; *subjectana*, var. *incertana*; *virgaureana*. — *Bactra lanceolana*, abundant in the bogs, rather smaller than southern specimens. — *Grapholitha campoliliana*; *Penkleriana*. — *Coccyx ustomaculana*. — *Dicrorampha herbosana*. — *Catoptria cana*. — *Eupœcilia angustana*. — *Argyrolepis enicana*. — *Aphelia pratana* = *osseana*.

Tinea cloacella; *semifulvella*. — *Micropteryx aruncella*. — *Hypolepia costella*. — *Depressaria pulcherrimella*. — *Gelechia diffinis*; *terrella*; *galbanella*; *notatella*. — *Endrosia fenestrella*. — *Glyphipteryx thrasonella*, common among rushes. — *Argyresthia nitidella*; *retinella*; *sorbiella*; *pygmælla*; *Gødartella*, and do., var. *literella*; *Brockeella*. — *Cedestis farinatella*. — *Coleophora nigricella*. — *Lithocolletis spinicolella*.

Pterophorus Loewii.

Besides the above, five specimens occurred of a *Gelechia* which I am as yet unable to identify.

My thanks are due to Mr. C. G. Barrett for his kindness in naming a large number of the above insects, with which I was not at all, or only partially, acquainted. — F. D. WHEELER, Norwich: September 15th, 1876.

P.S.— Under the head *Pachnobia alpina*, I omitted to mention that this is a most variable, as well as beautiful, insect. In our specimens, the ground colour varies from bright rosy, or, in one instance, delicate pink, to a deep steely-blue. The markings also differ much in extent and intensity.

Occurrence of Epanda luteolenta, var. lueneburgensis, in Scotland.—On the 17th September, I received from near Loch Laggan, Co. Inverness, three specimens (two ♂ and one ♀) of a moth I thought I never saw before, which had been taken at sugar on the night of the 15th September; so I sent a neighbour of mine, Mr. W. Greaseley, of Wallasey, a very observant entomologist, to work it up. He succeeded

in taking four more of the moths, obtained eggs from two females; noticed a plant very much eaten in the locality where the moths were taken, and a deal of frass, like that of *Noctuæ* larvæ, underneath the plants; consequently he brought the seeds to try to grow the plant for the larvæ to feed on in spring.

The plant is red rattle, *Pedicularis palustris*. The moth was so local, that although two men were sugaring for it, none were taken except in one spot of about a quarter of a mile in extent. Different plans in the neighbourhood were tried, higher up the mountain and on both sides of the favoured spot, also the wood by the lake side, but not a single moth could be found except where the first specimens were obtained.

The eggs were laid on or about the 2nd of September, and hatched on the 2nd or 3rd of October. I sent a few to three of my friends, none of whom seemed to recognise the eggs as those of *lutulenta*, though two of them had bred *lutulenta* from the egg.

The Rev. J. Hellins thus describes it:—"Somewhat depressed, globular, opaque, with small button on top, surrounded by *irregular* flutings (or shallow *ribs*) with transverse reticulation, about 35 flutings or ribs, shell glistening, colour now pale dull yellowish, irregularly blotched to a great extent with purplish-brown, a small egg for size of moth." I may here remark that the moths are much smaller than the *lutulenta* we take here, and Mr. Greaseley says the eggs were pale yellow when first laid. Before hatching, they changed to deep lead colour, and just before they hatched became lighter, pale blue-grey. The young larvæ are green with a few hairs or spines and dark heads. I suppose all young larvæ are very much alike, they feed well on grass and knot grass.

Mr. R. McLachlan kindly examined the anal appendages of a male I sent him for the purpose of comparison with the type form of *lutulenta*, and found no apparent specific difference, which exactly corresponds with my own observation.

Mr. N. Greening, of Warrington, came here to see the series which I sent for Mr. Bond to exhibit at the Meeting of the Entomological Society in London, on the 4th inst., and he said Mr. James Cooper brought the same variety from Loch Rannoch about twenty-five years ago for us,—a fact which I had entirely forgotten, but which accounts for a specimen I found in my brother Benjamin's cabinet at Bowdon.

It is such an interesting variety, and itself varies from light grey to nearly black, that if any of us succeed in rearing the larvæ, very likely more will be written about it for the information of your readers.—NICHOLAS COOKE, Gorsey Hey, Liscard: 12th October, 1876.

Notes on Cidaria reticulata.—This pretty species was taken by the late T. H. Allis and myself when on a tour in the Lake District in 1856. In the first week in August, for several years, we visited the same spot without success. Mr. Allis told a collector, who now and again went to the woods, that he had left pieces of paper stuck on thorns for my guidance, and when he called on the man found he had taken five examples. The collector has been many times since to the same locality to no purpose. Some seven years afterwards, Mr. Gregson took a specimen when I was with him, and the next year another. On this latter journey he found the supposed food plant, *Impatiens noli-me-tangere*. He sent word to the Rev. J. Hellins that he

had found a small bed of the plant, and that gentleman informed me that he knew the history of the insect, and that it had been bred by Carl Plötz from a green larva feeding on that plant. Mr. Gregson described the locality to me, but added that he had been there several times, and could not re-find the plant. I determined to try different districts from Ambleside on both sides of the lake, but the result appeared hopeless, until one day towards the end of August I found a few plants, when trying to extricate myself from a thicket in a very wet place; others were found by tracing the sound of rushing water. As I did not wish to destroy so tender a plant, I picked a few outside tall specimens to see if there were any eggs. After bringing home some sprigs, I set to work with my glass, and found a few eggs; the first larva that hatched I sent to Mr. Buckler, and a second after first moult: he will no doubt give an ample description. The larva feeds by night only, on the seeds; occasionally, from hunger, it will nibble the leaves. I fancy some larvæ may hibernate. I saved every bit of the plant, and to-day have found a pupa and dead larva.—J. B. HODGKINSON, Preston: 9th October, 1876.

Notes on Dianthæcia casia and other Lepidoptera in the Isle of Man.—*Dianthæcia casia* has been abundant in the Isle of Man during the present summer. Owing to an accident, I was unable to climb to the dangerous positions on the cliffs which it has been common to select for the capture of this insect, during its short twilight visit to the flowers of *Silene maritima*, and perforce had to be content with what a few plants nearer home and on the level might produce. I was fortunate enough to find a little recess, about ten feet across, amongst the rocks on the shore, of easy access, and where the *Silene* grew freely; this I visited on twenty evenings during June and July, and without moving from the spot, indeed, sitting on a stone the most of the time, I captured the following moths, flying over the solitary patch of flowers:—105 *Dianthæcia casia*, 32 *D. capsophila*, 4 *Plusia v-aureum*, 16 *P. gamma*, 6 *Cucullia umbratica*, 2 *Hadena adusta*, 10 *Xylophasia polyodon* (including several melanic varieties), 4 *Hepialus velleda*, and 8 *Setina irrorella* ♂ (the two last named captured as they passed, not I think attracted by the flowers), and 12 *Eupithecia venosata*. *Basilinea, brassicæ, exclamationis*, and *cubicularis* also came in some numbers, but *casia* was by far the most abundant species; nearly all the moths named visited the flowers between 9.15 and 9.45 p.m. There were very few other flowers within 100 yards, and probably most of the moths in the neighbourhood were concentrated on this isolated patch.

Casia remains on the wing for at least three months; I captured the first, a worn ♀, June 2nd, the last, a ♂ in fine condition, August 25th. This unusually long flight is probably explained by the circumstance that this species sometimes remains in the pupa-state two, three, and even four years (see Guenée, *Noctuérites*, vol. ii, p. 18), and we might expect that moths which are the produce of the larvæ of various years would emerge from pupa at slightly different dates.—E. BIRCHALL, 77, Derby Square, Douglas: October 1st, 1876.

Occurrence of Tinea angustipennis, Herrich-Schäffer, in England.—Of this very striking species (of which probably not ten specimens are known), a specimen was sent to me by Mr. Sorrell for determination last April. It was taken in 1874 in a weedy field opposite Acton Green. I was in hopes that Mr. Sorrell would himself have communicated a notice of this interesting capture.

When at Frankfort-on-the-Main in July, 1868, I saw, in Herr Mühlig's collection, a specimen of *Tinea angustipennis*, which had been bred from rotten wood.

Breslau, Munich, and Frankfort were the only localities known to me, till I learnt that it had occurred near London.—H. T. STANTON, Mountsfield, Lewisham: October 12th, 1876.

Occurrence of Gelechia (Doryphora) morosa, Mühlig, in England.—This insect has been bred by Mr. Jenkinson from a larva found at Wicken Fen on June 13th, in the shoots of *Lysimachia*. The perfect insect made its appearance on July 8th. Its similarity to *G. farinosa* (which will no doubt be some day detected in localities in the north of England, where *Primula farinosa* is plentiful) is so great, that any one who has seen the one species can imagine the other, the ochreous tibiae of the posterior legs in *G. morosa* affording the only striking difference; in *G. farinosa* these tibiae are dark grey.

In September, 1869, I received from Wicken Fen young larvæ in *Lysimachia* shoots, which I thought might be referable to this species, but with me they did not survive the winter.—Id.

ENTOMOLOGICAL SOCIETY OF LONDON: October 4th, 1876.—Sir S. S. SAUNDERS, C.M.G., Vice-President, in the Chair.

Mons. A. P. De Borre, of Brussels, Secretary of the Belgian Entomological Society, was elected a Foreign Member.

Mr. Bond exhibited, on behalf of Mr. N. Cooke, several interesting British *Lepidoptera*, viz.: three examples of *Crymodes erulis* from Loch Laggan, a long series of a form of *Epunda lutulenta*, apparently pertaining to the var. *lueneburgensis*, Freyer, and *Sericoris irriguana*, from the same locality. Also an unusually pale ♀ of *Hepialus humuli*.

Mr. Higgins sent a letter respecting the exhibition of specimens of *Deilephila euphorbiae*, said to have been taken near Harwich. [*Vide* report of the Meeting for Nov. 17th, 1873 (E. M. M., vol. x, p. 183), when *Sphinx pinastri* was recorded from the same locality]. He and Mr. Janson had recently visited the locality, where they were joined by the supposed finder. They were able to assert that the food-plant grew at the place indicated.

Mr. S. Stevens had received information that led him to believe that an example (exhibited) of *Callimorpha Hera* had recently been taken at St. Margaret's Bay, near Dover.

Mr. W. Cole exhibited a fine series of *Ennomos angularia*, bred from eggs laid by the same female; the larvæ having been fed upon four different food-plants. The result was negative so far as phytophagic variability was concerned. But all differed in wanting much of the yellowish tint observable in captured specimens, of which a series was placed by the side of those bred, for comparison. Mr. McLachlan said that this result was quite in accordance with an opinion expressed by him many years ago, to the effect that food has little influence in causing variation in *Lepidoptera*.

Mr. Forbes exhibited a *Carculio*, found living at Highgate, amongst exotic Orchids. Mr. Pascoe stated that it was apparently an *Alcides*.

Mr. Enoch exhibited a mounted slide of *Polynema ovulorum*, one of the *Proctotrypidæ*, prepared in his usual careful manner.

Mr. Smith communicated a paper on new species of *Cryptoceridæ*, belonging to the genera *Cryptocerus*, *Meranoplus*, and *Cataulacus*.

A further instalment of the proposed Catalogue of British Insects—*Hemiptera* (*Heteroptera* and *Homoptera*, groups *Cicadaria* and *Phytophthires*), by J. W. Douglas and John Scott, was on the table.

ON MELANOCHROISM AND LEUCOCHROISM.

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

Climatic variation is a subject that has always possessed great attractions for me; it was, therefore, with much interest that I read my friend Mr. Birchall's notes "On Melanism," at p. 130.

Mr. Birchall begins by stating "that specimens of many *Lepidoptera*, from the Highlands of Scotland, vary widely from English examples of the same species, and that the variation is usually towards a darker coloration; that there is, in short, a tendency to the production of melanic varieties, and that in some cases a dark variety has completely supplanted the lighter coloured type."

That there is frequently a difference between *South* English and Highland examples of the same species will be admitted I think by every one; and that this variation is, in the majority of cases, in the direction of melanism, has been generally taken for granted. That it really is so, the following brief analysis of the Highland *Lepidoptera* will show. In it I have compared the majority of the *Macro-Lepidoptera* of Scotland north of the Tay with South English (and in a few cases with South European) specimens of the same species; for it must be remembered that North or North-West English specimens frequently exhibit the same, or even a greater, tendency to melanism, than the Highland specimens.

Before beginning the analysis it may be as well to define what is meant by "melanism."

Strictly speaking the term "melanism" ought to be restricted to such forms as *Amphidasis betularia* ab. *Doubledayaria*, Mill., which are more or less infuscated with black; but, as in that variety, the melanism is due to the excessive increase of the markings at the expense of the ground colour, therefore all cases wherein there is a tendency to a suffusion with darker colour, or where the markings and ground colour are alike deepened, must be considered as melanic, as well as those cases where the melanism is produced by suffusion with black. To take an extreme case, a change from a white to an ochreous ground colour, must be regarded as melanism. "Melanism" is not I think a good term for all these various cases, and I would suggest the use of the term "melanochroism" as preferable. On the other hand, "leucochroism" is the very opposite to "melanochroism." By leucochroism I do not mean "albinoism," which ought to be regarded as a more or less diseased or abnormal condition. Any change to a paler colour (as from ochreous to white), or where

markings usually dark are assimilated to the ground colour, or where a pale ground colour is increased at the expense of dark markings (*e. g.* when the red in the hind-wing of *Arctia caja* gains ground at the expense of the black spots) is leucochromism.

In determining whether a species has a tendency in either direction, a certain allowance (how much, experience alone will show) must be made for individual idiosyncrasy in coloration.

I will proceed with my analysis.

Of the 130 (or thereabouts) *Macro-Lepidoptera* inhabiting Scotland north of the Tay, the majority may be at once put aside as not exhibiting sufficient variation for our purpose. Be it observed, however, that when there is a tendency to variation, it is in the majority of cases in the direction of a heightened (darker or more brilliant), and not of a diminished, coloration.

Another group, consisting of species more or less variable in every locality, may also be dismissed with the same observation. In it are included *Tenioocampa*, several species; *Larentia cæsiata*; *Crocallis elinguaris*; *Hypsipetes*, several species; *Oporabia dilutata*; *Cidaria russata* and *immanata*, &c.

The remaining species may then be divided as follows:—

I. MELANOCHROIC.

1. Species of which all the specimens, or a large majority, are melanochroic—in short, melanochroic races.—*Arctia menthastri* (var. *ochracea*); *A. fuliginosa* (var. *borealis*, Stdg.); *Trichiura cratægi* (approaching var. *arise*, Hb.); *Orgyia fuscelina* (approaching var. *obscura*, Zett.); *Scodionia belgiana* (var. *fulvacearia*, Hb.); *Thera juniperata* (var. *scotica*); *Melanippe fluctuata*; *Notodonta dromedarius*; *Cymatophora duplaris*; *Gortyna flavago*; *Apamea fibrosa*; *Aplecta occulta* (*Note.* The very north European form is pale).

2. Species frequently melanochroic, but of which many individuals are not so.—*Hepialus humuli* (ab. *hethlandica*, Stdg.); *Odontopera bilentata*; *Phigalia pilosaria*; *Aspilates strigillaria*; *Thera variata* (ab. *obliterata*); *Melanthia rubiginata* (ab. *plumbata*, Curtis); *Cidaria suffumata* (ab. *piceata*, Stph.); *C. populata* (ab. *musanaria*, Frey.); *Coremia ferrugata*; *Bryophila perla*; *Xylophasia polygonon*; *X. rurea* (ab. *alopecurus*, Esp. and ab. *combusta*, Dup.); *Agrotis tritici*; *Triphæna orbona* (ab. *Curtisii*, Newman); *Noctua xanthographa*; *Tenioocampa gracilis*; *Orthosia suspecta*; *Epunda viminalis* (ab. *obscura*, Stdg.); *Hadena adusta*; *H. protea*;

H. pisi (?); *Larentia didymata*; *Agrotis nigricans**; *Noctua C-nigrum*. (The last three species ought perhaps to be included in division 1).

Besides the above, melanochoic forms of several other species occur, but rarely, *e. g.* the green aberration of *Trachea piniperda*.

II. LEUCOCHROISM.

1. Species of which all, or a majority, of the individuals are paler than in the South.—*Lycæna Agestis* (var. *Artaxerxes*, F.); *Fidonia piniaria* (the type; the yellow southern form is the var. *flavescens*); *Platypteryx fulcula* (var. *pallida*); *Teniocampa cruda*.

Reference may also be made to—*Pararge Ægeria* (in comparison with the brighter-coloured South European form); and *Cænonympha Pamphilus* (in comparison with the form *Lyllus*).

2. Species frequently paler but not invariably so.—*Cænonympha Tiphon*; *Chelonia plantaginis* (ab. *hospita*, Schiff.); *Cidaria corylata* (ab. *albocrenata*, Curtis); *Eupithecia satyrata* (ab. *callunaria*, Stn.); *Noctua festiva*; *Teniocampa gothica* (ab. *gothicina*, H.-S.); *Xanthia cerago* (ab. *flavescens*, Esp.); *Lithosia mesomella*; *Venilia maculata*; *Cleora lichenaria* (?); *Leucania lithargyria* (?). (The last four species perhaps belong to division 1).

It will be observed that many of the forms included in both classes are not confined to the Highlands, but are found in Lowland Scotland, and elsewhere.

Of the melanic varieties mentioned by Mr. Birchall some, as *Cymatophora diluta*, *Leucania pudorina*, &c., do not occur in the Highlands, and therefore do not come within the range of my remarks; others, as *Cirrhædia xerampelina*, *Polia chi*, and *Aplecta nebulosa*, do not show melanochoism there: some, as *Crocallis linguaria*, *Hypsipetes elutata*, *Larentia cæsiata*, &c., might equally (or nearly so) be cited as samples of leucochoism. *Epunda lutulenta* (var. *lunenburgensis*) I rather consider as illustrating leucochoism than melanochoism. *Hepialus humuli* ab. *hethlandica* is a local insular form, and not even I believe the predominating form in Zetland.

We now come to the consideration of the cause of the prevalence of melanochoism in the Highlands.

In suggesting "natural selection" as the cause, I believe that Mr. Birchall has solved a great part of the difficulty; not entirely perhaps, for, considering all the facts, I still think there must be some exciting cause (probably meteorological) for the first production of

* The Southern form is the ab. or var. *rubricans*, Esp.: the dark form is the type.—F.B.W.

the melanochromism. Melanochromism once set up and advantages found to accrue from the possession of it, then natural selection comes into play, and eventually, perhaps, melanochromic races are established. In other cases, where only a proportion of the individuals of a species are melanochromic, the special conditions which made melanochromism an advantage to its possessor, may have ceased to exist, and consequently circumstances permit of a reversion to ancestral forms; or the melanochromic may be the ancestral form, and the dark individuals are reverting. In like manner leucochromism may be an advantage to its possessor, and have been similarly developed by natural selection.

That there is an exciting cause for both forms I am persuaded, because we find that species which are sufficiently common for us to observe year after year in abundance, are found to be much more subject to variation in some years than in others; and if (presumably) the meteorological differences of one year form another cause, in a single locality of a varying amount of variation in species, we may reasonably conclude that the meteorological differences between one locality and another, continued year after year, will tend to variation in different directions in the individuals of a species common to both. Then if in one locality where the struggle for existence is greater, a peculiar variation is found to carry advantages with it, natural selection steps in and does its work, and, if the advantage is very great, may eventually result in that particular variety supplanting all others. If the advantages were not so great, the particular variety would not be so peculiarly favoured; and if there was no special advantage (but still no disadvantage), then the variety would only be on an equal footing with the other forms, and individuals of that character would vary in number from year to year according as the meteorological conditions (presumably the exciting cause) varied, with a certain percentage for heredity.

By this theory, local varieties and aberrations (both melanochromic and otherwise) may perhaps be accounted for. For example, let us take the ab. *hethlandica* of *Heptalus humuli*. This is a form of the ♂ in which the usual satiny white colour is frequently tinged with yellow, and dark markings, as in the ♀, are more or less apparent. At the time this moth is on the wing there is scarcely any darkness in Zetland, and consequently the hovering white moths must be very conspicuous and easily seen by gulls and other birds, which, I have noticed in other localities, eagerly pursue them. But a ♂ of darker

colour more easily escapes observation, and hence, by natural selection, the propagation of a local variety (probably meteorologically originated) is favoured.

That melanochoic (or melanic) insects are peculiarly favoured with stronger constitutions and more acute senses, there is not, I think, any reason for supposing. Frequently, in fact, melanochoic (and more frequently, melanic) individuals are of smaller size than the typical form.

After all, we require many widely extended and repeated observations before we can venture to say that we know anything of the cause of these phenomena. Botanists are aware that the plants of the West Coast are less brilliantly coloured than those of the East; and I think that it is in the west rather than the north that melanochoism in British insects may best be studied. At the same time I hope that observers in all parts of the country will turn their attention in this direction.

Perth: *November, 1876.*

NOTES ON MR. ATKINSON'S COLLECTION OF EAST INDIAN
LEPIDOPTERA, WITH DESCRIPTIONS OF NEW SPECIES
OF *RHOPALOCERA*.

BY W. C. HEWITSON, F.L.S.

I send a short notice of the Atkinson collection, and of the naturalist who brought it together. Mr. Atkinson had been for fifteen years Director of public instruction for Bengal, and during that time possessed peculiar facilities for the gratification of his taste, himself visiting the best localities—fortunately also the most healthy—during his holiday time. He had thus made the finest collection of Indian *Lepidoptera* ever brought to this country. He had retired from his educational labours, and had come home with his collections for the future enjoyment of his life; but before settling down to the pleasures of home, he had most unfortunately gone to Italy, where, after a few hours' illness, he died at Rome, on the 15th of January, 1875, at the age of fifty-five.

His collection was sold, and, by the great kindness of Mrs. Atkinson, came into my possession; and I regret that illness has delayed me so long in writing this tribute to the memory of a brother naturalist. The butterflies in number and condition far surpass any which have come to Europe from the same locality.

There are but few species for me to describe, because there are probably not many unknown species in India, and also because Mr. F. Moore, as Curator of the India Museum, enjoys opportunities before other naturalists of becoming acquainted with, and of describing, any novelties that arrive. I have added thirty-five new species from Mr. Atkinson's collection to my own, twelve of which are hitherto unknown, and of some of these I now send descriptions. The grand thing of the collection is the *Butanitis Lidderdalii*, figured by Mr. Atkinson in the Proceedings of the Zoological Society for 1873, the most remarkable addition to the Diurnal *Lepidoptera* since Mr. Wallace made known to us the *Ornithoptera Brookiana*. It is quite distinct from, and much surpasses in beauty, the *Amandia Thaidina* brought to Paris by the Abbé David. There is a female—so difficult to get—of *Teinopalpus imperialis*; there are several specimens of *Æmona Lena*, also figured and described by Mr. Atkinson, and with it the other rare species of the same genus, *Æmona Amathusia*. There are besides the rare *Limenitis Austenia*, a new *Debis*, a new and beautiful *Zophoessa*, and several *Lycænidæ*, which were new when Mr. Atkinson very kindly lent them to me to figure and describe.

The moths of the collection, many of which were taken by Mrs. Atkinson, are as fine as the butterflies, and are in the possession of Dr. Staudinger, who can better appreciate their value than our English collectors. They are, however, to be described by Mr. Moore, who tells me that there are several hundred new species.

ADOLIAS SATROPACES, *sp. n.*

Upper-side: male dark brown: anterior wing projecting at the apex, as in *Cocytus*; marked in the cell by a black line and by two large pale spots bordered with black, by a spot and two short black lines below these, and by another pale, undefined spot nearer the apex; the outer margin, except at the apex, rufous-grey: posterior wing with the outer half of the same colour.

Under-side ochreous-yellow: anterior wing with the spots in the cell and a linear sub-marginal band of brown: posterior wing with some scarcely-seen spots before and after the middle.

Female pale rufous-brown: anterior wing with the spots in and below the cell as in the male, marked beyond the middle by six transparent spots, fixed in a transverse band, and one near the apex; crossed near the outer margin from the apex by a dark brown band, which is continued to the middle of the inner margin of the posterior wing: posterior wing with two spots in the cell, and a series of sub-marginal lunular spots of brown.

Under-side as above, except that it is orange-yellow, and that the sub-marginal band has its origin at a different part of the apex, and is not continued on the posterior wing.

Exp., ♂, 2 $\frac{7}{16}$; ♀, 3 $\frac{2}{15}$ inch.

Hab.: Moulmein.

The female of this species very closely resembles *A. Aphidas*.

DEBIS SERBONIS, sp. n.

Upper-side rufous-brown: both wings with two sub-marginal brown lines: anterior wing with two indistinct pale spots on the costal margin beyond the middle: posterior wing with a series of three black eye-like spots, and an ocellus near the anal angle.

Under-side rufous: anterior wing with a zig-zag black line and a large pale spot, bordered on both sides with black within the cell; the disco-cellular nervure brown, crossed beyond the middle by a dark brown band, bounded outwardly, near the costal margin, by a dull white spot; a white spot near the apex, and below two small ocelli, one of which is incomplete, followed by a band of brown and a sub-marginal band also brown: posterior wing crossed by two brown bands, before and at the middle; a brown line at the end of the cell; a series of six ocelli, the first and fifth larger and more distinct than the rest; the outer margin and a line near it black.

Exp., $2\frac{3}{10}$ inch.

Hab.: Darjeeling.

ZOPHOESSA ATKINSONIA, sp. n.

Upper-side: male dark brown, rufous towards the base: both wings with a sub-marginal black line: anterior wing marked by several rufous-orange spots; two in the cell; a quadrifid band beyond these, three (one bifid) near the apex, and five below the middle: posterior wing with rufous-orange band near the outer margin, marked by five black spots: a sub-marginal rufous line.

Under-side rufous-brown: a spot in the cell, which is bordered on both sides with brown, and a continuous band beyond the middle, sinuated and bordered inwardly with dark brown, both yellow; a series of four small white spots near the apex, and two sub-marginal linear brown bands: posterior wing tinted with green near the base, marked by two short bands of yellow, and followed by a band of the same colour; the outer half of the wing rufous-brown, marked by five black ocelli, with rufous iris and pupil of blue: a sub-marginal band of white.

Exp., $2\frac{1}{10}$ inch.

Hab.: Darjeeling.

DODONA DEODATA, sp. n.

Upper-side: both wings white, crossed near the base and parallel to the inner margin by three bands of brown: anterior wing with the outer half dark brown, marked by ten white spots; four in a band from the costal margin to the anal angle, and two bands of three spots each near the apex: posterior wing with the outer margin broadly brown, traversed by two bands of white spots.

Under-side as above, except that several of the small white spots, near the apex of the anterior wing, meet and form a band; that there are two linear white spots near the anal angle, and a linear band leading to two black spots near the outer margin of the posterior wing; and that there is a lobe at the anal angle as in the other species, bordered above by orange-yellow, marked by two black spots.

Exp., $1\frac{7}{10}$ inch.

Hab.: Moulmein.

MYRINA SYMIRA, *sp. n.*

Upper-side brown, tinted with purple, the outer margin dark brown: posterior wing with the anal angle dark brown, with two tails, a long one in continuation of the first median branch and a short one inside of it.

Under-side rufous-orange: posterior wing with a black spot crowned with silvery-blue at the base of each tail.

Exp., $1\frac{1}{10}$ inch.

Hab.: Darjeeling.

HESPERIA CEPHALA, *sp. n.*

Upper-side dark brown, the fringe brown and white alternately: anterior wing with three transparent white spots and an opaque spot near the inner margin; one at the middle bifid, one at the apex trifid, and one below it: posterior wing with two transparent spots near the middle.

Under-side: anterior wing as above, except that the costal margin from the base to the transparent spot, and the outer margin from the apex to the middle, are yellow: posterior wing yellow, with a black spot near the base, a third white spot adjoining the transparent white spots, which are bordered below with rufous-brown: the outer margin rufous-brown.

Exp., $1\frac{7}{10}$ inch.

Hab.: Darjeeling.

HESPERIA CERATA, *sp. n.*

Upper-side dark brown: anterior wing with four transparent white spots; one in the cell sinuated on both sides, two below this between the branches of the median nervure, and one near the apex bifid: posterior wing with a central series of four and five indistinct white spots.

Under-side as above, except that both wings have a sub-marginal series of pale spots; that the posterior wing has a white spot near the base, and a transverse central series of six distinct white spots.

Exp., $1\frac{4}{10}$ inch.

Hab.: Darjeeling.

Oatlands, Weybridge: *October, 1876.*

LIST OF THE BUTTERFLIES NOW KNOWN TO INHABIT NEW ZEALAND, WITH DESCRIPTIONS OF A NEW GENUS, AND A NEW SPECIES, IN THE COLLECTION OF JOHN D. ENYS, ESQ.

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

NYMPHALIDÆ.

DANAINÆ.

1. *Danais Archippus*, Fabricius.—Both sexes.

SATYRINÆ.

PERCNODAIMON, *n. gen.*

Allied to *Erebia*, but in general pattern more like *Leptoneura*; the antennæ more distinctly clavate; the palpi shorter and broader; the lower radial of primaries emitted above the angle of the dis-

cocellulars instead of below it; the lower discocellular of secondaries more oblique and less sigmoidal; the legs smoother. Type *P. Pluto*.

2. *Percnodaimon Pluto*, Fereday, = *Erebia merula*, Hewitson.—Although Mr. Fereday only describes this species as black, not mentioning the ocelli, his name will have to stand, since there is no other black *Erebia* in New Zealand.*

3. *Argyrophenga antipodum*, Doubleday.—One of Mr. Enys's specimens has only two ocelli on the upper surface of secondaries, and no silvery streaks at the apex of the under surface of primaries.

NYMPHALINÆ.

4. *Pyrameis Kershawii*, M'Coy.—One of the examples from North Island.

5. *Pyrameis Itca*, Fabricius.

6. *Pyrameis Gonerrilla*, Fabricius.

7. *Diadema Nerina*, Fabricius.—One male.

LYCÆNIDÆ.

LYCÆNINÆ.

8. *Lycæna Phæbe*, Murray, = ? *L. Alsulus*, var. Herr.-Sch.—I believe *L. Alsulus* to be simply a brown female of the above, in which case it will take priority.

9. *Lycæna Oxleyi*, Felder.

10. *Chrysophanus Boldenarum*, White.—This species is said to be common.

11. *Chrysophanus Salustius*, Fabricius.—A variety occurs in North Island, with the wings much brighter below.

12. *Chrysophanus Enysii*, n. sp.—♂. Above very like the female of *C. Salustius*. Wings bright tawny; veins black; a rather broad dark brown border round each wing; an equally broad transverse sigmoidal band of the same colour across each disc; base densely and finely irrorated with black scales; primaries with a small round spot in the cell, a similar spot below the origin of the first median branch, and an oblong spot on the discocellulars, black: secondaries with a transverse dark brown spot on the discocellulars; several tawny spots on the outer border near anal angle; wings below much paler; primaries deep ochreous; costal area dull sulphur-yellow; outer border brownish, paler towards apex, bordered within by black spots towards external angle; discal band of upper-side converted into a row of blackish spots; basal spots smaller and narrower than above; secondaries stramineous, becoming sordid sulphur-yellow towards the

* In the "Transactions of the New Zealand Institute," vol. viii, pp. 302-304, pl. ix (May, 1876), Mr. Fereday re-describes and figures this insect as *Oreina* (?) *Othello*, stating that he changes the name *Pluto* because it had previously been "appropriated" to another butterfly — A. G. B.

base; outer border pale clay-brown, an irregular narrow discal band, a sub-costal spot, the discocellulars, and a spot on interno-median area, all of the same colour: body above olivaceous; prothorax slightly tawny; head blackish, with the margins of the eyes and sides of the palpi white: body below whitish. Expanse of wings, 1 inch 3 lines.

♀. Very much darker, so that the intervals between the bands are reduced to golden-orange spots, the bands and veins themselves being deep chocolate-brown; basal scaling more golden; wings below brighter, the secondaries crossed by a broad, strongly-elbowed reddish-brown band, which tapers to the abdominal margin; an indistinct sub-marginal series of conical spots of the same colour, with whitish lilacine centres: body above much brighter than in the male; below tinted with rosy. Expanse of wings, 1 inch $3\frac{1}{2}$ lines.

♂, ♀, North Island (J. D. Enys).

13. *Chrysophanus Eredayi*, Bates.

PAPILIONIDÆ.

PIERINÆ.

14. *Catopsilia Catilla*, Cramer.—A single male of this species is in the collection.

The whole of the above-mentioned butterflies are in the collection of Mr. Enys.

British Museum: *October, 1876.*

DIAGNOSIS OF A NEW SPECIES OF *PSALLUS* (HEMIPTERA-HETEROPTERA).

BY O. M. REUTER (HELSINGFORS).

PSALLUS WOLLASTONI, *n. sp.*

Testaceus, nitidus, magis minusve rubedine tinctus, nigro-pilosulus, subtilissime flavo-pubescens; antennis articulis duobus ultimis simul sumtis secundo longitudine sub-æqualibus, quarto tertio circiter duplo brevior (♂); femoribus magis minusve rubidis, anterioribus innotatis, posticis tantum subtus obsolete et parce fusco-punctatis, tibiis spinis nigris validis e punctis minutissimis tantum in basi tiliarum conspicuis nascentibus; cuneo testaceo, margine interno ad apicem usque sat late saturate rubro; membrana fere innotata, venis rufescenti-testaceis; vertice oculo circiter duplo (♂) vel fere $2\frac{1}{3}$ (♀) latiore. Long. $2\frac{1}{2}$ —3 mm. Species pubescentia flava subtili, pictura insigni cunei, femoribus rix fusco-punctatis, tibiisque punctis ad basin spinarum minutissimis, bene distincta.

Two specimens captured by Mr. Wollaston in Madeira, and kindly communicated for description by Dr. Buchanan White.

Abo, Finland: *8th November, 1876.*

DESCRIPTIONS OF NINE NEW SPECIES OF *BUPRESTIDÆ*.

BY EDWARD SAUNDERS, F.L.S.

The types of these species are in the collection of the British Museum.

MELOBASIS CUPREOVITTATA.

Fusca; capite cupreo, piloso, fortiter ruguloso-punctato; thorace punctato, lateribus rotundatis; elytris punctatis, lateribus postice denticulatis, utrinque vittis duabus cupreis, unâ basali, alterâ apicali ornatis. Subtus cuprea, lateribus pilosis.

Head coppery. Thorax cyaneous-brown. Elytra brown; each with two longitudinal vittæ, and a spot on the lateral margin coppery-golden, of these vittæ the upper one begins at the base near the shoulder and gradually approaches the suture, reaching to just beyond the middle of the elytra; the posterior one begins just beyond the middle, but nearer the lateral margin, and does not reach the apex: the marginal spot is placed above the middle; beneath coppery-brown, centre brilliantly coppery.

Head rugosely punctured and covered with greyish hairs. Thorax, at the base, half as broad again as long; anterior margin emarginate, sides rounded, base very shallowly bisinuate; surface punctured, the punctures closer together and deeper on the sides, which are covered with grey hairs. Elytra twice as long as wide, punctured, each with four slightly raised lines, including the suture; sides denticulate near the apex, which is largely rounded. Beneath, punctured, sides and legs covered with long, adpressed, silvery-grey hairs.

Length, 6—7 lines. Breadth, 2—2½ lines.

Hab.: Gawler, Australia.

MELOBASIS COSTATA.

Cupreo-fusca; capite thoraceque punctatis; elytris punctatis, utrinque costis quatuor nitidis ornatis, marginibus postice denticulatis, apice utrinque spinoso. Subtus punctata, lateribus albopilosis.

Entire insect coppery-brown.

Head flat, deeply punctured; pubescent above the mouth. Thorax, at the base, three-quarters as broad again as long; anterior margin smooth, very slightly raised, and somewhat emarginate; sides scarcely rounded behind the anterior angles; posterior angles acute; base with a shallow median lobe; surface punctured, especially at the sides. Elytra twice as long as wide, finely and very closely punctured, each with four raised smooth lines, those on the sides less distinct than those nearer the suture; sides slightly sinuate below the shoulder, finely denticulate posteriorly, apex of each terminating in a sharp spine. Beneath punctured, sides and legs hairy.

Length, 7—8 lines. Breadth, 2—2½ lines.

Hab.: Swan River.

Differs from *M. nervosa*, Boisid., by the straighter sides to the thorax, the more strongly marked costæ of the elytra, and also by the apex of each elytron terminating in a sharp spine.

MELOBASIS RUBROMARGINATA.

Ænea; capite punctato; thorace punctato, margine anteriori rotundatâ; elytris punctatis, lateribus cupreis, utrinque costis quatuor elevatis, marginibus posterioribus denticulatis. Subtus viridis, punctata, lateribus igneo-cupreis.

Above bronzy. Sides of thorax with a slight coppery tinge. Margins of the elytra coppery-red. Beneath green; sides of breast and abdomen coppery-red.

Head deeply and rugosely punctured, with a few scattered hairs. Thorax, at the base, two-thirds as broad again as long; anterior margin produced in the centre and at the anterior angles; sides slightly rounded; greatest width of the thorax just behind the middle; posterior angles nearly right angles; base shallowly sinuate; surface punctured, very closely so on the sides. Elytra twice as long as wide, punctured, each with four raised costæ; sides sinuate below the shoulders, denticulate from behind the middle, apex of each somewhat pointed. Beneath and legs punctured, sides with a few very short white hairs.

Length, 6 lines. Breadth, $2\frac{1}{4}$ lines.

Hab.: N. W. Australia.

MELOBASIS IGNICEPS.

Æneo-fusca; capite igneo-cupreo, albopiloso; thorace punctato, lateribus rotundatis; elytris punctatis, lateribus postice denticulatis, utrinque lineis duabus elevatis irregularibus ornatis. Subtus punctata.

Head fiery-red, rugosely punctured, covered with silvery hairs. Thorax, at the base, three-quarters as long as wide; anterior margin rounded, slightly produced at the angles; sides rounded, posterior angles acute, being slightly produced towards the shoulders; base, with a largely rounded median lobe; surface punctured, especially on the sides; dorsal line indicated at the base by a large puncture; sides, each with a small ovate punctured depression just above the hinder angle. Elytra a little more than twice as long as wide, closely and rugosely punctured, each with two slightly raised vein-like lines uniting behind the middle, and not quite reaching the apex; sides sinuate above the middle, posterior margin denticulate; apex of each rounded. Beneath and legs punctured, covered with short white hairs.

Length, 7 lines. Breadth, 2 lines.

Hab.: N. W. Australia.

MELOBASIS LETA.

Capite thoraceque cæruleo-viridibus, punctatis; elytris viridibus, punctatis, costis quatuor cupreis utrinque ornatis, lateribus concoloribus, apicibus rotundatis. Subtus aureo-cuprea, punctata, pedibus antennisque cyaneis.

Head and thorax bluish-green, the latter with coppery reflections. Elytra green, each with four raised lines, and the margin cupreous. Beneath coppery-golden, legs and antennæ cyaneous.

Head punctured, covered with long white hairs. Thorax two-thirds wider than long at the base; anterior margin produced in the centre and at the angles; sides rounded, gradually converging to the base; widest just behind the anterior angles; base nearly straight; surface deeply punctured, especially at the sides; dorsal line faintly marked. Elytra nearly twice as long as wide, deeply punctured, each with four raised costæ; sides denticulate behind the middle, apex of each finely rounded. Beneath and legs punctured, covered with long grey hairs.

Length, 5 lines. Breadth, $1\frac{3}{4}$ lines.

Hab.: Australia, Swan River.

N.B.—I have another specimen almost entirely coppery.

MELOBASIS VIRIDICEPS.

Ænea; capite viridi, punctato; thorace punctato, lateribus rotundatis, basi recta; clytris punctato-striatis, interstitiis nonnihil elevatis, marginibus posticis denticulatis, apice acuta. Subtus punctata, pedibus anticis viridibus.

Bronzy; head and front legs green. Thorax with greenish reflections on the sides.

Head punctured, covered with scattered short white hairs. Thorax three-quarters as long as wide: anterior margin slightly rounded in the middle and produced at the angles; sides rounded, base nearly straight; surface deeply punctured, especially on the sides; dorsal line smooth. Elytra rugosely punctate-striate, twice as long as wide; posterior margins finely denticulate; apex pointed. Beneath and legs punctured.

Length, 5 lines. Breadth, 2 lines.

Hab.: N. S. Wales.

MELOBASIS OBSCURA.

Cupreo-ænea, punctata; capite capillis albis brevissimis obsito; thorace lateribus rotundatis; clytris subtiliter punctatis, marginibus posterioribus denticulatis, apicibus rotundatis. Subtus viridi-purpurea, pedibus anterioribus antice viridibus.

Coppery-bronze. Beneath with green reflections, front legs green anteriorly. Head deeply punctured, covered with exceedingly short, scattered, white hairs. Thorax, at the base, three-quarters as long as wide; anterior margin rounded in the middle, and slightly produced at the angles; sides rounded, base straight; surface closely punctured and transversely rugose, punctuation larger on the sides. Elytra slightly wider than the thorax at their base, one and three-quarters longer than wide, rugosely punctured, with two faintly raised irregular lines on each; sides sinuate below the shoulders; posterior margins denticulate; apices rounded. Beneath and legs punctured; sides with a few scattered silvery-white hairs.

Length 5 lines. Breadth, 2 lines.

Hab.: Adelaide.

MELOBASIS VIRIDIS.

Viridis; capite thoraceque punctatis; thoracis lateribus post medium rotundatis; elytris punctatis, lateribus postice denticulatis, apice utrinque rotundatâ. Subtus punctata.

Bright green, suture posteriorly very finely margined with purple.

Head flat in front, deeply and closely punctured. Thorax, at the base, three-quarters as wide again as long; anterior margin rounded, slightly produced at the angles; sides rounded, their greatest divergence being just behind the middle; base straight; surface closely and transversely punctured, especially on the sides. Elytra twice as long as wide, deeply and closely punctured, each with two very faint raised lines on the disc; sides slightly sinuate above the middle, finely denticulate posteriorly; apex rounded. Beneath and legs deeply punctured.

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

Hab.: Adelaide.

NOTE.—I have one specimen in which the elytra are of a golden-copper hue.

Spencer Park, Wandsworth:
30th October, 1876.

NOTES ON BRITISH TORTRICES.

BY CHAS. G. BARRETT.

(continued from vol. xii, page 8.)

Stigmonota dorsana, Fab., and *orobana*, Tr.

My former notes on these species (E. M. M., x, p. 148) were written from insufficient information; for instance, *Orobans niger*, as pointed out by Dr. F. Buchanan White, is a rare Highland vetch, and could not be the food-plant of a species found in the North of England.

For some years past, my friends Mr. J. Sang of Darlington, and the late Mr. T. Wilkinson of Scarborough, endeavoured to work out the life-histories of these two species, with, until the past season, but partial success.

Orobana appears to be exceedingly local, and is found on the cliffs to the north of Scarborough, among *Vicia sylvatica*, over which plant it flies commonly on sunny afternoons in July. It has also repeatedly been reared from larvæ in the pods of that plant. Mr. Sang thus describes the larva:—"When full-fed, dark yellow, with a decided brown tinge; head and second segment nearly black; spots prominent. When younger, some are lighter yellow, with the spots distinct but not so prominent." Full-fed early in September, when it leaves the seeds and spins a tough cocoon among rubbish.

I reared this species myself last July from pods of *Vicia sylvatica* received from Mr. Wilkinson.

Dorsana appears to be more widely distributed. Mr. Hodgkinson took it at the end of May, 1844, at the Pass of Killiecrankie, and it occurs near Darlington, Scarborough, and Newcastle-on-Tyne. It is taken among *Orobus tuberosus*, and for years Messrs. Sang and Wilkinson found larvæ in the pods of that vetch, which are thus described by Mr. Sang:—"The larva in *Orobus* pods, which I take to be *Dorsana*, is as large as that of *Orobana*, but deep yellow, *without* the brown tinge, and the usual spots invisible. *Head very little darker than the body.* It shows no external trace of its presence in the pods, which must be opened to find it. It eats right through the middle of all the seeds, and then goes, I think, to other pods, but still without there being any mark to show that it has done so. Full-fed generally at the end of July. Spins a thick cocoon among rubbish, or, in confinement, often within the empty split pods of the vetch."

It is only in this last season that this larva has been reared. A very fine ♀ *dorsana* emerged on June 17th from larvæ in pods of *Orobus tuberosus*, sent by Mr. Wilkinson in the previous summer.

Mr. Sang has found larvæ precisely similar in pods of yellow vetch (*Lathyrus pratensis?*), and probably these also will belong to *dorsana*; but it is difficult to pronounce with certainty, since larvæ precisely like those of *Orobana*, found in pods of *Genista tinctoria*, produced *Catoptria ulicetana*.

As Wilkinson confused the two species, or rather described and figured *Orobana* under the name of *dorsana*, it may be well to point out the distinguishing characters. *Dorsana* is blackish-brown; fore-wings narrow, pointed, with oblique hind margin; costal streaks indistinct; dorsal blotch *elbowed*, and uniformly narrow. *Orobana* is olive-brown; fore-wings broader than in *dorsana*, not pointed; hind margin rounded; costal streaks white and very distinct; dorsal blotch broad, curved, and clubbed.

Eupæcilia hybridella, Hüb. (*carduana*, Z.).

This species was reared by the late Thomas Wilkinson of Scarborough from the seed-heads of common cow-thistle (*Sonchus oleraceus*). He gave me no description of the larva, but wrote: "These larvæ are very hard to keep in confinement until they make their cocoons. They usually change to pupa in May. I know of no larvæ that feed up so rapidly as they do." From this, it is evident that they remain as larvæ in the cocoons for nine or ten months. I have seen reared specimens, which are undoubtedly *hybridella*.

METAMORPHOSES OF *XYLOPHAGUS CINCTUS*, F., AND
X. ATER, F.

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

When in Braemar a year or two ago I occasionally came across some very curious dipterous larvæ, living under the bark of dead pines and birches. These larvæ, though found on such very different plants, were so similar in appearance, that I concluded that they belonged to one species; and it was only on rearing them to the perfect state that I found that the one under pine bark belonged to *Xylophagus cinctus*, F., and the other to *X. ater*.

The following is a description of the larva and pupa of *X. cinctus*, from notes made at the time:—

Larva cylindrical, slightly tapered to each extremity; shining dirty whitish; integuments tough; segments twelve. The head is a shining black, horny, triangular beak, slightly flattened, and with the apex prolonged. Near the middle of the prolongation is a narrow longitudinal furrow (or opening?) on each side. On each side of the centre of the apex is a slit or furrow, and near the apex below is an oval opening (the mouth). The head is furnished with a few erect brown hairs. The 2nd segment is much wider than the head, and nearly covered above with a square chocolate-coloured sealy plate, lacerated in several places, more especially by two longitudinal lines which divide it into three equal parts. Near the posterior angles of the plate are the oval spiracles. There is a trace of the plate on the under-side of the segment, on the outer and anterior edges, widest at the anterior angles, and nearly obsolete in the centre of the anterior margin. Between the 2nd and 3rd segments is a series of small, square, brownish scales, rounded at the ends. This series is continued all round the division between the segments, but is more or less interrupted at the sides, and the scales are half on one segment and half on the other. There are similar series between all the other segments, but the scales are smaller and placed in a double row, one on each side of the fold. 3rd and 4th segments, with shining chocolate-coloured plates, as on the 2nd, but narrower (on the 4th narrower than on the 3rd), and lacerated in a similar manner. No plates on the under-side, and no spiracles. 5th to 11th segments similar to each other. At the centre of the anterior margin (except of the 11th segment above) is a rather broad space (occupying about one half the breadth), covered with rows of erect brownish corneous points, small in the three or four uppermost rows, but larger, and connected—the points of one row with those of the other—by corneous ridges in the two lower rows. About a fourth of the length from the hind margin is a row—going round the segment (except on the under-side of the 5th)—of flattened spiny hairs, of various lengths, adpressed and directed backward; and (except on the 5th segment) halfway between this row and the front margin, is a short oblique row of small brown scales (similar to those between the segments), lying halfway between the mesial line and the sides. The under surface of the segments is like the upper, but the oblique line is longer. On the side of each segment is a spiracle (small, round, and apparently “blind”), with a short, stout, triangular spine below it. The 12th segment is quad-

rate, rounded at the apex. A diamond-shaped, shining, chocolate-coloured plate occupies the apical third, and the vestiges of a plate covering the rest of the segment are apparent in two longitudinal patches on each side of the anterior angle of the diamond. Near the posterior angle are two short horn-like points, divergent and curved upwards, each with three or four brown hairs. Apex of the horns black. Anterior, and a little exterior to the base, of the horns, are the large, oval, black spiracles. The under surface of the segment is convexly rounded, with, near the anterior margin, a fleshy oval proleg, in the centre of which is the anal opening. Round the margin is a double series of corneous points, and a V-shaped line of similar points is situated on each side, and attached by one arm of the V to the oval circlet of points; the open end of the V faces forward.

The pupa is cylindrical, slightly narrower in front and tapering behind. Dirty yellowish-ochreous in colour (ochreous-olive, darker at the sides, and head and thorax shining blackish-brown before the exclusion of the imago). Head, thorax, and appendages not very separable. Head situated in front of thorax; hind-margin deeply bisinuate. In front of the head are two "respiratory tubes;" these are joined together at the base for a short distance, and are then abruptly (at right angles) bent outward and slightly downward; below they are joined to the head for a short way by a thin membrane; below them two tubercles represent (perhaps) the antennæ-covers. From the head there arises behind on each side a semi-circular row of long, curly, pale brown hairs.

Thorax: the leg-coverings lie parallel to each other, between the wing-covers, which are of the same length as the third pair of legs, and show the nervures.

The spiracles (one on each side of thorax and of the first seven segments of the hind-body) are prominent and truncate at the apex, which is hour-glass shaped, but cleft to the base at the middle of the anterior side. Hind-body with eight well-marked segments (the last segment consisting perhaps of two united segments). Round each of the first seven segments runs, near the hind margin, a row of long brown, spiny hairs; a short, stout spine within and below the base of the spiracles; and below that again is a slightly-curved impressed line, running longitudinally across the segment, and a similar line on the outer side; and on the ventral surface an impressed line runs obliquely from the longitudinal lateral line to the posterior ridge, and bears short, flat, triangular spines. Eighth segment somewhat quadrate, with a conical end. Above, at the base of the cone, is a semi-circle of spines, of which the end ones are largest and situated on a tubercle. The cone terminates in two conical, spiny points; below, at the base of these two conical points, are two shining callosities; in front of them two others not so shining; and in front again two more. About the centre of the segment are two rugose tubercles, and near the edge of the segment, on each side, a deep, longitudinal furrow.

Length of ♀ five-eighths of an inch; ♂ similar, but much more slender, and length nearly half an inch.

A day or two before the imago emerges the colour of the puparium is darker and the hairs on the hind-body of the imago are so distinctly visible that they look as if they were on the exterior surface of the puparium.

The larva lives beneath the bark of dead fir trees (*Pinus sylvestris*), where it feeds on other larvæ. I once saw one with a small yellowish dipterous larva impaled on the beak-like head, and I

believe it sucks the juices of its prey. The larva hibernates, becoming a pupa about the end of May or June, and the imago emerges in June and July. The pupa is found in the decaying matter between the bark and wood of fir trees. The imago may often be found resting on the bark of the same trees.

Zetterstedt (Diptera Scandinaviæ, i, 129) says that *X. cinctus* inhabits the trunks of *Pinus* and *Abies*, and gives a short description of the pupa. He reports it as rare in the south, but more frequent in the north of Scandinavia. I am not aware that *Xylophagus cinctus* has been previously recorded as a native of Britain.

Xylophagus ater. I am sorry that I cannot give a detailed description of the larva and pupa of this species, because till I reared the imago I considered the larvæ that I found to belong to the same species as those of *X. cinctus*, to which they have a very great resemblance, and consequently I omitted taking notes. The larva lives between the bark and the wood of dead birch stumps, almost invariably in company with the larva of *Pyrochroa pectinicornis*, on which it probably feeds, though I never saw it attacking that or any other insect. The habits and times of appearance of *X. ater* are the same as those of *X. cinctus*. Zetterstedt (i, 128) states that the imago frequents the trunks of living birches in North Scandinavia, and of aspens in South Scandinavia. At p. 2947 (vol. viii) he says: "Larvæ hujus speciei in larvis Pyrochroæ coccineæ prædantes vivunt, teste D. Drewsen;" and in vol. xiii (p. 4929) he mentions that the pupa had been found under the bark of a beech. In the "Modern Classification of Insects" (ii, 536), Professor Westwood gives a short description and figure (127, 18 and 19) of the larva, from specimens sent by M. Van Roser, and found by him in decayed birch wood. Schiner, though he includes both species in his "Diptera Austriaca," gives little information regarding the larvæ.

As *X. ater* occurs in England, the larvæ will probably be found in company with those of *Pyrochroa coccinea*.

Perth: November, 1876.

Captures at ivy-bloom.—During the last half of October, I visited various places in the South West of England, and examined the ivy-bloom at each of the localities.

On the 14th October, I arrived at Tintern, and in the bright sunshine observed, among a number of *Vanessa Atalanta*, a specimen of *Grapta C. album*; in the evening I took *Dasyampa rubiginea* and a few *Cidaria psittacata*, the common species of *Noctua* being abundant. On the 17th, at Penzance, I found on the under-

cliff, between the villages of Newlyn and Mousehole, a quantity of ivy in a most luxuriant state of bloom, but the only species I noticed, beyond the common ones, was *Agrotis saucia*, which was rather plentiful.

On the 21st, I reached St. Mary's, Scilly, and found the ivy in the island of a most scanty description, and only observed two species of moths, viz., *Agrotis segetum* and *Miselia oxyacanthæ*. At Torquay, from the 27th to 31st, I took the following, viz., *Agrotis saucia*, *Xylina rhizolitha*, *Xylina semibrunnea*, *Xylina petrificata*, *Epunda nigra*, and *Cidaria psittacata*.—A. H. JONES, Shrublands, Eltham: 6th November, 1876.

Deiopeia pulchella at Torquay.—Whilst on a recent visit to Torquay, Mr. Terry of Babbacombe, showed me on his setting-boards two specimens of *Deiopeia pulchella*, the one taken by him on the 17th October, at rest on a spray of ivy-bloom, and the other on the 19th, on a rock, both in the same locality near the sea. They are now in my possession.—ID.: 6th November, 1876.

Deiopeia pulchella at Brighton.—A specimen of this somewhat scarce moth was taken a few weeks ago on the race-hill, just above my house. The insect appears to fly about dusk.—GEO. DAWSON ROWLEY, Chichester House, East Cliff, Brighton: 21st October, 1876.

Deiopeia pulchella at Neath.—I have much pleasure in notifying the capture here of *Deiopeia pulchella*, which will probably be an interesting note for the Magazine.

Ever since our capture of the American *Danais Archippus*, all my people here have been very keen in bringing me specimens of all sorts—and to-day one of my men brought me a noble specimen of this lovely insect (*Deiopeia pulchella*), in excellent order. It was caught flying in the day-time on a wild hill-side, where two years ago a wood was cut down, and now there is a strong undergrowth of shrubs, briars, and fern.

The best general captures of late are *Agrotis saucia* and *Epunda nigra*, which latter seems especially partial to the flowers of *Arbutus*.—JOHN T. D. LLEWELYN, Ynisgerwn, Neath: October 19th, 1876.

Is Dianthæcia cæsia double-brooded?—Is it not likely that the fresh specimens of *Dianthæcia cæsia* taken by Mr. Birchall in August (E. M. M., vol. xiii, p. 143) were the produce of the June moths? Several years ago, when taking *D. cæsia* and *capsophila* in June, in the same locality as Mr. Birchall took his specimens, I also at the same time found larvæ of *capsophila* in all stages of growth; and many of these larvæ produced imago in two months, that was, in August following.

I did not then get any larvæ of *cæsia*, but it appears not improbable that two such closely allied species, flying together in June, and the larvæ of both feeding on the same food (the seed-capsules of *Silene maritima*), should have a history pretty much in common.—GEO. T. PORRITT, Highroyd House, Huddersfield, November 6th, 1876.

Description of the larva of Epunda lutulenta.—My knowledge of the history of this species is not quite so satisfactory as I could wish, as a brood of larvæ I fed

from eggs received on the 20th September, last year, from the Rev. P. H. Jennings, M.A., of Gravesend, died off before having undergone their last moult. It is very likely however that the adult markings had been assumed, though as *Epunda lichenea* totally changes in appearance (from green to brown) at the last moult, it is quite possible that *lutulenta* may do the same. However, as Mr. Jennings was unable to send me eggs again this year, it is perhaps advisable to say as much about it as I know.

The egg is distinctly ribbed; at first it is pale yellow, but soon becomes pink, it has a rather large purple spot in the centre, and is encircled with a conspicuous band of the same colour. Before hatching (which event took place on the 16th of the following month), they changed to deep slate colour.

The newly emerged larva is hairy, dark green, the head black. Not being able to procure the reputed food, I tried them with a large variety of other low plants, and eventually they settled and promised to do well on ordinary garden grasses. They grew exceedingly slowly however, and began to hibernate when not more than a quarter of an inch long. Before the middle of February they recommenced feeding, and then, in preference to grass, on dock and other low plants. At the end of April, I described them as follows:—Length, about an inch, of moderate bulk in proportion, and uniformly cylindrical throughout; the head has the lobes full and rounded, and is about as wide as the second segment; segmental divisions distinct, skin smooth and semi-translucent; a few very minute hairs which are most noticeable on the head.

Ground colour, a pleasing bright apple green, yellowish at the segmental divisions; the head also bright green and polished; dorsal stripe composed of a dark green pulsating vessel; subdorsal lines clear and distinct, yellowish-white; spiracular stripes rather broad and very conspicuous, white, tinged with green; spiracles distinct, clear white. Ventral surface, legs, and prolegs, uniformly bright green, with the segmental divisions yellowish.

After the end of April, we had several weeks of almost continuous east wind, with intensely cold weather, to which every larva succumbed.—*Id.*: November 8th, 1876.

Note on Epunda lutulenta, var. luneburgensis.—On looking at my series of this species, I find one specimen (received from Dr. Trail, and taken near Aberdeen) which agrees exactly with H.-S. 428, *luneburgensis*. Another example from Forres (Mr. Norman) is like H.-S. 405, *lutulenta*, but rather smaller, and not markedly different from my English examples.—F. BUCHANAN WHITE, Perth: November 1st, 1876.

Larva and food-plant of Pachnobia hyperborea (alpina, Westw.).—On the night of the 26th July last, I found at rest, near the top of Schiehallion, a ♀ specimen of this interesting species, depositing eggs on crowberry (*Empetrum nigrum*). Upon placing her in a box with some of the food-plant, the eggs were freely laid to the number of 21. The eggs when first laid, were a pale yellow, almost white, and afterwards changed to a reddish-brown. The young larvae hatched out in twenty days, and fed freely upon crowberry and bilberry, preferring the former.

The larvae now, November 16th, are about 4 lines in length, and of a dull brownish colour, with scarcely any markings, and when touched roll into a ring, similar to many of the *Agrotis* larvae. Dr. Staudinger's description of the pupa corresponds with one that I have from Rannoch, except that I fail to see *four* curved spines, mine has only *two*.

I quite agree with Dr. Staudinger, that the larvæ may hibernate twice, as the top of the mountain where my ♀ was caught is now covered in snow, and will remain so till next May.

I have never caught a specimen at a less elevation than 3,000 feet, in fact the highest points at which the food-plant exists, and every specimen caught is hard earned; what with the dense fog and extreme cold it is almost unbearable to stay upon the mountains all night, but once up you must stay there till morning or risk a broken neck in the descent. They do not appear to come to sugar, but fly wildly about in front of the thick fog or mist, which makes it necessary to wring out your net every few minutes.—E. G. MEEK, 56, Brompton Road, S.W.: November, 1876.

Anesychia bipunctella, Fab. (*echiella*, Hübn.)—A single specimen of this beautiful species (of which Mr. Stainton says in the Manual “reported to have been taken many years ago near Aylesbury and Dover,” and which was placed by Mr. Doubleday among the *reputed* British species) was sent to me a few days ago for identification. It was taken flying over a patch of *Echium* on the south coast of Kent, in August last, by Mr. F. W. Andrewes, of Reading. It is highly satisfactory to see this handsome species—one of the largest of the *Tineina*—restored to our lists.—CHARLES G. BARRETT, Pembroke: 15th November, 1876.

Notes on some Tineina observed in 1876.—*Dasytoma salicella*: bred from larva feeding on *Populus tremula*.

Ornix anglicella: bred from larvæ feeding on *Pyrus torminalis*. Both larva and imago have been compared with authentic specimens of *anglicella* from hawthorn.

Laverna epilobiella, Römer: having attended to this species during three years, I am able to say that the accounts of its pupation given at p. 184, vol. xi, “Nat. Hist. Tim.,” and by me at p. 238, vol. xi, “Ent. Mon. Mag.,” though appearing contradictory, are quite reconcilable. In the state of nature, as I found by examining the food-plants in its habitat, the full-fed larva quits its mine and makes a new one (in some uninjured portion of the growing leaf), of a size about sufficient to contain its cocoon, which it then constructs within; and it does the same in captivity when it has only healthy growing plants standing quite free of each other within reach. When, as is usually the case in confinement, the plants are injured, crumpled, or more or less dried or decayed, the larva avails itself of any convenient corner to spin its cocoon in. One or two larvæ spun up in their old mines; and one upon the soil, its white cocoon being coated all over with earth.

Tischeria dodonea: bred this for the first time. Having kept the larvæ in a nearly air-tight glass in a cold place till the middle of May, I then placed them upon moss and moistened the surface of their mines daily, or every second or third day, as the heat and dryness of the air varied; by these means, breeding twenty-one moths from twenty-three unstung larvæ. About two-thirds of the larvæ fall a prey to parasites.

Tischeria angusticollis: some larvæ of this insect were full-fed in August, and some attained the moth state the same month in a state of nature; other larvæ quite young appearing in October. The larva of this insect, like the others of its genus, remains unchanged through the winter.—J. E. FLETCHER, Pitmaston Road, Worcester: October, 1876.

Thecla W-album in *Worcestershire*.—As I believe this insect has been only once recorded from this district (E. M. M. ii, 183), it may be worth while to state that a young collector recently informed me that he caught numerous specimens on thistles, near Powick, on one day in the beginning of July, 1875; and, also, that I caught a single worn example on the 24th of July last, at the same place.—ID.

Galls of Nematus gallicola occurring over water.—A colony of the larvæ of this insect inhabits a willow growing by the river Teme, at Powick, the vast majority of which occur on the branches overhanging the rapid current of water. This, being contrary to the received opinion of the creature's habit, seems deserving of notice.—ID.

Morayshire Noctuæ and Hemiptera-Heteroptera.—During the past season, I have only added two species of *Noctua* to the list of Morayshire insects: these are *Xylophasia lithoxylea* and *Tethca subtilsa*; the first at sugar, the latter from heather near aspens at Relugas.

In turning over stones in a pine wood here, I find a rather rare bug, *Eremocoris plebeius*, not uncommon; yesterday I took thirty-one specimens, and saw others in the larva state. This is probably the same locality that yielded the first British specimen to Mr. Hislop, for I remember this gentleman often searched the wood for *Coleoptera*.—G. NORMAN, Cluny Hill, Forres: 15th October, 1876.

Scarcity of autumnal Homoptera.—On the 18th October, at the foot of the Addington Hills, I beat out of various trees, but chiefly Scotch and spruce fir, *Psylla pineti*, Flor., *Ps. fumipennis*, Först., *Trioza hematodes*, Först., and *T. albiventris*, Först., and from whitethorn *Psylla mali* var. *rubida*. The first two, although not rare, were not so plentiful as on the 26th October last year at the same place, the others were very scarce, more so than a year ago; and *Psylla ferruginea* and *Aphalara polygoni*, then taken sparingly, did not now appear at all.

Typhlocybidæ, of which many species occur at this season in abundance, were very scarce; this has also been the case elsewhere within my knowledge, for, at Lec, such species (notably *T. ulmi*, which in windy weather settles on the fences and sits on my windows by dozens) have been only casual visitors. I think there can be but little doubt that the continued rough weather of September and first half of October played havoc among these tender legions, and that their typical habit of moving from one side of a leaf to the other did not avail against the wind that swept and the rain that washed both sides.—J. W. DOUGLAS, Lec: 31st October, 1876.

On the transformation of Trombidium.—I read Mr. R. H. Meade's note on parasitic *Acari* in the last No. of Ent. Mo. Mag. It may interest you to know that I have bred, several times, the scarlet *Trombidium* that infests *Phalangidæ*, and have invariably found them turn into the oval pupæ (?) he mentions. These pupæ, however, I have only once succeeded in keeping alive, and that one occasion a scarlet, velvety, 8-legged mite emerged after twenty-two days. I also noticed that the *Trombidii*, after the death of the "harvest men" on which they fed, would kill one another, and that they would feed on other insects, *e. g.*, on bluebottle flies, and once on a Lepidopterous larva.—T. D. GIBSON-CARMICHAEL, All Saints' Parsonage, Newton Stewart, N.B.: October, 1876.

Meloë and Mylabris as cures for hydrophobia.—At the Meeting of the French Entomological Society, 13th September, 1876, M. Reiche communicated the following notes, sent to M. de Sauley (père) by his correspondent M. Chevavarie from Gabès, in Tunis. The latter says :—“ I make known to you the Arab remedy for hydrophobia. “ It consists of two species of beetles, of which I send specimens. They were given “ to me south of the Ouderna by a man of the tribe of the Amerna ; he possesses a “ dozen, which he guards preciously. In giving them to me, he detailed their virtues, “ and explained fully the mode of application. On my return to Gabès, I spoke of “ this remedy to a very intelligent Arab ; he assured me that all that had been told “ me was very true ; that it was recorded in their books on medicine, in which one “ reads that the *Dernona* (the insect) cures hydrophobia when administered within “ 20 days of the bite : that it should be given to the patient in a portion the size of “ a grain of wheat in a morsel of food. This insect has very powerful vesicant pro- “ perties, according to the Arabs, and it would be dangerous to increase the dose. “ The Arabs are unanimous in affirming that the remedy is effectual, but it acts only “ during the first 18 or 20 days. It appears, also, beyond doubt, that it occasions “ dreadful colics, so that, being a remedy of extreme violence, it should only be ad- “ ministered with the greatest prudence.”

M. Reiche says that the *Coleoptera* belong to *Meloë tuccius*, Rossi, and *Mylabris tenebrosa*, Castelnau, extremely vesicant species ; and he remarks that the employment of *Meloë* in this way has been long known. He thinks that too much publicity could not be given to the notice in order to induce medical men to try the supposed remedy for this frightful disease.

[Without expressing any opinion as to the value of this supposed remedy, we would remark that the belief in it by the Arabs of the present day is evidently only the remnant of a faith at one time far more general. Hagen's "Bibliotheca Entomologica" contains about 15 references to works (mostly published in the last century), in which *Meloë*, *Cantharis*, and especially *Melolontha*, are credited with curative powers in this disease. Or more probably the word "preventive" would be better than "curative." The "intelligent Arab's" statement does not appear to us to show that the "remedy" has any effect when the disease has manifested itself ; and it is always open to the incredulous to say that no virus had been received into the blood (and hence the disease not incubating), in those cases where no ill effects followed a bite, if the "remedy" had been administered within the stated time. We observe in the *Bullettino* of the Italian Entomological Society, just received, viii, pp. 229—233, a letter from Dr. Sansino to Professor Targioni Tozzetti, on *Mylabris fulgorita*, Rehe., used in Egypt as a preventive for hydrophobia. In this, various references are given to medical works bearing on the subject.—EDS.]

The Doubleday Collection.—As many of the readers of the *Entomologists' Magazine* are aware the hours for visiting the Collection have been from 10 a.m. till 5 p.m., I beg to forward for publication the following letter.—D. PRATT, *Secretary*, East London Entomological Society, 333, Mile End Road, E. *South Kensington Museum, London, S.W.*: 1st day of November, 1876: *Bethnal Green Branch Museum.*—Sir,—In compliance with the wish expressed by the Members of the East London Entomological Society in the letter received from you to-day, I beg to acquaint you that arrangements have been made for the Doubleday Collection at

the Bethnal Green Branch Museum, to be open for inspection until 9.30 p.m. on Tuesdays. I am, Sir, your obedient Servant, P. CUNLIFFE OWEN, *Director S. K. M.*
To D. PRATT, Esq., 333, Mile End Road, E.

Review.

THE BUTTERFLIES OF NORTH AMERICA, with coloured drawings and descriptions; by W. H. EDWARDS. Second Series, parts iv and v; New York, Hurd and Houghton, 1875, 1876. 4to.

These two parts fully sustain the reputation of Mr. Edwards' magnificent work. Part iv is occupied by three species of *Argynnis*, one of *Melitæa* and its transformations, two of *Grapta*, and *Papilio brevicauda*, which latter appears to be quite distinct from *Asterias*, differing not only in the short tails, &c., of the imago, but also considerably in the larva. Part v comprises *Colias Philodice* and its transformations and variations, occupying no less than fifteen figures, some of the varieties, especially a melanic ♂, being very curious and interesting; three species of *Argynnis*, and *Apatura Clyton*, varieties *ocellata* and *Proserpina*, with full illustrations of transformations.

As usual, the engraving and colouring, and the minute care shewn in investigating the history of each species, leave nothing to be desired, and, considering the heavy expense the production of such a work must entail, we hope the author may receive such encouragement as will enable him to continue it beyond the second series.

ENTOMOLOGICAL SOCIETY OF LONDON: 1st November, 1876.—PROF. WESTWOOD, M.A., F.L.S., President, in the Chair. Professor Katter, of Putbus, Island of Rügen, was elected a Foreign Member.

Mr. F. Smith exhibited thorns of an *Acacia* from Natal, inhabited by a species of ant (*Pseudomyrma*) of the family *Cryptoceridæ*. These thorns were several inches in length, and the nests of the ant were formed in the hollow interior.

Professor Westwood exhibited larvæ of *Lasiocampa rubi* from Deal, found feeding on *Hippophae rhamnoides*; the finder stating that he had suffered much irritation from the hairs of the larvæ entering the skin. He also exhibited a very curious Coleopterous larva from Zanzibar, about half an inch in length, oval and flattened, steel-blue in colour, and furnished with singular clavate antennæ. Likewise a specimen of *Hesperia Sylvanus*, to the haustellum of which were attached several pollen-masses of an Orchid. Furthermore, he exhibited the pseudo-bulb of an Orchid from Ecuador, received by Mr. Hewitson, the interior of which was hollowed out, and in it were found no less than six species of cockroaches of large size, including *Blatta orientalis*, *americana*, *maderæ*, *cinerea*, and two undetermined. He called attention to an exhibition of noxious and useful insects recently held in Paris.

Mr. Champion exhibited a singular Hemipterous insect (*Mustha spinosula*) from Besika Bay, sent by Mr. J. J. Walker.

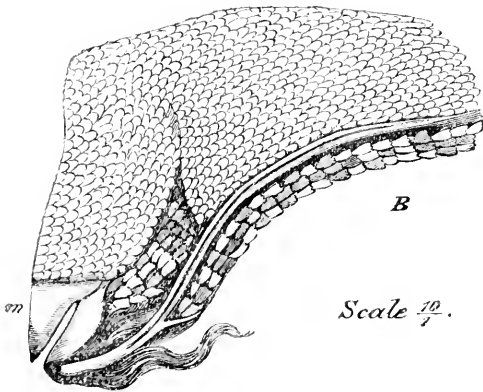
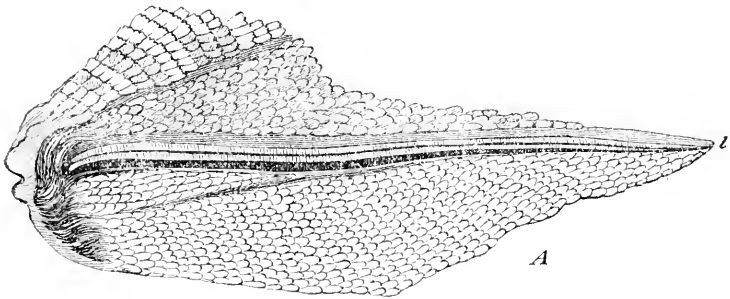
Mr. Dunning communicated supplementary notes on the genus *Acentropus*, chiefly from the researches of Mr. Ritsema. The latter (who had bred apterous females) was inclined to consider there were two good species, but Mr. Dunning said that the arguments used had failed to convince him of this.

Part iii of the "Transactions" for 1876 was on the table.

ON STRIDULATION IN THE GENUS *VANESSA*.

BY A. H. SWINTON.

The earliest record (with which I am acquainted) of stridulation in this genus of butterflies will be found in the Transactions of the Entomological Society of London, new series, 1852, vol. ii, Proceedings, p. xviii, where the Rev. Joseph Greene informs us, that on the 8th December, when out on one of his autumnal diggings for pupæ in Buckinghamshire, he came to a beech tree on a high bank, the roots

Scale $\frac{10}{7}$.

- A. Basal portion of fore-wing of *Vanessa Io*; showing limba (?) or anal vein beneath.
 B. Basal portion of hind-wing; showing costal vein on which the limba works. *m* is a transparent patch to impress (probably) the vibrations so produced on the air.

of which formed an arch about a foot in height, and faced the north, the opening being quite exposed to rain, snow, &c.; and, as he was on the point of inserting a trowel into the cavity, he heard a faint hissing noise, and to his surprise he found that, in searching for heterocerous pupæ, he had startled a colony of Peacock-butterflies

(*V. Io*) wintering there with shut wings. He tells us:—"Two were attached to the concave part of the arch, the third was on the ground, and the noise I heard proceeded from it;" and adds: "the noise resembled that made by blowing slowly, with moderate force, through the closed teeth; and while making it, the wings of the butterfly were slowly *depressed and elevated*." Apparently doubting the evidence of his senses, Mr. Greene pushed off another of these insects, "which immediately commenced the same movement of the wings, accompanied by a similar noise." That it was the testy temperament of the performers that thus sought vent, as spoilt children's cry when awaking from sleep, he next afforded an ingenious proof. Pointing the trowel at one of the performers that had expended its spite, and closed its wings again to slumber, he saw it immediately turn towards it, and recommence the noise and motion with renewed vigour; and he noted that whenever this experiment was repeated, the same querulous manifestation ensued.

The next record of this strange phenomenon on the part of this butterfly, for which I have adopted the term "stridulation," in conformity with the accepted nomenclature when speaking of similar manifestations of the stimuli of the passions, in *Orthoptera*, *Coleoptera*, and *Hymenoptera*, (may I add *Hemiptera*, and *Diptera* ?); will be found also shortly after in the same publication. Mr. Hewitson, whose collection of, and taste for, butterflies is well known to naturalists, writing on the 28th of January upon the conduct of a Peacock-butterfly that had been hibernating since the first hoar frosts,—we presume on the ceiling or wall of his sitting-room at Weybridge,—says (Trans. Ent. Soc., new series, vol. iv, Proc. p. ii, 1856): "They had been cleaning my room and had driven it from its winter quarters. I had handled it rather roughly, which it resented by *spreading out its wings horizontally to their fullest extent, and rubbing them rapidly together*, it produced a distinct sound, like the *friction of sand-paper*. This it continued to repeat for some time, and seemed greatly exasperated."

I will now relate as corollary my own late observations of a kindred manifestation on the part of the sole *Tanessa* that thrives beyond the Cheviots, and will then proceed to describe the exact method in which each of these insects produces its stridor, and to consider its import and place among similar manifestations in Insecta, to the right interpretation of which I have spared neither time nor attention.

It may be conjectured that beneath pure Italian skies the portion of the year passed by the *Vanesside* in hibernation would be brief; but in more northern countries the few species that gladden the landscape shrink from encountering the first visits of the benumbing airs of winter. I took advantage of a singular opportunity thus afforded, during a sojourn in the Highlands, to investigate the capability of *V. urticae* for stridulation. On the 22nd of August, a dull day, when there had been a sudden fall in the temperature, a fresh brood of the Tortoiseshell-butterflies, newly sunning themselves at West Loch Tarbert, hastened from the fields to shelter and remain torpid, perchance to dream. I detached one of these, a female, hanging on cobwebs in an outhouse, and seated her, still drowsy, on the palm of my hand. Then with the other hand, touching lightly the tails of the hind-wings, I induced her to depress and shut the wings successively. Each time she testily performed this action I heard distinctly, as the fore-wings were brought forward, *when only the extreme basal portion of the wings were in contact, a soft sound, like grating sand-paper.*

In *V. urticae* then certainly, and in *V. Io* more than probably, it will be noticed, the sound produced by the vexed insect must have arisen from the friction of some hard parts at the basal portion of the wings; and if so, it had long struck me the analogy of the stridulation of the leaf-crickets would point to the possession of some chitinous serrature or file, situated on one of the veins, which would also account for the stridor having so distinct a sound-colour of sand-paper. Prepossessed with this idea, I submitted specimens of the wings of *V. urticae* and of *V. Io*, male and female, to an excellent microscope of several working degrees of power that I had borrowed expressly for the purpose, and I then found, whenever the under surface of a fore-wing of either insect was focussed and adjusted, the required file or serrature (lima) came at once to view, situated on the anal vein at its base, and running along it for one-third of its length, for which distance it is tumid, spindle-shaped, and bare of scales. In the case of *Io*, and I believe also of *urticae*, it was much more strongly developed in the female than the male, and the vein had a blacker, firmer consistence. In structure, this lima did not much differ from that which we find in a musical cricket or leaf-cricket (formed, as I have reason to believe, by an unusual development, which metamorphoses the various parts of the wing and protrudes the spiral thread that surrounds the hollow wing-veins as well as the tracheæ), but the teeth were somewhat less regular.

The vein that clasps this notched or filed one when the wings are rubbed together is not difficult to find in the costal vein of the hind-wing, recognisable by a bare raised surface, curved outwards, with a smooth bevel above where it comes in contact with this filed vein; but it likewise only presents this character at the base, for if we trace it outwards, we soon notice its upper surface to sink in a series of sharp notches beneath the feathery scales; the tasteful chequering, notching, and glossy colours of which serve to throw the bare veins bearing the parts of the instrument of music into relief. But this is not all: in each of these butterflies there is an organization which I would compare to the mirror of the males of the leaf-crickets in structure and object; for we find at the fore side of the costal vein the wing-membrane is bare in a little circular patch which is embossed, a provision, I conclude, to impress the musical tremours arising from the friction of the filed vein on the air.

Lastly, I think we may strictly infer, from the experiment of the Rev. J. Greene and the *séance* vouchsafed to myself, that the object of this stridulation in *Tanessa Io* and *urticæ* may be classed with those phenomena of rivalry and love so conspicuous in the *Orthoptera* and large *Hemiptera*, but of an intensity of expression marking a degree of intelligence little superior to that manifested in this direction by stridulating beetles, in which it has been most often alluded to under the epithet of fear. Yet I must here observe, *V. Io* will also utter this sound when disturbed in summing itself, and I have reason to think also when the male and female are coquetting in air. And here it is singular that the development of the file allows the female to take precedence of the ardent male, the reverse being the rule in musical insects generally.

In conclusion, I may mention that I have by me careful drawings of the musical organization in each of the insects specified; one of these (*antè*, p. 169) showing its appearance in the female *Io* beneath a strong microscopic power, is an illustration of a very perfect development of an insect-file in the *Lepidoptera-Rhopalocera*, or butterflies. It will scarcely be necessary to add that the stridulation of *V. urticæ* is improperly noticed in Hagen's *Bibliotheca Entomologica*, ii, p. 477, and that the reference there should be to *V. Io*.

NOTES ON BRITISH *TENTHREDINIDÆ* AND *CYNIPIDÆ*.

BY P. CAMERON.

Having this year had an opportunity of examining the *Tenthredinidæ* in Stephens' Collection, I give here a few of the most important notes which I made on the specimens. It would serve no useful purpose to mention all the misnamed species which I noticed, as in many cases four or five species, belonging to nearly as many different genera, are under one name, and frequently these bear no resemblance to the description of the species they are supposed to represent.

Hylotoma Leachi, Ill. Mand. vii, p. 17 = *ustulata*. *H. anglica*, p. 16 = *berberidis*.

Lophyrus pallidus, p. 21 =, I believe, *rufus*. *Pallidus* must, therefore, be deleted from our lists, as I know of no British specimens.

Pristophora varipes, p. 27 = *Cladius padi* and *C. difformis*. *P. atra*, p. 26 = *C. padi*. *P. duplex*, p. 26 = 1 *Nematus conductus*, Ruthe, and 1 *N. obductus*, H. *P. rufipes*, p. 26 = apparently *N. compressicornis*, Fab. (= ? *alvirorus*, Cam.), or a large specimen of *N. fulvipes*, Fall. *P. testaceicornis*, p. 26 = *ruficornis*, Ol. *P. pallipes*, p. 25 = *N. appendiculatus*, H. *P. testacea*, p. 25 = 1 *N. pallidiventris*, Fall., and 1 *N. ribesii*, Scop.

Euura cynips (of the collection, but whether of Newman is another matter) = 3 *N. Vallisnieri* and *Euura gallæ*. *E. gallæ* = ? a new species.

Black, shining: mouth, tegulæ, feet, and pronotum white: head a little testaceous behind the eyes: femora nearly all black, with a pale band on the under-side of posterior: posterior tarsi and apex of tibiæ broadly black: posterior tarsi nearly longer than tibiæ: antennæ nearly as long as the body, thin, 3rd and 4th joints equal: cenchri large, dull white: cerci long, slender, pale, pointing outwardly: terebra long, hairy, projecting: area pentagona very distinct: wings hyaline: stigma white, fuscous at base: 3rd sub-marginal cellule nearly square: 1st sub-marginal nervure distinct.

Comes near *N. dolichurus*, Th., but the coxæ and trochanters are pale, and the apex of the tibiæ and posterior tarsi are black. The antennæ are longer and thinner than in *N. cinereæ*, the area pentagona much more distinct, the band on the pronotum more conspicuous, and at the same time shorter and thicker.

Should this species prove (as I suspect it will) to be undescribed, I propose for it the name of *Nematus anglicus*.

Nematus bicolor, p. 27 = *Dineura stilata*. *N. gallicola*, p. 36 = *N. Vallisnieri* and a *Cryptocampus*. *N. proximus*, p. 36 = 1

N. ruficornis, 3 *N. conductus*, and a ♂ of a doubtful species. *N. intercus*, p. 36 = apparently a form of *N. appendiculatus*, or a species allied thereto. The first sub-marginal nervure is a little visible, and the posterior tarsi and apex of tibiæ black. *N. pallipes*, p. 27 = *N. appendiculatus*. *N. niger*, p. 37 = *ruficornis*. *N. melanostigma*, p. 35 = *Cladius difformis*. *N. ribesii* = *Dineura stilata* (mostly). *N. apicalis*, p. 31 = *D. stilata*. *N. bipartitus*, p. 32 = *N. myosotidis*. *N. 3-maculatus*, p. 31 = *N. ribesii*. *N. dimidiatus*, p. 29 = *melanocephala*, H. (*salicis*, Thoms.) *N. dorsalis*, p. 29 = *N. fulvus*, H., and 1 *N. bilineata* (*vide infra*). *N. melanopsis*, p. 29 = *N. dorsatus*, Cam. (Ent. Mo. Mag. xii, 129). The description of *melanopsis* given by St. Fargeau is not specific enough to warrant the sinking of my name: it will apply to more than one species. *N. flavescens*, p. 29 = *N. testaceus*, H. *N. testaceus*, p. 29 = an immaculate specimen of *N. fulvus*, H. *N. vittatus*, p. 34 = mostly *N. miliaris*, Pz. (*viridis*, H.) *N. capreae*, p. 33 = *N. miliaris*. *N. tæniatus*, p. 34 = (I think) *N. pallipes*, Fall., and *capreae*, Pz. (*Kirbyi*, Th.) *N. hæmorrhoidalis*, p. 35 = *capreae*, Pz. *N. analis*, p. 35 = a ♂ of a doubtful species. *N. fumipennis*, p. 35 = *N. abdominalis*, Pz. (*ventralis*, H.). *N. fuscipennis*, p. 31 = *abdominalis*. *N. Suessionensis*, p. 35 = *N. miliaris*. *N. fallax*, p. 34 = *N. capreae*. *N. affinis*, p. 31 = *capreae*. *N. oblitus*, p. 31, I could not determine. *N. interruptus*, p. 33 = *myosotidis*. *N. melano-sternus*, p. 33 = (I think) *N. fallax*, Lep. (*striatus*, H.) *N. gonymelas*, p. 34 = *N. miliaris*. *N. nigricornis*, p. 37 = *N. miniatus*, H. *N. cinctus*, p. 37 = *N. lucidus*, Pz.

Athalia annulata, p. 44 = *A. rosæ*. I have never seen a British specimen of *annulata*. Has anyone else?

Selandria fulvicollis, p. 47 = *Blennocampa melanocephala*. *S. Spinolæ*, p. 46 = *hyalina*, Kl. *S. melanocephala*, p. 78 = *Hoplocampa pectoralis*, Th. *S. funerea*, p. 50, is wrong. *S. versicolor* (Newman) is apparently *B. hyalina*. *S. alternipes*, p. 52, is wrong. *S. uncta*, p. 54 = *Taxonus glabratus*. *S. tenuicornis*, p. 53 = a species I have in my collection under the name of *alchemillæ*. *S. lineolata*, p. 53 = a *Pæcilosoma*. The true *lineolata* has been bred by Mr. J. E. Fletcher of Worcester, so it may be added to our lists. *S. scapularis*, p. 46 = 1 *Dineura stilata*, and 1 *D. testaceipes*.

Hoplocampa plagiata and *fulvicornis*, p. 38, are wrong. *Plagiata* I think has been taken by the Rev. T. A. Marshall. *H. brevis*, p. 47, is represented by a small species of *Nematus*. It may be here mentioned that *H. chrysorrhæa* is British. .

Eriocampa consorta, *trista*, and *picea* (MS. names) = *E. aethiops*, Fab., see. Cam.

Allantus rufipes, p. 72 = *Taxonus glabratus*.

Emphytus immersus, p. 92 = ♂ of *Pæcilosoma obtusum*. *E. gilripes*, p. 73 = *E. grossulariæ*. *E. didymus*, p. 90 = *E. melanarius*. *E. nigricans*, p. 83, *cingulatus*, p. 89, *cereus*, p. 92, and *E. perla*, p. 89, are not in the collection; and, with the exception of *perla* (which I have taken at Rannoch), I have seen no British specimens, nor am I aware of any other record of their occurrence in this country.

Lyda stigma, p. 97, and *fumipennis*, p. 98 = *L. sylvatica*. *L. marginata*, p. 98 = *L. pratensis*. *L. fasciata*, p. 102 = *clypeata*. *L. fallax*, p. 99 = *L. hortorum*. *L. arbustorum*, p. 100 = *L. hortorum*. *L. cingulata*, p. 100 = *L. hortorum*. *L. flaviventris*, p. 101 = *L. depressa*. *L. varia*, p. 99, *lutescens*, p. 102, and *aurita*, p. 101, are not in the collection, and must be erased from our lists if native specimens are not forthcoming.

“*Melicerta ochroleucus*,” Ill., pp. 94 and 95, is a puzzle. It is represented in Stephens' collection by *Strongylogaster eborinus*, with which his specific description agrees, but not the generic one, *i. e.*, the clypeus is stated to be not emarginated, the 3rd antennal joint to be as long again as the 4th, the wings shortish, with only three sub-marginal cellules, the 2nd of which receives two recurrent nervures; and as the 1st cellule receives one also, this gives three recurrent nervures in all; and again, the 1st marginal cellule is stated to be small, so that it is clear that this description cannot have been taken from *eborinus*, unless from a remarkably aberrant specimen, differing in form of the clypeus, antennæ and wings from the ordinary form.

Hemichroa alni.—I captured a specimen of the ♂ of this species in Dunham Park, near Bowdon, in June last. It differs considerably from the other sex; it has no red on the head and thorax, the antennæ are testaceous, and the feet reddish-yellow. The ♂ is very rare in comparison with the ♀; but the ♂ of *H. rufa* seems to be much rarer; indeed, it is not, so far as I am aware, known at all, although the females are common enough, and have often been bred.

Dineura stilata.—The larvæ of this species have been very abundant during the present autumn, on the hawthorn hedges around Glasgow. They feed quite exposed on the face of the leaves, eating the upper epidermis: they are very sluggish, rarely moving even when

touched, and have a very powerful and nasty odour, somewhat resembling that given out by certain *Hemiptera*. Along some of the road-sides, I noticed that some of the hedges had quite a withered look, to such an extent had the leaves been devoured. The larvæ are found as late as the end of October.

Another destructive larva this year has been *Nematus pavidus*, Lep., = *Wttewaalli*, Voll. In several localities I noticed willows (generally *Salix caprea*) nearly denuded of their leaves by the voracious larvæ of this species. Like the larvæ of *D. stilata* they have a powerful odour and feed quite exposed, flinging the body in all directions whenever anything approaches. *N. miliaris*, Pz. (*viridis*, H.), is likewise frequently injurious to willows, but I have never seen it make such a clean sweep of the leaves as *N. pavidus*. The larvæ of *Lophyrus pini* have been unusually abundant here this autumn. I observed one small fir with many hundred larvæ on it.

Cræsus latipes, Vill. (see Ent. Mo. Mag. xii, 228).—Mr. J. E. Fletcher, of Worcester, has fortunately succeeded in breeding this species, and I have also bred it from larvæ sent to me by that gentleman, so that now there can be no hesitation in adding this insect to our lists. *Latipes* may be known from *septentrionalis* by its smaller size, the smaller clouded band in the anterior wings, the wings in *septentrionalis* being clouded from the stigma to the apex, whilst in *latipes* there is only a small cloud below the stigma, while again the posterior femora are reddish-brown underneath, these in *septentrionalis* being quite black on the under surface.

Our three species may be tabulated thus:

A.—Fore-wing more or less clouded.

Fore-wing distinctly clouded from stigma to apex; femora black underneath. ♂ antennæ black; apex of abdomen black.—*septentrionalis*.

Fore-wing with only a small faint cloud below the stigma, unclouded at apex; posterior femora reddish beneath. ♂ antennæ brown beneath at the apex; apex of abdomen entirely brownish-red.—*latipes*.

B.—Fore-wings unclouded.

Femora reddish above and beneath, black at apex.—*rarus*.

Nematus abbreviatus, Hartig, Blatt- und Holz-wespen, 205.—In the collection of Dr. Sharp I find a specimen of this species, taken by him in Braemar. The larva feeds on the apple; cf. Von Vollenhoven, Tijds. Ent., 2nd Ser. iii, 206, pl. 10.

Nematus imperfectus, Zaddach, Schr. Ges. Königsb. xvi, p. 80.—This recently described insect is British. It belongs to the *caprea* (= *Kirbyi*, Thoms.) group, and is very difficult to separate from *caprea*, although I dare say it is a good species.

Nematus longiserra, Thomson, Opusc. Ent. 632, 39; Hymen. Scand., i, 128, 55.—The only British specimens that I have seen of this insect are a ♀ and ♂ which I bred from larvæ found on *Salix caprea*, at Glenelg, in 1874; these larvæ having been collected in the belief that they were those of *N. histrio*, which I discovered on the same bushes two years before (see Ent. Mo. Mag., xi, 65). From this, it will follow that the larvæ of *longiserra* cannot differ much from those of *histrio*, or otherwise I should have noticed it, as I am well acquainted with the larvæ of the latter species; and it will be equally clear that *longiserra* cannot be the *Tenthredo nigrata*, Retz., a willow feeder, as Thomson seems to suggest. *Longiserra* is easily known from *histrio* by its having the last abdominal segment considerably lengthened above.

Nematus bilineatus, Klug.—From the remarks of Professor Zaddach in the above-quoted work, it appears that the supposed var. of *N. luteus*, with black marks on the thorax, which I described last year in this Magazine (xii, 130), is in reality *bilineatus*, which is a distinct species from *luteus*, as is proved by its having a different larva; though it is very like that of *luteus* in form and habits, yet being easily distinguished by the number of tubercles, &c. It is also stated by Zaddach that *N. Klugi*, Dbm., is not *bilineata* (which was described by Klug, Wiedemann's Zool. Mag., ii, 86); and in this case the name of *bilineata* must of course be retained.

The British species of the *luteus* group may be distinguished as follows:

A.—Head and thorax black; wings deeply infuscated.—*abdominalis*, Pz.

B.—Head and thorax for the greater part luteous.

a.—Abdomen broad at apex.

Mesonotum immaculate, stigma black at base, wings deeply smoky. ♂ mesonotum black.—*luteus*, L.

Mesonotum with two or three black marks, stigma scarcely black at base, wings slightly smoky, ♂ thorax luteous.—*bilineatus*, Kl.

b.—Abdomen narrowed at apex, stigma usually unicolorous, dorsum of abdomen with black bands, breast luteous.—*dorsatus*, Cam.

Nematus pallescens, Htg.—I have taken in Cadder Wilderness the undescribed ♂ of this species. It has the antennæ thicker and longer than in the ♀; the vertex is black; there are three black marks (nearly joined together) on the mesonotum; the metanotum is black; the scutellum at the edges is also marked with black; and there are broad black transverse marks across the back of the abdomen: the stigma is obscure testaceous.

Nematus vesicator, Bremi, = *helicius*, Brischke.—I have bred this gall-maker from a large bladder-like gall of a green colour, which I found on a willow in Rannoch, during a visit of one day's duration which I made to that place last year, in order to procure some other insects. My specimens show considerable variation in the coloration of the abdomen, one example having it nearly all luteous, while in other specimens the belly only is of that colour, the rest being black. It has no relation, I believe, with the *N. helicius*, Thoms.

Nematus Westermanni, Thomson, Opusc. Ent., 615, 3; Hymen. Scand., i, 87.—I captured four specimens (three ♀ one ♂) of what I take to be this species, last June, among osiers on the banks of the Severn below Gloucester. It is very like the above variable species, but is, I think, distinct from it.

Cryptocampus angustus, Inehbald (*nec* Htg.), Ent. Mo. Mag., i, 47; *C. mucronatus*, Vollenhoven (*nec* Htg.), Tijds. Ent. (2) vi, pl. 12 = *C. pentandra*, Retz.—I have taken *pentandra* in various parts of Scotland. It seems, however, to be local, and in some years is far more abundant than in others. I have seen several small willows with their twigs very much distorted by the galls, so numerous were they. Last spring I noticed, among a number of galls collected on the Kilpatrick Hills, a curious instance of how one animal can appropriate to its own use the work of another. From the galls I speak of, a good many of the flies had emerged (this was in March), and the empty cocoons had been utilized by a spider, which had filled them completely with her eggs, there being none, so far as I could see, in any other part of the gall. I am sure I counted upwards of a hundred cocoons filled with eggs; sometimes there would be several cocoons in a gall containing them, while in others there would be only one; and in every case I could not help admiring the neat way in which the eggs were packed in the cocoons. A few of the cocoons were also tenanted by a black species of *Aphis*, and from it I bred a couple of *Allotria minuta*, Htg.

(To be concluded in our next).

DESCRIPTIONS OF TWO NEW BUTTERFLIES FROM THE
PHILIPPINE ISLANDS.

BY W. C. HEWITSON, F.L.S.

ZETHERA THERMEA.

Upper-side: male dark brown; both wings crossed below the middle by a band of white, commencing near the costal margin of the anterior wing by three separate white spots, followed by a fourth

white spot bordered with grey, and to the inner margin by a band of grey, marked by four white spots, broad on the posterior wing where it is bordered outwardly by grey, and sinuated in the form of arches; both wings crossed beyond the band by a series of linear grey spots in pairs, and a sub-marginal series of spots of the same colour.

Under-side as above, except that it is rufous-brown; that the spots in the band of the anterior wing are all separated; that the band of the posterior wing is divided by dark brown nervures, and that the two series of spots which follow it are much more distinctly marked.

Exp., $3\frac{2}{10}$ inch. *Hab.*: Philippines (Sama, Bohol, Paraon).

The kindness of Dr. Semper has enabled me to add to my collection the two valuable species now described.

MELANITIS BEZA.

Upper-side: female blue-black; both wings crossed near the outer margin by a series of oblong blue spots; both wings slightly dentated: the fringe of the posterior wing spotted with white.

Under-side rufous-brown; both wings crossed near the outer margin by a series of white spots, commencing on the posterior wing at the middle of the costal margin; anterior wing with a small white spot at the end of the cell outside; posterior wing with a similar spot near the base.

Exp., $3\frac{1}{10}$ inch. *Hab.*: Philippines (Mindanao).

Most nearly allied to *M. Patna*, but very distinct.

Oatlands, Weybridge: *November*, 1876.

LOCUSTS IN YORKSHIRE.

BY W. DENISON ROEBUCK, SECRETARY OF THE LEEDS NATURALISTS' CLUB.

During the past season, a number of locusts have been taken in various parts of this county. I give the occurrences in order of time so far as it can be done.

1. The first example is one taken by Mr. B. Bagshawe in High Street, Sheffield, July 5th. (*Sheffield Daily Telegraph*, July 6th). This I have not seen.

2. Seven weeks elapsed before the next specimens occurred. On August 22nd, one was taken near Laisterdyke Station, Bradford.

3. August 27th, one in a field at Buttershaw, between Bradford and Halifax, which I have not seen.

4. One about the same time at Armley Green, near Leeds, is in the collection of the Leeds Philosophical and Literary Society.

5. One about the same time was taken at Beeston Hill, Leeds.

6. One about the same time in Westgate, Huddersfield, now in the local collection of the Huddersfield Naturalists' Society.

7. Another about the same time was taken in the prison yard at Wakefield, is the property of Mr. William Talbot, and is the largest specimen of the series.

8. On the 1st September, one was captured in a field at Aeaster Malbis, on the Ouse below York, perched upon a sheaf of corn. This I have not seen.

9. Another specimen taken at Wakefield; date not known. Reported to me by Mr. William Talbot.

10. One was taken at Hyde Park, Leeds, and shown to me, but the date is not known.

11. Finally, the latest in date is an example which flew on a lady's dress, in Spring Street, Huddersfield.

I have thus had reports of eleven specimens taken in this county, seven of which (those numbered 2, 4, 5, 6, 7, 10 and 11) I have had under my own examination. Four of the specimens (numbered 4, 6, 7 and 11) have been placed in the hands of Mr. McLachlan, to whom I am much indebted for determining the species, which he makes out to be *Pachytylus cinerascens*.*

It is somewhat noteworthy that concurrently with this Yorkshire visitation, only two examples have hitherto been recorded out of the county, namely, the one recorded in the Ent. Mo. Mag. for November, and one taken at Wells, Somerset, as recorded in "Science Gossip" for December.

It would be interesting to place on record any additional specimens that have occurred, in order to justify conjecture as to the line of migration. Can it be, as the remarkable preponderance of Yorkshire examples would seem to indicate, that such line of migration was from the northern parts of Central Europe, by way of the German Ocean and the Yorkshire Coast, and that the few southern specimens were stragglers from the north? I should be glad to see or receive additional records, and intend to contribute a paper on the subject to the "Naturalist" (published at Huddersfield) should additional facts come to light.

9, Sunny Bank Terrace, Leeds:

December 2nd, 1876.

Locusts in Yorkshire.—By way of supplement to the above note, I may say, that I have heard of another Yorkshire specimen, which was taken on the 6th of September "enjoying the beauties of Nature" in the cemetery at Scarborough (Scarb. Daily Post, Thursday, Sept. 7th, 1876). I have not seen this example.—
 Id.: December 14th, 1876.

* It is generally acknowledged by Orthopterists that there are two species confused under the name of *Pachytylus migratorius*, one of which should bear the familiar name, and the other that of *P. cinerascens* (Fab.). As I understand these species at this moment, the visitors to Yorkshire are the latter. There exists an idea that this breeds annually in certain parts of Northern Europe (e. g., Belgium), whereas the former only appears occasionally.—R. McLACHLAN.

The insects of the Arctic Expedition.—Having been favoured with an opportunity of glancing over a portion of the collections made by Captain Feilden, one of the naturalists who accompanied the expedition, I jotted down a few notes that cannot, I think, fail to be interesting to entomologists generally, and which I have Captain Feilden's permission to publish. A large portion of the collections is still unpacked. That seen by me consists of a box of pinned insects, and a considerable number in tubes, and is probably the most interesting because the greater number of the insects were collected near Discovery Bay in $81^{\circ} 42'$, N. latitude; some of the *Lepidoptera* are even from $82^{\circ} 45'$. Of course, the most interesting fact is the occurrence of five or six species of Butterflies within a few hundred miles of the North Pole, especially when taken into consideration with the fact that Iceland and the large islands of the Spitzbergen group, although in lower latitudes, have apparently no butterflies.

In *Lepidoptera*, I observed four examples (2 ♂, 2 ♀) of the genus *Colias*, possibly two species (? *Boothii* and *Hecla*). Apparently three species of *Argynnis* or *Melitæa* (or both). A *Chrysophanus* apparently identical with *phlæas*. In the *Noctuidæ*, only one individual,—an *Acronycta*. In the *Geometridæ*, one *Amphidasis* or *Biston*, and several Cheimatobioid forms with apterous females. Of the *Crambites*, one *Phycis*, perhaps our *fusca*.

The *Hymenoptera* are represented by a *Bombus*, and one of the *Ichneumonidæ* of considerable size.

In the *Diptera*, there is one large fly, probably belonging to the *Tachinidæ*, and perhaps parasitic on the larvæ of some of the *Lepidoptera*. One species of *Tipulidæ*; and a considerable number of *Culicidæ*, and of what looks like a *Simulium*, which, however, do not appear to have annoyed the members of the expedition in these high latitudes.

Of *Coleoptera*, *Hemiptera*, and *Neuroptera*, I saw none; but the bird-lice are naturally well represented.

No doubt we shall hereafter have an extended report on all the Natural History collections, which, thanks to Captain Feilden's diligence under peculiarly trying conditions, will be the most valuable contribution to a knowledge of the Arctic Fauna and Flora that has yet been (or, perhaps, ever will be) furnished.—R. McLACHLAN, Lewisham, London: 6th December, 1876.

Note on Bruchus pisi.—As this insect is generally (if not always) found in England in shops or store-houses, it may not be uninteresting to note that I beat a specimen of it last August off *Sisymbrium* near Stretford, on the canal bank. This is a district, however, where there are many market gardens, and much of various kinds of garden and field produce is brought by boat through it to Manchester.—J. CHAPPELL, 2, Boundary Street, Hulme, Manchester: December, 1876.

The Colorado Beetle (Doryphora decemlineata).—The Commissioners of Customs have issued to all the ports of the United Kingdom a General Order, accompanied by a description and figure of the Colorado Beetle, directing that the Officers of the Out-Door Department of the Service, in addition to the orders given in 1875, respecting the particular examination of potatoes brought from the United States and Canada, with a view to prevent the introduction of the beetles into this country,

are, "especially during the months of August and September, to look for and destroy any beetle answering the description given, which they might find on board vessels, or on wharves, quays, sheds, or packages landed from vessels, and they are to encourage other persons to do the same."

That this is a step in the right direction, and not taken without reasonable apprehension of the importation of the beetles that have proved extensively destructive to the potato-crops in America, is evident, from the following extract from a letter from Colonel Mason C. Weld, a well-known American agriculturist, which has recently appeared in the "Agricultural Gazette:"—"We are indebted to the Old World for much that we are or ought to be thankful for, and for evils in the shape of weeds almost without number. I heartily hope we may never repay that debt. Nevertheless, we are about to make a small return in the shape of the Colorado potato beetle. I have no doubt whatever that you will have them in abundance within two or three years. Every ship which sails during the summer months from our entire Atlantic coast is liable to carry out living ones. When the wind blows favourably, that is, directly towards New York from either of the great potato-regions in the vicinity, the beetles are found abundantly in the streets; of course, they are liable to get upon the ships, to be stowed with the cargo, and to be unloaded alive and well at your ports. They certainly will live long enough without food to cross the Atlantic; whether they will be active enough to lay their eggs after the fatigues of the voyage is another question. I have had them in close-stoppered phials upon my table for several weeks, and found them lively at the end of that time. So much for your consolation." The immigration of these beetles thus seems certain; it is a moot-point whether they will live in Britain, for, as Col. Weld goes on to say, "as the creatures do not seem to enjoy life in wet weather, they may be so discouraged by your moist climate and grey skies, that that they will not thrive in England. Who knows?" If they do effect a settlement, it appears that hand-picking of the perfect insects off the growing potatoes, and watering the plants with "Paris Green," in solution, when they are attacked by the larvæ, are the most effectual preventive means yet discovered. Mr. Weld finishes by saying:—"The beetles do not depend upon being hidden in a barrel of potatoes in order to reach your shores alive, and if they did, every ship that sails from one of our Atlantic ports offers them the opportunity in the ship's stores."—J. W. DOUGLAS, *Lee*: 9th December, 1876.

[The following observations, bearing on the improbability of the importation of this beetle, appeared in "The Field" of 18th November last, appended to a reprint of the notice above referred to:—"The common-sense precautions suggested in the above memorandum are especially applicable to the Canadian dominions, which, however different in temperature and physical conditions from the original home of the beetle, are still on the same continent, and capable of being attacked by it in the course of years, during which successive broods may become acclimatized on the way. But it may not be out of place (and without in the least degree suggesting an avoidance of the safeguards above mentioned) to allay the fears of English agriculturists by pointing out: (1) That not a single American injurious insect has ever obtained a footing here, although many European insect-plagues have thriven only too well on the American continent. (2) That the protracted

"wet of north-western Europe, added to the absence of excessive summer heat, is quite opposed to the conditions necessary for the welfare of the beetle. (3) That the group of *Chrysomela* to which it belongs is naturally of a very circumscribed area in its native land; and (4) That the danger is here diminished, by one-half at least, since (it being tolerably certain now that neither eggs, larvæ, nor pupæ are likely to be imported) of such individual specimens of the perfect insect as may be transported here in ships, the only possible vehicle, it is only gravid females that can be of any harm. The fortuitous conjunction of a pair of the beetles in this country is altogether improbable; and it is, moreover, very unlikely that an impregnated female, ready to deposit ova, would act so contrary to instinct as to select a ship for that purpose, or retain the eggs during the whole passage.

"It may also be observed that in Colorado itself, according to Mr. Riley's report, the damages by the beetles are now so much reduced as to be scarcely worth recording."

To the arguments therein adduced may be added, that proper food for the young larvæ is scarcely to be found near quays and docks, even supposing an impregnated gravid female survived the passage without laying her eggs on ship-board.—E. C. R.]

Pyrameis Huntera in England.—I have just had the pleasure of setting out a very fine and perfect specimen of *Pyrameis Huntera*, which was taken about the 30th of August in Goss Lane, Christchurch, Hants, by the youngest son of S. Evans, Esq., of Eton College, who has just begun to make a collection. There can be no doubt about the freshness of the specimen, which is still in perfect condition. Mr. Evans tells me that it was taken on a patch of Valerian in a lane where *P. cardui*, *C. Edusa* and *C. Hyale* abounded, some of which were taken at the same time, and are now in his son's collection.—A. VERNON JONES, Eton College: Dec. 8th, 1876.

[We have not seen this specimen, but see no reason to doubt the correctness of the identification. The species is figured in Wood's "Index Entomologicus," pl. 53, fig. 8, with the remark—"Said to be taken in Pembrokeshire by Captain Blomer." An example from South Devon was recorded in the "Entomologist" for 1876, p. 255.—EDS.]

Note on the food plant of Pachnobia hyperborea (alpina, Westw.).—I was very glad to see Mr. Meek's note on the food plant of the larva of this species, for I felt that the previous note (p. 109) extracted from Dr. Staudinger's work did not say all that had to be said on this point.

On 10th of last August, Mr. F. O. Wheeler sent me from Norwich two newly hatched larvæ, obtained from eggs laid by a female moth, which he and Mr. Richardson had captured at Ramoeh; they reached me alive, though I could not see that they had tasted any of the leaves of various common plants and bushes which had been put in with them. I placed them in a glass-stoppered bottle, and supplied them with bits of everything I could at the instant procure, that might at all be supposed likely to suit their taste; amongst the rest, whortleberry (*Vaccinium myrtillus*), and two Saxifrages; had my plants of *Empetrum nigrum*, imported to feed former consignments from the north, still been alive, I should certainly have included their leaves also; but I was not so lucky. Various plants were nibbled, but

Vaccinium myrtillus was not touched, and seeing that *Saxifraga hypnoides* was more eaten than anything else, on August 29th I planted some of it in a flower-pot, and turned the larvæ (which had scarcely grown, though one had moulted since I had them) out upon it. I fear, however, that this substitute food, as it now proves, did not sustain them long, for I have never been able to see them, or any trace of their having been feeding, again.

I find I noted the young larvæ as being of a dingy olive-brown, and looking somewhat like an *Agrotis*, but not so translucent, with head and plate on second segment shining black, the usual warts distinct, black, and furnished each with a short stiff bristle. The one that moulted became of a warm dark velvety-brown, with paler lines.—JOHN HELLINS, Exeter: December 11th, 1876.

Notes on Epunda lutulenta, and description of the larva.—Mr. Porritt is correct in supposing his description of the larva of *E. lutulenta* to be unsatisfactory, as the principal character does not appear until the last moult has taken place.

The imago is tolerably common in this district, appearing in September, and is usually captured at sugar and ivy bloom. The ♀ lays over 100 ova, which hatch about four weeks after deposition, and the larvæ, when young, feed on grasses, and do not seem to restrict themselves to any particular species, at least in confinement.

At first they devour the cuticle only, both upper and under sides, leaving the central membrane untouched. After changing their first skin, they are bright pale uniform green, with a broad conspicuously white spiracular band. In repose, they rest with the anterior segments raised and arched like many *Geometra*, and at this stage are rather sensitive, dropping at once to the ground if disturbed.

My larvæ have been subjected to various conditions of temperature, but they always appeared perfectly hardy; and those kept indoors in a room with a fire did not materially outstrip in size those exposed to all the vicissitudes of the weather out of doors, where their cage was frequently buried beneath several inches of snow. A warm night, even in mid-winter, invariably brought them up to feed.

As the spring advanced, and the larvæ increased in size, they were not so particular in their diet, and I have observed them feeding (besides grasses) on plantain, *Matricaria*, marigold, chickweed, groundsel, dock, and the unexpanded flower buds of the blackthorn; the last named and dock are, however, their especial favourites. As the larva has been taken at large by my friend Mr. B. Bower feeding at night on the blackthorn buds, it is probable that they follow the habits of many *Noctua*, of which the genera *Tryphæna*, *Aplecta*, and *Noctua* afford well-known examples.

In May they arrive at maturity, but before this period, the conspicuous white spiracular band has lost much of its brightness; this is, however, resumed after the last moult, when the violet characteristic edging is first distinctly visible.

I append a description, taken from a brood of over fifty individuals, among which I only noticed the variation recorded below:—

Rather elongate, cylindrical, velvety; head rounded; *bright apple-green*, minutely irrorated with grey; a grey dorsal shade, very frequently forming blackish dots at the incisions; sub-dorsal line whitish, distinct; *a broad yellowish or greenish-white spiracular band, its upper and lower margins pure white, the former edged with a violet line joining the white spiracles*; belly slightly paler than the ground colour; legs and prolegs tinged with purplish; head of the ground colour, hardly shining; mouth black.

A variety occurs with the white sub-dorsal lines represented by series of grey or dark ferruginous dashes. The reddish-brown pupa is enclosed in a brittle earthen cocoon below the surface. I believe the imago appears a few weeks earlier in Scotland, where it is not scarce in some localities.—C. FENN, Ashley House, Eltham Road, Lee : 11th December, 1876.

Eupithecia minutata and its variety knautiata.—During this and last season I made a few notes on the larvæ of these two forms. At the end of September in last year, Mr. Owen Wilson sent me a number of larvæ he had found on *Scabiosa succisa*, near Carmarthen, which he and I at once suspected were those of Gregson's so-called *knautiata*. They were much more variable than our form of *minutata*, and considerably larger. Different specimens were purplish-grey, grey, brown, and some almost black; whilst our ling-feeding form is nearly always pinkish, with a small sprinkling of grey ones. I found those from the scabious would feed equally well on ling, and also on ragwort; whilst our ling-feeding form fed equally well on ragwort. The imagos from the scabious-feeding larvæ were, so far as I could make out, in all respects the same as those from ling; and for my part, I am tolerably satisfied they are one and the same species.

The larger size of the scabious-feeding larvæ is sufficiently accounted for by the more succulent nature of the food; the hard dry nature of the ling seemingly has a tendency to dwarf the larvæ, whilst their colour arises no doubt from the ling flowers, which part of the plant alone they eat.—GEO. T. PORRITT, Highroyd House, Huddersfield : December 2nd, 1876.

Description of the larva and habits of Lobophora viretata.—On looking over the scanty records of this species for the last twenty years, I find nothing to show that it has more than one brood in the year, or more than one food-plant, viz., privet, for the larva. In the belief, therefore, that some further light on its history may be desirable, I have here put together the few facts, which within the last two seasons have become known to me, and which go to show that *viretata* must at least be partially double-brooded, the flights being in May or June and again in August, and that, as is generally seen in the case of double-brooded species, the *moths* of the first flight from hibernated pupæ are larger specimens than those of the second flight, and also that the larva is by no means confined to one food-plant.

On 12th July, 1875, I received from the Rev. Bernard Smith, three larvæ, which had been found by him each in a slight web amongst flower-buds of *Ligustrum vulgare*; they continued to feed three days longer, eating, as I observed, the interior of the flower-buds, portions of the leaves, and the rind of the flower-stalks; on the 17th, they were spun up; the moth appearing on 20th August. Mr. G. F. Mathew also informs me that at the end of last May, and through June, he was feeding up some *P. plumigera*, and that whilst providing them with fresh food, he occasionally noticed between united leaves at the ends of the sycamore twigs, some small geometers, but that taking them to be only *C. brumata* he threw away most of them; after the *plumigera* had gone to earth, he left the cage to itself—introducing no other larvæ,—but one day, about the middle of August, he looked into it to see all was right, when he was astonished to discover two perfect specimens of *viretata* evidently just out, and a day or two afterwards to find a third specimen, and thus became aware of the

identity of the little larvæ he had been previously throwing away: with both of us, therefore, *viretata* proved double-brooded in confinement; that it is double-brooded also in nature I obtained evidence on the 8th September, 1875, when a friend, who was with me helping to search for larvæ of *L. Argiolus*, found a very different larva sitting in the midst of a small umbel of blossom-buds of *Hedera helix*, which was surrounded with a very thin and transparent open meshed web; several of the buds were eaten out and a few grains of frass were clinging to part of the web. I felt a little puzzled for a few hours about this larva, which then had no marking, and was like the ivy-buds in colour when first found; but a subsequent examination convinced me it was *viretata*; it moulted on the 13th, and continued to feed well on ivy-buds until September 21st, when it burrowed into earth, and the moth, a fine male, appeared early on the morning and was flying round its cage in the afternoon of May 6th, 1876.

The full-grown larva is about half-an-inch in length, or a trifle more when stretched out, thick and stumpy in aspect, the head fitting partly within the second segment, which is smaller than the third and fourth, they being tumid both above and at the sides; the last two segments a little taper to the end, which has two minute anal points; all the segments plump, yet having two or three transverse wrinkles at each end, though not very noticeable till the larva is full-fed; the minute tubercles warty; when the larva is at rest, and often while feeding, the head is tucked under the thoracic segments which are arched above, and from them again the back is arched to the end of the tenth segment. Individual examples vary in details of colouring, though the ground colour is always some pale green or tint of greenish: in one variety, the head and thoracic segments are much suffused with pink, and on the fourth segment a lateral wedge-shaped transverse streak of darker pink extends from behind the legs upwards, from thence each segment to the ninth has on the middle of the back a broad trilobed mark of dark pink connected in the short intervals by a stout dorsal line of the same colour; on the back of the tenth the pink marking is more rudimentary, and on the three posterior segments is little more than a dorsal and imperfect sub-dorsal stout line, which all merge together at the anal tip, along the pale greenish side is a faint and interrupted pinkish line, and on it the small tubercular warts are whitish, elsewhere they are the same colour as the surface whereon they happen to be, and so are not noticeable; this is the case also with the spiracles.

A second variety has the ground colour very pale and slightly glaucous in its delicate tint, though strengthened a little in depth anteriorly; the dorsal mark on the third and fourth segments is a line of purplish-pink which occurs again on the last four, while on each of the intermediate segments is a purplish-pink broad-arrow mark with its point close to the division in front, extending backwards about two-thirds of the length of the segment, the ground colour of the remaining third being rather paler than usual: these arrow heads are deepest in colour and rather suffused on the fifth and sixth segments, and each one following is more distinct and paler by degrees; the sub-dorsal line is of the same pink colour, distinct and continuous throughout.

A third variety I found in the autumnal larva before mentioned, which, previous to its last moult on September 13th, was of precisely the same tint as the young ivy-buds amongst which it was found, and destitute of any markings; but afterwards,

though it retained the same pale greyish-green ground colour, it became conspicuously marked with dark crimson on the head, more faintly on the second segment, where was a dorsal line of the ground colour, and large crimson blotches on the back of the fourth and fifth segments, in which dorsal and sub-dorsal lines could be seen of still darker crimson; a part of these blotches extended transversely down the side and round the belly on the junction of the fourth and fifth, and nearly so on the junction of the fifth and sixth; whilst towards the end of the sixth, seventh, and eighth segments on the dorsal division of each was a large and broad crimson, somewhat blunted, diamond-shaped blotch, edged behind with whitish; at the division of the ninth and tenth segments were three short and very fine crimson streaks on the dorsal and sub-dorsal regions; the eleventh without marking, the twelfth crimson with ground coloured dorsal and sub-dorsal lines, and the thirteenth crimson, the anal flap edged with ground colour, the front of the anal legs tinged with whitish which continued down them as a stripe dividing a dark crimson blotch, from which proceeded a small dash forwards on each side of the belly; the skin soft and velvety, the head only glossy.

The larva spins itself up in a cocoon about $\frac{3}{8}$ -inch in length by $\frac{1}{4}$ -inch in breadth, of a roundish oval figure, attached to a stone, a leaf of the food-plant, or other substance on the surface of the earth or a little below it, and composed exteriorly of grains of earth, and smoothly lined inside with silk.

The pupa is plump-looking, about $\frac{5}{16}$ -inch in length, and nearly $\frac{1}{8}$ -inch in diameter in the thickest part, namely, across the ends of the wing-covers, which are long in proportion and well developed, having the rays in slight relief; the thorax rounded near the head; the eye-covers prominent, the abdomen rough with fine punctured depressions except at the divisions, and tapering rather sharply towards the tip, which is furnished with several fine curved-topped bristles, the two central the longest: its colour a dark brownish olive-green on the back of the abdomen, with brown divisions, and a darker brown dorsal stripe becoming reddish near the tip; the wing-cases darkest between the rays, together with those of the antennæ and legs bright olive-green, eye-covers brown, the whole surface rather shining.—WILLIAM BUCKLER, Emsworth: *October 23rd, 1876.*

Gelechia lutulentella at Cheshunt.—At the beginning of August, amongst a number of moths taken by the signal-man at light at the Cheshunt Station, I found a good specimen of *Gelechia lutulentella*. There is one peculiarity about it that I believe has not been noticed before, viz., that it has a yellow patch on the upper-side of the abdomen like that on *G. populella*, but slightly smaller. This was obscured by grease when I showed the insect to Mr. Stainton; but I noticed it before setting it out, and it has again become visible now that the grease has been removed.—W. C. BOYD, Cheshunt: *December 11th, 1876.*

Padisca rufimitrana, H.-S., new to Britain—Mr. F. J. H. Jenkinson, of Trinity College, Cambridge, has taken two specimens (1 ♂, 1 ♀) of this new species, both at light, in July of successive years, in Cambridge. One of these I sent to Mr. Barrett, suggesting that it was probably *rufimitrana*, H.-S.; he concurred, but kindly forwarded figures to Prof. Zeller, who was enabled to pronounce with certainty that

it was the true *rufimitrana*. As it is not described in any English work, I give a brief description. Having only these two rather dissimilar specimens to compare, greater accuracy of detail would be injudicious.

Size and shape of *Ratzeburgiana*: fore-wing of ♂ longer, and costa less arched, than in ♀. Head deep yellow-ochreous; thorax brown-grey, collar ochreous. Abdomen grey, in ♂ with a pale ochreous tuft. Fore-wing pale bluish-grey; basal patch composed of numerous dark grey-brown transverse striae, its outer edge forming a very dark, almost black, irregular fascia; in the ♀ specimen strongly angulated, in the ♂ almost straight and very oblique, but with a large externally-projecting tooth in the middle. Central fascia slender, very dark brown-grey, margins very irregular; running from middle of costa to anal angle. The pale space between basal patch and central fascia is irregularly striated with brown-grey, and indistinctly streaked with yellow, dilating into an indistinctly yellowish blotch on dorsal margin; it is bordered on each side by a faintly metallic line. Costa beyond central fascia with four pairs of whitish strigæ; from 2nd and 3rd pairs indistinctly metallic lines run to above anal angle; between them hind-margin indistinctly yellowish. Beneath apex an irregular dark brown spot. Hind-wing brown-grey; cilia paler grey, intersected by a strong dark line.

Although an obscure looking species, not very like any other; nearly allied to *Ratzeburgiana*, but easily distinguished by the different colour, and especially the yellow head, which separates it at once from all its British allies. It frequents fir trees, and appears to be rather local, but not uncommon, in Germany.—E. MEYRICK, Ramsbury, Hungerford, Wilts: December 18th, 1876.

Lygus pellucidus, Fieb., in *Morayshire*.—Some time during the month of October, I took, by beating, near Forres, a species of *Lygus*, which Mr. Saunders considered to be *L. pellucidus*, but recommended me to send to Dr. Reuter. This I did, and have recently got his reply. Dr. Reuter considers my insect to answer to Fieber's description, also that it is the same as his (Dr. R.'s) *L. pellucidus* (*Revisio critica Capsinarum*), but thinks, after all, it is merely a variety of *Lygus pastinacæ*.—GEO. NORMAN, Clunmy Hill, Forres: 14th November, 1876.

Abnormal structure of the antennæ of Hemiptera.—On former occasions (*Ent. Mo. Mag.*, ii, 270, & iii, 200) I drew attention to the irregular formation of antennæ in species chiefly belonging to the Section *Lygæina*, in which there had apparently been a reproduction of one of the antennæ, or part of it, after casual excision. In these cases, one antenna had three instead of four joints, but one of these was longer than in the natural condition, so that the antenna as a whole approximated the other in length; whence it was inferred, that the mutilation having occurred while the insect was growing, the effort of nature to supply the deficiency had resulted in the production of one joint instead of two, but shorter than the two, and always with the terminal joint perfect in form if not in size. Mr. G. Norman, of Forres, having recently signalled his advent as a collector of *Hemiptera*, by taking *Eremocoris plebeius*, hitherto one of our rarest species (*ante* p. 166), had the goodness to send me some examples, among which I found one, of which both the antennæ were composed of three joints only, and I at first thought the fourth had been accidentally

broken off after the insect was mature. Examination, however, has shown me that while the first and second joints are of the natural length and thickness, the third is somewhat shorter, thicker, and slightly more clavate than usual, and is rounded off at the apex, very much like an ordinary terminal joint, but more obtuse. I infer, therefore, that the loss of the fourth joint took place just at the period of the last moult, when there was neither time nor material to form a substitution, and all that could be done under the circumstances was to make the third joint while still soft as much like an ordinary fourth as possible. It is the only instance of the kind I have ever seen.

Nearly all the examples of reproduction of antennæ that have come under my notice among the *Hemiptera* have been in *Lygaeina*, which, from their terrestrial habits, are more exposed to the attacks of enemies living like themselves in secluded quarters under moss, grass, and *débris*; it will probably be found that the loss of antennæ is caused by geodephagous *Carabidæ*, to which the tender asparagus-like antennæ may be the only portion of the otherwise unsavoury *Hemiptera* they could eat. In the majority of cases, I presume the victim, in its struggle for existence, manages to escape from its assailant after the amputation of one, or part of one, of its antennæ.

The subject of the reproduction of last parts in the *Articulata* does not appear to have received attention commensurate with its physiological interest; this may possibly be due to the inherent difficulties of investigating it, and the requirement of patience and skill such as Newport brought to it.—J. W. DOUGLAS, Lee: 14th December, 1876.

Homoptera flying in December.—Yesterday, a female *Chlorita viridula*, as verdant and lively as if just perfected, flew into my room, and for her temerity I made an example of her. The thermometer in the shade stood at 50°, the wind was S.W., and there were occasional gleams of sunshine; these conditions doubtless tempted other *Typhlocybidæ* to leave their winter quarters, though they did not visit mine.—Id.: 4th December, 1876.

ENTOMOLOGICAL SOCIETY OF LONDON: 6th Dec., 1876.—Sir S. S. SAUNDERS, C.M.G., Vice-President, in the Chair. Professor E. Grube, of Breslau, and Dr. Katter, of Putbus (the notice of whose election in our last No. was premature), were elected Foreign Members; and Lord Dormer was re-elected a Subscriber.

Mr. McLachlan exhibited (by request of Mr. W. D. Roebuck, of Leeds) examples of locusts taken last autumn in several localities in Yorkshire, over which county a swarm had evidently passed (details are given in the present No. of this Magazine).

Mr. W. C. Boyd exhibited living larvæ of the Trichopterous insect known as *Brachycentrus subnubilus*, in their quadrangular cases, reared from the eggs. He had, on previous occasions, exhibited the same larvæ, but had not, until now, succeeded in keeping them alive for so long a time; the cases being more than half-an-inch in length, and the larvæ healthy. Latterly he found they would feed on water-cress (*Nasturtium officinale*).

Mr. S. Stevens (on behalf of Mr. E. Birchall) exhibited *Cirrhædia xerampelina*, var. *unicolor*, *Agrotis lucerneæ*, var. *latens*, and a small variety of *Zygæna filipendulæ*, with its cocoon, which was whitish instead of yellow.

Mr. Meldola made the following remarks, in explanation of an exhibition made by him of parasites on the "Cabbage Butterflies:"—At the Meeting for July, 1875, Mr. Riley requested that English entomologists would supply him with cocoons of *Microgaster glomeratus*, in order that, by breeding the parasites, he might introduce them into America, and thereby check the ravages of *Pieris rapæ* on that continent. At a subsequent meeting, Mr. McLachlan had suggested that the *Microgaster* was possibly only parasitic on *P. brassicæ*; and that he did not remember to have seen larvæ of *rapæ* infested by it. Mr. Meldola said that the parasites bred by him from *P. rapæ* were not the *Microgaster*, but a species of *Pteromalus* belonging to the *Chalcididæ*. In addition to the ordinary parasite, he had obtained a *Tachina* from *P. brassicæ*. Mr. E. A. Fitch remarked that Von Vollenhoven obtained an ichneumon (*Pimpla examinator*) from *P. napi*. [The Editors desire to obtain authentic information as to whether any entomologist has observed the characteristic *Microgaster* cocoons surrounding the larvæ of *P. rapæ*].

Mr. F. Smith stated that from an otherwise empty nest of *Osmia muraria*, from Switzerland, he had bred an example of *Trichodes alvearius*, one of the *Cleridæ*.

Sir S. S. Saunders exhibited microscopic slides prepared, and forwarded, by M. Lichtenstein, of Montpellier, illustrating the primitive hexapod larvæ of *Mylabris*, &c. Also a collection of insects from Corfu, sent by Mr. Whitfield.

The Secretary stated that an example of *Deiopeia pulchella* had been taken recently near Falmouth, by Mr. James, of Truro, and exhibited a photograph of it forwarded to him.

Mr. C. O. Waterhouse read descriptions of 20 new species of *Coleoptera*; and also a very interesting analysis of Gemminger and Von Harold's Catalogue of *Coleoptera*, now completed. He found that 11,318 generic terms appeared in this Catalogue, of which 7364 are adopted (the others sinking as synonyms). The number of species catalogued and considered distinct, were 77,008, and those not included, but recently described, must raise the total to about 80,000. In 1821, Dejean catalogued 6692 species, whilst the edition of 1837 elevated the number to 22,099.

DESCRIPTIONS OF A NEW GENUS AND SOME NEW SPECIES OF NEW ZEALAND COLEOPTERA.

BY D. SHARP, M.B.

The species here described are amongst the most interesting of the *Coleoptera* I have lately received from New Zealand. The new Longicorns were sent to me by Captain Broun, in the spring after I had transmitted to Mr. H. W. Bates the species of the family described by him in the August number of this Magazine.

ENARSUS WAKEFIELDI, n. sp.

Indumento fusco tectus, suprâ valde rugosus, prothoracæ basi utrinque excisione profunda. Long. 9 mm. ; lat. elytrorum, 4½ mm.

This species is just the same length as *E. Bakewelli*, Pascoe, but is considerably narrower, the latter species being about 5½ mm. across

the elytra; in sculpture and clothing the two species are almost identical, but *E. Wakefieldi* has the excision of each side of the base of the thorax considerably longer and narrower. (For description and figure of *E. Bakewelli*, see Journal of Entomology ii, p. 445, pl. xx, f. 1).

This fine species of *Colydiidæ* was found by Mr. Wakefield, at Peel Forest, March, 1874.

EXARSUS RUDIS, n. sp.

Indumento fusco tectus, suprà valde rugosus, prothorace basi utrinque excisione profunda. Long. 6½ mm.; lat. elytrorum, 4 mm.

This species differs from *E. Wakefieldi* by the smaller size and shorter form, and its considerably shorter metasternum. From *E. Bakewelli*, its much smaller size and the deeper emarginations at the base of the thorax readily distinguish it. Though the three forms are so very similar to one another, I think it most likely they will prove to be distinct, and not one variable species, though only the examination of a number of individuals can render this decision satisfactory.

Christchurch, found by Mr. Wakefield.

LEPERINA WAKEFIELDI, n. sp.

Fusca, depressa, subopaca, squamulis subvariegatis, irregulariter minus dense vestita; thorace transverso, angulis posterioribus subobtusis, medio areis lævibus tribus sat discretis; elytris subtiliter costatis, costis subinterruptis. Long. 9—12 mm.

Labrum large and much exerted. Thorax 2½ mm. in length along the middle, and 3½ mm. broad; it is a good deal contracted behind the middle, so that the hind angles appear obtuse but are nearly rectangular; the sides bear dense coarse punctures; on the disc are three ill-defined, irregular, smooth spaces, separated from one another by rather sparing punctures; the sides bear some pale inconspicuous scales. Elytra with seven rows of fine costæ, which are only slightly interrupted; their surface clothed, but not in a very conspicuous manner, with patches of black and greyish scales. Legs nearly black.

This species has been found at Christchurch by Mr. Wakefield, after whom I have named it; it is just about intermediate between *Gymnocheila nigro-sparsa*, White, and *Leperina Brounii*, Pasc., and is probably rather closely allied to *Gymnocheila sobrina*, White, which I know only by White's description; but I expect White's species will prove to have the elytra more variegated, and their costæ more interrupted. Herr Reitter has recently divided *Leperina* into two genera, viz., *Phanodesta* and *Leperina*, but it seems to me pretty

certain that such a division is at present uncalled for. The New Zealand species are associated with some Chilian ones in *Phanodesta*, *Leperina* being formed by Australian species.

SAPHOBIUS WAKEFIELDI, *n. sp.*

Subquadratus, suprà opacus, subtus sat nitidus, obscure nigro-æneus, clytrorum margine plus minusve testaceo, pedibus rufis, antennis testaceis clava fusca; capite thoraceque dense punctatis, hoc basi medio longitudinaliter impresso; elytris sericeo-opacis, obsolete striatis; pygidio exserto (subperpendiculari), leviter inflexo.

Long. $4\frac{1}{2}$ mm. ; *lat.* 3 mm.

In the male, the hinder part of the metasternum is slightly impressed in the middle, and the apical ventral segment is a good deal shorter in the middle than it is in the female; otherwise the two sexes are quite similar.

Four individuals of this species were captured by Mr. Wakefield (after whom I have the pleasure of naming the species) in the Otira Gorge, Canterbury.

Obs.—This species is extremely similar to *Saphobius Edwardsi*, but is a little larger, and the front tibiæ are less curved, the metasternum is longer, and the femora are red. In the individual from which I described *S. Edwardsi*, the pygidium is entirely immersed under the elytra, while in the two individuals of *S. Wakefieldi* before me it is quite exposed. It is, therefore, probable that the position of this part in the unique individual of *S. Edwardsi* is the result of an accident. The genus *Saphobius* is very close to the Australian *Homodesmius* (which is probably synonymic with *Canthonosoma*, MacLeay), but has the hind tibiæ differently formed.

HETERONYX PUMILUS, *n. sp.*

Angustulus, subcylindricus, rufo-testaceus, subopacus, parce subtiliter punctatus, elytris striis suturali minus distincta.

Long. $4\frac{1}{2}$ mm. ; *lat.* 2 mm.

Labrum quite visible from above, very transverse; sides of the clypeus explanate or turned upwards, the labrum filling the space between them; anterior part of head with rather rough tubercular sculpture, hinder part more sparingly and indistinctly punctured; antennæ small, eight-jointed. Thorax broad and short, nearly as broad as the elytra, the hind angles entirely rounded; the surface sparingly and obsoletely punctured, the sides with long cilia. Scutellum large, indistinctly punctured: elytra elongate and narrow, finely and not closely punctured, the sides ciliate, the suture with an indistinct stria. The front part of the labrum is broad and very short, and its anterior edge emarginate. The tarsal claws are simple.

I am indebted to Mr. Pascoe for the only individual I have seen of this species. There are a great number of allied species in Australia, but the genus has not before been indicated as represented in New Zealand. I have in my collection a New South Wales species (I believe undescribed), which is extremely closely allied to *H. pumilus*, but is a good deal broader.

BUPRESTIS ENYSI, *n. sp.*

Elongatus, angustulus, nigro-æneus, elytris maculis transversis quatuor luteis; prothorace quadrato, lateribus ante basin subconstrictis, profunde ruguloso; elytris profunde striato-punctatis, latera versùs rugulosis, lateribus postice serratis, angulo apicali externo spinoso; corpore subtus æneo, lateribus sparsim albido-pilosis; antennis pedibusque elongatis, gracilibus.
Long. 8—10 mm.

Head densely punctured. Thorax transversely quadrate, the sides nearly straight but very slightly contracted just before the base, the hind angles directed therefore somewhat outwards; it is covered with deep, coarse rugæ, and in front of the scutellum there is a deep fovea; the base is very closely connected with the elytra. The elytra are elongate, and are furrowed by very deep striæ, which are coarsely punctured, the interstices are rather narrow, the third from the suture being somewhat more raised, and its basal portion rather broader than the others; the sides of the elytra are coarsely rugose, so that the striæ are there quite indistinct, the suture at the extremity is a little prominent, and the outer edge of each elytron ends in an acute tooth; on each elytron, there are two transverse yellow marks, the upper pair of which are placed a little obliquely. The under surface is rather closely punctured, except along the middle of the ventral segments, and the punctured parts bear fine white hairs. The prosternum is very densely punctured, and its process is broad and short.

This insect is named, at the request of Mr. Wakefield, in honour of J. D. Enys, Esq., its discoverer; it has since been found by Mr. Wakefield, near Christchurch, I believe.

This species may, I think, be placed at present in the genus *Buprestis* (*Aneylochira*, auctt. plur.), though the prosternal process is remarkably short, and its apex is broad and rounded. There is no suture to be seen between the middle legs, so that I cannot say whether the cavity for the reception of the prosternal process is formed entirely by the mesosternum or partly by the metasternum.

XUTHODES APICALIS, *n. sp.*

Capite prothoraceque fulvis, opacis; elytris nitidis, flavescentibus, nigro-punctatis, pone medium fascia angusta, punctis pone fasciam haud nigris, ad apicem densioribus; thorace impunctato, obsolete tuberculato.
Long. 1½ mm.

This species greatly resembles the figure given by Mr. Pascoe of

Xuthodes punctipennis, and has a similar peculiar sculpture of the elytra; but in *X. apicalis* the punctures behind the fascia are not black, and though those immediately behind the fascia are smaller and distant, those near the apex are coarse and closely placed. The head in *X. apicalis* is only indistinctly channelled between the eyes.

Sent from Tairua by Captain Broun, with the information that he had only been able to find two individuals of the species.

XUTHODES BATESI, *n. sp.*

(*Oculis in vertice remotis*). *Piceus, antennis, pedibusque rufescentibus, elytris fusco-testaceis, lineis longitudinalibus eburneis, punctisque sat magnis, remotis, apicem versus obsoleteis.* Long. $16\frac{1}{2}$ mm.

Antennæ with the 2nd and 3rd joints sub-equal, the 3rd slightly the shorter, and much shorter than the 4th and following joints. Thorax with the anterior angles very obtuse and indistinct, and without the slightest projection; it is about as long as broad; the sides are about straight till behind the middle, and are thence distinctly narrowed towards the base; the surface is rather dull, but bears some distant punctures and a fine pubescence; in front of the middle, there is on each side a shining obtuse elevation, and along the middle just behind these a slightly elevated longitudinal smooth space. The elytra are shining and of a smoky-yellow colour, and each has three rather undulated, paler, ivory-like lines, and the suture and external margin are also similarly pale; they bear also scattered pits or punctures of an obscure reddish colour, those towards the apex being obsolete.

Two individuals of this species have been found in the Hikuwai forest by Captain Broun, one in December, 1874, the other on 16th January, 1876. The individual he sent me bore the number 15 to distinguish it.

I have named this striking species in honour of Mr. H. W. Bates, and have done so with the more reason because it seems, from information sent me by Mr. E. W. Janson and Mr. C. O. Waterhouse, that the species described by me as *Zorion Batesi* is probably *Z. guttigerum*, Westw.; *Xuthodes Batesi* differs from *X. apicalis* and *punctipennis* by its more remote eyes, and slight differences in other details of structure, but I do not think it is necessary to make a new generic name for it at present.

DROTUS ELEGANS, *n. sp.*

Elongatus, perangustus, minus convexus, fusco-rufus, capite thoraceque obscurioribus, parvis griseo-pubescentibus, prothorace inæquali, biconstricto, elytris sutura, lineisque duabus pubescentiâ pallidâ.

Long. 11 mm.; lat. elytr. basi, $1\frac{3}{4}$ mm.; long. anten. $11\frac{1}{2}$ mm.

Head rather coarsely and closely punctured, of an infusate reddish or somewhat pitchy colour, with a few short, depressed, delicate, silvery hairs. Thorax elongate

and slender, on its dorsum in front of the middle obtusely elevated, the elevation somewhat notched at its summit, behind the middle with a curved elevation extending from side to side, but becoming obscure on the dorsum; this curved swelling makes the broadest part of the thorax; the colour and sculpture are similar to those of the head. Elytra of a reddish colour, dull, their sculpture rather coarse and close but indistinct; along the suture and down each are two lines of somewhat silvery pubescence, and there is also a much less distinct marginal line of such pubescence. Under surface reddish, with scanty silvery pubescence. Legs reddish, thickened portion of the femora rather darker.

A specimen of this interesting species was transmitted to me in spirit by Captain Broun as No. 198, and accompanied by the information that two individuals had been found by him on birch near Tairua.

It is advisable to make a new generic name for this species, and below will be found such information as is necessary to explain the name *Drotus*.

DROTUS, *n. gen.*

(*Cerambycidae*, *ex aff. Calliprasonis*).

Head obliquely declivous in front, and produced into a broad process, which has an elongate impression on each side in front of the eyes: eyes distinctly, but still only a little, emarginate (less than in *Stenopotes*, Pascoe, *vide* Ann. Mag. Nat. Hist., 1875, pl. v, f. 7a, but more than in *Calliprason Sinclairi*): antennæ with the basal joint very elongate, and swollen towards the extremity; third joint elongate: thorax very uneven, constricted in the middle and again at the base: elytra slender, elongate, depressed: legs very elongate, slender: femora not abruptly broader towards the apex. General form very elongate and slender, especially posteriorly.

The allies of this species are almost certainly *Calliprason Sinclairi* (unknown to Lacordaire) and *Stenopotes pallidus*, Pascoe; from the former it differs by the elongate and obliquely declivous front of the head, and by the peculiar form of the thorax; the antennæ and legs of the two being rather similar. The insect apparently agrees with *Stenopotes pallidus* in the form of the head, but departs from it in the form of the thorax and antennæ.

Lacordaire's groups of the allies are evidently artificial, but the present insect would doubtless have been placed by him in one of the first three "groupes" of his section *B. Cerambycides*.

HYBOLASIUS LANIPES, *n. sp.*

Oblongus, nigricans, minus dense albido-vestitus, prothoracis tuberculis magnis; elytris parce punctatis, tuberculis basalibus valde elevatis, acuminatis, nudis; tibiis longius sed minus dense albido-setosis.

Long. 7 mm.

Basal joint of antennæ thick, black; 3rd and following joints reddish, with their apices infusate, their setæ rather long and conspicuous. Head with the antennal elevations acute, the vertex deeply impressed, and more densely clothed with the nearly white pubescence than the other parts. Thorax with the lateral tubercles large and pointed, its pubescence scanty and easily removed, and the surface then without sculpture and nearly shining. Elytra rather elongate and narrow, with an irregularly distributed whitish down, and some upright black setæ, and with distant coarsish punctures, which are quite obsolete before the apex, at their base with two strongly-elevated, acute tubercles, which are destitute of pubescence. Legs rather long, tibiæ reddish towards the knees, elsewhere blackish, but somewhat variegated by the distribution of the whitish pubescence, the hairs on the inner sides of the four posterior tibiæ remarkably long and fine.

This very distinct species should be placed next *H. crista*, from which, however, it is very different; the acute, bare tubercles of the elytra, and its little variegated whitish pubescence, easily distinguish it.

Sent by Captain Broun from Tairua. I have, unfortunately, lost the number he attached to distinguish this species.

Eccles, Thornhill: *November, 1876.*

NOTES ON BRITISH *TENTHREDINIDÆ* AND *CYNIPIDÆ*.

BY P. CAMERON.

(concluded from page 178.)

Taxonus equiseti, Fall. (*bicolor*, Kl.)—The larvæ of this species feed on *Rumex acetosella*, in the leaves of which they make large holes, and, as they are very voracious, the plant gets its leaves nearly all destroyed wherever the creatures abound.

The upper part of the head of the larva is fuscous, the lower portion white; the mandibles brown; the eyes are placed at the end of the fuscous part. Feet and claspers white. The lower part of the body is whitish, with the spiracles brownish; the upper half green, sometimes tinted with red, probably through the contents of the food-canal shewing through; the skin is in furrows, and obscurely marked with black. When it becomes full-fed, the body gets stouter and shorter, and the skin assumes a yellowish tinge. I presume that in a state of nature the larvæ do not spin cocoons, but pass the winter in the stems of plants, for in my breeding jar they bored into the corks and bramble stems which I provided for their use, and passed there the period of quiescence, without the protection of a cocoon, like the larvæ of *T. glabratus* (*cf.* Ent. Mo. Mag. xi, 118), from which they differ very little, either in form or habits, except perhaps that they

appear later in the season. So far as I know, there is but one brood in a year. It is probably the larva of *equiseti* which Kalténbach mentions in his "Pflanzenfeinde," p. 519.

Synopsis of the British species of *Taxonus*:

A.—Posterior wings with two middle cellules; tegulæ black.—*agrorum*, Fall.

B.—Posterior wings without middle cellules.

a.—Legs reddish.

Abdomen with a red band; tegulæ white.—*equiseti*.

Abdomen without a red band; tegulæ black.—*glabratus*.

b.—Legs black.—*glottianus*.

Selandria stramineipes, Kl.—On recently examining my specimens of *S. stramineipes*, I found that I had among them two forms, in one of which the coxæ are black, whilst in the other these organs are whitish-yellow (except the extreme base, which is black), like the rest of the legs. Further differences between them I cannot discover; yet it is worth while calling attention to this group, as Thomson has described two new species which differ but slightly from *stramineipes*. The Swedish author describes the coxæ in the last-mentioned species, and in his *S. temporalis* (in both sexes in *stramineipes*) as black, while in his *S. analis* they are stated to be yellow at the apex, the latter species having also the anus white above. These two new species he distinguishes further by differences in the relative depth, &c., of the frontal sutures and foveæ, the length of the antennæ, and other minute points, all of which are very difficult to apply, though, doubtless, if one had types of the three species for comparison, they might be evident enough. At any rate, I have satisfied myself by an examination of a large series of specimens, both continental and British, that no reliance can be placed on pedal coloration as a means of separating the species, for I find it to vary more or less.

The form with yellow coxæ I have taken on ferns, and hence I am inclined to believe that it may be the same as the *S. cereipes*, V. Voll., the larva of which feeds on *Polystichum filix mas*.

The males are very rare compared with the females. I have in my collection only two specimens—one British, the other continental. They have the coxæ and trochanters black, and the pronotum in front of the tegulæ is distinctly yellow. Assuming that Thomson's three species are distinct, then this ♂ cannot be his *stramineipes*, for he makes no mention of its having any yellow on the pronotum in the ♂, and this is a character so apparent that it could scarcely have escaped his acute eye. The ♂ of *temporalis* and *analis* he does not mention. In those specimens having the coxæ yellow (this being a

character of *analis*), I cannot find any with the anus white above. Dours, in his "Catalogue Synonymique des Hyménoptères de France," states that *stramineipes* feeds in the larval condition on the alder; but whether he actually bred it, or merely suspects from having found the perfect insect on that plant, that it feeds thereon, I cannot say.*

Selandria sociâ, Kl., is merely an aberration of *S. serra*.

Synopsis of British species of *Selandria*.

A.—Abdomen luteous.

a.—Eyes nearly touching the base of mandibles; labrum and base of antennæ black.

3rd antennal joint not much more than double the length of 4th; 2nd sub-marginal nervure not interstitiate.—†*serra*.

3rd antennal joint more than double the length of 4th; 2nd sub-marginal nervure interstitiate.—**grandis*.

b.—Eyes distinctly distant from base of mandibles; labrum and base of antennæ luteous.—*flavescens*.

B.—Abdomen black.

a.—Tegulæ white.—*stramineipes*.

b.—Tegulæ black.

Legs yellowish.—*morio*.

Legs black and white.—*aperta*.

I was not aware of *Selandria aperta*, Htg., being a British insect until I observed it (named) in the collection of Mr. McLauchlan, who took it in the London district.

Tenthredo dispar, Kl.—I have long been in doubt as to whether *T. dispar*, Kl., was a distinct species, or merely a variety of *T. atra*, as had been suggested by Hartig; and until this year I was unable to come to any definite conclusion regarding the matter; but I now know from my knowledge of the life-history of *dispar* that it is a good species.

T. atra, according to F. Rudow, Stett. ent. Zeit., xxxii, p. 386, says: "Ihre Eier anfangs Juli in dicke Blattrippen der Erlen, muthmasslich, aber nicht allein in diese." Details regarding the after

* It may be useful to point out some errors about the habits of saw-flies, &c., in this Catalogue of Dours. *Emphytus carpini* is stated to feed as a larva on *Sorbus aucuparia*, instead of *Geranium robertianum*; *Fenusa pumila* under the dead leaves of oak instead of on birch (cf. Cameron, Proc. Nat. Hist. Soc. of Glasgow, ii, p. 7); *Monophadnus albipes*, "sur les chatons des saules," instead of on *Ranunculus*; *Athalia sponzium* and *A. rose* on roses instead of on various *Crucifera*; *Toxonus agilis* on "les buissons, les gazons" instead of on *Polygonum*. *Hoplacampa xylostri*, Gir., is mentioned twice—as a *Hoplacampa* and as a *Selandria*; and among the *Cynipide* *Trigonaspis nagapecta*, Pz., and *crastalis*, Htg., are given as two distinct species, instead of the latter being regarded as a synonym of the former.—P. C.

† I believe that these two are quite distinct; nevertheless, intermediate forms occur which are not easy to class with the one or the other, so that the question whether they are to rank as species or varieties can only be definitely settled by breeding both the forms.—P. C.

life-history of the larva he does not give; but he mentions that from his observations on *atra* and *dispar*, he has no doubt about their distinctness. It is also stated by Dours (*lib. cit.*) that the larva of *atra* "vit sur les Ribes, les Salix;" he also giving *dispar* as a distinct species; while, on the other hand, Dietrich (Mitth. d. schweiz. ent. Ges., ii) regards it as a variety. If the observations of Rudow and Dours be then correct, there can be no hesitation in treating *dispar* as a good species, since its larva is attached to *Scabiosa succisa*, on which it feeds in July and August. It has the head black, except the face, and at the sides, which are green, the eyes being situated in the dark portion. Body dark green; the folds of the skin marked with black, and across the back there are darker green stripes proceeding from the edges to the centre, but still remaining apart; below the spiracles the sides are of a lighter green, and the feet are of the same colour. Across the skin there are also whitish raised dots—two rows to a segment,—and the head bears a few scattered hairs. When alarmed or touched, it rolls itself up into a ball, and ejects a brownish liquid from the mouth. I could not see if anything issued from the sides, as in the *Cimbicides*. When full-fed, it became of a glassy light green colour, and proceeded to pupate in the earth.

Length, 13-14 lines.

Tenthredo mesomela, L., *sec.* Thoms. (*viridis*, Kl.)—The following is a diagnosis of the hitherto undescribed larva of this species: Head deep shining black; mouth parts pale; upper part of the body deep black; sides pale, spotted with pale brown; feet white, claws black. Body covered with white tubercles and short hairs. Full-fed: shining olive-green; pupates in the earth. Length, 12 lines. Food-plants: *Ranunculus*, *Hieracleum*, and apparently others.

Emphytus calceatus, Kl.—Last year I was fortunate enough to discover the larva of this *Emphytus* at Possil Marsh, feeding on *Spiraea ulmaria*. It has the head deep black, with the mouth parts paler. The upper part of the body is slaty-black, often with a greenish tinge; the rest of the body, with the feet, white, the claws being also of this colour. The skin is wrinkled and furrowed, and bears a few hairs. The spiracles are darkish. In confinement, it passed the pupa state in bramble stems, and in form and habits does not differ from the other larvæ of the genus. Length, 12 lines. With regard to the imago, I may add that I have in my collection a specimen without a coloured band on the abdomen.

Spathogaster albipes, Schenck, Beitr. z. Kennt. d. nassanischen

Cynipiden, pp. 84, 85, and 110; Mayr, Die mitteleuropäischen Eichen-gallen, p. 50, No. 72, pl. vi, f. 72, I find commonly around Glasgow. The very small size of the gall renders it easy to be overlooked.

Aulax hieracii, Bouché.—This gall-insect is regarded by Dr. Mayr (and I have no doubt correctly) as a variety of *A. sabaudi*, II. I found the galls in great abundance at Baldernock on *Hieracium sylvaticum*, close to the roots of the plant, half buried in the soil.

Periclistus caninae, Hartig, is a common inquiline in this country, in the galls of *Rhodites eglanteriae*, but seems to have been hitherto overlooked. The galls tenanted by the guest gall-fly are readily known from those inhabited by the gall maker, by their being considerably larger, more irregular in shape, of a whitish-green colour, rarely relieved by any red, and more particularly by being polythamous.

Ceroptres cerri, Mayr, Verh. z.-b. Wien, xxii, 725.—At Cadder Wilderness I have taken two examples of a *Ceroptres*, which agree very well with the description of *C. cerri*, and also with a type of that species which I received from its able describer. According to Dr. Mayr, *cerri* is an inquiline in the galls of *Cynips cerricola*, *Dryophanta macroptera*, *Andricus circulans*, *A. multiplicatus*, *A. crispator*, and *Spathogaster glandiformis*, none of which I have hitherto found in Scotland. At p. 672 of the above-mentioned work, Mayr states that of *C. arator* he has bred 600 females and not one male; while of *C. cerri* he has reared 98 females and only 4 males; so that in this genus we have mixed partheno-genesis as in the latter, and simple partheno-genesis, as in the former species.

Through a *lapsus* at p. 227 of vol. xi, I have written *Sapholytus apicalis* instead of *Synergus apicalis*, Hartig, Germ. Zeits., 201, 11.

Pentacrita nigra, Thomson, Öfvers., 1861, 399, may be added to our lists. I have taken it at Dalry in August. And also may be added:—

Torymus hibernans, Mayr, l. c. xxiv, p. 111, I having bred this Chalcid from the galls of *Neuroterus lenticularis*, collected in Cadder Wilderness.

Pimpla, sp.—Two years ago I opened a young juicy gall of *Neumatus riminalis*, and found inside of it a small parasitic larva, scarcely more than a line in length, and which, from its small size, I considered to be a Chalcid. Being desirous of watching its development, I carefully closed the gall again, bound it together with a thread, and placed it in an air-tight bottle; but before doing so, I

examined with a lens the inside of the gall, and satisfied myself that this larva was its only inmate; and I may further add that the saw-fly larva in the galls on the same willow-bush from which the specimen in question was taken, were either in the egg or in the first moult. A day or two after closing the gall, I re-opened it, and the larva then appeared to have increased in size; this struck me as rather singular, and my curiosity being awakened, I determined to watch its progress, so it was again carefully returned to the bottle. In the course of five days it had become a pupa, and more than double the size of the larva when I first saw it, the pupa itself being smaller than the full-fed larva. From this observation it became clear to me, that whatever the larva may have been before I noticed it, it was undoubtedly, when under my scrutiny, a vegetable-feeder, feeding on the juices of the gall, which I had managed always to keep fresh. The following year I endeavoured to repeat my observations, but without success, although I examined hundreds of galls. I did notice one curious fact: in one gall I found a saw-fly larva, about three-fourths fed, along with a parasitic larva; but an accident prevented my seeing the issue of this case of what might be termed commensalism.

It will be remembered that Dr. Giraud (in his Memoir on the Insects of the Reed and *Triticum repens*) has detailed observations clearly proving that *Pimpla graminelle* is, at least partly, phytophagous in the galls on the last-mentioned plant; and the Chalcid, *Aulogymnus aceris*, in the galls of *Bathyspis aceris*.

Glasgow: 14th November, 1876.

NOTES ON THE DEGREE OF TENDENCY TO VARIATION EXHIBITED BY THE *LEPIDOPTERA* OF PEMBROKE AND ITS NEIGHBOURHOOD.

BY C. G. BARRETT.

The interesting papers on variation by Mr. Birchall and Dr. Buchanan White, in recent Nos. of the Magazine, have brought the subject so prominently forward, that it becomes almost a duty that those who are able to collect, in districts subject to any peculiar climatal influences, should record the apparent results.

In Pembrokeshire the climatal conditions are so peculiar, that over the greater part of the southern half of the county *tree*-feeding species of *Lepidoptera* are almost totally absent, and the number of species to be found is remarkably small. This arises, no doubt, in part, from the mildness of the winters, and, in a far larger degree, from their extreme humidity; but I think that the principal cause of

the exclusion of tree-feeding species, is the furious violence of the storms which, coming from the Atlantic, rush upon this coast from the south-west with a fury which the trees themselves can barely resist. It follows, therefore, from the scarcity of species, that the number of them which present noticeable variations is proportionately small; but such as they are, I think them worth recording.

Anthocharis cardamines.—In this species the male is the sex most liable to variation. Last year I recorded a specimen in which the black of the tip of the fore-wings on the upper-side was suffused down the veins, so that half the orange patch was clouded with black atoms. This variety I have been unable again to meet with; but when looking for it this spring, I took several specimens which showed a tendency in the same direction, the black tip being suffused along its inner margin and slightly down the nervures, instead of being comparatively well defined, as is usually the case. In the female, the only variation beyond what is everywhere observable, consists in a slight increase in the size of the white blotches in the black tip.

Colias Edusa.—In this species, as is well known, the female is the variable sex. It has not been very common here, but between June 24th and October 13th—its first and last appearances—I picked up about a score. Of these but three were females. In one the usual yellow spots in the black border of the fore-wings are of only half the usual size; in the second only three of them are visible, still smaller; while the third has its border entirely black, except a faint indication of the position of these three spots. In this last specimen the border of the hind-wings is very narrow, the usual pale spots being absent, and the space filled with dusky yellow, like the rest of the wing.

In the male I find only one slight aberration, which, singularly enough, is in the same direction as that of *cardamines*, the inner edge of the upper part of the black border of fore-wings being suffused into the yellow, and the yellow lines which cross the border, also suffused and lost, giving the apex of the wings a very cloudy appearance.

Argynnis Selene.—Rather common on the slopes of some of the sea cliffs. In both sexes the ground colour of the upper-side is darker than usual, though not conspicuously so, and the markings on the under-side of the hind-wings are also of a deeper brown.

Melitæa Artemis.—I have seen but few specimens, and of these the majority of the males resemble those from the South of England, but two or three make some approach in colouring to the beautiful

dark Irish varieties. Of two females taken, one is also dark, but the other a singular pale variety, the usual irregular transverse central line or shade being absent, the middle of the wings is occupied by a broad band of oblong pale yellow blotches. It is, therefore, a very handsome aberration, but apparently rather a freak of nature than a climatal variation.

Lasiommata Aegeria.—Blacker and more velvety than usual, and in the female with smaller pale yellow spots in the fore-wing. This is especially noticeable in lanes *near the sea*.

Satyrus Tithonus.—Also apparently affected by the neighbourhood of the sea. In this species the male is the variable sex, the dots on the under-side of the fore-wings being reproduced on the upper-side. In the typical form only one of these spots, near the anal angle of the hind-wing, is visible as a white-centered black spot on the upper-side. Here I have taken specimens having respectively two, three, and four of these dots on the upper-side, and in one or two instances all are white-centered. One of them has also two additional spots on the upper-side of the *fore-wing*; another has two on one side and one on the other; and another male has no *dots* at all on the upper-side of either fore or hind-wings, and the apical round black spot has but one faint white pupil. In fact, of a dozen specimens, no two are quite alike, but they are picked out from among numbers of the ordinary type. In the female I find no variation beyond an occasional second dot on the hind-wing.

Lycæna Argiolus.—One female specimen has a very *broad* dark border.

On the other hand, *Satyrus Hyperanthus* and *Janira*, *Lycæna Alexis* (*Icarus*) and *phlæas*, all of which present curious aberrations in various parts of the South and East of England, although very abundant in this district, appear to be restricted to their *normal* forms; and *L. Medon*, which is common on the sand-hills, shows no tendency towards its northern variation.

Of the very few *Bombyces* and *Geometræ* occurring here, scarcely any present any striking variation. I recorded last year a specimen of *Odonestis potatoria*, of a rich dark chocolate-brown. Those reared this year are nothing like so dark, but resemble the well-marked forms found in the Norfolk and Cambridgeshire fens.

Abraxas grossulariata is not at all remarkable. Of a hundred reared as an experiment, two or three proved to be dusted over with black atoms so as to look smoky, and the majority had the spots

united into irregular fasciæ; but I have nothing approaching the extraordinary aberrations produced in Yorkshire and Lancashire. On the other hand, a captured female is the largest and *whitest* I ever met with.

Melanippe montanata sometimes occurs in the hill districts, with the central band of the fore-wings unusually dark; but the vast numbers which enliven the lanes in the lower country are all of the usual English forms.

Although no black *Xylophasia polyodon* has yet occurred, several other *Noctue* show decided and interesting phases of variation.

Epunda lichenea is of a rich and *dark* green-grey, with faint clappings of rufous on the stigmata, and pale band. Reared specimens are decidedly handsome.

Anthocelis lunosa, in its dark form, is of a very rich black-brown, but the drab and red varieties, although scarce, are quite normal.

A. pistacina, on the other hand, is *less* variable than I ever saw it before, but then it is also less common.

Orthosia lota, among plenty of the ordinary colour, presents an occasional specimen in which the red irroration is so strongly developed as entirely to suffuse the fore-wings with the beautiful colour of the sub-terminal line; and in the still commoner *Xanthia ferruginea* there is a somewhat similar heightening of colour, especially in the nervures and other markings. One specimen, however, is suffused with pale *lead*-colour.

Of a dozen *Xylina petrificata* taken at the ivy-bloom, several are as pale as the palest English specimens, but others have the reddish tinge well developed, and the stigmata more than usually marked.

Among the *Pyrales*, the only noticeable variation is a *Scopula ferrugalis*, spotted and suffused with dark brown; but all the other specimens seem to be of the ordinary type.

Now I will not attempt to philosophize upon these small data (lest, haply, I get out of my depth), but will just point out that the special peculiarity of climate likely to affect these species, is its excessive moisture, and that the tendency is (as suggested) to deepen or intensify the colour and markings, but that there is not, with this abundance of rain, an excessive decrease of *light*, since the rain falls rapidly and heavily; there are comparatively few cloudy days *without rain* in proportion to what are experienced in drier districts; and the

frequent and brilliant sunshine, and exquisitely clear and pure blue sky, afford a striking contrast to that of the Metropolitan and manufacturing districts, in which cases of melanism are so frequent, and consequently cases of pure melanism appear to be very rare here.

Pembroke : 15th December, 1876.

NOTES ON *RHOPALOCERA* FROM ANGOLA, WITH DESCRIPTION
OF A NEW SPECIES OF *DEUDORIX* FROM ZANZIBAR.

BY W. C. HEWITSON, F.L.S.

Mr. and Mrs. Monteiro, who have gone out to Delagoa Bay to collect specimens of Natural History, have sent home a large number of butterflies in the finest possible condition, but, with few exceptions, which I shall presently mention, the same species which we have had from the Cape; the same too (most of them) which Mr. Rogers sent me from the opposite coast as long as he remained on the banks of the river Quanza. The collection contains specimens of *Papilio Colonna*, and a fine series of the beautiful *Acræa Rabbaia* of Ward, from Zanzibar, *Rhomaleosoma Neophron*, which I have had from the Zambesi, and a number of specimens of the rare *Erebia Panda*, notable for its lovely under-side. These were nearly all taken in the winter months, during which Mr. Monteiro says scarcely an insect was to be had in Angola. He was told that the summer would begin in October, but when he wrote to me (Nov. 5) he said: "It has been very windy, cold, and raining for the last few days, and the summer has not yet set in." Mr. Monteiro is delighted with the country, and is very sanguine that he will be able in "a couple of months time to gladden our eyes with some really fine things." He will do that if he sends us some more of the Zanzibar species, and two or three beautiful things figured by Hopffer, from Mozambique.

The following description is that of a new *Deudorix*, the female of which I have from Zanzibar:—

DEUDORIX DARIAVES, sp. n.

Upper-side (Male). Anterior wing dark brown; posterior wing with one tail scarlet; the base brown, the outer margin black, narrow, the lobe rufous, with the centre black, irrorated with gold.

Under-side grey; anterior wing with a spot at the end of the cell, and a broad transverse band beyond the middle grey-brown, bordered on both sides with white; a sub-marginal series of brown spots bordered inwardly with white; posterior wing nearly white towards the outer margin, marked near the base by five scarlet spots bordered with white, crossed at the end of the cell by a spot, and beyond the middle by a series of grey spots, bordered on both sides with brown, and by a sub-marginal brown band; the lobe and caudal spot black, crowned with gold, the spot between gold, all bordered above with yellow.

Exp., $1\frac{4}{10}$ inch.

Hab.: Delagoa Bay.

Oatlands, Weybridge: January, 1877.

DESCRIPTION OF A NEW SPECIES OF *ARGYNNIS* FROM
ARCTIC AMERICA.

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

The first examples of this species brought to this country were presented to the British Museum in 1851 by Sir John Richardson, captured between $67\frac{1}{2}$ and 68° ; they were much worn, having evidently been on the wing for some time previous to their capture. In 1855 a nearly perfect female example, of which I here give a description, was presented by Captain Collinson, of H.M.S. "Enterprise," and forms part of a collection of 100 *Lepidoptera* made in Winter Cove and Cambridge Bay.

Soon after Mr. W. H. Edwards had commenced his illustrations of N. American *Argynnides*, to which so many of his admirable plates have been devoted, I sent him a sketch of this *Argynnis*, in order, if possible, to get a name for it. Mr. Edwards, however, wrote back to me that the species was entirely new to him, and desired me to describe it at once. As he has, from time to time, written to me since then, but has not obtained the insect, and as he still wishes me to make it known, I here append a description:—

ARGYNNIS IMPROBA, *n. sp.*

Primaries above dull tawny, irrorated with brown scales, the basal area deep chocolate-brown, clothed (particularly on the internal area) with olivaceous hairs; an oval spot across the centre of the discoidal cell, a B-shaped marking at the end, a bifid spot beyond the cell, a slightly sinuous transverse discal series of diverse spots, an externo-discal series of uniform bifid spots, a sub-marginal series of angular >-shaped spots, dark chocolate-brown, and the outer border to the sub-marginal series slightly paler brown; secondaries deep chocolate-brown; an ill-defined greyish tawny oblique series of three spots immediately beyond the cell; an arched dull tawny discal fascia, separated by the dark nervure into six elongated divisions, the second to the sixth with central dark brown spots; a sub-marginal series of dark spots as in the primaries: body blackish-brown; primaries below much clearer in colour than above, the spots much less strongly defined, linear; costal border testaceous; secondaries with the basal two-thirds ferruginous, dusky and irrorated with grey scales at its external margin, the latter forming a well-marked angle upon the radial nervure, above which it is trisinate, and bordered from the costa downwards by a tapering diffused white spot; external third fleshy-brown, densely speckled with white, the outer border greyish, bounded internally by an interrupted dusky line; costal margin pure white; a sharply-angulated transverse band (as in *A. Frigga*) across the basal area, indicated by two irregular parallel dark brown lines, its sub-costal area filled in with white, and its central angle irrorated with the same: fringe testaceous; body below coffee-brown, legs tawny: expanse of wings, 1 inch 9 lines.

Allied to *A. Frigga*, *polaris*, *Tarquinius*, and *lapponica*, but differing most strikingly in the pattern of the under surface of secondaries.

ON STRIDULATION IN THE GENUS *AGERONIA*.

BY A. H. SWINTON.

That the stridulation of these butterflies must be ascribed to the same mechanical cause as we find existing in the genus *Tanessa*, is not at first obvious; for whereas the stridulous sounds produced by the latter are emitted generally while the insect is reposing, semi-torpid, and subject to some unusual excitation, the former have only been heard to emit their clicking noise when chasing each other in the free air. Yet there seems no reason on this account to anticipate a different mode of production, as I have observed that the *Tanessæ* will emit the sound on the wing as well as when at rest, motion of the wings being the only requisite for its production.

Darwin notices the sounds made by *Ageronia Feronia* (Voyage of the Beagle, iii, pp. 37-8) thus: "Brazil, May-June, 1832.—This butterfly is not uncommon, and generally frequents the orange groves. Although a high flier, yet it very frequently alights on the trunks of trees. On these occasions, its head is invariably placed downwards, and its wings are expanded in a horizontal plane, instead of being folded vertically, as is commonly the case. This is the only butterfly which I have ever seen that uses its legs for running. But a far more singular fact, is the power which this species possesses of making a noise. Several times when a pair, probably male and female, were chasing each other in an irregular course, they passed within a few yards of me, and I distinctly *heard a clicking noise*." Darwin is corroborated by Mr. A. R. Wallace (Trans. Ent. Soc., n. s. ii, 257): "The common species (at Pará), *Ageronia Feronia*, produces it (the sound) remarkably loud, when two insects are chasing each other and constantly striking together. One alone does not produce the sound in flying, and I have never heard it made by the small species, *A. Chloe*, which is equally common with the other. I am inclined, therefore, to believe that it is produced in some way by the contact of two insects, and that only the larger and stronger-winged insects can produce it."*

Mr. E. Doubleday (Trans. Ent. Soc., iv, Proceed., p. 123) says that "he had examined *Peridromia Feronia*, the butterfly described by Mr. C. Darwin as making a noise during flight like the rustling of parchment, and that he had detected a small membranous sac at the

[M. J. B. Capronnier (Ann. Soc. Ent. Belge, xvii, p. 21) says of *Ageronia*—"There have hitherto been some doubts if the noise referred to was peculiar to the male, but M. Van Volxem, who has had frequent opportunities of observing the *Ageronia* enjoying their frolics, affirms that the noise is common to both sexes.—EDS.]

base of the fore-wings, with a structure along the sub-costal nervure like an Archimedean screw or diaphragm in the tracheæ, especially at the dilated base of the wing."

I have examined the female *Ageronia Feronia*, and find the superficies of the wings that overlap of considerable dimensions. On the surface of the hind-wing the costal vein is elevated, indurated, black, curved, and bare of scales for about 3"', and at first sight remarkably smooth and glossy. But if this apparent smoothness be observed obliquely with a strong magnifying power, in bright daylight, parallel indentations or slight striæ are seen all along its surface; and under the microscope these develop into a fine file or lima. When the wings are expanded, this costal vein is received into a little concavity in the inflated, rounded, smooth anal vein of the fore-wing, beneath and near its base, which can be traced, after the fore-wing has been detached, by the depression its great prominence leaves in the membrane adjacent. *This concavity is suited in every way to act as a clasp, sonorous when the wings are moved*, while the whole adjustment presents, in elementary form (if we overlook a slight divergence as regards correspondence of the veins), the bristle and catch that lock the wings of *Heterocera*.

Guildford: Jan., 1877.

Stridulation in the genus Vanessa.—Mr. Swinton's remarks (E. M. M., xiii, 169) on this subject are very interesting, and I wish that observations of a similar character were oftener made and recorded. It seems to me, however, that the object of the stridulation will bear a different interpretation from what Mr. Swinton has given it. If it belonged to the class of "phenomena of rivalry and love," the mechanism would surely be more developed in the male than in the female, but it is very much the reverse. I rather think that the object of it is intimidation of any possible enemy, and that the sound should be put in the same category as the hiss of a snake or the warning note of an angry wasp or bee. As it is on the female for the most part that the perpetuation of the race depends, she will have greater need for protection, and hence the greater development of the apparatus.—F. BUCHANAN WHITE, Perth: January 15th, 1877.

Stridulation in Vanessa Antiopa.—Mr. A. H. Swinton's article in this month's Magazine, p. 169, reminds me that the power of stridulation exists in *Vanessa Antiopa*. In 1872, a female *Antiopa* came into my possession, in a hibernating condition, and in that state she would, when disturbed, partially expand her wings, and, at the same time, was produced a grating sound, which seemed to come from the base of the wings.—A. H. JONES, Shrublands, Eltham: 9th January, 1877.

Lobophora viretata double brooded.—As it would appear, from Mr. Buckler's interesting article in the last number of the Magazine, p. 185, that *Lobophora viretata* does not appear to have been recorded as double brooded, I may state, that on the 13th August, 1873, I took, at light, a specimen of this insect, thus affording additional proof that this species, even in a state of nature, has two broods in the year.—ID.

On variation in the larva of Pyrameis Atalanta.—This butterfly is very abundant in the Isle of Man, and although it occurs almost everywhere in the British islands, the larva does not seem to have been very commonly observed, if I may judge from my correspondents' letters.

In the neighbourhood of Douglas, during the past summer, the larvæ swarmed in every lane, disputing the possession of the nettles with *Vanessa urticae*, and far outnumbering the larvæ of *Vanessa Io*. It is usually called a "solitary" larva—Stainton's Manual, i, 37, Newman's British Butterflies, p. 62—but the word solitary can only be applied to it here in a restricted sense, and as referring to its habit of requiring sole possession of at least one leaf for the construction of its tent, for I have taken eighteen full-fed larvæ from one plant of nettle, and left behind at least as many young ones; the plant was not a solitary one, but grew in a lane bordered with nettles, so that the female butterfly was under no compulsion to deviate from her supposed ordinary practice of depositing her eggs singly over a wide range. The larva of *Pyrameis Atalanta* varies in colour remarkably, but may generally (perhaps always) be classed under one or other of the following descriptions, and yet the colour of some of them is so far intermediate that the variation can scarcely be called simply dimorphic.

- 1.—Ground colour grey-green, varying to dingy white, the lateral stripe not very distinctly marked. This is, I think, the typical form, and the only one that I have seen in England.
- 2.—Ground colour intensely black, the lateral stripe white or yellow.

The spines on the various segments vary in colour almost indefinitely in both forms of larvæ: some being black throughout their whole length, others only tipped with black, some are white and semi-transparent, some smoke coloured. The black type of larvæ certainly predominates in the island, but not very markedly.

I reared upwards of one hundred butterflies from each form of larva, keeping well marked specimens of each type in separate cages, with the view of ascertaining what differences, if any, in the perfect insect corresponded with the strongly contrasted colours of the larva, rather expecting to find it a sexual one, but the results were purely negative. The sexes were produced in about equal numbers by both forms of larvæ. The white spot sometimes found on the upper surface of the scarlet band on fore-wings is *not* indicative of the female sex as stated by Newman (British Butterflies, p. 62), it was present in about one-tenth of the specimens, was produced from both forms of larvæ, and in about equal numbers of both sexes, it varies greatly in size, in some specimens being a barely discernible speck.

In short, I am not able to indicate any difference by which the butterflies produced from such remarkably distinct looking larvæ can be distinguished from one another. I venture to ask you to find a corner for this rather unsatisfactory note,

in the hope that it may induce some of the readers of your Magazine to tell what they know on the interesting and obscure subject of larval variation.—EDWIN BIRCHALL, Douglas, Isle of Man: *December 28th, 1876.*

Acherontia Atropos in the north of Scotland.—I have recently heard of the occurrence of *A. Atropos* at St. Andrew's and Wick, and though it is rather late to record them, still I think it would be as well to do so, as this fine moth is not often reported from Scotland.

In the autumn of 1875, a large specimen was seen resting on a shrub in a garden at St. Andrew's. It was not disturbed by any one, probably through fear, as the insect must have had rather an ominous appearance in the twilight; the other was found on a cabbage leaf by a gentleman, in his garden at Wick, and it allowed him to touch it without flying off, or showing any signs of irritation. Has any account appeared of the capture of *Atropos* so far north as Caithness?—W. M. SANDISON, Glasgow: *6th January, 1877.*

[The insect has occurred still further north, in Orkney and Shetland. Its distribution in Europe is probably co-extensive with that of the potato.—EDS.]

Eggs of Cymatophora flavicornis and Dianthæcia casia.—At page 232 of Vol. xii, I gave some account of the egg of *Cymatophora ridens*; since then Mr. Buckler has given me the opportunity of examining the egg of *flavicornis*, and I find it nearly resembles that of its congener; it is oblong, not quite cylindrical, being slightly depressed on one side, with one end wider and blunter than the other; the shell covered all over with a small reticulated pattern—oftener triangular than otherwise, and not arranged in regular rows; the colour dull white, with the raised network slightly glistening; unless considerably magnified, these details do not show out; under an ordinary pocket lens, the shell looks slightly granulated.

So far then I have seen the eggs of two species of *Cymatophora* which do not follow the usual *Noctua* form, but a still greater deviation is exhibited by the egg of *Dianthæcia casia*; on the 18th of last June, Mr. E. Birchall sent me three eggs which he had found in his collecting box, and as he had been taking this species, he concluded they had been laid by a pinned female. However, on examination, I told him they must belong to some geometer, and, as they proved unfertile, I could say no more; but, on June 26th, he sent me a single egg, which he had detached from the ovipositor of a female *casia*, thus excluding all doubt. The egg of *casia* therefore is thus described: of a short oval outline, full, with very faint indications of a large pattern of pentagonal reticulation all over, but with the knobs at the angle of the pattern prominent; glossy; colour dull green, afterwards pale brown.

After this I shall be glad to see the eggs of other species of *Dianthæcia*, in order to settle whether this is a generic, or only a specific (special) peculiarity in the egg state.—JOHN HELLINS, Exeter: *January 12th, 1877.*

How to find the larva of Triphana subsequa.—It may interest your readers to know that January and February (if the weather be mild and damp) is the season to take the larva of *T. subsequa*. I took it first early in January, 1874, by sweeping tufts of *Dactylis glomerata*, and afterwards took it at night feeding on the common

trailing heath-grass *Triticum repens*, and it was seen still feeding on grass as late as April. As it grows in size, it seems to seclude itself more, for after that date I could discover no trace of it. It may perhaps then take to roots. It is considerably in advance of *T. orbona*, it being nearly half-grown when *T. orbona* is very small. Here it was fed on grass to the last, but would not eat chickweed and other herbage if supplied; as two that I sent to friends did not emerge, and all mine did, I think it is possible that the more succulent herbage was too fattening, and that grass is the safest food.—HENRY WILLIAMS, Croxton, Norfolk: *January 4th, 1877.*

Captures at sugar in North Wales, in October.—The following captures at sugar in my garden at Colwyn Bay, near Conway, during the first week in October last, may be interesting, as the district has been very little worked, and has a somewhat peculiar climate. Some of the species mentioned were also taken at *Arbutus* blossoms. I have given every species taken, so as to give a fair idea of the *Noctuidæ* that occur at that time of year:—*Hydræcia micææa*, one specimen; *Xylophasia polyodon*, one specimen; *Agrotis suffusa*, two specimens; *Agrotis saucia*, two specimens; *Agrotis segetum*, one specimen; *Triphæna pronuba*, one specimen; *Orthosia lota*, one specimen; *Orthosia macilenta*, common; *Anthocelis litura*, not common; *Anthocelis pistacina*, very common; *Anthocelis rufina*, one specimen; *Scopelosoma satellitia*, one specimen; *Xanthia ferruginea*, common; *Epunda nigra*, common (!); *Miselia oxyacanthæ* (common); *Phlogophora melicnosa*, very abundant; *Calocampa exoleta*, one specimen; *Gonoptera libatrix*, one specimen.—ALFRED O. WALKER, Chester: *December 18th, 1876.*

Notes on Lepidoptera in 1876.—The past season may be said to have been an exceptional one as regards heat, and there can be no doubt that prolonged or excessive heat affects insect life as it does plant life. Botanists or nurserymen would explain to us, there can be no doubt, what excessive heat does upon vegetation; and, on the other hand, entomologists can show its effect upon insect life, and it would be interesting for us to chronicle whatever has come under our notice. I have put these notes together with these impressions upon me, as second broods of insects have occurred with me which usually only have one. And while all the insects under mentioned have not double broods, they perhaps may be worth recording. *Chærocampa Elpenor*—I took this insect, for the first time in this locality, at sugar, in June, a female which laid me a number of eggs. These hatched, fed up, and I have now 15 safely in pupæ. *Smerinthus ocellatus* and *populi*—larvæ plentiful on crab and poplar, from the latter I had a second brood of two males. *Heptalus hectus*—flying at dusk in a wood near here, common. *Limacodes testudo*—beat a larva out of birch in September, which I took to be this species not quite full-fed, green, with no perceptible legs. *Arctia cæja*—found a batch of eggs which produced this species, they fed away well, a goodly number of them outstripping the rest, and 12 becoming pupæ this autumn. *Trichiura eratægi*—eggs sent me, reared 12 to pupæ, 6 of which emerged in September, the others I expect remaining over until next year. *Pæcilocampa populi*—took one off a gas-lamp. *Eriogaster lanestris*—bred 5 females, I had 16 pupæ, no males made their appearance. *Metrocampa margaritata*—took a female which laid a batch of eggs, the larvæ of which

are now hibernating. *Eurymene dolobraria*—larvæ, beat two out of oak in September. *Crocallis elinguaris*—took a female which laid a batch of eggs, 140. *Ennomos tiliaria*—beat a larva out of birch, from which I reared a fine female; being anxious to obtain eggs, I placed her outside in a box, sufficiently open to admit her spouse. But of this I was deprived the pleasure, seeing that no males were attracted by her charms, and so my experiment to obtain eggs failed. *E. fuscantaria*—13 eggs sent me, I reared 7 imagos, 3 females and 4 males. These I succeeded in pairing, and they very generously laid me over 200 eggs. *Phigalia pilosaria*—found 4 larvæ in September. *Amphidasys prodromaria*—beat 2 larvæ out of oak. *A. betularia*—last autumn I collected a number of larvæ of this species off rose and apple, from these I had the pleasure of seeing come out 10 imagos in my breeding cage, 5 were of the ordinary type, and 5 were thorough black ones with the exception of two white spots at the base of the fore-wing of two of them, otherwise they were as large in expanse of wing as the type. Some entomologists appear to think that starving the larvæ is the chief cause in the production of varieties; but my experience in this instance does not bear the starving process out. These larvæ were nearly full-fed when I found them. I then placed them in a large jam-pot, supplied them with plenty of food until they assumed the pupa state. *Boarmia repandata*—took a fine female at rest on the bole of a tree: unfortunately it laid me no eggs. *Iodis lactearia*—beat a number of larvæ out of oak, these larvæ very much resemble some of the *Eupitheciæ*, *exiguata*, for instance; before entering the pupa state they spin loosely together the leaves of their food, then fasten themselves by their tail, and are left suspended. *Acidalia incanaria*—found 2 at rest. *A. imitaria*—a female on a grassy bank. *Eupithecia venosata*—larvæ in seed-heads of *Silene inflata*. Several *E. pimpinellata* larvæ on *Pimpinella*; *albipunctata*—bred 70 in April. *E. fraxinata*—took a female at rest on a bole of an ash, which laid me a batch of eggs. These produced me 32 larvæ, which fed up well and turned into pupæ, one of which appeared as second brood in October. *E. nanata*—a few larvæ on heather. *E. minutata*—scarce this season. *E. assimilata*—on black-currant. *E. tenuata*—a few on willow catkins. *E. abbreviata*—beat a few larvæ out of oak in June. *E. exiguata*—out of hawthorn in September. *E. sobrinata*—out of juniper in May, imagos appearing in July. *Collix sparsata*—I was fortunate in taking about 90 larvæ of this species during the summer in all stages of growth, full-grown, half-grown, and others just out of the eggs. *Dicranura bifida*—I was pleased by taking 21 larvæ of this species this season, 20 of which have spun up. *Notodonta dictæa*—bred 4 imagos, and took 5 larvæ. *N. dromedarius*—bred 2, and took a number of larvæ. *N. ziczac*—imagos and larvæ. *Thyatira batis*—one at sugar. *Cymatophora diluta*—found one at rest. *U. ridens*—beat 3 larvæ out of oak. *Acronycta tridens*—found a few larvæ on rose. *Acronycta leporina*—12 larvæ on poplar and birch. *Leucania pudorina*—a few at sugar. *L. comma*—a few at sugar. *Mamestra anceps*—12 at rest under old mats. *Grammesia bilinea*, var.—one at sugar. *Agrotis nigricans* and *Orthosia suspecta*—at sugar. *Orthosia epsilon*—larvæ from bark of willows. *Dianthæcia carpophaga*—larvæ in seed-heads of *Silene inflata*—rather common. *D. capsicola* and *cucubuli*—in seed-heads of *Lychnis dioica*. *Hadena suasa*—at sugar. *H. pisi* and *thalassina*—plentiful at sugar. *Hydrelia unca*—scarce, took only two on the wing.—THOS. WILSON, 1, North View, Holygate, York: January, 1877.

Description of the larva of Coremia propugnata.—I received a batch of eggs of this species through the kindness of Mr. Owen Wilson, of Carmarthen, on the 16th June last. They were globular, smooth, and polished, and uniformly pale straw-colour; two days later, or three or four after they were deposited, they had become orange, and before hatching changed to lead colour. The young larvæ appeared on the 23rd June, were slender, dark olive-brown, the head brownish. They fed up rapidly on young cabbage leaves, and, by the middle of July, were full grown. Length, about an inch, and of moderate bulk in proportion; the head has the lobes rounded, and is considerably narrower than the second segment; body rounded above and below, but the two portions are distinctly divided by the skin at the sides, forming a raised lateral ridge; it is of tolerably uniform width, tapering only a little towards the head; the segments are distinctly divided, and the skin has a somewhat tough appearance.

Ground colour dingy ochreous, but (except on the last four or five segments) is almost entirely covered with dark, dull smoke-colour; in some specimens this dark shade is nearly black, whilst in others a very dark green tint is observable: head glossy, pale brown, with darker brown spots; dorsal line darker green, paler on the posterior segments; sub-dorsal lines rather wavy, grey; there is also an indistinct finer grey line between the sub-dorsal and spiracular regions, but there are no perceptible spiracular lines. On the anterior of each segment, and situated on the dorsal line, is a conspicuous, rather large, black spot, and this spot is generally preceded by an equally conspicuous paler mark, of various tints in different specimens, in some being pink, in others grey or yellowish; spiracles distinct, black, the raised tubercles grey.

Ventral surface dull ochreous or (in some specimens) pinkish; it has a fine smoke-coloured central line, enclosed in a band of the ground colour, outside of which, on each side, is an olive band, bordered outwardly with a fine smoky line, and there are faint indications of one or two other wavy lines between this and the spiracular ridges; on each side too is a double series of black dots of two sizes, a large one being in front, followed by a smaller one.

The pupa is enclosed in a silken cocoon, and is about two-fifths of an inch in length, rather dumpy, smooth, and highly polished; thorax cylindrical; wing-, eye-, and antenna-cases boldly defined; the abdomen attenuated, but not rapidly, towards the anal point, which, however, is fine and sharp. Colour dark brown, the antennæ-cases and outer edges of the wings pale brown; the whole changing to deep mahogany-brown just before the emergence of the imago.

All the brood, forming a very fine series, emerged about the middle of August.—GEO. T. PORRITT, Highfryd House, Huddersfield: *January 4th, 1877.*

Natural History of Asthena sylvata.—On the 15th of last July, I was very glad to receive some eggs of this species, which had been obtained by Mr. J. Batty, on the 4th of the month; the larvæ were hatched on the 16th, fed away at once on alder, preferring all through their growth tender open leaves, but avoiding the sticky leaf-buds; they grew rapidly, and by August 8th, were in their last skin, and, in a few days more, would have been full-fed, when I had the misfortune to get them killed. To replace them, Mr. Batty kindly sent me the larvæ he had been rearing himself, but I found these were by no means so far advanced as mine had been, for,

by August 15th, they were not half-grown, and did not pass their last moult for another week; however, by the beginning of September, they had spun up. A larva captured by Mr. McLachlan, in Devonshire, in 1875, did not spin till the second week of September, whilst one lent for figuring in 1874, by Mr. A. H. Jones, was nearly full-fed by July 17th. These dates—varying from the middle of July to the middle of September—for the maturity of the larva, almost give time enough for a second brood, but I suppose the safer inference is that the single brood of moths has a flight of some duration.

The egg is bluntish-oval in outline, flattened, the shell embossed all over with a small triangular pattern, the colour very pale yellowish-white throughout, no change taking place to the last; hence it is necessary to watch very carefully for the hatching of the larvæ, for there is nothing to give warning of their exit, and, being very delicate, they will soon die if not supplied with food.

The newly-hatched larva is of a very pale greenish-white tint, the head very slightly tinged with brown, the skin shining, the usual hairs fine, and whitish in colour. As the larva grows, and up to the last moult, it becomes more translucent; when three-eighths of an inch long its figure is stumpy, the segments looking puffed, stoutest at the 9th, and thence tapering towards either end; the body now looks quite pellucid, except that the internal organs show as a pale dull green stripe down the back, and the puffed spiracular region is pale yellowish-green; the small head black. With the last moult comes a complete change: the pellucid look disappears, and a very handsome contrast of colours is seen, the tints of which, as usual, are much richer and deeper at first, becoming gradually paler as the larva approaches maturity. When full-fed, the larva measures five-eighths of an inch in length, or nearly three-fourths when fully stretched out, in figure stoutest at 9 and 10, tapering considerably towards the head, which is the smallest segment, and has its lobes well-defined, and not so much towards the tail; this actual tapering of the figure appears much enhanced to the eye by the arrangement and outline of the markings; all the segments plump, and well-defined; a favourite attitude of the larva is to rest along the midrib at the back of a leaf, with the head held up; segments 2 to 5 kept close to the leaf, 6 to 9 raised in an arch or sometimes a loop, and 10 to 13 again pressed close to the leaf.

The colour of the head is shining blackish-brown, the triangular space between the lobes in front pinkish, barred across above the mouth with blackish-brown, the lip and base of palpillæ pinkish, the jaws blackish-brown; on the 2nd segment is a narrow black shining plate, from which commences, on the back, a broad marking of dark purplish-brown, widening as it proceeds, and obliterating the pale yellow-green ground, at the end of the 5th segment it reaches below the spiracles and begins to spread over the ventral surface, in some examples quite enveloping the whole body, as far as the 9th, on which segment its colour becomes rosy-red, and thence narrows again as a dorsal stripe to the anal extremity; this dark marking is darkest—almost black—on its lower edge, and has throughout a narrow edging of sulphur-yellow melting into the yellow-green below; on each side of the 5th is a patch of yellow on the yellow-green ground, and there is an elongate yellow patch on each side of the 9th, showing very conspicuously on the dark colouring which there surrounds it; on the dark marking at the beginning of segments 5, 6, 7, and 8, is a squarish dorsal violet mark, whence slants backward on either side a whitish streak, thus forming

nearly a perfect chevron pointing forwards ; the dorsal line can scarcely be traced on the thoracic segments, but thence backwards it continues as a violet-white line to the anal extremity ; on the dark marking the shining black tubercular warts project conspicuously from white rings, on the green portions they are also green, small in size, and escape notice ; the spiracles are also inconspicuous, being small, and of the same colour as the segments, on which they happen to come ; all the legs are yellow-green.

The cocoon is placed just on the surface of the soil, and formed of small particles of earth, leaves, &c., fastened together with a tough, although not hard, lining of pale silk ; the pupa is five-sixteenths of an inch in length, rather stout in proportion, the abdomen tapering off rapidly from the end of the wing-cases, and ending in four or five eurled-topped spines of unequal lengths, but twisted together so as to look like a spike ; the eye-cases rather prominent ; in colour the wing-cases are tinged with greenish, all the rest mahogany-brown and shining.

I have now made acquaintance with the earlier stages of three species of *Asthena*, namely: *candidata*, *sylvata*, and *Blomeraria*, and find them exhibiting as close a resemblance in these, as in the perfect state ; of *luteata* I do not know so much, and am anxious to know more, and shall be extremely obliged to any one who, during the coming season, will kindly forward me a few eggs.—JOHN HELLINS, Exeter : *January 10th, 1877.*

Melanism in Lepidoptera.—It seems somewhat absurd for me to enter an arena of controversy where Mr. Edwin Birchall and Dr. F. Buchanan White are to be found ; truly the circle is one “ where angels might fear to tread,” but it does appear to my humble judgment that both have to some extent overshot the mark in trying to account for varieties of coloration in *Lepidoptera* ; first, Mr. Birchall quotes from learned writers who assert in fact that darker coloured animals, from the lower orders up to the superior animal man, have advantages in freedom from disease, less liability to parasites, superior acuteness of the senses, &c., which their paler coloured fellows do not possess ; I must say I do not see any foundation for this doctrine ; in the races of men it certainly does not appear to hold good, as the fair-haired Saxon is able to hold his own physically and intellectually against the darker races, the single instance in which the rule holds being the albino in all animals, but this is, after all, a diseased type. If Mr. Birchall’s theory of survival of the fittest be true, and that the darker races in insects, animals, and the superior animal man are the fittest, the inevitable conclusion to which it points is that the darker forms in insect and animal life, and the Negro in man, would, after so many ages of natural selection, largely predominate in the world, the contrary being, however, the fact.

Secondly, Dr. White, adopting the natural selection theory, appears to reject Mr. Birchall’s notion that cold, damp climates, with the absence of sunshine, may be the cause of the origin of variations of colour, and suggests meteorological causes.

May we not then very easily suppose that variations of colour in insects may be, so to speak, accidentally produced by external objects, present to their acute vision during the process of generation, and this may occur again and again ; it seems to me a less far-fetched theory than to assert dogmatically that dark coloured insects are endowed with stronger constitutions, and are therefore perpetuated by natural selection.—S. RADCLIFF FETHERSTONHAUGH, 17, Eccles Street, Dublin : *December 20th, 1876.*

Supplementary note on Xylophagus ater and X. cinctus.—In my notes on these species (E. M. M., xiii, 160), I overlooked certain articles which are referred to in the Zoological Record, and which I have not yet had an opportunity of seeing. Damianitsch (Verh. zool.-bot. Ges. in Wien, xviii, 117) found the larva of *X. ater*, under alder bark, and describes its metamorphoses. Frauenfeld (*l. c.* 166) confirms Drewsen's statement that the larva is carnivorous. The transformations of *X. cinctus* are re-described and figured by Perris (Ann. Soc. Ent. Fran., 4^e série, x, 202, &c.), who found the larva in the galleries of *Tomicus stenographus* in *Pinus maritimus*. He thinks it feeds on the "frass" of the beetle, and is occasionally carnivorous.—F. BUCHANAN WHITE, Perth: December 23rd, 1876.

Locusts in Yorkshire.—In addition to those recorded in the E. M. M., for January, by myself, I will add that Mr. N. F. Dobrée, of Beverley, informs me that two were taken at Beverley during the latter half of August, which he saw alive. He states that the length was fully 2 $\frac{3}{4}$ inches, and the colour grass-green, while that of a smaller specimen, taken at Spurn (the extreme south-east point of the county), during the first days of September, is a more yellow shade of green. He also informs me, on the trustworthy authority of Mr. Philip Lawton, of Easington, four miles from Spurn, that eight specimens were taken there during the second week of September, three of which are in Mr. Lawton's possession. Mr. Lawton also adds that two were brought to him in 1875, and that locusts are of frequent occurrence in the summer. Can it be that locusts breed in the British Islands? they seem to occur on some portion of our coasts or inland nearly every year. I have seen records of their abundant occurrence at or near Spurn Point in 1812, 1846, 1858, 1859, 1875, and 1876.—WM. DENISON ROEBUCK, Leeds: January 15th, 1877.

Locusts in Yorkshire.—I have had some correspondence with my friend Baron De Selys-Longchamps respecting the species of *Pachytylus* to which the examples noticed in our last No. should be referred. He agrees with me that they are certainly *P. cinerascens*, and adds, that he is persuaded that this species breeds regularly in Britain (as, according to him, it does in Belgium). I do not share this opinion; but it is probable that the greater part of those taken in Britain are *cinerascens*.—R. McLACHLAN, Lewisham: 30th December, 1876.

Change of generic name (Parthenos, Hübn.).—I propose to substitute for the above generic name, occurring in all the American lists of *Heterocera*, the generic name *Catocalirrhis*, reading thus:—

CATOCALIRRHIS, W. V. Andrews.
nubilus, Hübn.

My reason for this is, that *Parthenos* is also used by Hübner for a genus in *Rhopalocera* (Verz. bek. Schmett., 38, 1816); and, without reference to the law of priority, which does not apply in a case like this, where the same name is used by an author for two different genera, I think it desirable to suppress the generic name covering the fewest species; this, on the ground of convenience.—W. V. ANDREWS, 36, Boerum Place, Brooklyn, New York: December 26th, 1876.

[It is possible that the law of priority does apply in this case, as Hübner's "Verzeichniss" was in all probability published in sheets, in which case the *Rhopalocera* genus would stand by date. Hübner put only one species in it, however; so it is difficult to see how the idea of suppressing the name covering the fewest species can apply: Boisduval, moreover, has already re-named this first genus *Mimetra*, but without special reason, just as he re-named all the others that he took up. The species of the *Heterocera* *Parthenos*, by the way, is *nubilus*, and not *nubilus*.—EDS.]

ON STRIDULATION IN THE GENUS *ACHERONTIA*.

BY A. H. SWINTON.

The mouse-like cry of the European death's-head moth has long engaged the attention of naturalists, as may be seen in an article by H. N. Moseley, Profs. Westwood and Rolleston, in the number of "Nature" for June 20th, 1872. Réaumur says the sound is produced by *the friction* of the haustellum against the palpi; Roesel considers it due to *the friction* between the abdomen and thorax; Rossi to *expiration* of air from the haustellum; Schröter to *the friction* of the haustellum and head; Engramelle says it proceeds from the "spallete;" and Lorey from *expiration* at the base of the abdomen; Passerini from the haustellum, caused by *expiration* from a suction cavity at its origin; Chavannes and Rochebrune have also written on the subject. Then Burmeister thinks the seat of the voice is in the head; Vallot and Johet consider it is produced by *wing-percussion*; Wagner says it is due to *expiration* from the large vesicles at the anterior part of the abdomen, through the œsophagus and haustellum; Dugès that it proceeds from *the friction* of the opposite edges of the two halves of the haustellum; and Nordmann from *expiration* at the base of the abdomen. Duponchel and Guérin next refute Passerini, and state that the sound arises from *the friction* of the prothorax on the scutellum, and Goureau says it arises from *a crumpling* of the plates forming the integument of the abdomen; Abicot refutes Goureau, and Ghiliani confirms Passerini; Paris ascribes it to *a fluid* forced up and down inside the haustellum with the assistance of the palpi; and Landois to *the friction* of the palpi against the haustellum; J. Van der Hoeven says it proceeds from *friction* at the basal portion of the haustellum; Westmaas confirms Passerini and confutes Wagner; Caprommier says an imago with a deformed head was mute; Edward Newman, E. A. Johnson, W. H. Taylor, and the Rev. T. A. Preston, repeat the theories of Lorey and Passerini; and lastly, H. N. Moseley confirms the theory of Passerini, and gives a diagram and description of the cavity and its muscles.

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Many questions arise in weighing the evidence adduced by these authors, such as: is the sound emanating from this moth really due *to friction or expiration?* or, does it proceed from *the head* or *the base of the abdomen?* But these, and many more may, I think, be subordinated to the zoological query; may it be termed a *species of stridulation* as defined by Gourreau, *Annales de la Soc. Ent. de France*, 1837, p. 31 (*Entomological Magazine*, January, 1838, p. 89, &c.), and is an organism representing *the lima and clasp* implicated in its production? Now, Dr. H. Landois, as may be seen from his pamphlet, "Die Ton- und Stimmapparate der Insecten," published at Leipzig in 1867, a reprint from the *Zeitschrift für wissenschaftl. Zoologie*, xvii, has investigated the matter in this light (see pp. 55—58), and he, after remarking a motion of the palpi in connexion with the sound, submitted one of these organs to the microscope, when he found the crescent-shaped excavation on the inner side of the first joint of the palpus that receives the haustellum when coiled or depressed, indurated and

covered with fine furrows, which he compares to the files of certain stridulating *Coleoptera* of the genera *Necrophorus*, *Geotrupes*, and *Cerambyx*, and these he concludes produce the sound when rubbed over the haustellum, which is also furrowed transversely. He adds, the moth will only cease squeaking when these are entirely *eradicated*. The note of the female is deeper, and its lima coarser, than that of the male. He also finds the lima on the palpi of other *Sphingina*:—*Sphinx convulculi*, *ligustri*, *pinastri*, *Smerinthus tiliæ*, *Deilephila euphorbiæ*, and *Chærocampa Elpenor*, but poorly developed, and capable of producing only slight sounds.

It has been also submitted to my notice (by the Editors) that Linnaeus differed slightly from Réaumur in opinion, regarding the manner in which *Atropos* produces the squeak, for he does not say it passes the haustellum over the palpi, but, "*Stridet allidendo palpos ad linguam*" (Syst. Nat. ed. xii, p. 800, 1766—68), and this is the notion I imagine Dr. Landois would endorse. Without hazarding further conjecture on this crucial point, I merely add that, in "good squeakers" I have invariably found a portion of the hair at the outer edge of the basal joint of the palpi worn, and that the sound of the file may, in some slight measure, be re-produced after the death of the insect, by a gentle friction.

Thus it would seem *Acherontia Atropos* is really a stridulator, and yet there remain some phenomena in connexion with this stridulation that need explanation. For instance, when the species of this genus squeak, the two large air-vesicles at the anterior part of the abdomen generally inflate by an unusual spasmodic compression of the posterior segments beneath, and a yellow fan or fascicle of hairs, rising perpendicularly from a fold at either side, emits a pungent scent of jessamine, and expands to a stellate form, which gave rise to the theories of Lorey, Wagner, and Nordmann, lately resuscitated, to account for the stridulation of *Acherontia Satanas* ("Ceylon," by Sir Emerson Tennent, vol. i, p. 264, London, 1860). The former appearance seems also to have led Wagner to conceive air was then forced into the cleft haustellum, which has a double row of orifices at its extremity like the holes of a flute, a circumstance one would think of actual occurrence secondary to the stridor. But *the fan* itself, well described by Nordmann, may be shown, on the other hand, to be entirely unconnected with the "squeak"—a *secondary sexual character* it would seem, as I find the little wave moth *Acidalia remutata* carries it expanded during copulation. It also exists on the abdomen (base or anus), or on the 2nd pair of tibiæ in various genera of *Noctuina* (*Leucania*, *Xylophasia*, *Mamestra*, *Phlogo-*

phora, *Apamea*, *Catocala*, &c.); on the 3rd pair of tibiae or fore-wing of various genera of the *Geometrina* (*Boarmia*, *Macularia*, *Iodis*, *Acidalia*, *Ciliaria*, &c.); or on the fore-tibiae and first tarsal joint in the *Deltoides*.* It is invariably impregnated with an acid secretion, that often stains it orange or black in colour, and diffuses various unctuous odours (as of turpentine, when the imago frequents deal boards or the larva feeds on pine). The death's head moth, in squeaking, at times slightly elevates its abdomen, and depresses its wings, or it lays back its antennæ, whence the theory of Vallot and Johet, confuted by Kirby and Spence (Intr. to Ent., 7th ed., p. 493). It has a favourite sphinx-posture on its four hind legs, with its head raised, is fond of patting, with its fore-feet (suctorial insects "communicate" with the touch of the tarsus or antennæ), and will sometimes run after an object.

I should here mention that the larva of the "death's head" has the power of producing a crackling sound by a testy lateral jerk of the head, due, probably, to muscular contraction (Landois, Ton-und Stimmapp. der Insecten, p. 59), and inappropriately termed stridulation by Scopoli (Ent. Carn., p. 185, 1763)†. The motion is observable in many other lepidopterous larvæ, and a group of the caterpillars of *Callimorpha jacobææ* feeding, go through a really remarkable performance of this "head-wagging," when a cloud or passing object intercepts their sunlight. The accompanying crepitation peculiar to *Acherontia*, is nevertheless well attested (Meigen, Syst. Besch. der Europ. Schmet., Leipzig, 1830; Zoologist, 1858, pp. 6212, 6282; Ent. Weekly Intelligencer, vol. iv, p. 196, vol. v, p. 29; Canadian Entomol., vol. i, pp. 40, 47, 48; Trans. Ent. Soc., vol. iv, proceed., p. 157, &c.). The pupa of this "Sphinx," also, like many other pupa, emits a noise (Ent. Weekly Intel., vol. v, p. 117, vol. vi, p. 91).

Guildford: January, 1877.

NOTES ON THE *TORTRICES* OF PEMBROKESHIRE.

BY C. G. BARRETT.

Penthina sellana.—Early in July I found this species flying swiftly in the sunshine, about the face of the cliffs, at Tenby, and settling on stones or rocks. It also flies at sunset.

* If Mr. Swinton had examined a large general collection of exotic *Lepidoptera*, he might have multiplied instances of the possession of a "fan" in the ♂, and have added to the positions on which it is placed. There does not appear to be the slightest ground for supposing that it has any connection with "stridulation," and its use (whatever it may be) is probably as varied as its position. Many of the British *Noctua* possess it as a basal abdominal appendage, and yet, we remember that, a few years ago, a member brought to the Entomological Society, the ♂ of one of our common *Noctua*, as an interesting exhibition, because he had detected this fan. We should like to have further evidence to the effect that it is always "impregnated with an acid secretion."—Eds.

† "*Larva irritata stridens*." Scopoli, *l. c.*—Eds. .

Peronea Schalleriana.—More variable than usual. Along with typical specimens are others suffused with greyish-brown, in various proportions, and two of my specimens are entirely purplish-black, only recognizable as this species by the form of the fore-wings, and by the line of raised scales, which indicates the position of the costal blotch. The discal tuft of raised scales, or "button," is, however, brown, and more than usually distinct.

Peronea comparana seems to be less common, and not nearly so variable.

Peronea variegana frequently occurs suffused with purplish-black.

Spilonota incarnatana.—Found in plenty higher up the sand-hills than where I searched in vain for it last year. This is a peculiarly interesting discovery since the form found here is precisely what was wanting, to link together the small varieties which so abound on the Lancashire, Cheshire, and Dublin coasts, with the large rosy form which is found sparingly in Epping Forest and other inland localities. I have before recorded that many years ago I found among the rocks of the Hill of Howth small specimens with dark brown markings; and, on the neighbouring sands of Malahide, specimens also small, but with ochreous-brown markings, rather suffused. This last form also swarms on the Cheshire coast. On the other hand, those from Epping Forest, where it is scarce, are half as large again at least, with blackish-brown markings, and the ground colour clearer, and much more rosy. Now, these Pembroke-shire specimens, taken on high, firm sand-hills, vary in size, from that of the smallest Irish or Cheshire specimens, to fully that of the largest from Epping Forest, these large ones having the ground colour clear and rosy, while some of the small ones are rather suffused. The markings in all are black-brown, sometimes with a purple tinge.

Sciaphila perterana.—Plentiful last season, the larvæ feeding commonly in flowers of *Apargia hispida* and *Hypochaeris radicata*, as well as in the ox-eye and common daisies. One larva was found in blossoms of common buttercup, having departed from the usual habit of its species by fastening two flowers together. It fed upon them, and produced a lovely ♀. I have seldom met with any larva more absolutely determined to escape from confinement. Life was utterly unimportant in comparison to liberty. Many crushed themselves flat and died in the attempt, but those which managed to get out, were then perfectly satisfied, and would spin up in the first bit of leno that they came to. The variations of the female in colour are very striking.

Euchromia purpurana.—The first seen in the season was sitting on a large leaf in the garden, but before a net could be obtained it was gone. However, by following up a clue obtained last year, I found the species in some numbers in a clover field near the limestone quarries, where it flew freely, from about 7 p.m. till dusk. Some of the most perfect specimens have dull ochreous indications of fasciæ.

Orthotænia ericetana—The value of my discovery of the habit of *purpurana* was not diminished when I found that it was accompanied by this species in plenty, and in most lovely condition. Previously, I have thought myself fortunate if, in the course of a long afternoon's work, I have taken one or two little males, but in this field they were flying in scores, with large velvety females in equal numbers, some specimens varying to a purple-brown. The time of flight, however, was very short, just before dusk, and they would only move on calm, warm evenings.

The clover-field at this time was a lively spot,—the crop in some places had failed, and grass, coltsfoot, and silver-weed were taking its place, and these spots seemed to be the most favoured by the moths, probably because their larvæ had here destroyed the clover roots.

Halonote Brunnichiana was a nuisance, flying in the sunshine about the coltsfoot; the pretty little *Stigmonota composana* was at the same time flying over the clover; *Spilodes cinctalis* was ready to spring up whenever disturbed. As the sun declined, *Semasia rufillana* appeared with *Euch. purpurana* (already mentioned). A little later appeared *Xanthosetia humana* in swarms; then *Orthotænia ericetana*, followed very soon by *O. antiquana*, *Coleophora annulatella*, and occasionally a *Gelechia*, which still remains (I grieve to say) unnamed and undescribed, because, although it is evidently a novelty, no specimen sufficiently perfect could be obtained. Last, and by no means least welcome, when it was nearly dark, on warm, still evenings, three or four *Catoptria expallidana* occurred. *Orthotænia antiquana* is worthy of special notice from the extent of its variations. From the type—pale drab with brown markings—it ranged to pink, with the markings reddish-brown, to entirely reddish-brown, except a dark shade from the base, to glossy dark brown, in which the markings are obscured or obsolete, and to pale drab without the shade of a marking. There was little or no *Stachys* in this field, and it must feed on some other plant also. My impression is, that this and two or three of the other species find the clover roots entirely to their taste. *O. ericetana* and *antiquana* lasted till far into August, and the latter species occurred also, of course, among its usual food-plants—*Stachys sylvatica* and *ambigua*.

Catoptria cæcimaenlana again occurred in the quarries, especially among knapweed, but not commonly. It has a curious habit in the day time of sitting on bits of grey limestone on the ground, upon which it is hardly possible to distinguish it.

Catoptria expallidana, besides in the clover-field, occurred on the railway bank, and in the quarries, but only casually, and supplying no indication of its food-plant or habits, except that of flying when it is hardly possible to see it in the increasing darkness.

Eupæcilia pallidana.—Two specimens occurred on a sloping cliff, but in so exposed a place that the wind doubtless prevented it from flying in any numbers.

Eupæcilia flaviciliana.—A small *Tortrix*, netted over a sloping bank late at night, and boxed "on suspicion," proved to be this species. Pressing business, and very pressing weather prevented it from being further looked for. The capture of this lovely little rarity was an unexpected treat.

Pembroke: *January, 1877.*

NOTES ON MR. BUXTON'S EASTERN BUTTERFLIES, WITH DESCRIPTION OF A NEW SPECIES OF *PORITIA*.

BY W. C. HEWITSON, F.L.S.

Mr. E. C. Buxton, who has just returned from a twelve months' hunting excursion in the east, in Sumatra and Java, has brought with him 2000 butterflies, remarkable chiefly in showing how barren those countries are in anything that is new. The collection, nevertheless, contains some fine and rare species and in beautiful condition. Amongst them *Papilio Cænis*, and a fine series of *P. Leucothoe*, the rare *Cyrestis Perianther*, *Eurytela Costeleani*, *Melanitis Penanga* of Westwood, which was not in the Wallace collection, and is quite distinct from my figure of *Penanga* to which Mr. Wallace gave the name of *Sumatrana*. There are two new species of *Amblypodia*, a new *Poritia*, which I describe below, and some fine new species of *Hesperia*.

PORITIA PEDIADA, *n. sp.*

Upper-side: female, dark brown, slightly tinted with dull blue; outer margin of the posterior wing dentate.

Under-side: red-brown; both wings crossed transversely by two bands of lilac-white, one near the middle, the other sub-marginal. Posterior wing with a short band of the same colour between the others, and a sub-marginal line of white.

Exp., $1\frac{1}{10}$ inch.

Hab.: Singapore.

Oatlands, Weybridge: *February, 1877.*

DESCRIPTIONS OF NEW GENERA AND SPECIES OF *GALERUCIDÆ*.

BY JOSEPH S. BALY, F.L.S.

Sub-Fam. HALTICINÆ.

ACROCRYPHA PALLIDA.

Rotundata, postice rix attenuata, valde convexa, flavo-fulva, nitida, tenuiter punctata, punctis in elytris irregulariter substriatim dispositis; oculis antennisque extrorsum nigris. Long. 2 $\frac{2}{3}$ lines.

Hab. : Sumatra; collected by Mr. Wallace.

Head very short, transverse, vertex finely punctured; encarpæ distinct, quadrangular, nearly contiguous at the apex; eyes elongate, their inner border slightly sinuate; antennæ rather longer than the thorax, slightly thickened towards the apex, four outer joints pitchy-black. Thorax nearly three times as broad as long, obliquely bisinuate on either side at the base, medial lobe moderately produced, broadly rounded; sides obliquely converging from the base towards the apex, all the angles broadly rounded. Scutellum elongate-trigonate. Elytra rather broader at the base than the thorax, shoulders distinct, but abruptly rounded, inflexed limb broadly dilated; surface more distinctly punctured than the thorax. Legs short, robust.

ACROCRYPHA PURPUREA.

Rotundata, convexa, metallico-purpurea, capite corporeque subtus piceo tinctis, antennis inerassatis, nigris (articulus ultimus caret); thorace sub-remote punctato; elytris fortiter punctatis. Long. 2 $\frac{1}{2}$ lin.

Hab. : Borneo (Sarawak).

Head similarly sculptured to *A. coccinelloides*; antennæ more robust than in that species, the second and third joints slender, ten lower joints black;* base of jaws and anterior border of labrum rufo-fulvous. Thorax three times as broad as long; basal margin rounded, slightly oblique and faintly bisinuate on either side; sides obliquely converging and slightly rounded from base to apex, hinder angles obtuse, the anterior produced, thickened, very obtuse; disc sub-remotely punctured. Scutellum broad, trigonate. Elytra broader than the thorax, shoulders obsolete, surface rather coarsely punctured; inflexed limb horizontal, slightly concave, its outer edge scarcely produced.

ACROCRYPHA COCCINELLOIDES.

Rotundata, convexa, piceo-nigra, nitida, abdomine fusco-fulvo, piceo tincto, femoribus anticis dorso, tibiisque anticis quatuor intus, piceis; antennis modice incrassatis, nigris, articulo ultimo albido, thorace nigro, tenuiter punctato, lateribus anguste piceis; scutello elytrisque rufis, his distincte punctatis, singulatim maculis nigris, 5, 2, 2, 1 dispositis, ornatis. Long. 2 $\frac{1}{4}$ lin.

Hab. : Borneo (Sarawak).

* I possess three specimens of this species, but in each the antennæ are imperfect.--J. S. B.

Head smooth and shining, vertex very minutely punctured, encarpæ oblique well defined, quadrangular, nearly contiguous at their apices; clypeus smooth, impunctate, trigonate; antennæ longer than the thorax, only moderately thickened, the two lower joints pithy, the apical one white. Thorax nearly three times as broad as long, basal margin oblique on either side, broadly and obtusely rounded in the middle; sides obliquely converging, hinder angles obtuse, the anterior rounded, thickened; surface remotely punctured. Scutellum large, trigonate. Elytra broader than the thorax, shoulders obsolete; above distinctly punctured, each with five small black spots, two at the base (the outer one close to the scutellum, the other on the humeral cellus), two placed transversely across the middle, and one between the middle and the apex, but rather nearer the latter; inflexed margin concave, its outer edge only slightly produced.

Sub-Fam. GALERUCINÆ.

Genus XENODA.

Corpus elongatum, parallelum, modice convexum. Caput exsertum; antennis articulo basali clavato, incrassato, secundo brevissimo, tertio ad septimum incrassatis, cylindricis, inter se fere æqualibus, conjunctim fusiformibus, octavo brevissimo, in apicem articuli septimi immerso, apice in spinam elongatam acutam producto, tribus ultimis filiformibus, gracilibus, nono longissimo a basi ad apicem leviter incrassato; encarpis trigonatis, contiguis. Thorax transversus, dorso transversim excavatus. Scutellum trigonatum. Elytra thorace latiora, parallela, limbo inflexo, angustissima; dorso rugosa, pube subrectâ sat dense vestita. Pedes graciles, simplices; coxis anticis erectis, fere contiguis; tibiis incrinitis; tarsorum posticorum articulo basali tribus sequentibus fere æquilongis; unguiculis appendiculatis. Prosternum angustissimum, acetabulis anticis apertis.

This genus, nearly allied to *Ædicerus*, is remarkable for the singular structure of the antennæ in the male; these organs apparently consist of ten joints, the eighth being very long and armed at the base with a slender perpendicular spine, which nearly equals in length the joint itself; on closer examination, however, it will be seen that the antennæ are really eleven-jointed, the body of the true eighth joint (from the outer apex of which springs the slender spine) being very short, and almost entirely concealed in the hollow apex of the seventh. I do not know the female, but that sex probably has simple antennæ as in *Ædicerus*.

XENODA SPINICORNIS.

Elongata, parallela, convexa, piceo-fusca, nitida, pedibus antennisque nigris, his articulis duobus ultimis albidis; clytris violaceo-purpureis, rugosis, pube subrectâ subvestitis. Long. $2\frac{1}{2}$ lin.

Hab. : Sarawak.

Body clothed beneath with griseous hairs. Head prominent, smooth, impunctate, glabrous, face short. Thorax three times as broad as long, sides straight and parallel, faintly sinuate before the middle, all the angles acute; upper surface transversely convex, transversely excavated on the hinder disc, surface smooth, impunctate, sides very sparingly clothed with a few long, scattered, erect hairs. Scutellum piccous. Elytra broader than the thorax, sub-elongate, the sides parallel, surface coarsely rugose, clothed with sub-erect griseous hairs.

Genus *CARITHECA*.

Corpus elongatum, modice convexum. Caput exsertum; antennis corpore fere æquilongis ♂, brevioribus ♀, filiformibus, modice robustis, articulis 2^{do} et 3^{tio} brevissimis, æqualibus; encarpis magnis, subquadratis, contiguis; carinâ lineari; oculis magnis, valde prominentibus, rotundatis. Thorax transversus, dorso transversim excavatus. Scutellum elongato-trigonatum. Elytra thorace latiora, parallela, apice conjunctim rotundata, confuse punctata. Pedes modice robusti, simplices; coxis anticis exsertis, subconicis, apice fere contiguis; tibiis posticis quatuor apice spinâ acutâ armatis; tarsorum posticorum articulo basali tribus sequentibus longitudine fere æquali; unguiculis appendiculatis. Prosternum angustissimum, acetabulis anticis integris.

Type—*Carithea quadripustulata*.

This genus ought to stand near *Haplosomyx*.

CARITHECA QUADRIPUSTULATA.

Elongata, parallela, dorso modice convexa, sordide alba, nitida, subtus picco plus minusve tincta, vertice, antennis (articulis primo et ultimo exceptis), thoracis vittâ latâ, scutelloque nigris, pectore obscure metallico-purpureo; elytris confuse, subfortiter punctatis, singulatim maculis duabus transversim oratis, unâ ante alterâ pone medium positis, flavo-albis, ornatis.

Long. 4 lin.

Hab. : Sumatra.

Head exserted, face concave between the eyes, vertex very sparingly punctured; joints of antennæ cylindrical, basal joints scarcely thickened, slightly convex; encarpæ well defined. Thorax nearly three times as broad as long; anterior margin concave-emarginate in the middle, obliquely truncate on either side; sides straight and parallel, slightly dilated before the middle, hind angles nearly rectangular, the anterior obtuse; upper surface very slightly convex transversely, coarsely punctured, transversely excavated across the middle, the excavation not extending to the sides, less deeply impressed in the centre. Scutellum trigonate, longer than broad. Elytra broader than the thorax, moderately convex, coarsely and deeply punctured.

CEROPHYSA WALLACII.

Elongata, convexa, nigra, nitida, capite thorace pedibusque flavis; elytris metallico-purpureo-violaceis; scutello metallico-cyaneo.

Mus: antennarum articulis 6^{te} et 7^{mo} incrassatis. Long. 2½ lin.

Hab.: Sumatra.

Head smooth, impunctate; encarpæ large, impunctate; antennæ with the first joint curved, second short, moniliform, third and fourth obovate, fifth short turbinate, sixth and seventh swollen, equal in length, eighth short, ninth and tenth rather longer, equal in length, the eleventh ovate, its apex acute; the four upper joints, together with the inner surfaces of the seven lower ones, clothed with stiff erect hairs. Thorax one-third broader than long, sides straight and parallel, rounded and converging at the apex, all the angles rounded; upper surface transversely excavated just behind the middle, shining, nearly impunctate, a few minute punctures only being visible under a lens. Scutellum trigonate, its apex rounded. Elytra narrowly oblong, broader than the thorax, finely granulose, distinctly punctured.

Warwick: February, 1877.

Occurrence in Britain of Cardiophorus rufipes, Fourc.—I have great pleasure in being able to record the occurrence in this country of *Cardiophorus rufipes*, Fourc., a single example having been captured by Mr. John Dunsmore in the summer of 1875, by sweeping rank grasses at Corkendale Law (a hill that rises on the table land of the Gleniffer Braes, and surrounded by peaty marshes), the highest peak in Renfrewshire, and about six miles from Paisley.

This example—liberally presented to me by Mr. Dunsmore—was found in company with *Corymbites cupreus*, *æneus*, and *quercus*, &c. *C. rufipes* cannot well be confounded with any other British species; it is smaller than *C. asellus*, shining black in colour, finely pubescent, with the interstices of the elytra convex, and closely and finely punctured, the antennæ entirely black, the femora and tibiæ reddish-testaceous, the tarsi pitchy, with the base of each joint and the claws red, &c.

It is generally distributed throughout Europe, occurring not rarely in France, Germany, Austria, Russia, &c.—G. C. CHAMPION, 274, Walworth Road, London, S.E.: February 9th, 1877.

Insect-notes from the Sandwich Isles.—We are getting pretty settled here, and like the country and climate very much, though the heat is very trying, the thermometer now (mid-winter) ranging daily from 80° to 84°. Trying though this be, I think it is, notwithstanding, a great improvement on an English winter to have clear bright skies and sunshine, albeit it is hot. The country is about the most beautiful I ever saw; magnificent mountains, crossed with woods, and dipping right down into the sea, among which are the most charming villages, full of oranges, lemons, cocoa nuts, mangoes, bananas, &c., &c. The profusion of brilliant flowers is most astonishing to anyone unaccustomed to the tropics.

The insect fauna seems very peculiar. *Coleoptera* are distinctly not common. I have only seen about seven or eight species of *Geodephaga*, a single specimen of something near *Tarax** (found in the house), a *Bembidium* (one specimen), and a

* Probably a *Phloxionus*—EDS.

Tachys (common) in a salt marsh, and three or four species near *Anchomenus* (I think of the actual genus, others probably *Dyscolus*) occurring, the *Anchomenus* commonly under stones up one mountain (not seen on any other), the rest beaten from leaves of trees in woods on mountain summits. Notwithstanding frequent use of the water-net, I have not yet seen a single species of *Hydradephaga*, but have got two or three *Philhydrida*. *Brachelytra* are a little less rare, among them being what I cannot separate from *Creophilus maxillosus*. The rest (excepting *Philonthi*) are small *Aleocharidæ* and *Oxytelidæ*, *Phlæocharidæ* and *Piestidæ*. *Necrophaga* seem, I think, the prevailing *Coleoptera*, chiefly small, and connected with decaying wood; among them are a few *Epuræa* (?) and *Histeridæ*. Species near *Carpophilus* are in the greatest number; some of these so remarkably simulate the appearance of *Homalium* that I hardly know which to call them. Probably there are new genera among them. *Lamellicornes*, so far as I have seen, are represented by *Aphodius* and cognate genera only, and in small numbers. *Eucnemidæ* (only one, a rather nice insect); *Buprestidæ*, none as yet; *Elateridæ*, three or four species,—all very pretty,—one, a magnificent *Chalcolepidius* (?), nearly two inches long; *Malacodermata*, a few *Malthodes* and allied species,—all small; *Bostrychidæ*, several fine things; a few *Cis*, *Anobium*, &c.; *Heteromera*, a few species near *Helops* and *Heliopathes*, also an *Anthicus*, and my old friends *Tribolium ferrugineum* and *Gnathocerus cornutus*; *Rhynchophora* not very common, only one or two above average size; the rest chiefly *Cryptorhynchidæ*, *Cossonidæ*, and *Hylesinidæ*; *Longicornes*, a few very fine insects; *Prionus*, *Lamia* (the grandest thing I ever met with), *Saperda* (?), *Leptura*, and some others; *Eupoda*, none; *Pseudo-trimera*, a few *Coccinella* and *Scymni*.

There are a good many *Orthoptera*, chiefly earwigs and cockroaches, in considerable variety; a fair number of *Hymenoptera*, including some nasty-looking wasps; too many *Diptera* of the mosquito type; a moderate allowance of *Hemiptera* (some very striking); and many *Lepidoptera* (though I have only seen two species of butterfly—a large *Papilio*, and one which I have identified as *Vanessa Kamehameha*, Kotz.). I am collecting insects of all orders in what little time I have.—THOS. BLACKBURN, Honolulu: 30th December, 1876.

The insects of the American ("Polaris") Arctic Expedition.—The reports of the scientific results of the *Polaris* expedition have been delayed simply, we are sorry to say, for want of means for publication. Dr. Bessels, the scientist of the expedition, made valuable collections of animal life at *Polaris Bay*, between latitudes $81^{\circ} 20'$ and $81^{\circ} 50' N.$, and soon after his return placed in the writer's hands the insects and fresh-water crustacea. Now that the English expedition has returned, it is deemed expedient to publish a preliminary notice in order to secure priority. The *Hymenoptera* were represented by *Bombus Kirbyellus*, Curtis, which occurred at *Polaris Bay*, May 31st and July 10th, and a new species, apparently, of an ichneumon fly, *Microgaster Hallii*, found in cocoons at *Polaris Bay* in June and again July 4th.

Of *Lepidoptera*, *Luria Rossii*, a moth closely allied to our *Dasychira*, was obtained in all stages from the egg to the imago. The eggs are spherical, smooth, and white, 0.06 inch long, and laid in a mass of about sixty, and, as in *Orygia*, upon the cocoon. The larva when half-grown is broad and short, the body, including the hairs, measuring 0.60 inch in length and 0.30 in breadth. The body is densely covered

with long, fine reddish-brown hairs projecting in all directions and concealing the head and end of the body. There are six large, short, dense, subconical tufts, the two anterior and two posterior ones black, the middle ones yellowish. Head and body black. The full-fed larva is a little longer, the head broad and large and black, as is the rest of the body, including all the feet. In this stage the dorsal tufts are all black, with the hindermost one acute, and more prominent than the others; two segments intervene between the fifth and sixth pair. It is 1.60 inch long and 0.60 inch wide.

The cocoon is loose and thin, made of the long hairs of the caterpillar, held together by a thin, fine, silken web. There is an inner layer of hairs held in place by a very slight web. It is grey in colour, and is an inch and a-half long by one inch in diameter.

The two specimens of the moth are male and female, well preserved, and agree with Curtis's description, except that the hind wings are unicolorous, with no "broad, blackish margins."

In the same bottle with the caterpillars of *L. Rossii* occurred a *Tachina* puparium of the usual form and 0.36 inch in length.

Besides this species occurred *Anarta Richardsonsii* (Curtis) and *Glaucopteryx Sabiniaria* (Curtis) with its larva, already described by the writer in the Monograph on Phalenidæ of the United States.

The following *Mallophaga* have been identified by Mr. S. E. Cassino:—*Physostomum mystax*, Burm., from *Larus eburneus*; *Docophorus lari*, Fabr., from *Larus glaucus*; *Goniodes colchica*, Denny, from *Strepsilus interpres*.

A small, blackish Poduran, *Isotoma Besselsii*, occurred in abundance at Polaris Bay, July 5th, 1872. The *Arachnida* were represented by four species, two of which have been identified by Mr. J. H. Emerton. *Erigone psychrophila*, Thorell, occurred at Polaris Bay, June 3rd, 1872, and there were two unnamed species from Polaris Bay. At Foulke Fiord *Lycosa glacialis*, Thorell, was collected. All the spiders have been sent to Dr. Thorell to report upon. Upon the body of a *Bombus Kirbyellus* occurred several specimens of a *Gamasus*.

Of fresh-water *Crustacea*, besides a Copepod, *Daphnia rectispina*, Kroyer, occurred abundantly at Polaris Bay August 1st, 1872, as well as *Branchinecta groenlandica*, Verrill.—A. S. PACKARD, Jr.

[The foregoing extract from the "American Naturalist" is, to some extent, complementary to my notes at p. 181, *ante*. Dr. Bessels does not appear to have found any of the Butterflies that figure so conspicuously in Captain Feilden's collections. The *Bombus* found by the latter is probably the known Arctic species. *Glaucopteryx Sabiniaria* is, I believe, one of the Cheimatioid forms mentioned, but I have had no opportunity of making any critical examination.—R. McLACHLAN].

On sounds produced by Lepidoptera.—The emission of a sound by the Death's Head Sphinx (*Acherontia Atropos*) is well known, and the method by which it is produced was established by the thorough investigation of Landois (Die Ton- und Stimm-Apparate der Insekten, pp. 55–59). It is the same as that which Réaumur had long since accepted, namely, that the sound was caused by the friction of the palpi against the haustellum, the latter mostly remaining motionless. The inner surface of the palpi is naked at the base. Microscopic observation of this space,

which to the naked eye appears smooth, shows that it has a great number of fine striæ, which, in their structure, have the greatest resemblance to the friction ridges of the *Necrophori*, Dung-beetles and Longicorns. It is remarkable that in the moths the surface rubbed (the violin) is moveable, whilst the bow is represented by a longitudinal ridge at the base of the haustellum.

Landois also discovered a similarly constructed mechanism for producing sound in other *Sphingidæ*. Only some other *Lepidoptera* have the power of making a sound, namely, *Vanessa Io* (Hewitson), *V. urticae* (Greene), *Euprepia matronula* (Czerny), *Chelonia pudica* (Solier), and *Orthosia* (Haldeman), yet it may be supposed that a mechanism for producing sound, similar to that existing in *Acherontia*, may exist in other *Lepidoptera*, and I find, as a fact, in many *Vanessæ*, viewed under the microscope, that there is a very finely sculptured friction-surface at the base of the palpi. This is constructed differently from that of the *Sphingidæ*, and is of a rounder form, but it affords all the conditions for stridulation. I also examined a number of other butterflies, *Bombyces*, *Noctuæ* and *Geometræ*, and found that, except in three species, a friction-surface, well constructed for stridulation, exists at the base of the palpi. The formation, however, is very dissimilar in different genera, and I will hereafter publish the result of my researches in detail. It is thus established as a general principle that a capability to stridulate exists typically among *Lepidoptera*, and that the want of such capability is exceptional. But generally the sound is so faint that our ears cannot perceive it. The object of the stridulation is as yet unknown. The organs of stridulation, *e. g.* in *Doritis Mnemosyne*, are more developed in the ♂ than in the ♀, but in other species no such difference is perceptible.—O. M. REUTER (in Kraatz's "Entomologische Monatsblätter," vol. i, Berlin, 1876, p. 53).

Supposed occurrence of a variety of Pyrameis Huntera in England.—I send you a butterfly which I had in my collection for some time, in hopes it may prove to be *P. Huntera*. The circumstances of its capture were as follows:—In the end of July, or beginning of August, 1871 (when I was just beginning to collect), as I was going home for the holidays with one of my brothers, he drew my attention to a butterfly on the roof inside one of the L. & S. W. R. carriages, shortly after leaving Wokingham station: this insect I always considered a variety of *P. cardui*, until quite lately.—T. D. GIBSON-CARMICHAEL, Castle Craig, Dolphinton, N.B.: *January, 1877.*

[The condition of this specimen induced me to question my observant young correspondent as to the possibility of an error of memory, or confusion with another insect, having occurred. His answers were satisfactory so far; and he stated that he possessed two *P. Huntera* in a case of "British" Butterflies, and that this appeared to differ from them. Upon comparing the example at the British Museum, it turns out to be the Brazilian form of *Huntera*, differing very considerably from the typical N. American insect. My correspondent admits the increased difficulty, but still thinks he has made no mistake. It may be well to remark that the Brazilian Mail Packets come to Southampton, which is on the L. & S. W. Railway.—R. McL.]

Stray notes on Lepidoptera.—*Thecla betulæ*.—I found one ♀ at the end of August sitting on the blossom of a small *Umbellifer*—probably *Pimpinella*, and so

busily investigating every flower as to permit itself to be boxed without the intervention of a net. There must be a station for this species somewhere in the woods which border the upper part of the Haven, but I have not been able to find it.

Sesia ichneumoniformis.—Again rather common on *Lotus corniculatus* in the quarries. I noticed several specimens flying over the banks of stones just before sunset.

Selenia illustraria.—One specimen occurred in the only good locality for *Geometra* known to me in the neighbourhood—the garden at the back of the house.

Lobophora viretata.—Again tolerably common, sitting principally on trunks of sycamore during the day, and flying about bushes for a few minutes from 9 to 9.15 p.m. I found a single larva in the garden, feeding on the cultivated variety of the guelder rose (*Viburnum opulus*), and reared several from the egg on the same plant. I suspect, however, that it also feeds on the sycamore. As far as my observations go, this species is *completely* double-brooded. All my larvæ from eggs laid by females of the spring brood fed up together and *all* the perfect insects appeared in the autumn; and this appears to me the more conclusive because having sent away, to friends who wanted them badly, all the eggs that I could obtain from *early* females, I retained and reared the larvæ from eggs laid by *late* females of the spring brood. Each female, in confinement, lays very few eggs, and with extreme reluctance, although kept in the open air. The duration of the first brood of moths appears to be from about May 6th to June 5th, of the second brood from August 17th to September 7th. The duration, however, must depend on the weather: in this neighbourhood some furious storm of wind and rain usually finishes them.

The garden also produced *Eupithecia virgaureata*, *albipunctata*, and *coronata*.

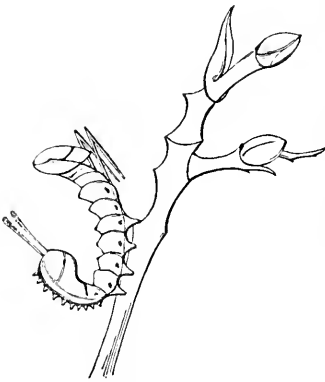
Dianthuxia capsophila.—A larva, found on *Silene maritima* on the coast in June, produced a small specimen in August. This is a new locality for the species, but is unfortunately too far away for night work.—CHAS. G. BARRETT, Pembroke: 17th January, 1877.

Metamorphosis of Stauropus fagi.—Through the kindness of the Rev. Bernhard Smith, I had the opportunity last summer of observing the larva of *Stauropus fagi*, and as there appears to be some misconception current as to its habits, I venture to trouble you with a few notes. The larva is curiously economical in the consumption of its food, eating every scrap of a leaf, and generally the stalk also, before attacking a fresh one. The first pair only of the legs are used for grasping or steadying the leaf on which the caterpillar is feeding; the long second and third pairs, which appear to terminate abruptly and without a claw (but I regret to say I did not examine them with a lens as I ought to have done), seemed to be used as crutches or walking-sticks, and perhaps also as feelers, the ends (so to say, the soles, of the feet) being evidently very sensitive. The gait of the larva is crustacean-like, reminding me of the cautious, gingerly way in which many of your readers have no doubt seen *Palinurus quadricornis* stalking about the bottoms of the tanks in the Crystal Palace Aquarium, as if troubled with corns. When teased, the caterpillar strikes out rather viciously with one of its long legs (or, as I have suggested, walking-sticks), and I can imagine them very effective weapons for its protection from a prowling *Ichneumon*.

I had the pleasure of twice watching a larva change its skin; there was not the difficulty I expected from its singular form and varying diameter; the three pairs of

legs were drawn out from the old shells precisely after the manner of a crab or lobster, but with much greater ease, owing to the small amount of contraction at the joints, a few seconds only been needed for the operation. The new legs on emergence are semi-transparent and apparently soft, and are at once folded up against the forepart of the caterpillar, which then rests for a few minutes, for the purpose, I suppose, of allowing the newly-developed legs to acquire colour and hardness by exposure to the air; in about five minutes they are unfolded, and the work of extricating the body proceeds; the swollen terminal segments offer no difficulty, the old skin seeming to possess great elasticity.

In the December number of Newman's Entomologist, pp. 269—272,



Mrs. Golding Bird states that *Stauropus fagi* has two sets of legs at one and the same time; that the two old pairs (why not three pairs?) are cast with the old skin of the body, and that two new pairs are then found doubled up against the sides of the larva. Mrs. Bird offers some elaborate speculations on the sudden transfer of muscular power and connexion with the body from the old legs to the new ones; but I think it is hardly necessary to argue against a theory which, as it appears to me, rests upon a mere error of observation, and which, if true, would make the metamorphosis of *Stauropus fagi* a solitary habit without a

parallel in creation. The hairs and spines of caterpillars are merely dermal appendages, and lie on the surface of what is to be the new skin; but the limbs and other members are in all cases developed inside the old ones, and withdrawn from them in moulting. Mrs. Bird has simply missed the critical moment of withdrawal, and if she had carefully examined the supposed old legs, would have found merely empty shells.

One of my larvæ had lost the whole of the second off fore-leg, except the coxa, when it reached me, also nearly the whole of the caudal horn on the same side; it did not seem to suffer any inconvenience from these losses, and at none of the three subsequent changes of skin which took place was there any renewal of the missing members or increase in the length of the stumps; although no instance of the reproduction of lost parts amongst the *Lepidoptera* has come under my notice, the semi-crustaceous aspect of this caterpillar led me to look for, and almost to expect, something of the sort. Had there been new legs packed away under the skin of the body, as Mrs. Bird supposes, we might certainly have looked for a complete set to be supplied.

When the larva is at rest, the legs are doubled up in front like a carpenter's rule, and the insect, especially when young, closely resembles in colour and outline one of the twigs of beech with unopened buds on which it frequently stations itself. (See Illustration.) When feeding the long legs are protruded, and the anal segments being elevated, its likeness to a great earwig or *Staphylinus* is very striking, and probably may give it some security from the attack of enemies. *Ichneumons* may fail to recognize it as a *Lepidopterous* larva, and other foes may dread the anal

forceps of the earwig, or the jaws and fetid odour of the supposed beetle; but in the absence of observation, I desire to speak doubtfully of the sharp eyes of a bird or *Ichnemon* being deceived when engaged in its own special business by any such colourable imitation.

I should be glad if some naturalist, skilled in the application of the theory of natural selection, would suggest how the anomalous structure of the larva may have been developed or retained, and also to know whether the larva of any other Lepidopterous insect is known to possess similarly jointed legs. The perfect *Stauropus fagi* does not, so far as I know, differ in structure from ordinary Lepidopterous forms, or show any traces of its strangely-constructed antecedent.—
EDWIN BIRCHALL, Douglas: *January, 1877.*

*Natural History of *Catocala promissa*.*—On August 26th, 1875, Mr. J. Ross of Bathampton, most kindly sent me thirty-nine eggs of this species, being the whole produce from six imprisoned ♀ moths captured by him in the New Forest on August 2nd, and with them the permission to select some for myself.

The eggs had been laid from the 9th to the 16th of the month, some on oak bark, the others extruded through the interstices of the lino covering of their cage to which they adhered; they were of two different colours, and I contented myself with choosing three of each, and returning the remainder to Mr. Ross, from whom I afterwards heard they all proved sterile.

The egg of *promissa* is of a good size, of a rather flattened spherical figure, a little depressed in the upper centre and much more beneath, the shell covered with coarse, projecting, sinuated ribs, varying from fourteen to eighteen in number, so close together as almost to hide the surface between them, the depressed spot in the centre of the top coarsely reticulated; when fertile, it is of a dull drab colour, and so continues through the winter, but, as I found, when sterile, it is dark brown, and eventually shrivels up.

About the middle of April, 1876, while looking at the three drab coloured eggs, I fancied two of them seemed rather more plump than before, and a close examination proved this to be the case, as a little of the smooth shell had become visible between the rough ribs, and the upper central hollow nearly filled up; this last, on the 18th, was completely rounded over, and the ribs were turning paler; on the 20th, they had become whitish, and the interstices greenish-drab colour; and on the morning of the 21st, I found one larva was hatched; the dull, whitish, empty shell showed a large hole in the side, through which the larva had escaped; the next morning I saw a second had hatched. At this time, none of the oak-buds had burst, nor were many much swollen, but I picked open two or three at a time of the best to be found, for the young larvae to feed on—Mr. Ross also, at this juncture, kindly supplying me with a few tender oak leaves which he had contrived to force out,—but, in placing this food in the cage, I noticed one of the larvae when put on the leaves swing away from them by a thread, and though I replaced it before shutting the cage, yet it must have again swung out, for at that moment I unconsciously lost it; however, next morning (the 25th) I was somewhat consoled at seeing the third was hatched, and so I again had two young larvae to watch. Curiously enough, neither of them seemed to care then for the leaves, but chose the buds and those containing blossoms in preference, feeding only after dark, and resting all day stretched out at full length,

motionless, belly upwards on the muslin cover of the cage, a habit continued through all stages of growth, the moulting included, a process which invariably occurred at night, in that position, as proved by the cast skin next morning adhering to the muslin with all the legs spread out to their full extent.

No doubt, in a state of nature, the larva passes the daylight in this quiescent position, probably on the under surface of horizontal or sloping twigs or branches of the oak, where it would be in shadow, and would assimilate wonderfully well to the more or less lichen-covered surface on which it would be closely pressed, and would be in a great measure safe from the prying eyes of birds, and, I may add, of entomologists, for I remember no recorded instance of its having been found at large by any who have collected in that favourite hunting ground, the New Forest.

The newly-hatched larva was three-sixteenths of an inch long, with largish head and slender body, stoutest at the 9th and 10th segments, the first two pairs of ventral legs quite rudimentary, the 3rd and 4th pairs conspicuously developed, and also the anal pair; its mode of progression was precisely similar to that of a geometer; the colour of the head black, of the body a light drab, broadly banded with dark brownish-grey across most of the segments, with fine pale double longitudinal lines along the sides, and with two pairs of black dots and bristles on the back of each segment: after the first moult, the dark bands disappeared, and the colouring was light greenish-grey, the dorsal line showed as darker and then a lighter spear-shaped mark on each segment; the pale twin-like sub-dorsal lines still remained, and below them a blackish blotch on the side of each segment: after the second moult, at the end of a fortnight, the larva was five-eighths of an inch in length, and of stouter character, having an elevated ridge on the back of the 9th and 12th segments, the anterior pairs of ventral legs now first in use for walking over the food by night; the colouring very lichenous in appearance, no lines on the sides, but large and conspicuous whitish blotches on the 5th, and 8th, and 9th segments, the elevated ridge darker grey than the rest: in another week, when the length of seven-eighths of an inch was attained, a whitish narrow streak appeared over the crown of the head, and the ridge on the 9th segment became black, the rest of the body light greenish-grey with paler blotches as before; on the 16th of May, one of the two larvæ fixed itself for a moult, but died on the 19th, unable to complete the operation. Meanwhile, the remaining larva thrived well, and, by the 21st, had become one inch and three-eighths in length, the growth being rapid now, the colouring much as before, very lichenous in appearance: the last moult occurred during the night of the 23rd, and, the next morning, I found it measure one inch and three-quarters in length, the general colouring a rather greener-grey than at any previous stage, even the whitish blotches were now faintly tinged with greenish-ochreous: on the 26th, it had reached its full-growth, when I took its third portrait, and a full description which follows presently; on the 28th, it was shortening evidently, although continuing to feed at night till the 30th, when it had decreased considerably, and was irritable at the least disturbance, and on the 31st, it retired amidst some sprays of oak, and entered a little way into some light soil beneath, where it formed a cocoon composed chiefly of small particles of dry stalks and roots with peat earth, and lined, as I afterwards found, with coarse, whitish silk, disposed in very large meshes, yet smooth enough; the upper surface being just level with the surrounding soil, and partly attached to a stone I had placed there. The moth, a female, appeared on the 21th of July.

The full-grown larva is two inches and one-eighth in length, the body thickest at the 9th and 10th segments, tapering from thence a little gradually to the head, and a little more to the anal extremity; the head rises a little on the crown, where the lobes are slightly defined, and is flattish in front; there is a prominent ridge having a triangular hump on the back of the ninth segment, and a slight elevation occurs near the end of the 12th, bearing the hinder pair of tubercles more sharply prominent than the rest; the back is rounded, the belly flattened, at the junction of the two surfaces just above the legs is a fringe of fleshy filaments, more or less branched, though a few simple ones occur amongst them; the anterior pairs of tubercular warts on the back are small and unobtrusive, while the hinder pairs, and the single row along each side, are rather large and bluntly pyramidal, every one having a fine bristle; the anterior and ventral legs extend laterally, at right angles to the body, the anal pair also at an obtuse angle backwards, the third ventral pair long, and the fourth pair longest. The ground colour is a light greenish-grey, with a distinct, large, pale patch of faint ochreous-greenish on the sides and back of the 5th, another on the 9th, and on the 10th less and less pale, strongly contrasted towards the division by a sooty transverse irregular band extending down either side from the blackish hump on the 9th to the back of the leg, from whence it spreads behind, at first broadly, then slants off to a point on the lower side of the 10th, the end of the 12th segment is a little darkened: the head is light greenish-grey, reticulated with darker grey, a transverse streak of black reticulation over the crown extends to the mouth, defining the boundary of the face, behind this a shorter black streak marks the back of the cheeks, the face itself is whitish, with a dark greyish streak on either side downwards to the mouth; the thoracic segments are very much covered with freckles of lightish grey, dark grey and black, some of them so disposed as to faintly indicate dorsal and sub-dorsal double lines, on the 5th the back, though pale in front, is clouded behind, while on the 6th, 7th, 8th, and all beyond the 9th, it is rather uniformly covered with fine greenish-grey freckles, forming on each somewhat of a truncated diamond shape, each successively growing paler, from the 6th to the end of the 8th, these diamonds are relieved by the hinder pairs of whitish prominent warts, more or less ringed at their base with dark grey or black, from these proceed backward to the segmental division short, dark greyish double lines rather convergent, most strongly defined on the 5th, 11th, 12th, and 13th; along the sides, from the end of each segment, is a broad-based, somewhat wedge shape, of the paler ground, flanked below by the lateral whitish wart, from whence a pale sinuous streak ascends a little obliquely forwards, finely and sharply edged below with black like the wart itself, the dull red oval spiracle, outlined with black, comes close beneath in front of the wart; the rest of the side is freckled to about the same appearance as the back; the fleshy filaments are pearly-white; the anterior legs pale and ringed with dark greenish-grey; the two first ventral pairs are whitish-grey; the third and fourth pairs greyish in front, darker greenish-grey behind, bearing a few black freckles, the anal pair similar: the belly is whitish, with a conspicuous blackish mark on the middle of each segment, viz.: a transverse bar between each pair of the anterior legs, a largish round spot on the 5th and 6th segments, a very much larger spot on the 7th, 8th, 9th, and 10th, on these two last they are elongated transversely to a diamond shape, the spot is round on the 11th, 12th, and 13th, each smaller in the order mentioned; the skin of the head, back, and sides, a little rough, the belly smoother, the filaments smooth.

The pupa is nearly an inch in length, by five-sixteenths in diameter across the thorax, which is rounded and sloping smoothly to the head in a convex curve, behind on the back of the abdomen is a slight depression, the wing-covers smooth, and from them the abdomen is full, but soon tapers rather sharply to the tip, which is rough and furnished with several converging, curled-topped spines; the colour of the skin is purplish-brown, the abdominal divisions dingy red; though this local colouring can only be seen on parts that happen to be rubbed, as the surface generally is covered with a fine opaque powdery bluish bloom, a few short, fine, light brown, bristly hairs, pointing behind, are sparingly distributed over the abdomen.—WILLIAM BUCKLER, Emsworth: *December 2nd, 1876.*

Description of the larva of Pterophorus lithodactylus.—The larva from which I took down my notes was received, amongst some of those of *Ebulea crocealis*, feeding on *Inula dysenterica*, from Mr. W. H. Grigg, of Bristol, June 15, 1875. It was full-grown, five-eighths of an inch in length, and of average bulk in proportion. Head globular and polished, smaller than the second segment, into which it can be partially withdrawn. Body of nearly uniform width throughout, but tapering slightly towards the posterior extremity; it was clothed rather thickly with short hairs. Ground colour bright yellowish-green; head pale green, the mandibles brown; throughout the entire length of the dorsal area is a broad pink stripe, edged on each side with a narrower purplish one, which is again edged with a fine whitish line. Ventral surface uniformly pale green. The hairs on the dorsal area are dark brown, those on the sides whitish. The pupa is so similar in appearance to the larva, that it had actually been in that stage several days before I found out the fact. I noticed, as I fancied, the larva on the upper side of a leaf, motionless, I supposed changing its skin, and was not a little surprised, on examining it closely, to discover it had become a pupa. The markings and almost the shape had assumed the same character as the larva, but the broad purple dorsal stripe was gone, and replaced by a series of pale green lozenge-shaped marks, connected at the abdominal divisions; the sub-dorsal region dull purple; wing-cases pale green, with several purplish streaks; under-side of abdomen pale green: like the larva also, thickly clothed on the dorsal surface with short, whitish hairs. The imago appeared on the 12th of July.—GEO. T. PORRITT, Highroyd House, Huddersfield: *February 3rd, 1877.*

The economy of Laccometopus clavicornis, Lin.—Upon this subject (giving the name of the insect as *Eurycera clavicornis*) M. Ed. André, of Beaune, writes as follows in the "Feuille des jeunes Naturalistes," for January last:—"This Hemipteron lives in the interior of the flower-buds of *Teucrium chamædrys*, which grow and develop almost normally up to the time when they should open, but the final evolution is prevented by the insect having soldered the anthers of the stamens to the petals, by means of a black, glutinous matter, derived either from itself, or from the pollen transformed by the agency of the insect. The petals being thus unable to open, the corolla becomes a close chamber, the capacity of which, in consequence of the presence of the foreign body, becomes of larger proportions than is natural. The insect undergoes its changes under this shelter, and, in August, when it has assumed the perfect state, escapes by separating the margins of the petals, which, at the sides, are only contiguous and do not adhere, to fulfil the functions

that remain for it to accomplish before it dies. Each flower contains but one insect; and on opening one in August, besides the perfect Hemipteron, the skin of the pupa is found. The insect always has its head turned towards the base of the flower. By collecting the flowers that are inflated in the form of a sac, and unopened, a very large number of the insect may be obtained, which it would be much more difficult to capture by means of a net or cloth."

"This habitat is very summarily indicated by Amyot (*Méthode mononymique*, No. 294, *Mephisse*), and by Fieber, who says that it is in the interstices between the stunted leaves and the flowers of *Teucrium chamædrys*."

To this I would add that Réaumur, more than a century ago (*Mémoires*, iii, 513, pl. 34, fig. 1—6), described and figured this insect, its "nymphé," and the flowers of *T. chamædrys* swollen and unable to open in consequence of the inquiline, to which, however, he does not give a name.

Geoffroy (*Hist. Ins.*, i, 461, 56) refers to Réaumur, and confirms his account, saying that the larva of this bug, which he calls "La punaise tigre," lives in the interior of the flowers of "chamædrys," which appear larger and more swollen than ordinary, when they contain the insect.

Herr von Frauenfeld (*Verhandl. z.-b. Ges. Wien*, iii, Sitz.-bericht, p. 157, *et seq.*) describes *Lacometopus clavicornis*, Lin., and *L. teucrii*, Host, confirming the previous authors, and showing the differences of the insects and their economy. *L. teucrii* he found on the flowers of *Teucrium montanum* growing near Mödling.

The genus *Eurycera*, Laporte, to which *Cimex clavicornis*, Lin., is referred by M. André, is long anterior to *Lacometopus*, Fieber, but the name was rejected by the latter author (*Entomologische Monographien*, p. 21, 1844), on account of its previous employment by Dejean, for a genus of *Coleoptera*.

I have adverted to the subject, and cited M. André's account of the economy of *L. clavicornis*, because it contains some interesting details not given by previous authors, chiefly in the hope that the species, which is distributed throughout Europe, and is common in France, may be re-discovered in this country. It is given as British by Stephens, in his "Catalogue," and by Walker, in his "List of British Hemiptera," but in each case the authority for saying it is a native is unknown, no authentic specimens, as far as I know, being in any collection. *Teucrium chamædrys* is a rare plant in Britain, found chiefly on old walls, and I believe specially in the northern counties of England; but the localities are doubtless known to, and may be learned from, local botanists.—J. W. DOUGLAS, *Lee*: 19th January, 1877.

On mounting Typhlocybidæ.—Finding it impossible satisfactorily to examine certain *Typhlocybidæ*, especially those of the *rosæ* type, when carded in the ordinary way, I have adopted the following method:—Having carded the insects in the ordinary manner, and allowed them to get thoroughly dry, I take two ordinary glass microscope-slides, clean them, and, a few minutes before I am ready to operate, put on the one which is to be the lower, six or eight small patches of gum, at equal distances along the length of the slide, just large enough to hold the *body* of the insect securely; I then proceed, by the aid of a setting needle applied underneath the legs, elytra, and wings, to carefully raise each insect from the card, and place its body in a patch of gum on the slide, and, having filled the slide, put it away for a few hours, secure from dust, to allow the gum to set. I next cut, in one piece, a

frame of cardboard, about one-eighth of an inch wide, and the exact size of the slide, and, having gummed under each insect a small disc of paper bearing its No. in the Locality Register, I place the frame on the slide, and over all put the other slide, and bind with a thin paper edging, and when dry, clean and apply a coating or two of sealing wax varnish to render the slides dust and mite proof. In the matter of arrangement I proceed as follows:—To facilitate reference, each slide has a distinctive number, and the contents of each separate slide are numbered progressively. The drawer devoted to the *Typhlocybidæ* is racked, after the manner of a microscope-slide cabinet, and, just beneath the glass, a piece of cartridge-paper is fitted, ruled and labelled like an ordinary cabinet drawer minus the specimens, and, in the space where, under ordinary circumstances, the insects would be pinned, are inserted numbers, the upper one referring to the number of the slide, and the lower one to the number of the insect on that slide. Thus, in the space allotted to *Typhlocyba quercus* are the figures $\frac{4}{6}$, $\frac{2}{5}$, which indicate that a specimen of that insect is to be found, No. 4 on slide No. 6, and No. 2 on slide No. 5, and so on. It is obvious from the foregoing that there is no necessity for separating species before putting them on the slides. No doubt a microscopist could suggest many improvements, but I find the plan described above answer every useful purpose, as the insects can be held up to the light to see the venuration of the wings, &c., the under-side is visible without any extra trouble, and the slides, wrapped in a piece of paper, may be carried in the pocket for examination at any opportunity with very little risk of damage to the insects. To anyone whose stock of available daylight, especially at this period of the year, is as limited as my own, this last is no mean advantage.—JAMES EDWARDS, Lane's Buildings, St. Faith's Lane, Norwich: December 12th, 1876.

[Although this method of mounting *Typhlocybidæ* has the disadvantage of preventing the examination of the genitalia from the side, it serves admirably for affording a view of the under-side of the body, and the venuration of the elytra and wings, both of which in species that are green or colourless, and in others that are generally similar to each other, such as *rosæ* and *alneti*, are points of the first importance. The method, suitable either for the microscope or lens, and applicable also to the *Psyllidæ*, will be a valuable adjunct to the cabinet, although, for the reason above stated, it will not supersede the ordinary method of preservation.

The Rev. T. A. Marshall recommended sticking the wings of *Typhlocybidæ* upon thin glass, by means of water, for temporary examination (E. M. M. iii, 198), and by putting examples in this way on a microscope-slide, and fastening over them a piece of thin glass, I have rendered them of permanent service. I think that by a modification of the plan, specimens of entire insects may be prepared for placing in the cabinet. A hole, of diameter somewhat greater than the expanse of the insect, should be punched in a piece of thick card (of which the size may easily be determined), under which a piece of thin glass, somewhat smaller than the card, should be fastened with gummed paper at the sides; in the receptacle thus formed the insect, previously set out, is to be fixed, and another piece of thin glass fastened over it; then, a pin being put through the card, it would be fit for the cabinet.—J. W. D.]

Review.

MONOGRAPH OF THE BRITISH APHIDES. Vol. I. By GEORGE BOWDLER BUCKTON, F.R.S., F.L.S., F.C.S. London: Ray Society, 1876. pp. 193, and 45 plates.

The Aphides, on account of the wonderful peculiarities of their natural

history generally, have engaged the attention of many of the most acute and philosophical naturalists during the last century, and they have also been much studied by describers and classifiers. Yet, although on the one hand we, in this country, can cite the labours of Owen, Newport, and Huxley, and on the other of Westwood, Curtis, and Walker, there existed no one work in English which presented a general view of the Family or descriptions of the British species.

Mr. Buckton has devoted many years of assiduous attention to the Aphides, and gives the result of his labours in the present work, which, however, is somewhat erroneously termed a "Monograph of the British Aphides," since it enumerates only those species that have come under his notice in the living state. It contains—

"1st.—A Terminology, which includes the general anatomy.

"2nd.—A Bibliography, containing a *résumé* of the most noticeable work of the early authors.

"3rd.—A Life-history, which includes the metamorphoses of Aphides, supplemented by a brief statement of the views of more recent investigators, with reference to their reproductive economy.

"4th.—A Diagnosis of such species as have come under my notice in a living state, each species being illustrated by coloured figures representing the larval, pupal, alate, and where possible the sexual forms.

"5th.—A description of the principal organs connected with the reproduction of Aphides, coupled with short remarks upon the morphology of the family."

Fifty-three species, some of which are deemed to be new, are figured on forty-two plates; and there are three plates of anatomical details. All the figures, made from life under the microscope, have been excellently lithographed by the author, and it is a great merit that they are not too highly coloured. The usual marking of the natural size is however, omitted. We notice, in the anatomical portion of the work, that *prothorax* and *pronotum* are used as equivalent terms, and the same with regard to *mesothorax* and *mesonotum*, and *metathorax* and *metanotum*; whereas, in each case, the first term signifies the entire segment, and the second the superior portion of it only. In the descriptive portion of the work only the name of the author of the genera and species is given, without any citation of the name and page of the work where the description occurs,—a serious deficiency for those workers who come after, entailing upon them an immense amount of labour which should have been rendered unnecessary. Neither are there any directions as to the capture of, or the best or any method of preserving, *Aphides*;—the want of any satisfactory mode of doing the latter having hitherto, doubtless, had a large share in deterring those who would otherwise have collected such fragile creatures: possibly some such plan as that mentioned at page 237 *ante* might prove effectual. Nevertheless, English entomologists (especially those who care for anything more than making a collection) should be grateful to the author for having so well placed before them the result of the investigations of the best naturalists, distributed as they are in several languages throughout voluminous works, and we trust his labours may prove an incentive to collect and study the too much neglected Aphides.

The work was originally intended to be comprised in one volume, but it has been found necessary to divide it into two or three. We hope that the last volume will contain an enumeration with diagnoses of the native species not seen by the author and not cited as synonyms, with a reference in full to the works wherein they have been described.

ENTOMOLOGICAL SOCIETY OF LONDON: *January 17th, 1877.*—ANNIVERSARY MEETING.—Sir S. S. SAUNDERS, Vice-President in the Chair.

A letter was read from the President stating that, owing to a slight accident, he

was unable to attend the Meeting, and the reading of his Address was therefore postponed. The following were elected Members of the Council for 1877, viz. :—Messrs. Bates, Champion, Dunning, Douglas, Grut, Meldola, E. Saunders, Stainton, Weir, Prof. Westwood, Sir S. Saunders, the Rev. A. E. Eaton, and T. A. Marshall. The following Officers were elected, viz. :—Prof. Westwood, President; Mr. J. J. Weir, Treasurer; Rev. T. A. Marshall, Librarian; and Messrs. Grut and Meldola, Secretaries.

February 7th, 1877, Professor WESTWOOD, President, in the Chair.

The President nominated Messrs. J. W. Douglas, J. W. Dunning, and H. T. Stainton, Vice-Presidents for the year; after which he proceeded to read extracts from the Address he had prepared for the Anniversary Meeting.

Mr. Bond exhibited another example of *Danaïs Archippus* taken in England, near Haywards' Heath, Sussex, by Mr. Alford Wood in the second week of September last.

Professor Westwood exhibited an example of the beautiful and curious butterfly *Bhutanitis Lidderdalii*, Atkinson, from Bhootan.

The President remarked that Baron Osten-Sacken had directed his attention to a paper by the late B. D. Walsh, in the Proc. Boston Soc. Nat. Hist., in which it was related that he had bred a Dipteron from a cocoon of *Limacodes hyalinus*, which Dipteron proved to be the common North American species of *Systropus* (*S. macer*, Loew); and referring to Professor Westwood's remarks in his paper on the genus *Systropus* in the last part of the Transactions, in which he had stated that *S. crudelis* was bred from a cocoon in Natal, having a resemblance to that of *Limacodes*—he considered it a remarkable instance of community of habit among insects of the same genus in such distant parts of the globe. The Professor had also been informed by M. Ernest Olivier, of Moulins, who had recently visited Pompeii, that he had observed large numbers of *Bombylii* flying in company with a bee of which he had forwarded a specimen—but this proved to be an *Anthophora*, and not an *Andrena* like those described by him in his paper in the last part of the Transactions (Nota Dipterologica, No. 1).

Mr. McLachlan exhibited an extraordinary case of a Lepidopterous larva from Zanzibar, sent by Dr. Kirk, who had found it on *Mimosa*. It was probably allied to *Psyche* and *Oiketicus*, and was in the form of a flattened *Helix*, half-an-inch in diameter, formed apparently of a kind of *papier maché*, with a smooth whitish outside coating.

Mr. C. O. Waterhouse exhibited curious varieties of the following British *Lepidoptera*:—*Agrotis exclamationis*, *Chrysophanus phleas*, and *Polyommatus Adonis* and *Alexis*.

Dr. F. Buchanan White forwarded an extract from the "Medical Examiner" of 21st December last, containing an account by Dr. Tilbury Fox of an extraordinary case of "Pruritus" which infested every member of a family and household, including even the dog and cat. A specimen of the creature had been submitted to Dr. Cobbold, who had pronounced it to be a species of *Trombidium*—and it was believed by Dr. Fox to have originated from certain plants in the garden, and that the cat and dog who appeared to have been the first affected were agents in conveying the parasite to the human members of the family.

The following papers were read, viz. :—

Notes on the African *Saturniideæ* in the collection of the Royal Dublin Society, by W. F. Kirby.

Descriptions of new genera and species of Phytophagous Beetles, belonging to the Family *Cryptocephalidæ*, together with diagnoses and remarks on previously described genera, by Joseph S. Baly, F.L.S.

Descriptions of new species of Phytophagous Beetles belonging to the Family *Eumolpidæ*, and a monograph of the genus *Eumolpus*, by Joseph S. Baly, F.L.S.

DESCRIPTIONS OF HYMENOPTERA FROM SPITZBERGEN,
COLLECTED BY THE REV. A. E. EATON.

BY THE REV. T. A. MARSHALL, M.A., F.L.S.

The following five species (of which four are new) were described by me some time ago, at the request of the captor; but the descriptions having been mislaid by him, it has become necessary to repeat them. They are written so as to be in conformity with Holmgren's Monographs. The insects are not remarkable, except as being a sample of the Arctic Fauna, and containing among them a form of *Orthocentrus* with the wings imperfectly developed.

MESOLIUS, Holmgr.

MESOLIUS ARCTOPHYLAX, *n. sp.*

Nitidulus; *clypeo apice subdepresso, truncato vel levissime emarginato; area supero-media angusta, triangulari; postero-media distincta; segmento 1^o planiusculo, basin versus sensim angustato et (cum dimidio segmenti 2^{di}) coriaceo, carinulis distinctis; spiraculis ante medium sitis; alarum nervo transverso anali infra medium fracto; areola nulla —; niger, ore, clypeo, palpis, faciei maculis 2 interdum ♂, alarum squamulis, segmentorum marginibus infra et lateribus, cum plica ventrali, flavidis; pedibus rufis, trochanteribus ex parte nigris, tibiis tarsisque posticis nigris; alarum stigmatibus fusco.*
♂ ♀. Long. 3½—4 lin.

Belongs to Holmgren's Sec. II, Div. I, A, *b, β, †, ***, Spp. 31—41. Head not wider than the thorax, scarcely narrowed behind the eyes, alutaceous; face, clypeus and palpi with pale hairs; one ♂ has two triangular yellow patches on the face; head not beccated; teeth of the mandibles brownish. Antennæ black, nearly as long as the body; first joint of the flagellum half as long as the second, the third longer than the fourth. Mesothorax trilobate, the furrows distinct. Metathorax sub-rugulose; supero-median area very narrow, elongate; postico-median area cordiform; the lateral areae sub-distinct. Abdomen ovato-lanceolate, with short white hairs towards the apex. Terebra slightly exerted. Wings hyaline.

July 18th, 1873. East side of Wide Bay. Four specimens.

BASSUS, Fab.

BASSUS HYPERBOREUS, *n. sp.*

Nitidulus, punctulatus; metathoracis area supero-media minuta, postero-media ampla; abdominis segmento 1^o subquadrato, scabriculo, carinis fere ad apicem extensis; alarum nervo transverso anali infra medium fracto —; niger, ore, clypeo, faciei macula, orbitis internis, antennis subtus, alarum squamulis, pedibus anticis cum coris, flavidis; femorum posteriorum basi rufescente; tibiae posticae annulo ante basin flavo.

Var. Coxis anticis nigris.

♂. Long. 2½ lin.

Belongs to Holmgren's Sec. II, A (?), *a, v*. Clypeus margined

with a raised line at the base. Mandibles black, yellow in the middle. Abdomen sub-cylindrical, segments 1—3 with the anterior half scabrous.

July 19th, 1873. East side of Wide Bay. Three specimens.

ORTHOCENTRUS, Gr.

ORTHOCENTRUS REPTILIS, *n. sp.*

Nitidus, impunctatus, fronte et facie læviusculis; abdominis segmentis inter se distincte separatis; segmento primo apice et lateribus striolato, carinulis obsoletis; secundo latitudine longiore, apice (cum sequentibus) fortiter compresso; septimo brevi; terebra vix exserta. Alarum stigma mediocre; nervus radialis externus incrassatus, incurvatus; areola deficiens; nervus transversus analis obsoletus; alæ imperfectæ, abdomine multo breviores. Metathoracis area supero- et postero-media confusæ; cæteræ nullæ. Antennarum articulis tertius sub-quadratus —. Niger, pedibus piceo-testaceis, femoribus coxisque posticis validis. ♀. Long. 1 lin. (vix).

Belongs to Holmgren's Sec. I, Div. II, Subd. 2, A, Spp. 21—35. The shortness of the wings, which are unfit for flight, distinguishes this species from all others of the genus. In one of the two specimens preserved, the wings are altogether torn off, in the other they are in their natural state.

July 31st, 1873. Loom Bay. Two specimens, one in bad condition.

MESOCHORUS, Gr.

MESOCHORUS DOLOROSUS, *n. sp.*

Segmentum 1^{um} abdominis apice lævissimum; unguiculi tarsorum inermes; facies latitudine longior (Holmgr. Sec. I, D, a). Nitidulus, punctulatus, niger; ore, clypei apice, palpis, alarum stigmate, segmenti 2^{di} marginæ postico, pedibusque fusco-testaceis; plica ventrali flava. ♀. Long. 2½ lin.

Head scarcely narrowed behind the eyes, pubescent; face sub-square, punctate, cheeks not buccated; antennæ a little shorter than the body, attenuated towards the apex. Thorax not narrower than the head, pubescent; superior areæ of the metathorax five, distinct. Abdomen smooth, glabrous; the first segment curved, wide (for the genus), the medial channel distinct; the second longer than its breadth; terebra less than one-third of the length of the first segment. The radial nerve slightly bent at its apex; the transverse internal cubital nerve interstitial; the anal transverse nerve straight; areolet large, receiving the recurrent nervure very little before the middle.

August 2nd, 1873. Hecla Cove. Six specimens.

ICINEUTES, Nees.

ICINEUTES REUNITOR, Nees, Mag. Ges. Berl., 1816, p. 276, pl. 7, f. 3, &c.

Eight individuals from Hecla Cove, taken on the same day as the preceding. They belong to Wesmæll's species *I. brevis*, which is supposed to be a small variety of *reunitor*. Both forms are occasionally found in England.

Belsiz · Park Gardens, N.W. :

February, 1877.

Lepidoptera captured during an Excursion to Switzerland and the Italian Lakes.—The following list of *Lepidoptera*, observed by myself and a friend (Mr. M. J. Michael, of St. John's College, Cambridge), during a short trip in Switzerland and the Italian Lakes last summer, may be of interest to entomologists who have collected on similar occasions, as showing how much (or, rather, how little) can be done in entomology on a tour where this is not the only object. When in company with non-entomological friends (we were in all a party of four) a great deal of collecting has to be done on the sly, as it were,—I mean by resorting to such expedients as walking up hills when travelling along the roads; and by these means a number of additional species were procured, though sometimes perhaps at the expense of the time of the less interested members of the party. Unfortunately, the time for departure from England (about the middle of August) coincided with the setting in all over Western Europe of the spell of bad weather which prevailed for about a month continuously; and this, combined with the lateness of the season, no doubt much contributed to the lack of species observed, and the entire absence of some usually common, e.g. *Daphilice*, *Palæus*, &c. It also entirely frustrated our intention of visiting Zermatt, where we had intended to have spent some days collecting the insects of the high Alps. The total number of species observed in the month was 107, of which 33 are not British species. For naming some of these I am indebted to Dr. Staudinger, whose nomenclature I have throughout followed.

LIST OF SPECIES OBSERVED.

Papilio Podalirius—seen near Colico. *Papilio Machaon*—Colico, Bellaggio, Menaggio. *Parnassius Apollo*—one ♀ specimen at rest on thistles near Andeer. *Pieris brassica*, *rapæ*, *napi*—everywhere in cultivated grounds. *Leucophasia sinapis*—common in the gardens of the Villa Serbelloni and elsewhere at Bellaggio; also at Menaggio and Pallanza. *Colias Hyale* occurred nearly everywhere, and usually commoner than the next. *C. Edusa*—with the last. The var. *Helice* occurred at Bellaggio and Menaggio, but not commonly. *Rhodocera rhamnii*—Villa Serbelloni and Pallanza. *Polygonmatas virgaureæ*—one ♂ specimen near the village of Splügen. *P. Doritis*—Baden; common at Bellaggio and Pallanza. In this species the ♂ is quite dark above, the ♀ having the primaries orange with dark spots, and an orange border to secondaries. *P. Phleas*—Baden, Bellaggio, Pallanza. The Italian specimens have the markings less distinct, the copper colour redder, the spots smaller, the costal margin of the primaries darker, and the marginal band broader and narrower than any English examples I have. The under-side too, of the primaries, is redder, leaving the circumscriptions of the eyes and the veins of the wings paler. *Lycæna Argiades*.—This little "tailed" blue occurred, but not commonly, at Baden and Bellaggio. *L. argyrotoxus* (*Egon*)—Colico and Bellaggio, in the grounds of the Villa Serbelloni. *L. Astrarche* (*Agestis*)—Bellaggio.* *L. Icarus*—Baden, Kandersteg, Colico, Menaggio, Bellaggio. *L. bellargus* (*Adonis*)—Kanderthal, Chur, Bellaggio, Menaggio, Val Vedro. The var. *Ceronus*—(which also occurs in England)—at Bellaggio. *L. Corydon*—Kanderthal, Chur, Menaggio, Val Vedro. Two ♂ Swiss specimens have all the black points on the under-side of the wings much smaller and less distinct than in English ones; in one also the row of

* The Bellaggio specimens have both the red and black spots on the wings larger, and the ground colour of the under-side greyer than in English specimens.

orange spots on the post-margin of the under-side of the secondaries has almost disappeared. *L. Damon*—Kandersteg, Chur. *Apatura Iia*. The *ab. Clytie*, which differs from the type in having the ground colour of all the wings reddish-ochreous instead of white, occurred commonly on the poplars lining the road between Chiavenna and Colico. This species flies strongly, but does not soar like *A. Iris*, and sits on the leaves sunning itself till disturbed, but generally too high to be in reach of an ordinary net. The females have much less metallic gloss than the males. *Limenitis Camilla*—in the gardens of the Hotel Grande Bretagne at Bellaggio, but not at all common: one specimen also in those of the Villa Serbelloni and Menaggio. *Vanessa Io*—near Tiefenkasten. *V. Atalanta*—Colico, Bellaggio, and Menaggio. *V. cardui*—Bellaggio. *V. Antiopa*.—We only saw one of this species throughout our trip, and that was at Sargans, on the railway from Zurich to Chur. *V. e-album*—Bellaggio and Villa Serbelloni. *Melitæa Athalia*—Menaggio and Bellaggio, in meadows. *M. Parthenie*—Baden. *M. didyma*.—This species was not uncommon on the railway banks near Waldshut, and a timely delay of the train enabled us to get out of the carriage and procure some specimens before it started off again. *Argynnis Dia*—Baden and the Via Mala. *A. Paphia*—Baden, Colico, Bellaggio, Menaggio, and the Val Vedro. The *var. valezina* also occurred at the two last-named localities. *A. Adippe*, *var. Cleodoxa*—Bellaggio and Val Vedro. *A. Niobe*, *var. Eris*—near Splügen: also at Pallanza. *A. Lathonia*—common at Baden; also at Bellaggio and near Tiefenkasten. *Melanargia Galathea*—a worn specimen in the Val Vedro, and another on the hill behind Bellaggio. *Erebia Stygne*—Kanderthal, near Frutigen, in meadows at about 2,500 feet elevation; also on a rocky wooded hill behind Bellaggio. *E. Nerine*—a single ♂ specimen of this rather rare species near Splügen. *Erebia Pronoë*, *var. Pitho*—This handsome species was rather common in sloping, dry meadows, between Frutigen and Kandersteg, at about 3,000 feet elevation, but difficult to get in good condition.* *E. athiops (Blandina)*—Thun; common in the valley of the Kander, and on a hill behind Bellaggio. *E. Ligea*—near Splügen. *Satyrus Hermione*—Colico, Menaggio, and Bellaggio; frequented a rocky wooded hill behind the latter, and seemed to like resting in shady places. On the wing somewhat resembles a large *L. Sibylla*. *S. Circe*—A specimen of this handsome species was seen at Baden. *S. dryas (Phædra)*—This fine species was abundant at Bellaggio, frequenting, like *S. Hermione*, a rocky, bushy hill behind the town, wheeling in its flight over the bushes, the roughness of the ground making it a matter of some difficulty to catch specimens. The female is larger and lighter in colour than the male; has the blue eyes on the primaries larger, and with brighter blue pupils than in that sex, and is altogether a finer-looking insect. It also occurred at Menaggio, where it frequented the flowers of the millet (*Milium effusum*), which is grown in the vineyards in patches between the rows of vines, at Pallanza and near Colico. *S. Actæa*, *var. Cordula*—with the last, at Bellaggio and Menaggio, but much less common. *S. Semele*—Menaggio and Bellaggio. *Pararge Hiera*—Villa Serbelloni, at Bellaggio, Menaggio, and Val Vedro. *P. Egeria*—Bellaggio, Menaggio. I think those I saw belonged to the pale northern form *Egerides*, but not having kept specimens cannot say for certain. *P. Janira*—Baden, Colico, Menaggio, Bellaggio.

* The *var. Pitho* has the red bands nearly obliterated.

P. Tithonus—Bellaggio, Menaggio, and Pallanza. *Cœonympha Pamphilus*—Baden, Bellaggio, Menaggio, and Val Vedro. *Spilothyrus alceæ*—Bellaggio. *Syrictæus Alveus*—Baden, Bellaggio, and Menaggio. *S. Proto*—gardens of the Villa Serbelloni, at Bellaggio. *Hesperia comma*—everywhere: on the whole, the commonest butterfly, as far as regards our experiences. *Sphinx convolvuli*—gardens at Schaffhausen and Thun. *Macroglossa stellatarum*—common in gardens at all places visited, except in the Alpine valleys. *Zygæna filipendulæ*—Baden, and near Chur. *Lithosia deplana*—one at Thun. *Callimorpha Hera*—Via Mala; common at Bellaggio and Menaggio, fluttering about flowers in the sunshine like a butterfly. *Cossus ligniperda*—a full-grown larva picked up in the Via Mala, and an empty pupa case near Liuno. *Bombix rubi*—larvæ common, crawling in the roads, near Chur, Splügen, and in the Val Vedro. *B. trifolii*—a ♂ specimen picked up in the road near Menaggio. *Agrotis c-nigrum*—Thun. *Plusia triplasia*—Bellaggio. *P. gamma*—Schaffhausen, Bellaggio. *Catocala paranymphe*—a single worn specimen in the inn "Belle Vue" at Frutigen. *Acidalia perocharia*—common in meadows near Baden, and in the Kanderthal, near Frutigen. *A. immorata*—Baden. *A. immutata*—Bellaggio. *A. strigilaria*—common at Pallanza, on grassy slopes near the lake. *A. ornata*—common at most places we visited, but not in the Alpine valleys. *Timandra ornata*—Schaffhausen, Liuno. *Numeria capreolaria*—one specimen near Chur. *Gnophos glaucinaria*—one specimen near Chur. *G. dilucidaria*—Baden, Bellaggio. *Ortholitha limitata (mensuraria)*—Chur. *O. bipunctaria*—Chur; larger and darker than English (chalk) specimens. *Minoa murinata (enphorbiata)*—Pallanza. *Anaitis plagiata*—Baden, Schaffhausen. *Lygria populata*—common in fir woods, at about 4,500 feet elevation, near Splügen. Some specimens marked with dark, but I saw none of the *var. musavaria*. *Cidaria variata*—two on the Merkurberg, near Baden. *C. ferrugata*—Schaffhausen. *C. cœsiata*—in company with *L. populata*, as in Scotland. *C. flavicinctata*—one specimen in the hotel at Splügen. *C. verberata*—common in all the Alpine valleys we passed through. *C. bilineata*—Baden, Schaffhausen, Chur, Liuno. *Eupithecia enphrasata*—one specimen on a hill behind Bellaggio. *Rivula sericealis*—Bellaggio. *Hypena obesalis*—a specimen near Andeer. *H. obsitalis*—common in passages amongst vineyards, near Bellaggio. *Botys purpuralis*—meadows at Bellaggio. *B. cespitalis*—Baden. *B. nubilalis (lupulinalis)*—one specimen at Bellaggio. *B. lutealis*—near the waterfall on the Splügen. *Eurygereon verticalis*—Schaffhausen. *Pionea forficalis*—Baden. *Diasemia litterata*.—This pretty little species was common at Bellaggio, flying gently in the sunshine just above the top of the grass, in grass and clover-covered meadows, in the neighbourhood of vineyards, &c. *Crambus tristellus*—Baden, Bellaggio. *C. culuellus*—Baden, Bellaggio. *C. perlillus*—Chur, Bellaggio. *C. geniculatus*—Bellaggio. *Pempelia semirubella (carnella)*—common at Bellaggio and Menaggio, in places like those frequented by *litterata*. The *var. sanguinella* (with pale costa) also occurred. *Mgelois rosella*—one specimen of this pretty little species at Menaggio. *Sericoris conchana*—Baden. *Depressaria Heydeni*—some pupæ picked up from moss under stones whilst searching for *Coleoptera*, on the Splügen, near the top of the pass (at about 6,500 feet), produced this species, for naming which, as well as the last, I am indebted to Mr. E. Meyrick, of Trinity College, Cambridge.—W. A. FORBES, West Wickham, Kent: January 17th, 1877.

Notes on Light, as a means of attracting Lepidoptera.—The following notes are not intended as an essay on the subject, but are published simply in the hopes of inducing entomologists in various parts of the country to try, during the coming season, a method of collecting, which at present is far from receiving the attention it deserves. I could have wished to make them more complete, by waiting another year, during which I hope to make a trial of a more powerful light—the magnesium—which has, I understand, been applied to this purpose by Mr. Thornthwaite, with startling success; but enough has been done to show that with ordinary lamps, and at a cost within the means of all, grand results may be achieved, and I am anxious that another season should not pass without a more general experiment. Considering how long it has been known that moths are attracted by light, and how much has been done by collecting the insects that come to stationary lamps, it is strange that so few should have attempted to take the light to the insects. Of course, there is no originality in the idea, and that such a method of capture is feasible, is, doubtless, generally known, but I think it is *not* generally known how great the results of such work sometimes are, nor how many species, formerly of excessive rarity in our collections, may be taken almost with certainty in this way.

In September, 1872, I made my first attempt by taking to one of the Norfolk Broads a paraffine lamp, “warranted to burn in the open air.” The night was dark and warm, but very windy, and, need I say, the “warranted” lamp alternately flared, smoked, and went out: moreover, only one solitary moth was rash enough to leave the shelter of the thick reed-beds to reward the attempt. First impressions are often lasting, and had that moth been a “common beast,” very probably I might not have been eager to try again; but as luck would have it, it was a fine specimen of *Nonagria canna*, at that time quite new to my collection, and always a great rarity, at least in Norfolk. After this I tried that lamp several times within the month, but always with the same result, as far as the behaviour of the lamp went, and always without result, in the shape of rarities. That winter I manufactured a huge contrivance, hexagonal in form, to carry six colza lamps with reflectors, the whole hoisting on a pole. The first opportunity for trying it occurred in June, 1873, when, in company with my friend Mr. C. G. Barrett, I embarked (lamp and all) for a two days’ cruise among the Norfolk Fens. The first night, at Ranworth, a thick fog came on, and nothing was to be seen; the lamp attracted, however, two *N. ziczac*, and a few *P. lignata*. Next day was wet and dull, and the evening still threatened rain, but was free from fog. We worked along the shores of Barton Broad, hoisting the lamp about 10 p.m. The first moth to turn up was *Meliana flammea*, and, though nothing else of that character put in an appearance, we found the night lively enough with swarms of *C. phragmitellus* and *P. lignata*, with a fair sprinkling of *C. gigantellus* and *mucronellus*. During the year I tried the lamp twice more in Norfolk, and several times at Wicken Fen, Cambridgeshire, always with good success. Next year, 1874, I introduced some further improvements into the lamp, but retained its style intrinsically the same; during July and August of that season, I was staying within six miles of Wicken Fen, and was therefore enabled to work this locality with some degree of regularity, and without that, very little can be done towards exploring a collecting ground. One good night is worth weeks of average weather, and only by constant work, while living on the spot, can these opportunities be ensured. The labour was very severe, and many a time, after walking over at dusk and working

till dawn, perhaps in drenching rain, I have been scarcely able to drag myself home, without an hour or two's sleep in the fen—a dangerous luxury in wet clothes,—but then the sport was proportionate. Two nights in particular, July 10th and 11th, the weather being just perfection, *i. e.*, oppressively close, and the sky black with clouds, from which thunder and at intervals a drop or two of rain descended, were to me times never to be forgotten. Standing beneath the lamp, its rays made a circle of light amidst the surrounding blackness, and this circle was apparently closed in with a hovering cloud of moths—I am sure that I do not exaggerate when I say they were in tens of thousands; to select under such circumstances was impossible, and every dash of the net among the swarms that from time to time came close up to the light, produced a mingled assemblage of captives, that made boxing a difficult matter, for often two or three would crowd into the pill-box. Sometimes this was varied by the sudden bang of a *M. arundinis* against the glass, followed by a buzzing as it fell among the grass and rushes, or the noisy dashing about of *G. quercifolia*; but the *tout ensemble* produced an impression, the very recollection of which calls up a thrill of excitement.

Altogether, my diary shows a total of 300 insects, belonging to 34 species, for the 10th, and among the species are *M. arundinis*, *N. ciliaris*, and *B. uliginosana*; while the record for the next night falls not far below, and even surpasses it, in the matter of *N. ciliaris*, of which I obtained no less than 10 specimens. When I mention that I have *never* since then seen more than two in one night, and that only once, and that the insect does not appear to fly at all, unless the evening be just to its taste, the above success becomes even more remarkable.

At the close of this season I made an alteration in the lamp:—having found that paraffine lamps will burn well enough even in a hurricane, when enclosed in a glass case, fitting perfectly tight at sides and bottom (*i. e.*, without any air-holes) and with perforated zinc top, I substituted this for the colza, obtaining a far steadier and brighter light, and one that required no attention.

In 1875 I was too much occupied to collect, but getting out for a night in November, was rewarded by taking *Nouagria lutos*a, and the second brood of *B. uliginosana*, including a finely streaked form. Last year I added to my stock of lamps a small one, made to pack up into a portable form, and whose weight was not too great to be carried strapped on the back (the colza apparatus weighed 60lbs.); this enabled me to try the method in fresh localities, *e. g.*, a large wood near Norwich, where *A. alni* headed the list of victims, and in July, after some labour, Mr. N. M. Richardson and myself established it on a summit of a Perthshire mountain, where it proved fatal to *Pachnobia alpina*.

I must confess that for wood collecting light has not in my experience proved such a success as in the fens, where it simply eclipses all other methods of capture for a large number of the rarer species; still, the few times I have been able to try it in large woods show clearly that it is a method which should assuredly not be neglected. The one grand merit of it is that *all* classes of *Lepidoptera* (except *Diurni*) seem alike to be attracted by it; and the *Bombyces*, *Geometra*, *Pseudo-Bombyces*, and *Tyrales*—for which we have no other special method of capture—are to the full as headstrong in coming to light as the *Noctua*—perhaps more so. The apparatus which I now use is simply a square case glazed all round (two opposite sides opening as doors), say one foot square and fourteen inches high, with a wooden

bottom and wire gauze top, and a cylinder of tin fitted up the middle, through which I can pass a pole to hoist it. This carries four meteor paraffine burners, and will show a splendid light for an oil lamp. The smaller one has two burners only, and takes to pieces, packing up into a space of 12 inches by 8 by 5. With this strapped on my back, I am able twice or thrice a week in the summer time to spin over on my bicycle to Ranworth or Barton, or some other of the Norfolk Fens or woods, enjoy a delightful night's work till two a.m., snatch a couple of hours' sleep in a boat—a reed stack in the fens—or some convenient cottage, and ride home to business in the early morning. Of course this is too laborious to be regularly done—two successive nights always knock me up; and I am anxious that the method should be fairly tried by some one whose leisure or situation permits him to do so with less labour than it costs me. I am quite convinced that any of the *Bombyces* or *Deltoides* which, though they can be assigned to definite localities, e.g., *G. ilicifolia* in Cannoch Chase, or *Madopa salicalis* in the woods of Surrey, are yet rare from our ignorance of how to catch them, might be certainly obtained by patient trial of this plan.

I cannot conclude these notes without some allusion to the three brighter lights—Electric, Magnesium, and Oxy-Hydrogen lime light. It might naturally be expected that these more powerful means would be proportionately more productive of insects, and Mr. Thornthwaite has shown this to be the case. Hitherto I have not tried them myself, chiefly on account of the cost of maintaining any of these, and the weight of apparatus required, certainly for the first and last, and will therefore not trespass on the ground of another. I have, however, said enough I hope to convince beginners (and it is of course for their benefit that I write) that they will do well to add this to their other ways of collecting. I can only add that I shall at any time be most happy to render any assistance I can to those who wish to try it.—F. D. WHEELER, Norwich: *March 14th, 1877.*

Description of the larva of Axylia putris.—In the summer of 1875, Mr. Owen Wilson, of Carmarthen, found a ♀ imago of this species amongst lettuce. As it deposited eggs, he tried the young larvæ on the above-named plant, to which they took with evident relish. At the end of July, he kindly forwarded half-a-dozen of them to me, when I found they had already attained a length of three-quarters of an inch. They grew rapidly, and, by August 9th, were nearly an inch and a half long, and rather plump. The head has the lobes rounded, but is rather flat on the face, it is narrower than the 2nd segment, into which it can be partially withdrawn. Body of nearly uniform width, but rather sharply attenuated from the 4th segment to the head; the 13th segment also small, and rounded off rather bluntly; each segment has a transverse dorsal ridge. Segmental divisions deeply cut, dividing the body into distinct sections; skin soft.

Ground colour dingy, dirty brown, strongly varied with equally dull, dark green; head highly polished, dark brown. A dark green pulsating vessel forms the medio-dorsal stripe, and a fine, undulating, yellow line the sub-dorsal; there is a dull pinkish band along the spiracular region, becoming, however, dull yellow and wider from the 10th segment to the base of the anal prolegs: on the sub-dorsal region is a series of oblique yellow marks, edged above with dull green, the green edging

forming wedge-shaped marks, that on the 11th segment being much darker than the others; there is also a distinct yellow spot, situate on the medio-dorsal line, on the posterior of each segment; spiracles very minute, greyish-pink.

Ventral surface dull greyish-green, irrorated with brown; the legs have their bases smoke coloured.

By the middle of the month, all the larvæ had disappeared beneath the surface of the earth in their cage.—GEO. T. PORRITT, Highroyd House, Huddersfield: *March 6th, 1877.*

Description of the larva of Lobophora hexapterata.—For several years I had been keeping by me a description of the larva of this species, taken from specimens beaten by myself, or sent to me by friends at various times, but it was not until 1875 that I was enabled, by the kindness of Mr. A. H. Jones, to describe the egg also. I received some eggs on May 30th; the larvæ hatched on June 1st, were full-grown in about four weeks, and spun up during the first week of July; captured larvæ usually spun up a week or so later. I am convinced from experience that aspen, *Populus tremula*, is the food, and though the larva will, for a time, eat other species of poplar, it will not thrive on them.

The egg is broadly oval in outline, flattened, and laid on its side; the shell shining, and covered all over with delicate hexagonal reticulations; the colour at first pale green, afterwards whitish. The young larva is at first pale dull white all over, afterwards becoming greenish. When full-fed, the larva is about three-quarters of an inch long, its figure rather stout, of even bulk, cylindrical, but showing to the eye as if almost squared; this appearance seems to be caused, first, by the absence of a dorsal line, for the pulsating dorsal vessel is scarcely to be seen without a lens, and so the eye catches the sub-dorsal line as forming the edge of a flat back; and secondly, by the habitual position of the larva, which, when at rest, contrives to lie perfectly flat on the surface of a leaf, somewhat in the fashion of those species which spin leaves together, though in this case I have never detected any spinning whatever; the lobes of the head are horny, and well-defined, the hinder segments taper a little, and there are two short anal points; the skin is somewhat wrinkled; the ground-colour is pale yellowish-green; the head dull pale green with small black ocelli, the mouth reddish-brown; the sub-dorsal line (the only ornamentation) is pale yellow, below it the side is more yellowish-green in tint than the back; the spiracles very indistinct, pale yellow; the belly whitish-green; the segmental folds yellowish when the larva is at rest, when it is in motion they appear green; the anal points pinkish-white; altogether this is a very dull looking larva, having so little variety of colour. When spinning, it makes a neat cocoon, three-eighths of an inch long, and just half as wide, compactly woven of dark silk, with fine grains of earth, &c., stuck over it; the pupa is five-sixteenths of an inch long, cylindrical, the eyes prominent, the abdomen about one-third of the length and tapering off in a curve, and ending in a bifid spike; the colour on the thorax and wings very dark greenish, on the abdomen deep reddish-brown; the skin rather glossy.—J. HELLINS, Exeter: *12th January, 1877.*

The Stack Rocks.—On July 18th, we started early in the afternoon for a drive along a range of rocky coast six or seven miles away, to view the sea-birds in their breeding-places on the Stack and other rocks. On the road my attention was attracted by small *Tortrices* hugging the hedge-side, and alighting, I was surprised

to find that *Eupæcilia rupicola*, taking advantage of the warm still sunshine was flying commonly over the *Eupatorium cannabinum* on the bank. By the time that the patience of my companions was nearly exhausted, I had secured a score of decent specimens, and had made the far more important capture of a specimen of *Opadia funebrana*, which was sitting on a bramble-leaf under some blackthorn bushes. It is the first and only time that I have seen this species at liberty, and the specimen is larger than those usually reared.

A few miles further, the road lay through some fields, and a corner of luxuriant weeds, among which *Stachys sylvatica* was prominent, attracted my attention. In a very few minutes *Ebulea stachydalis* was disturbed, and, in spite of their cowering and creeping close to the ground, nine specimens were secured.

On arriving at the coast the sea-birds claimed all our attention. The "Stacks," three in number—detached and inaccessible, but overlooked by the cliffs—had their broad sloping or flattish summits absolutely covered with guillemots and razorbills (both locally called elligooks, elligoos, or elligugs,—for the orthography like the etymology is obscure), and formed a wonderful sight, every inch of space being apparently occupied. (I grieve to say that the largest rock with its countless birds sitting erect, has been irreverently compared—by a young lady of course—to a *pin cushion*).

Below the flatter surface and shelves of rock occupied by the "elligooks," every chink and cranny was taken possession of by one or two of the pretty little kittiwake gulls, from the roundness of their heads looking as they sat like a host of owls. All around, the sea was alive with hundreds of birds swimming, diving, and flying to and from the rocks. The cliffs themselves, composed of mountain limestone, several hundred feet in perpendicular height, rough, jagged, and worn by the eternal beat of the waves and the terrible winter storms, had every available shelf occupied by the larger common gulls, while swarms of predatory daws and crows rested in the holes. While I waited to allow the young folks to go round to a different point where a finer view of the bird-covered rocks could be obtained, I was highly gratified to see a beautiful Cornish chough alight within twenty yards, showing its red legs and beak to great advantage. A little further on we were disappointed to find a rocky pinnacle, upon which I had previously seen a Peregrine falcon sitting on her nest, deserted, and although several of these fine hawks had flown around a week or two before, not one was seen on this occasion. Beyond this was a tremendous chasm where a portion of the inner rock had given way—undermined by the sea—leaving a massive arch of rock, beneath which the waves roared and tumbled. In this protected spot *Asplenium marinum*, *Limbarda crithmoides*, *Crithmum maritimum*, and other sea-side plants were growing luxuriantly, and on shelves above the archway the kittiwake gulls were setting near enough to toss a biscuit upon them. When disturbed, they merely flew round and round the chasm, and settled again.

Passing along the coast, headland after headland was occupied, more or less, by the larger gulls on the higher shelves of the precipices, and the guillemots and razorbills along the rocky ledges above high water mark, but in greatly diminished numbers.

In the meantime we had seen very few *Lepidoptera*. *Satyrus Semele* was common of course on the rocky slopes, but hardly any other day flying species seems able to exist on these bare downs and storm-beaten crags. An exception must be

made, however, in favour of *Herbula cespitalis* which kept flitting about in the sunshine wherever a hollow provided a little shelter from the breeze. This species could hardly have claimed attention but for the unusually large size and bright colouring of the specimens: the males varying from reddish-ochreous and red-brown with pale olive bands (far brighter when alive than when pinned and set) to the usual dull colour, while the females were almost bright enough for *Pyrausta*. Consequently it became necessary to secure some, not always an easy task between bright sunshine and strong wind, but the difficulty changed its character when the wind fell at 8 p.m., for we then witnessed the most extraordinary sight of the kind that has ever come under my observation. *Cespitalis* then began its evening flight, and at every step *actual clouds* of them started up and flew around us. I say clouds, for no other term expresses the numbers. They all flew at the same level, a few inches above the short turf, reminding one, as they skimmed away in every direction, of vast flocks of sheep fleeing in masses from the foot of an intruder. In fact, it is difficult to convey the impression given by such countless multitudes flying all in precisely the same manner,—it must be seen to be appreciated.

A month later, a young friend came down from London, and we again spent an afternoon along the cliffs; but we came almost too late for the birds, the vast hosts of "elligooks" had gone away to sea, but the sides of the Stack Rocks were still occupied by the kittiwakes, and peeping carefully over into one of the chasms, we saw what looked like a strange and most lovely species of small gull, which turned out, on further observation, to be the young of the kittwake full-grown and fledged, and probably nearly ready to accompany its parents in their approaching period of homeless wanderings.

The lower slopes of the inaccessible Stack Rocks were visibly covered with the tree mallow (*Lavatera arborea*) in full bloom, and the cliffs even bright with blooming *Limbarda crithmoides*, and other rock-plants; but again *Lepidoptera* were very scarce. We had previously beaten out a few small insects in the lanes—*Scopula lutealis* commonly, *Brachytenia semifuscana*, *Peronea Schalleriana*, and *Semasia populana*, among the shallows,—but nothing remarkable, and now the rocks bade fair to be even less productive. However, a momentary glimpse of a silvery bar across velvety black wings awakened interest, since I had never before found *Emyehia cingulalis* at home, and we commenced a systematic investigation. It was hard, however, to find the little beauty's favourite haunt, and when at last discovered it could hardly be considered satisfactory. Just where the sloping slippery grass reached the ragged edge of the tremendous precipice, was where *cingulalis* loved to rest and flit about, and catching it amounted to sport with a decided spice of danger. But again sunset favoured us. We had passed along to an awful chasm, long and narrow, almost meeting at its outer end, but with a sheer wall of perpendicular rock on each side, and called, from a local tradition, the Hunter's Leap. Along the edge of this chasm, and flying out over it, was *cingulalis* in some plenty, and to get it we were obliged to creep down a smooth slope and cling with one hand to the herbage while making random sweeps of the net along the edge with the other, each sweep bringing in perhaps two or three caught flying or sitting on the thrift and other overhanging plants. It was dangerous work, but we secured some of the most lovely specimens I ever saw, two or three of the females having the second yellowish fascia (near the base of the fore-wings) strongly marked. So attractive were they, that before we had explored the Hermit's Cell, at St. Govins, and its miraculous well, the dusk was coming on, and driving clear of the blocks of limestone, with which the track (called a road) is profusely studded, became a work of absorbing interest.—CHAS. G. BARRETT, Pembroke: 15th December, 1876.

On a peculiar form of variation in Tortrices.—The sight of a beautiful variety of one of our very common *Tortrices*, sent for examination by Mr. W. Prest, of York, and taken near that city, induces me to make a few observations upon a peculiar phase of variation which seems to be confined to the *Tortrices*—and, perhaps, to certain families in the group,—and not to any single species or genus.

It consists in the total obliteration of the *usual* markings of the species, which are replaced by cloudy markings of different form and position on a white or cream coloured ground. This phase of variation (or albinism) appears to be most frequent in *Penthina cynosbatella*, L. (*variegana*, H.), and forms the variety, *nubiferana*, Haw., Steph., but described by them as a *distinct species*. Stephens (simply translating Haworth) describes it :—“Anterior-wings bone-white with an irregular black streak from the base to the middle, extending along the costa; in the middle of the disc are two rounded deep black spots; on the middle of the inner margin is another dark streak, and one near the apex also towards the inner margin.” Wilkinson, however, describes *nubiferana* :—“Anterior-wings dirty white with indistinct and undefined dusky clouds from the base to beyond the middle; the costa destitute of markings; at two-thirds from the base and one-third from the dorsal margin is a largish cloudy fuscous spot.” And he asks whether it should not be restored to the rank of a species.

These two descriptions do not appear to agree very well, but this arises from the fact that in this variety there is variation. Of two specimens in my collection, one, taken near Pembroke in 1875, agrees accurately with Haworth's description, the other, taken some years ago in Surrey, is more cloudy, and comes very near to the form described by Wilkinson. That both are varieties of *Penthina cynosbatella*, L., admits, I think, of no doubt. When, therefore, Mr. Prest sent me a moth similar in size and colour to one of these, I returned it without hesitation as *cynosbatella*, var., but when he sent it again with another moth in the company of which it was taken—this other being obviously one of the pale ordinary forms of *Halonota Brunnichiana*,—and I was thereby induced to examine it more carefully, I found from the shape of the fore- and hind-wings, and the very dark colour of the hind-wings, that it was actually a variety of *H. Brunnichiana*, corresponding in a wonderful manner to the variety *nubiferana* of *cynosbatella*. There is no trace of the ordinary *Brunnichiana* markings on the fore-wings, which are bone-white, with the costal portion, from the base to the middle clouded with grey, a cloudy grey elbowed line towards the apex, and another cloudy line below it.

This recalls similar instances to memory. Among my *Sericoris littoralis*, taken near Dublin, sixteen years ago, are two specimens exhibiting similar characteristics. The fore-wings are whitish, with cloudy indications of fasciæ which are *not* placed in the positions occupied by the ordinary markings of the insect.

Some time ago, a specimen was sent me for identification, which, from the form of its fore-wings, I believe to have been *Phoxopteryx unguicella*, but, from its being an albino of the same character, with no indication of the position of the usual markings, it was impossible to decide with any certainty on its species.

Lastly, I took, some years ago, by the side of a country road near Haslemere, a *Tortrix* which has never been named, and probably never will be. From the form of the fore-wings, it may be a *Phleodes* or *Grapholitha*, but of what species I can-

not even give an opinion. It is also an albino, but not so pale as those already mentioned, having oblique, fascia-form, cloudy markings.

The most striking feature in this phase of variation—or what might be called the *nubiferana*-form of each species—is, that such markings as are found bear no relation whatever to the normal markings of the species to which they belong, and in this it differs from albinism, as observed in other groups of *Lepidoptera*, while the specimens, although differing so greatly in size and form, bear a curious resemblance to each other, and the variation seems to be confined to the anterior-wings.

Dr. Woock quotes *nubiferana*, Steph., as an aberration of *Penthina scriptana*, H. (*Brachytenia Hartmanniana*, L.), from which I judge that he has seen a similar variation in that species, but he ignores Haworth's description of *nubiferana* entirely, being probably puzzled by a reference in Haworth to *Sciaphila Wahlbomiana*, to which the insect does not bear the faintest resemblance. There is a chalky-white variety of *Sciaphila perterana*, Gn., found at Folkestone, among the ordinary forms, but it is devoid of any marking whatever, and can hardly have caused the confusion.

Now that the *nubiferana*-form of variation has been noticed in five species, belonging apparently to as many genera, it will be interesting to ascertain how much further it extends, and any information on the subject will be acceptable.—ID.: 3rd March, 1877.

Acherontia Atropos in the North of Scotland.—Having observed a notice of the occurrence of *A. Atropos* at Wick, I beg to inform Mr. Sandison that I have a specimen in my collection which was taken at Keiss, some years ago, resting on the sail of a vessel. It is a good specimen, and measures $4\frac{1}{2}$ inches across the wings.

There is a northern specimen of *A. Atropos* in the Banff Museum, possibly the one mentioned in Smiles's "Life of a Scotch Naturalist," as Mr. Edward was Curator of the Museum when I saw the specimen there, and he used, I believe, himself to fill gaps in the Collection.

A. Atropos has also occurred several times at Banchory, in Aberdeenshire; but the specimens in any case I have heard of have been smaller than is usual farther south.—L. DUNBAR, Wick, Caithness: 9th March, 1877.

The Colorado Beetle.—*Doryphora decemlineata* having been discovered in a living state at Bremen upon goods imported from New York, and having also been seen at other places in Germany, the Commissioners of Customs have issued an order to all ports that the precautions already directed to be observed (*vide* p. 181 *ante*) are to be exercised in the examination of potatoes brought from Bremen or any other German port:—a further endeavour to insure that no potato-beetle shall be passed without receiving the official stamp. But will *Doryphora* come with potatoes only?—J. W. DOUGLAS, Lee: 14th March, 1877.

Precocious appearance of Melolontha vulgaris.—At the Meeting of the Belgian Entomological Society, held on 3rd February, 1877, M. Weyers exhibited a living ♀ of *Melolontha vulgaris*, from Paris, which the mild weather had tempted out. M. Delamain (Bull. Soc. Ent. France, 1875, p. xli) has recorded this insect on the wing in the middle of January, at Jarnac, Charente.

The House-Ant at Stockport.—I enclose you specimens of a species of ant, which just now is a great pest on the premises of a friend, a shopkeeper and baker. They made their appearance about seven or eight months ago, having troubled his neighbours previously and then migrated; with him, however, they appear to have taken permanent lodgings. A short time ago he found a piece of wasp-cake had been eaten up; so the next supply was suspended by a string from a hook in the ceiling, in a place where they had not been previously noticed; in half an hour's time, however, it was quite covered, and, considering their small size, there must have been thousands of them. On their first appearance they took possession of the whole place, but have now settled down to the neighbourhood of the bakchouse, swarming over everything, issuing from cracks near the oven in troops of hundreds and thousands, and quickly covering everything in the shape of sweets or animal food left for a few moments. I should be glad to know if they are usually found in this country, and to have any hints as to their clearance.—S. II. GASKELL, 147, Brimington, Stockport: *February 15th, 1877.*

[Your insects are the House-Ant (*Diplorhoptum domesticum*), now very common all over London, and doubtless also in other large cities and towns. The nests are usually under the flooring, and this adds considerably to the difficulty in getting rid of the pests. The most feasible plan is to note the place whence they emerge on their predatory expeditions, and then to pour in boiling water, tar-water, solutions of carbolic acid, or of other destructive agents, repeating the operation frequently. Perseverance in this may have the desired effect.—EDS.]

Squirrel versus Hornet.—When on a collecting ramble, in July last, about the jungly ground at Pultah, near Barrackpore, I was much amused by the conduct of some three or four squirrels (*Sciurus palmarum*) which had taken up their position in the crowns of two date-palm trees; the trunks of these trees, just below the crown, had been cut all round in notches by the natives for the collection of the juice (Falár-Ros) in little earthenware pots (Ghurás); these pots had been taken away, but there was still sufficient juice to attract large swarms of the common Indian hornet (*Vespa cincta*), so that all the cut or bare portions of the trunks were covered by dense buzzing struggling masses of these insects; but the squirrels did not mind the hornets in the least, and every few seconds would descend upon them, brush and clear them away with their front paws, and then enjoy their fill of the sweets, then up again into the crowns of the trees, their places being instantly filled by the black mass of hornets; down would come the squirrels again, and again the hornets had to clear out, and this continued for over half-an-hour, when I grew tired and left. The squirrels behaved in the most business-like and systematic manner,—a pass or two with their front paws and a whisk of their tail and the hornets were cleared out, and hovered in clouds round the trees, waiting till their turn should come again. The hornets never made the slightest attempt at resistance but accepted the treatment by the squirrels as simply inevitable, and this is the more curious on account of *V. cincta* being anything but an easy-tempered fellow, as any one who has ever molested a nest of this species will know well, for they will attack and follow you up with the greatest persistence, and Europeans, natives, horses, and even elephants can be severely punished by their stings. I have noticed *V. cincta* to be especially fond of small species of “skipper” butterflies, about the size of *H. sylvanus*;

they hold these butterflies (after capture) sideways, their legs grasping firmly the roots of the two wings on the side pointing downwards, they then strip off the two wings on the other side that point upwards, and then work with their mandibles from the thorax to the apex of the abdomen squeezing out all the juices, and then when completely sucked dry they drop the body with its two remaining wings and fly away. I have watched *V. cincta* flying with "skipper" in this way, but they appear to prefer to retire to some tree or bush for the better enjoyment of their feast.—G. A. JAMES ROTHNEY, Barrackpore: *January 29th, 1877.*

Note on Trioza Walkeri, Först., and Chermes rhamnii, Schrank.—In this country, *Trioza Walkeri* had been found only on blackthorn and spindle-tree, but on the 20th September last, between Dartford and Darenth, I beat four examples from a bush of *Rhamnus catharticus*, and Mr. C. W. Dale writes to me that he finds it abundant on the same plant in Dorsetshire; thus, the statement of Flor, Rhyn. Livl., ii, 496 (1861), that the insect lives on the buckthorn, is confirmed. Flor does not describe the larva, but says that it is somewhat numerous on *Rhamnus catharticus*, and up to the time of its final development, in July and August, rolls the margins of leaves inwardly in the direction of their length. I saw several such leaves when I got my examples.

Herr von Frauenfeld (Verh. k. k. zool.-botan. Ges. Wien, xi, tab. 2) figures the wings of the imago, and the pupa of *Tr. Walkeri*, and a deformed leaf of *Rhamnus frangula*. He (p. 169) gives some interesting details of the habits of *Trioza Walkeri*, which he found on a bush of *R. frangula*,* of which nearly every leaf was disfigured by being rolled up, and in each roll the *Trioza* larva lived. "The margin of a leaf was rolled from beneath outwards in several places, the parenchyma was thickened and hardened, there being sometimes on one leaf one, two, or three rolls, each at times as much as 3 mm. diameter, by 15 mm. in length. The green larva grows very slowly, and invariably perishes if it be not left on the tree until near the time of its full development, which occurs at the end of August. The proximity of maturity is denoted by the progressive unrolling of the roll, and in the greater space thus obtained, the pupa, 1½ mm. long, throws off its last integument." The author then goes on to say that "the pupa is exactly like (ganz so) that described by Schrank in the 'Fauna Boica' as *Psylla (Chermes) rhamnii*, but that the imago agrees with Förster's description of *Trioza Walkeri*, and that the certainty that each author had the same species before him is fairly questionable. Schrank says nothing about the excrescence in which the larva lives, though he scrupulously notices such economy in other species; and Förster says nothing about the remarkable deviation in the form of the wings of *Tr. Walkeri* from all other species of *Psyllidæ*. The perfect insect, when first developed, is entirely green, the wings are transparent, and a long time is requisite for the full coloration to be effected. If killed in the immature condition and dried immediately, the insect is quite unlike the mature form, and can only be recognised as the species by the shape of the wings."† Nevertheless, Herr von Frauenfeld concludes that Schrank's and Förster's insects are the same species, and he adopts for it Schrank's specific name *rhamnii*.

* Dr. Löw thinks this should be *catharticus*; he finds *Tr. Walkeri* on this species of *Rhamnus* only (*op. cit.* xxvi, 209).—J. W. D.

† This is probably Mr. Scott's "var. *albipennis*," Trans. Ent. Soc., p. 553 (1876).—J. W. D.

Dr. Franz Löw (Ver. k. k. zool.-botan. Ges. Wien, xxvi, 1876, 211) gives in detail the natural history of *Trioza abieticola*, Först., which he finds on *Rhamnus catharticus*. The hibernated female lays her eggs in April or May, in batches, on the under-side of the tender leaves; above these, on the upper-side, small pustular elevations in a short time appear, beneath which, in about eight or ten days, the young are hatched, and for a time remain there sucking the leaf, but at each successive moult they remove to another part of the under-side, or rarely go the upper-side. The leaves suffer no other than the slight deformity consequent on laying the eggs, the sucking of the young *Triozae* causing no change in their appearance. Then follows a description of the young form which Dr. Löw says is without doubt identical with that described by Schrank as *Chermes rhamni*, and he adopts this name for the species.

Thus, two very distinct species have been referred, by different authors, to the *Chermes rhamni* of Schrank, and both on the ground of the early stage of the life of the insect agreeing with Schrank's description. But, as Dr. Löw says (*op. cit.*, p. 210), von Frauenfeld has overlooked the fact that Schrank states the body of his insect is transparent, and that this is not the case with *Tr. Walkeri*; and this makes it so much the more probable that Dr. Löw is right in claiming that his species, which has this peculiarity, is the *rhamni* of Schrank. Yet absolute certainty is wanting, because there is yet another species of *Psyllidæ*, unknown to Dr. Löw, which lives on *Rhamnus catharticus*—*Ps. rhamnicola*, Scott (Trans. Ent. Soc., 1876, p. 548, 10),—of which the larva is hitherto not observed, but which, when found, may also agree with Schrank's too brief description.

Förster (Verh. Ver. Rheinl., v, 97, 5) does not allude to Schrank's species further than by saying, under the description of *Psylla alaterni* (of which he received the types from Mr. Haliday, with this MS. name, and thence surmised that they were taken on *Rhamnus alaternus*), that he strongly doubts if it be the *Chermes rhamni* of Schrank. Mr. Scott (Trans. Ent. Soc., 1876, p. 535) places *Ps. alaterni*, Först., as a synonym of *Ps. hippophaës*, Först., yet, without questioning this conclusion, based probably on a comparison of the so-called species, it is only when the larva that lives on *Hippophaë rhamnoides*, and that which lives on *Rhamnus alaternus*, are discovered, and they and their economy are compared, that there will be absolute certainty of their identity or difference, or that the possibility of one or other, as the case may be, being *Ch. rhamni*, Schrank, can be determined.

With all these considerations in view, it appears to me to be rather premature to apply Schrank's specific name "*rhamni*" to any species, and that it is desirable it should remain in abeyance at present; or, better, that it should be dropped altogether.—J. W. DOUGLAS, Lee: January 15th, 1877.

Melanism, &c., in Insects.—This interesting subject has been ably treated by Mr. Birchall (p. 130 *ante*) on the Darwinian and climatic theories, and by Dr. Buchanan White as to its possible meteorological cause (p. 145 *ante*), but I am far more inclined to believe in the suggestion of Mr. R. Fetherstonhaugh (p. 215 *ante*), that the change is produced by a vivid impression of the color of the surrounding objects on the female insects during the *period of generation*, and a strong tendency to re-produce in their progeny the same colors among which they themselves have lived; and, as

we know that this phenomenon of nature has been accepted, we may fairly be permitted to consider it as a probable cause of melanism or leucochroism, under suitable conditions.

Now, it curiously helps this idea, when we consider that the very localities where we find melanism in *Lepidoptera* most pronounced, viz., Yorkshire, Lancashire, and Durham, are all manufacturing districts, where immense volumes of smoke are constantly given off from furnaces and coal-pits, covering more or less the whole of the vegetation with a fuliginous deposit, giving to large tracts the name of "the black country." What is more natural than that this prevailing color, continually before the vision of the pregnant insects, should tend very largely to produce melanism known to be so common in these regions, in their offspring? Smoky London too produces its melanic variety, *perfunaria*, of *Boarmia rhomboidaria*. The New Forest is also prone to produce melanic forms, where the soil is in places extremely dark colored, induced, doubtless, by the abundance of astringent vegetable matters, tannic or other acids, which through the annual decay of large quantities of oak, common brakes and heath, is set free, and washed into a soil charged with iron, and producing an inky blackness of earth. I could enumerate several *Lepidoptera* of this district that are decidedly melanic in tendency (and may mention that the common viper here is often *quite black*, the characteristic black or dark diamond pattern of its back being only faintly indicated, in consequence of the blackness of the whole body). But the best insect to illustrate my view is *Gnophos obscuraria*, a species very common in some parts of the Forest and where the soil is very black, and here is the most positive black type, harmonizing with the soil; this same species a few miles off, on the chalk, becomes a beautiful pale grey or almost white, agreeing admirably with the white and grey of the soil: thus, on the black soil we get *obscuraria* black, and on the chalk, pale grey.

Aberration of color in an insect may be occasional and purely accidental, but when we see, not single specimens but a constant and invariable prevalence of this harmonizing with the surrounding soil, I cannot but think, that the cause may be mainly the *powerful impression of surrounding objects on the female during the all important period of life, viz., that of propagation*, coupled with an instinctive provision for the protection of its future progeny: at any rate, the subject merits a further and deeper investigation.—WILLIAM HENRY TUGWELL, 3, Lewisham Road, Greenwich: *March*, 1877.

The Sale of the late Mr. Edwin Brown's Collections.—As this sale (which took place on the 9th, 10th, and 12th of March, at Stevens' rooms) was probably the most important that has ever occurred, a few statistics will be interesting. The entire Collection was comprised in over 900 lots, and realized about £1,670. That it was rich all round is sufficiently obvious, but Mr. Brown paid especial attention to Geodephagous *Coleoptera*. The *Cicindelidæ* were sold for nearly £160, the *Carabidæ* for about £480, the *Cetoniidæ* for about £215. The British Insects (excluding *Lepidoptera*, which were not in the sale) were sold for about £125, a portion of them being secured for the Royal Dublin Society. A very good British Herbarium was sold for the utterly insignificant sum of £6 6s. A few details may be given. The species of the genus *Manticora*, comprised in four lots, were sold for nearly £16. *Amblychila Piccolomini* (1 example) for £5 10s. (*H. Deyrolle*), *Platychila pallida*

(1 example) for £7 10s. (Janson), *Mouhotia gloriosa* (1 example) for £9 19s. 6d. (R. Oberthür), *Anacamptorhina fulgida* (2 examples) for £11 0s. 6d., *A. ignipes* (2 examples) for £10 10s., and a series of species of *Euryomia* (93 examples) for nearly £20 (Janson). We are told that Drury's and Francillon's collections were dispersed from the same place of sale, but have no memoranda as to the amounts obtained. Haworth's collection (catalogued by Westwood) realized in 1834 (10 days' sale) about £400, and Children's shortly afterwards (3 days) about £700 or £800.

Reviews.

ZOOLOGICAL CLASSIFICATION: a handy book of reference, with tables of the sub-kingdoms, classes, orders, &c., of the Animal Kingdom, their characters, and Lists of the Families and Principal Genera. By FRANCIS P. PASCOE, F.L.S., &c. Royal 18-mo., pp. 204: London, John Van Voorst, 1877.

The compiler of this useful little book comes before the zoological public in quite a new light. We do him no injustice when we say that, outside his own circle, he has been known only as an entomologist, and even as such only by descriptions of new genera and species of *Coleoptera*, almost exclusively from his own magnificent collection. We rejoice, therefore, that he now exhibits what was already well known to his friends—his extensive knowledge of general zoology. The lengthy title shows what the work is:—necessarily a compilation, but a compilation combined with originality. The inverse sequence is followed (practically) throughout, commencing with the *Protozoa* and ending with Man. As a beginning, the now-prevalent idea as to "*Bathybius*" is adopted, viz.: that it is not a living protoplasmic substance, but more of the nature of a chemical deposit.

Our special remarks on the work must relate purely to the entomological portion, or in other words, to the *Insecta*, which form part of the "sub-kingdom" *Arthropoda* (the *Articulata* of the older authors). Some idea of the author's views may be gathered from the "Orders" admitted, viz.: *Mallophaga*, *Collembola*, *Thysanura*, *Hemiptera*, *Orthoptera*, *Neuroptera*, *Trichoptera*, *Diptera*, *Lepidoptera*, *Hymenoptera*, and *Coleoptera*; but he wisely remarks (p. 76) that "the limits of this Class and of some of its Orders, are not quite beyond dispute." It is evident, at a glance, that this classification should not be merely termed a compilation; we think there is no hitherto published arrangement that accords with it in all points. The views of Brauer and Lubbock would, if followed, place the *Collembola* at the beginning, but we here find the *Mallophaga* (or bird-lice) preceding them, with the remark that "they are sometimes classed with the *Hemiptera*:" we would suggest, more frequently with the *Orthoptera*. The *Hemiptera** end with the *Thysanoptera* (or *Thrips*), and, apparently in despair, with the true lice; whatever doubts there may be as to the position of the former, the latter are generally considered as undoubtedly (if *very* degraded) *Hemiptera*. The *Orthoptera* are arranged (practically) after Burmeister's plan; we take exception to the words "Larva and *pupa* (our italics) without wings;" in effect the whole existence of the insect from the time of leaving the egg to its absolutely perfect stage, is only a question of degree. *Neuroptera*, as usual, form a stumbling-block. The term is used in the Linnean sense (excluding the *Trichoptera*, which are given ordinal position), and the result is

* We notice p. 78; "*Dermoptera*" given as a synonym of *Hemiptera*, and omitted under *Orthoptera*.

the inevitable *olla podrida*. The author apparently discards the term *Pseudo-Neuroptera*, and suggests Westwood's "Biomorphic insects," which is nearly equivalent to Gerstaecker's "*Amphibiotica*." Here again we take exception; this time to the words "pupa incomplete," as applied to the whole Order as here constituted. The so-called "pupa"-stage of the *Biomorphotica* is precisely in the condition of that of the *Orthoptera*, whereas in the "*Sub-neeromorphotica*" the fact that the pupa is active for a few minutes before its final change is scarcely of importance. In *Chrysopa* and *Myrmeleon*, the cast-off *puparium* lies by the side of the cocoon. The arrangement of the *Lepidoptera* has nothing peculiar in it; but we are not clear as to the position assigned to the anomalous *Castniidæ*. In the *Hymenoptera* the only remark that occurs to us is the retention of the *Cynipidæ* under the group "*Pupivora*," especially in conjunction with the habits of the group, as given in the line immediately above. To the *Coleoptera* is given (we think) rather undue prominence in details, but this is natural, the author being specially a Coleopterist. The *Stylopidae* are included in this Order; but we do not see in it, nor elsewhere, any mention of the *beaver-parasite*, which Le Conte declares to be Coleopterous, which Ritsema placed with the fleas, and for which Westwood erected the Order *Achreioptera*.

In the foregoing rapid analysis, some points have been touched upon just as they occurred to us, and we have borne in mind the fact that this book is necessarily synoptical. Nature abhors hard and fast lines, and, as the author says in his preface (p. iv), "exceptions occur to almost every character." Those who desire a handy book of reference will find the work answer their purpose; the details must be filled in afterwards.

THE TRANSACTIONS OF THE ENTOMOLOGICAL SOCIETY OF LONDON FOR THE YEAR 1876 (8vo, pp. 655 and lxxxvii, with 12 plates; at the Society's Rooms, 11, Chandos Street, Cavendish Square, and Longman & Co.).

To those who have not already made acquaintance therewith, we commend this comely volume. It contains twenty Memoirs, contributed by ten Authors, relating to five Orders of Insects; and of the twenty, seven relate to *Coleoptera*, four to *Diptera*, four to *Hymenoptera*, three to *Lepidoptera*, and two to *Hemiptera*.

The most important Memoir, itself extending to nearly 400 pages, is that of Dr. Sharp, on the *Staphylinidæ* of the Amazon Valley, mainly founded on the materials amassed by Mr. Bates, but supplemented by species collected by Dr. Trail and others. The number of species enumerated is 487, and of these no less than 463 are described as new; of 77 species brought home by Dr. Trail, 55 had not been found by Mr. Bates. These figures sufficiently attest our ignorance of these minute denizens of Tropical America: and when it is added that the author estimates the total number of Amazonian *Staphylinidæ* at from 4000 to 5000 species, it must be admitted that this preliminary contribution to a knowledge of the group has not appeared a whit too soon. The descriptions are elaborated with all Dr. Sharp's accustomed care, and are interspersed with observations on distribution and structure, and with critical remarks. If too special for the general reader, the paper must necessarily be indispensable to every future student of the Amazonian *Brachelytra*.

A word must be said about the nomenclature. Take, for instance, the genus *Belonuchus* (pp. 35, 145, *Belconychus*!), which, by the way, the author does not

regard as really distinct from *Philonthus*, but uses it only as a matter of convenience, because the species registered under *Philonthus* are already so numerous. The first species of *Belonuchus* is given as *Staphylinus hæmorrhoidalis*, the second as *Philonthus xanthopterus*, and the third (a n. sp.) as *Belonuchus Batesi*. Compare *Xanthopygus* (pp. 35, 125) and *Xantholinus* (pp. 36, 198). Viewed merely as a concise mode of stating that *Belonuchus hæmorrhoidalis* was first described by Fabricius as a *Staphylinus*, no objection can be made to the mode of citation or reference. But I suppose Dr. Sharp means more than this, and that the mode adopted is a practical carrying into effect of the doctrine propounded in his pamphlet, published in 1873, on "the object and method of zoological nomenclature," in which he suggested that a distinction ought to be made between the "species name" and the "classificational name." The "species name" is the name originally given to it according to the Linnean system, the duplex name consisting of what are commonly called the generic and specific names. What the "classificational name" is, whether it is to consist of two words or three, does not so clearly appear. But whatever it may be, each natural object is to have two distinct scientific names: a denominator, by which it is always to be spoken of; and something else, by which it is to be known to the initiated, but which is never to be mentioned as its name. To say nothing about the misconception of the Linnean system which is involved in Dr. Sharp's notion of the "species name," I believe zoologists have not yet become enamoured of this proposed simplification of nomenclature, or of the idea of having two separate names for each species, even if the classificational name do not consist of more than two words. But would it not be the inevitable consequence of the introduction of such a scheme that we should, in a short time, have a trinomial instead of a binomial system of nomenclature? In the instance in question, *Staphylinus hæmorrhoidalis* is the "species name;" but classifiers have removed the insect out of *Staphylinus* and placed in *Belonuchus*; the species name, if it stood alone, would mislead, for standing alone it would be an assertion that this insect is a *Staphylinus*, and to shew that it is not a *Staphylinus*, it becomes necessary either to substitute or to add the name *Belonuchus*. If the "species name" is retained, and it has to be shewn that the insect, though called *Staphylinus*, is not a *Staphylinus*, there seems to be no alternative but to speak of the insect as *Belonuchus (Staphylinus) hæmorrhoidalis*; and similarly *Belonuchus (Philonthus) xanthopterus*—or, if preferred, the order may be reversed and the insect called *Staphylinus (Belonuchus) hæmorrhoidalis*. I believe Dr. Sharp repudiates the idea of substituting a trinomial for a binomial system: but his mode of dealing with the previously-described species, in the paper now under review, goes far to show that such must be the result of his plan. At any rate, he can only avoid that result by calling one thing by the name of another: and in truth it seems to be the essence of his plan, that when we call a thing a spade, we do not mean that it is a spade. And the answer to the proposal is, that it is really impossible, and if possible would be undesirable, to keep scientific nomenclature and classification distinct. Now that it is agreed on all hands that the creature which Scopoli mistook for a butterfly and named *Papilio macaronius* is an *Ascalaphus*, to continue to call it *Papilio macaronius* is not only perpetuating a blunder, but telling a continuous falsehood. We may negative the false assertion by calling the creature *Ascalaphus Papilio macaronius*, but this is a trinomial system: the alternative is, to drop the erroneous *Papilio* altogether, and take *Ascalaphus macaronius* as the

name of the insect. And this, the prevailing plan, is I submit the proper one. In popular language, a turnip-fly may continue to be so called, though it is known not to be a fly at all. But when, in scientific language, I call an insect *Papilio*, I mean that it is a *Papilio*; if it is not a *Papilio*, I do wrong to call it one, and therein am neither scientific nor truthful.

Other Coleopterous memoirs are supplied by Messrs. Baly, Bates, Waterhouse, and Westwood. Mr. Bates has a coloured plate of Japanese *Geodephaga*, and Prof. Westwood a plate of *Malacodermata* from New Guinea.

The papers on *Diptera* are all from the pen of the President, and are illustrated by a plate of exotic *Tipulidæ*, two plates of *Acroceridæ*, and one of species of *Systropus*. *Systropus crudelis*, n. sp., from Natal, was bred from a cocoon resembling one of the Lepidopterous *Limacodes* or *Doratifera*; corroborating the observation of Mr. Walsh, who bred the North American *Systropus macer* from a cocoon of *Limacodes hyalinus* (Proc. Boston Soc. Nat. Hist., ix, 300). A doubtful species of this genus, not mentioned in the monograph, has been described by Dr. Philippi, in the paper mentioned below, under the name of *Systropus* (?) *chilensis*.

It is so long since the Society has had the opportunity of publishing anything on the *Diptera*, that it seems almost a pity to point out that, as Mr. Verrall informs me, the supposed new Chilian *Acroceridæ* were most, if not all, of them described by Dr. Philippi in 1865. Prof. Westwood appears to have overlooked the "Aufzählung der chilenischen Dipteren" published in the Verh. zool.-botan. Ges. Wien, xv, 595—782, pl. xxiii-xxix. The curious hunch-backed form *Megalybus* (Trans. p. 511, pl. v) is figured by Philippi, and all the four species, *M. pictus*, *tristis*, *gracilis*, and *subcylindricus*, are described by him under the same names (Verh., pp. 641—644), with two other species, *M. crassus* and *obesus*. The specimens in the Hopeian collection had MS. names attached, and as these have happily been retained, Dipterists are spared a number of synonyms. I may add that Schiner (Reise der Novara, Zool. Dipt., pp. 140—144, in 1868) referred *Megalybus*, Philippi, to *Thyllis*, Erichson, re-described *M. gracilis*, and re-named *M. crassus* as *Thyllis Philippii*, on the ground that there was already a *Thyllis crassa*. From the list of species of *Lasia* hitherto described (p. 508), Prof. Westwood has omitted *L. cyaniventris*, described in 1867 by Jännike (Abh. senek. Gesells., vi, 351), and *L. superba*, described in 1868 by Schiner (Novara, Dipt., p. 143), both from Chili; and of the four species added on p. 509, two at least, *L. anea* and *L. nigripes*, are described in the above-mentioned paper by Philippi (pp. 647, 648) under the names *Panops aneus* and *Panops nigripes*. Three other Chilian species, *P. carbonarius*, *rufus*, and *pullus*, are also described by the Professor of Santiago; but from these it would seem that Prof. Westwood's *Lasia aneiventris* and *bicolor* are distinct. Query, however, whether *L. aneiventris* is not the *cyaniventris* of Jännike? Of the genera of *Acroceridæ* mentioned by Prof. Westwood on p. 517, it may be observed that *Exetasis*, Walker, is, according to Loew (Wien. ent. Monats., i, 34), and Schiner (*ubi sup.*), identical with *Ocnæa*; that *Eulonchus* was established by Gerstæcker, not by Loew, *E. tristis* having been first published in 1872; that *Opsebius* was established by Costa, not by Loew, *O. inflatus* having been only re-described in Besch. europ. Dipt., and *Pithogaster*, Loew (Wien. ent. Monats., i, 33) is a synonym of *Opsebius*; that *Mesophysa* was established by Macquart (1838), not by Thomson, *M. Australasiæ* having been first published in 1868, and Schiner sinks *Mesophysa* in *Panops*. To Prof. Westwood's list, besides

Macquart's five genera, *Eriosoma* (which Schiner refers to *Ocnæa*), *Mesocera* (which the same writer refers to *Psilodera*), *Physegaster*, *Epicerina* and *Pteropexus*, the following may be added :—

SPLEROGASTER, Zett., Dipt. Scand., i, 232.

APELLEIA, Bellardi, Dipt. Messic., App^x. p. 17 (1862). *A. vittata*, Mexico.

HOLOPS, Philippi, Verh. z.-b. Ges. Wien, 1865, p. 645. *H. cyaneus* (*sic*) and *H. inanis*, Valdivia.

SPLEROPS, Philippi, Verh. z.-b. Ges. Wien, 1865, p. 646. *S. appendiculata* (*sic*) Santiago.

Further references to recently described species may be supplied as follows :—

Holops Frauenfeldi, Schiner, Novara Dipt., p. 143 (1868). Chili.

Philopota semicineta, Schiner, „ p. 144. South America.

Acroceræ obsoleta, Van der Wulp, Tijd. v. Ent., 1869, p. 139. Wisconsin.

Opsebius sulphuripes, Loew, Berl. ent. Zeits., 1869, p. 166. New York.

Oncodes costatus, Loew, Berl. ent. Zeits., 1869, p. 165. Massachusetts.

„ *formosus*, Loew, Eur. Dipt., iii, 101 (1873). Scharud.

And lastly, it may be added that Schiner (*ubi sup.*) mentions 103 species of *Acroceridæ* as having been described up to 1868, and divides the family into three sub-families, containing the following genera :—

ACROCERINÆ. *Oncodes*, *Acroceræ*, *Holops*, *Sphærops*, *Opsebius*, *Cyrtus*, *Psilodera*, *Sphærogaster*.

PANOPINÆ. *Pterodontia*, *Pialea*, *Astomella*, *Apelleia*, *Physegaster*, *Ocnæa*, *Epicerina*, *Pteropexus*, *Panops*, *Lasia*, *Eulonchus*.

PHILOPOTINÆ. *Terphis*, *Philopota*, *Thyllis*.

I presume Prof. Westwood's new genera, *Apsona*, *Leucopsina*, *Pialeoidea*, and *Nothra*, will all fall within the *Panopinæ*. And à propos of the genus *Astomella*, it may be mentioned that Brauer (Verh. z.-b. Ges. Wien, 1867, p. 737) describes and figures the larva and pupa of *A. Lindenii*, Erichs. (Entomog., p. 159); the larva being parasitic in the body of a spider, *Cteniza ariana*.

In *Hymenoptera*, Mr. Cameron is to be welcomed as a new contributor to the Transactions with a paper on *Tenthredinidæ* and *Siricidæ*, chiefly from the East Indies; whilst our old friend, Mr. Frederick Smith, describes and gives a coloured plate of *Formicidæ* and other *Hymenoptera* from New Zealand, and by way of Supplement to three previous papers on the *Cryptoceridæ*, he now adds a fourth, and describes and in an excellent plate figures all the sexes of *Meranoplus intrudens*, a South-African species, which constructs its formicarium in the thorns of a species of *Acacia*.

Of the papers on *Lepidoptera*, two by Mr. Miskin are descriptive of Australian novelties; whilst in the third Prof. Westwood gives, from the observations of Mr. Bowring, the habits of a remarkable moth from Hong Kong, apparently belonging to the family *Arctiidæ*, the larva of which is parasitic on the lantern-fly, *Fulgora candelaria*, and which in allusion to this circumstance is described under the name of *Epippyrops*. A capital plate of details of the various stages of the insect accompanies the letterpress.

The Hemipterous memoirs are especially valuable, as the only papers in the volume which are devoted to British Entomology. One is a Monograph, with two plates, of the Homopterous family *Psyllidæ*, by Mr. John Scott, in which 42 (or 43?) species of these curious little insects are enumerated. The other is the third part of Mr. Edward Saunders's most useful Synopsis of British *Heteroptera* (with a plate of *Saldæ*), the earlier portions of which appeared in the Transactions for 1875.

In addition to the more elaborate memoirs, the "Proceedings" contain many interesting and valuable notes by various members, an account of the principal objects exhibited at the meetings of the Society, a summary of the discussions there-
 on, and finally the Annual Address of the President, which contains a *resumé* of the Entomological doings for the year, both at home and abroad.

Even this does not exhaust the publications of the Entomological Society for 1876. Another part (the fifth) of the General Catalogue of the Insects of the British Isles was issued; and this part comprises the *Hemiptera-Heteroptera*, and the main portion of the *Homoptera*, giving the synonymy of upwards of 700 species, compiled by Messrs. Douglas and Scott.

The Secretaryship of the Society is no sinecure; and to say nothing of other duties, the editing of the publications and seeing them through the press is in itself a work for which many thanks are due to Mr. Grut.

A few errors have escaped author and editor alike. For instance, *Pæcilus* (Trans., p. 4) is a misprint for *Pæcilus*; *Pimpilides* (p. 479) for *Pimplides*; *Lathrobium minor* (p. 239) should be *L. minus*; *Sunius bispinus* (p. 301) is probably a mistake for *bispinis*; *Derecyrtia deceptus* (p. 474), *Rhopalum carbonaria* (p. 484), and *Lasia rufovestitus* (p. 509), can hardly be defended; *Prosopis* has hitherto been treated as feminine, so that *P. relegatus* and *capitosus* (p. 485) will scarcely accord with their congeners; *Acanthiæ* (p. 621) and *Reduviæ* (p. 623) should of course be *Acanthiidae* and *Reduviidae*; and the Latino-Greek hybrid, *Cryptocerus pallidicephalus* (p. 606) must have crept in by inadvertence.

The President, not content with describing new species, insists upon discovering new islands. Thus, of *Systropus sphenoides*, he says (p. 576): "Habitat in insulâ Makassar. Etiam in insulâ Celebes." Unless my memory is at fault, there is no Island of Makassar, but the town of Makassar is in the Island of Celebes. Again, of *Astychina flavicollis*, he says (p. 495): "Habitat in insulâ Malayanâ Dorei dictâ." I am under the impression that there is no Island of Dorey, and that the town of Dorey is in New Guinea; and on this point I cite the authority of Prof. Westwood himself, who in Trans. Ent. Soc., 1870, p. 128, describes a *Curculionellus doreianus*, and says of it: "Hab.—In Nova Guinea (Dorey)."

Mis-spellings like *Omalium* (p. 402), *Thoracophorus* (p. 418), *Ogeodes* (p. 516), and *Ploiaria* (p. 623), have doubtless been intentionally retained, because the names were so mis-spelt by the original nomenclators. But the compilers of the Catalogue of *Hemiptera* have emancipated themselves from that reverence for blunders which still enthralled some of the writers in the Transactions. In accordance with the suggestions of the Rev. T. A. Marshall (Ent. Mo. Mag., iv, 280), eyesores like *Eysarcoris*, cripples like *Ceraleptus* and *Myrmedobia*, and misbegotten deformities like *Systellonotus* and *Temnostethus*, are replaced by *Eusarcocoris* (p. 3), *Ceratoleptus* (p. 8), *Myrmedonobia* (p. 49), *Systolonotus* (p. 36), and *Tmetostethus* (p. 50). And following in the same course the compilers have amended *Arytaina* into *Arytaina* (p. 91), *Kybos* into *Cybus* (p. 79), *Dikraoneura* into *Dicranoneura* (p. 80), and *Stroggylocephalus* into *Strongylocephalus* (p. 74). But even in the Catalogue we find *Reduvina* (p. 55), and *Tettigonida* (p. 78), instead of *Reduviina* and *Tettigoniidae*; *Leptopterna ferrugatus* and *dolobratus* (p. 27); *Delphax* (p. 66), which is masculine, is made feminine; rightly as some, but wrongly as others, say, *Pediopsis* (p. 77) and *Eupteryx* (p. 82) are made masculine; and *Phytocoris nigrita*

is converted (p. 44) into *Systratiotus nigrilus*! Not only Douglas and Scott, but Herrich-Schäffer, Kirschbaum, Fieber, and Reuter, appear to entertain the idea that *nigrila* is the feminine of an adjective *nigrilus*: but the Nigritæ were people living near the Niger, "nigrila" is a noun substantive, "a nigger," just as "nauta" is a sailor. Fallén's *Phytocoris nigrila* was quite correct, and on removing *nigrila* into *Capsus* or *Polymerus* or *Pœciloscytus* or *Systratiotus*, there is no more ground for changing it to *nigrilus* than there would be for changing *nauta* into *nautus*, or *incola* into *incolus*.

As a curiosity in nomenclature, reference may be made to *Lopus mat*, the *Cimex mat* of Rossi (Cat. p. 48), which eclipses the *Bagous frit* of Herbst. "Frit" vocatur illud summa in spica jam matura, quod est minus quam granum; so at least says M. Terentius Varro, De Re Rustica, i, 48, 3. I was a long time in finding an explanation of Herbst's *frit*; can any one aid me to a meaning for Rossi's *mat*?

But to return to the Transactions. It is a matter for regret that several of the habitual contributors are this year conspicuous by their absence; nevertheless, the volume fully maintains the credit and reputation of the Society. It is, however, like some of its predecessors, open to the objections, first, that only a tithe of the whole has reference to the Entomology of our own country, a field which is yet far from being exhausted; and secondly, that descriptions of insects occupy nearly all the space. Thus the volume is more useful for reference than agreeable for reading; it is one for the study of the specialist, and contains too little that is attractive to the general reader. It must be borne in mind that probably the majority of those to whom the Society looks for support, are not, and never will be, entomologists *pur sang*; many of us are mere *dilettanti*, who take a warm and (let us hope) an intelligent interest in the science and all that concerns it, who recognise the necessity for, and the importance of, the descriptive branch, but who, nevertheless, would like to see a larger number of papers on habits and economy, of essays on classification or geographical distribution, or other subjects of less restricted interest. I think this result might be attained without pandering to popularity, and without relaxing too much from the severe standard which a scientific Society is bound to maintain. These remarks are addressed to intending contributors; for the Memoirs must be written before they can be published; and it is an indisputable fact that no single paper on British Insects has been excluded by one on Exotic, and that the excess (if it be one) of descriptive papers is due only to the dearth of papers on economic or philosophic entomology which are offered to the Society. The members therefore have the remedy in their own hands, and it will be their own fault if the Transactions for 1877 do not excel those for 1876 in the interest of their contents—surpass them in scientific value, I do not think they will.—J. W. DUNNING, Lincoln's Inn: *March, 1877.*

ENTOMOLOGICAL SOCIETY OF LONDON: *7th March, 1877.*—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the Chair.

Mr. J. M. Wills, Montpelier Road, Peckham, sent for exhibition an example of a Crustacean—apparently of the genus *Cirolana*—with a note stating that it was parasitic at the root of a pectoral fin of a flying fish, taken on board the "City of Canterbury," but the locality of the vessel at the time of the capture was not given.

Mr. Douglas exhibited a *Monochamus sartor*, which flew into a garden in the Camden Road, N. London, on a hot day last July, and was brought to him alive.

The species is a reputed native, but in this instance was probably imported as a larva in timber. He also exhibited a melanic example of *Orthosia suspecta*, taken by him at Dunkeld last August (*vide* p. 109 *ante*).

Mr. Champion exhibited *Cardiophorus rufipes*, Fouré. (*vide* p. 227 *ante*), a species new to Britain, taken by Mr. Dunsmore near Paisley; also a British example of *Aphodius serofa*, Fab, from the collection of Mr. Dunsmore, of which the exact locality had not been recorded.

Mr. W. L. Distant communicated a paper on the geographical distribution of *Danais Archippus*. The author remarked on the migration of the butterfly from North America (its original home) eastwards to Europe and the Azores, and westward to the South Sea islands and Australia; and attributed the "means of dispersal" to "winds, currents, and the agency of man." After the reading of the paper a discussion ensued, in which considerable doubt was expressed as to the probability of insects being conveyed on floating timber by agency of the gulf-stream or other currents.

Mr. Douglas read an extract from a letter just received from Dr. John Sahlberg, of Helsingfors: in which he stated, that for six months of last year he was absent on an entomological expedition to the Yenisei, returning through Siberia, and brought back from the extreme North a great quantity of insects, chiefly *Coleoptera* and *Hemiptera*, in the determination of which he was now engaged. The insect-fauna of Arctic Siberia agrees very closely with that of Lapland, and he had the pleasure to find, sometimes commonly, several species that he had previously discovered in the extreme north of his own country; for example, among the *Hemiptera*, *Platyptis allani* and *Bathysmatophorus Reuteri*, the latter being the commonest of the *Cicadaria* in the region. Near the river Yenisei, in places that are annually flooded, he obtained many species, which, although generally not new to science, have not yet been found in Europe.

He had just completed the examination of the *Hemiptera-Heteroptera* collected in Siberia, and as they were mostly obtained in the extreme north the number in this group is very scanty, consisting of little more than a hundred species, of which fourteen are new: namely, 1 *Aradus*, 1 *Calocoris*, 2 *Orthotylus*, 1 *Acomporis*, 5 *Salda*, 1 *Corixa*. The species of *Salda* are large and fine, and were all discovered in the high-north (69°—70°, 20'), "extra limites arborum."

He stated also that he had receive a commission to work out the *Coleoptera* and *Hemiptera* collected by the four naturalists attached to Nordenskiöld's Yenisei-Expedition (of whom Filip Trybom was the entomologist); the collection, however, is still in Siberia, and until he had examined it, he would delay any publication, although he had descriptions of the new species ready.

DESCRIPTIONS OF SOME NEW SPECIES, AND INDICATIONS OF NEW GENERA OF COLEOPTERA FROM NEW ZEALAND.

BY D. SHARP, M.B.

The *Coleoptera* described in this memoir are most of them due to C. M. Wakefield, Esq., who has recently given me a number of very interesting forms, found by him in New Zealand. The following is a list of the species to be described:—TROGOSITIDÆ: *Leperina farinosa*, *Promanus* (n. gen.) *depressus*, *Grynomia* (n. gen.) *fusca*, *G. diluta*. COLYDIIDÆ: *Ulonotus discedens*, *U. integer*. RHIZOPIAGINI: *Lenax* (n. gen.) *mirandus*. CUCUJIDÆ: *Brontes pleuralis*. DERMESTIDÆ:

Trogoderma serriger, *T. signatum*. CLERIDÆ: *Paupris* (n. gen.) *aptera*, *Parmiis* (n. gen.) *debilis*, *P. longipes*, *Balcus* (n. gen.) *niger*, *Phymatophœa hilaris*, *P. longula*. MALACODERMES: *Dasytes Wakefieldi*. PEDILIDÆ: *Macratia verticalis*. ANTHICIDÆ: *Cotes* (n. gen.) *vestita*. SCOLYTIDÆ: *Pachycotes* (n. gen.) *ventralis*.

LEPERINA FARINOSA, n. sp.

Fusca, depressa, opaca, elytris et prothoracis lateribus squamulis pallidis vestitis; prothorace dense fere regulariter punctato, lateribus sinuatis, angulis posterioribus rectis; elytris costatis, costis crebre interruptis; antennis pedibusque ferrugineis, illis articulo ultimo fere ovali. Long. 9 mm.

Antennæ with the 9th and 10th joints not greatly broader than long, 11th joint rather longer than broad. Head densely and coarsely punctured. Thorax a good deal contracted behind the middle, its hind angles sharply defined and just rectangular; thorax coarsely and closely punctured, but along the middle the punctures are more sparing, though they leave no distinctly defined smooth spaces; towards the margins it is clothed with coarse pale scales. Elytra with fine costæ, which are broken up by numerous narrow but quite distinct interruptions; they are clothed with coarse pale scales, and bear some indistinct patches of coarse, dark fuscous setæ or scales.

Christchurch, a single individual found by Mr. Wakefield.

This species is allied to *Leperina Brounii*, Pascoe, but is very distinct by the much less short terminal joints of the antennæ.

PROMANUS DEPRESSUS, n. sp.

Oblongo-ovalis, elongatus, subparallelus, nigro-piceus, marginibus dilutioribus, subnudus, haud nitidus, antennis pedibusque ferrugineis; prothorace fortiter transverso, lateribus subrotundatis, angulis posterioribus obtusis; elytris seriebus numerosis punctorum impressis.

Long. 7 mm.; lat. 3 mm.

Antennæ reddish, with the basal joint very large, the 9th joint abruptly larger than the preceding, rather strongly transverse, but a good deal narrower at the base than at the apex; 10th about as broad as but a little shorter than 9th; 11th about as long as broad, nearly as broad as 10th, its apex slightly truncate. Head coarsely and densely punctured, and bearing a fine very scanty pubescence. Thorax about as broad as the elytra, very transverse, the anterior angles not at all produced, the sides distinctly but not broadly explanate, the sides a little rounded, the width at the hind angles the same as at the front, the base broadly but slightly emarginate in front of the scutellum, the surface with shallow punctures and a few fine hairs; the punctures are coarse at the sides, but become quite fine towards the middle. Scutellum rather densely clothed with pale pubescence. Elytra elongate, each with about eighteen series of punctures, and with a very few fine and indistinct hairs. Under surface rather finely punctured, legs red.

Riccarton, found by Mr. Wakefield; also from Dunedin a considerably larger specimen, which presents some slight differences, so that it may possibly belong to a distinct species.

I have thought it advisable to create a new generic name for this species. Its principal structural characters are: antennæ 11-jointed, with a very large basal joint, and a triarticulate club; maxillary palpi largely developed, terminal joint elongate subsecuriform. Head small, with eyes very prominent; and with the clypeus separated from the front by a deep suture. Prosternal process very narrow, middle coxæ nearly contiguous; epipleuræ of elytra very narrow, except at the base. Its systematic position at present should be in the *Trogositidæ*, near *Ostoma*, in Herr Reitter's arrangement.

GRYNOMA FUSCA, n. sp.

Depressa, subopaca, fuscula, antennis pedibusque fusco-testaceis, pube albido micante sparsim vestita, elytris obsolete ferrugineo-variegatis, setis tenuibus erectis adspersis; prothorace minus distincte punctato, valde transverso; elytris punctis magnis et profundis, interstitiis angustis.

Long. 4 mm.; lat. 2 mm.

Antennæ small and slender, the two basal joints paler than the others. Head much narrower than the thorax, closely and indistinctly punctured. Thorax very strongly transverse, a little narrower than the elytra, very slightly emarginate in front, so that the front angles are very indistinct and scarcely at all prominent; hind angles also very indistinct, its punctuation coarse but very obsolete, and nearly wanting along the middle; it is of a smoky colour, becoming yellowish at the margins, and bears fine not very distinct hairs. Elytra densely covered with coarse punctures, and bearing a fine white pubescence, which at the margins is rather long; and also with some upright fine hairs; they are of a smoky colour, but are very indistinctly variegated with reddish or yellowish spots. Legs smoky-yellow.

Christchurch, found by Mr. Wakefield.

GRYNOMA DILUTA, n. sp.

Depressa, subtus fusco-testacea, suprâ magis testacea; elytris pube argentea irregulariter vestita, setisque erectis tenuibus minus conspicuis, fortiter punctatis, interstitiis latis; prothorace obsolete punctato.

Long. 4½ mm.; lat. 2½ mm.

This species is very closely allied to *G. fusca*, but is paler in colour, and has the punctures of the elytra much less dense, their silvery pubescence is more conspicuous, and the margins are a little more conspicuous.

Tairua; I have received one individual from Captain Broun; a second, destroyed on the journey, was numbered by him 158.

I have also proposed a new generic name for these two species. The chief characters are: antennæ small and slender, 10-jointed, with

a long and slender triarticulate club; maxillary palpi with the terminal joint very large, securiform. Head much smaller than the thorax, eyes moderately prominent; thorax strongly transverse, with its sides a little explanate; prosternal process so narrow that the coxæ are almost contiguous. Tibiæ entirely unarmed; tarsi with the terminal joint large in proportion to the others, the claws thickened at the base, but not dentate. The position of the species in Reitter's arrangement would be I judge between *Pelonyxa* and *Neaspis*.

ULONOTUS DISCEDENS, n. sp.

Fusco-niger, antennis tarsisque rufescentibus, illarum clava fusca; prothorace elytris angustiore, angulis anterioribus acutis, lateribus sinuatis, pone medium contractis, superficiei leviter inæquali, opaca, leviter granulata, setis (vel squamulis) minutis parcius vestita; elytris sat nitidis, crenato-striatis, maculis vagis setarum cineracearum vestitis; pedibus gracilibus, fere nudis. Long. 5—6 mm.

About the size of *Bolitophagus antarcticus*. White, and rather closely allied to that species in structure, but departing greatly from it in its appearance, owing to the sub-nude surface which is destitute of tubercular elevations. The antennæ are rather slender, and terminate in a rather elongate three-jointed club. The thorax has the front margin a good deal emarginate on each side, behind the eyes, and the front angles slender and acute; it increases in width from the front angle to behind the middle, the sides being slightly bisinuate in front of the broadest part, from there it is much narrower to the base, the hind angles being extremely indistinct and ill defined. The elytra show ten rows of punctures, the external indistinct, each puncture is connected with the following one by a fine short raised line; they are clothed with a scanty and very short ashy pubescence, arranged so as to give a spotted appearance. The under surface is nearly bare of pubescence.

Found on the West Coast by Mr. Wakefield.

ULONOTUS INTEGER, n. sp.

Oblongus, piceus, suprâ fusco griscoque variegatus; prothorace inæquali sed haud noduloso, elytrorum latitudine, lateribus rotundatis, in medio tantum obsolete excisis; elytris densius vestitis, haud vel vix nodulosis; antennis tibiisque rufis, illis clara nigricante, his squamulis griseis et fuscis vestitis. Long. corp. vix 4 mm.

This species is intermediate between *Tarphiomimetes viridipeta* and *T. Lawsoni*, Woll.; it differs from the former by its less nodulose elytra, and the almost interrupted curve of the side of the thorax, and from the latter by its thorax being less narrowed in front, its more uneven upper surface, the broader club of its antennæ, and its clothed and variegated tibiae.

The only individual I have seen was given me by Mr. Wakefield, and was found I believe at Christchurch. °

LENAX MIRANDUS, n. sp.

Elongatus, angustus, vix nitidus, sine pubescentia, nigricans, antennis pedibusque rufis; prothorace elongato, angulis anterioribus prominulis, dorso biserialim fortiter punctato; elytris longitudinaliter sulcatis, sulcis fortiter punctatis; abdominis segmento ultimo grosse punctato.

Long. $4\frac{3}{4}$ mm.; *lat.* 1 mm.

Head short and broad, as broad as the thorax, above with a very deep, large, irregular depression on each side, separating the eye and the portion of the head behind it from the middle; the broad middle part of the head is rather elevated towards the vertex, and emarginate in the middle behind; it is only very finely and sparingly punctured. The thorax is very elongate, and is at the base as broad as the elytra; it is very slightly narrowed towards the front, but the narrowing does not continue quite to the front, and the front angles are rather sharply marked and distinct: the upper surface is dull, and along the middle are two series of coarse punctures, placed each in an ill-defined impression and diverging a little towards the front; the lateral margins are neatly defined, and just within each is a series of punctures. The elytra are elongate and narrow, and bear each four grooves in which are placed coarse punctures, their hinder part is sinuate externally to facilitate the movement of the hind femora, and outside the four grooves there is a line of punctures on the broader basal portion; on the under-surface there are coarse punctures at the sides of the thorax and breast, and the ventral segments show some coarse punctures or impressions, forming an obscure series at the base of each segment, the apical segment is entirely covered with very coarse and deep, closely placed punctures. The legs are stout, the femora being incrassate.

Found in Peel Forest, Canterbury, March, 1874, by Mr. Wakefield.

Though this extremely remarkable insect should evidently be classed near *Rhizophagus*, it is so distinct therefrom that I have given it a different generic name; the following outline of its structural characters will enable it to be identified:—

Antennae very short, 10-jointed, the 1st joint short and thick, the 2nd stout and bead-like, 3—9 small, the 9th being very short and transverse, 10th joint forming a large abrupt club, the apical portion of which is pubescent, but not to be distinguished as a distinct joint. The parts of the mouth are but little visible, the mandibles being scarcely, if at all, visible from the upper surface. The head is abruptly constricted behind, so as to possess a broad neck; on the under-surface behind the eyes is a very deep large cavity, in which the club of the antenna can be received. Prothorax with the coxal cavities closed, and broadly separated from the mesothorax, and also rather widely separated from one another by a depressed space. Metasternum elongate. Hind-body with five ventral segments separated from one another by deep sutures, the basal one a good deal longer than the next; it is curved downwards towards the extremity, the pygidium is exposed, and shows a deep longitudinal groove on the middle. The tibiae are broad below the middle, but with the apex very oblique; they are armed near the apex with teeth or small projections.

The front and middle tarsi are 5-jointed, all the four basal joints are small, the hind tarsi are apparently only 4-jointed, but there may be a very short and concealed 5th basal joint.

BRONTES PLEURALIS, n. sp.

Castaneus, depressus, nitidus; prothorace fere impunctato, nitido, lateribus irregulariter profundeque serratis, vel fissis; elytris minus elongatis, humeris rotundatis, lateribus valde elevato-explanatis, epipleuris latis; metasterno brevi. Long. corp. 8 mm.; lat. fere 3 mm.

Antennæ elongate and slender, basal joint about as long as joints 2—5 together, 2nd joint about half as long as 3rd, from 4—11 each distinctly shorter than its predecessor, the 11th very nearly as long as the 3rd; their whole length from 7 to 8 mm. Head shining and almost impunctate, the antennal elevations large and strongly marked. Thorax nearly as long as broad, its surface shining and impunctate, but bearing several large shallow depressions, the sides divided by deep, irregular indentations. Elytra with the shoulders quite rounded, bearing six rows of coarse punctures, and with the sides elevated, the elevated part limited from the sutural portion by some large impressions, and its sculpture consisting of a few fine granules. Tarsi elongate, their basal joint much more elongate than in *B. planatus*.

Tairua; two individuals sent by Captain Broun, with the number 322 attached, and the information that they were found under bark.

OBS.—This interesting insect might be made the type of a new genus, for the broad epipleuræ seem to distinguish it abruptly from the other species described; but I think it better to call it at present a *Brontes*. The two individuals sent me by Captain Broun were (as other species of *Brontes* often are) entirely covered with a thick coat of matter, probably the result of the drying of the decaying sappy matter seen under bark, and thus their sculpture was entirely concealed.

TROGODERMA SERRIGERUM, n. sp.

Fusco-rufum, densius irregulariter griseo fuscoque vestitum; antennis apicem versus latissimis, basi testaceâ, apice fusco, articulis 5—11 intus productis. Long. 5 mm.

Antennæ very short, the 3rd joint slender and rather long, the 4th much shorter and a little angulated internally, the 5th slightly produced, and, like the following joints, very short; these apical joints are dark in colour, and each is strongly produced inwardly, the 11th joint being also very short and broad, but not quite so wide as the 10th. The upper surface is not of a uniform colour, but of different shades of infusate red, and it is densely clothed with depressed grey and fuscous hairs which obscure the sculpture, and which are not arranged so as to form any definite pattern. The legs are reddish.

The only specimen I have seen of this very distinct species was given me by Mr. Wakefield, who found it at Riccarton, Sept. 22nd, 1873.

TROGODERMA SIGNATUM, n. sp.

Nigrum, sat nitidum, pubescentia sparsa sat erecta, et in elytris fasciis tribus transversis albidis dispositis vestitum; antennis brevibus, basi testaceâ, apice fusco, clava 5-articulata; tibiis fusco-rufis.

Long. 3 mm.

Antennæ very short, the five apical joints strongly transverse, the point of articulation placed in the middle of each. Head small, closely punctured, and with a greyish pubescence. Thorax a little narrowed towards the front, the base in the middle much produced over the scutellum, its punctuation indistinct, its pubescence consisting of white hairs, which are not evenly distributed, while the parts between the patches bear more sparing, indistinct, darker hairs. Elytra clothed with white hairs at the base, and with two distinct transverse fasciæ of sparing white hairs, as well as some others at the apex, and the spaces between with some still more scanty and shorter hairs; the punctuation is distant and indistinct, so that the surface is a little shining, notwithstanding the clothing. The under-surface is sparingly clothed with fine hairs. The tibiæ and tarsi are very slender and obscurely reddish. The palpi are pale yellow.

This species was discovered some time since near Auckland by Mr. Lawson, and I have recently received some specimens of it from Captain Broun, with the number 342 attached.

PAUPRIS APTERA, n. sp.

Angustula, testacea, maculis parvis fuscis, parcius pubescens; elytris obsolete punctatis, apicibus singulatim rotundatis.

Long. 6 mm.; lat. 1 $\frac{2}{3}$ mm.

Antennæ short and stout, pale yellow, 2nd joint shorter than 3rd, 3—8 not differing much from one another, 9—11 about twice as broad as the preceding joints, 9 and 10 each broader than long, the 10th rather strongly transverse, 11th about as long as broad. Head, with the eyes rather broader than the thorax, yellow but infuscate, and with a brassy tinge, its sculpture obsolete. Thorax elongate and narrow, sub-cylindric, but a little dilated in the middle; it is yellow, but has some elongate, dark marks, which are variable in extent; it is almost without sculpture. Elytra small, being but narrow, and, when the hind-body is in the natural condition, not covering it; their shoulders absent, their colour yellow, with small dark marks. Legs long and rather stout, yellow, the femora near their apex and the tibiæ near their base with a more or less distinct dark mark. Beneath pale yellow.

Sent from Auckland by Messrs. Broun and Lawson.

It is well to make a new generic name for this curious Clerid; its chief structural characters are, wings quite wanting, elytra less developed than usual. Labial palpi with terminal joint very large, while that of the maxillary palpi is small and not at all dilated. Eyes coarsely granulated, very nearly entire, with only a very small emargination in front; antennæ inserted not quite close to the eyes, with

short apical joints. Hind coxæ rather widely separated; second joint of tarsus inserted very near the apex of tibia. The insect seems to be very distinct from any allied form, and may be placed near *Opilus*.

PARMIUS LONGIPES, *n. sp.*

Per-angustus, fusco-æneus, violaceo-tinctus, nitidus, parcius setosus, antennis pedibusque testaceis, femoribus posterioribus medio infuscatis.

Long. vix 4 mm.; lat. 1½ mm.

Antennæ short and rather slender, but with a rather broad short club, the 10th joint being strongly transverse, and the 11th rather stouter than the 10th, and hardly so long as broad. Head about as broad as the elytra, with a large triangular impression behind the labrum. Thorax sub-cylindric, but a little dilated in the middle, about as long as broad; it, as well as the head, is without punctures. Elytra very narrow, but with the shoulders well marked; they are marked by broad obsolete grooves, without punctures. Legs very long.

Sent from Tairua by Captain Broun.

I have made a new generic name for these two species: they have the eyes entire, very prominent, finely granulated, the antennæ with short club, the terminal joint of the labial palpi very large, that of the maxillary palpi small. Tarsi moderately long and broad, very distinctly 5-jointed, the 2nd joint inserted very near the apex of the tibia; hind coxæ rather widely distant. The two species differ from *Paupris aptera* by their finely granulated eyes, by the presence of wings, and the more normal form of the elytra.

PARMIUS DEBILIS, *n. sp.*

Angustulus, nitidus, parvissime pubescens, testaceus, elytris sutura late, prothorace capiteque ruge, fusco-signatis; elytris suturam versus indistincte punctatis; abdomine et pectoris lateribus fuscis.

Long. 5 mm.; lat. 1½ mm.

Antennæ short and rather slender, 3rd joint a little longer than 4th, 9--11 slender but broader than the preceding joints, 9 and 10 each about as long as broad, 11th rather longer than 10th, a little longer than broad. Head, including the very prominent eyes, rather broader than the thorax, of a yellowish or tawny colour, obsoletely punctured. Thorax about as long as broad, considerably narrower than the elytra, constricted in front and behind, with some indistinct dark marks along the middle, its sculpture indistinct, consisting of indistinct depressions. Elytra narrow and parallel, with the shoulders well marked and rectangular; they are shining and of a yellow colour, with a broad irregular dark mark extending down the suture; they bear a very few fine upright hairs, and have indistinct large punctures near the suture. Legs entirely yellow.

A single individual, which was found I believe at Christchurch, has been given me by Mr. Wakefield.

(To be continued).

DIAGNOSES OF FOUR SPECIES OF *DORYPHORA* FROM COLUMBIA.

BY JOSEPH S. BALY, F.L.S.

DORYPHORA HAROLDI.

Orata, postice paulo attenuata, valde convexa, nigra, nitida; elytris sub-seriatim punctatis, flavis; singulatim suturâ anguste, fasciâ latâ crosâ utrinque abbreviatâ, ante medium positâ, vittisque quatuor pone medium, exteriori geminatâ, 1—2 et 3—4 ad basin, 2—3 ante apicem conjunctis, nigris. Long. 8 lin.

DORYPHORA PULCHELLA.

Oblongo-ovata, cæruleo-nigra, nitida; thorace tenuissime, ad latera magis distincte, punctato; elytris metallico-cyaneis, minus fortiter punctato-striatis; interspatiis planis, 3^{to} et 9^{no} paulo latioribus, apice conjunctis, flavis, limbo basali inter vittas flavo. Long. 5½ lin.

DORYPHORA BIVITTATICOLLIS.

Oblongo-ovata, valde convexa, fulva, nitida, antennis (basi exceptâ), thoracisque vittis duabus, basi et apice abbreviatis, nigris; thorace irregulariter punctato, ad latera varioloso; elytris confuse punctatis. Long. 8½ lin.

DORYPHORA INGENUA.

Ovata, convexa, rufo-picea, nitida, antennis (basi exceptâ) nigris; thorace sat fortiter punctato, maculis quatuor, transversim positis, nigris; basi utrinque piccotinctâ; elytris sat fortiter punctato-striatis, striis gemellatis, ad latera confusis; piceo-æneis, singulatim punctis duobus basalibus, vittâ submarginali, alterâ subsuturali, basi abbreviatâ (vittis apice conjunctis), fasciâque prope medium positâ, ad vittam exteriorem adfixâ, intus abbreviatâ, flavis. Long. 5 lin.

Warwick: April, 1877.

ON STRIDULATION IN SOME *LEPIDOPTERA*—*HETEROCERA*.

BY A. H. SWINTON.

It is not very generally known, I believe, that a musical moth, belonging to the *Sesiidae*, is found in North America. The following account is given by Dr. George Gibb, in the "Canadian Naturalist and Geologist" (vol. iv, p. 121).—"I have heard a stridulous sound emitted by many species of the *Sphinx* or hawk-moth tribe, captured generally in the evening twilight. This sound is something like the squeaking of a mouse or bat, and was strikingly produced in a beautiful and rare species of the humble-bee hawk-moth, the *Sesia Pelasgus*. This squeaking noise continued as long as the creature remained alive, and was much louder than in any other of the numerous Sphinges it was my good fortune to capture." And in another place he says: "I retained one I captured myself for some time alive, to hear its murmurs."

The formation of the palpi in our indigenous *Sesia fuciformis*, and the faint sound produced when they are rubbed on the haustellum, would lead one to think a musical organ must be looked for in the *Sesiidæ*, placed as in *Acherontia*.

In the *Bombycina*, next in review, the rule appears general that the capability for stridulation is greater in the male sex, the organs by which it is produced having in it the greatest development. Many species possess a high degree of susceptibility, and pertinaciously sham death in the net, while the pervading brightness of their colour seems to negative the law pertaining to the *Orthoptera-Saltatoria*, where, as a rule, a dulness of hue indicates an increase in the capacity for music in a species. The organism by means of which these moths produce, or probably produce, a stridor, consists in a *little triangular bladder*, external, denuded of hair and scales, or virtually so, formed simply, it would appear, by a vesicular dilatation of the integument of the episternum of the metathorax, over the surface of which runs a *lenticular crumpling representing a lima*, placed vertically, and lying invariably in the depression on its tense membranous superficies, that receives the *inwardly bowed hind femur* (which, in its position of repose, is adducted to the thorax), the inner superficies of which, often in part semi-denuded, is so directed as to suggest its function of effecting a stridor. The complete apparatus invites comparison with the inflated abdomen of the male *Orthoptera* of the genus *Pneumora*, and its semi-circular row of rectangular tubercles placed on either side of the third segment, that give rise to a stridulous sound or friction, when incited by the oscillatory movement of the hind femora. Or it may be paralleled with the spherical tymbals on the upper surface of the first dorsal arc of the abdomen of the male *Cicadæ*, traversed by raised chitinous striæ, which effect the drumming notes (if I may draw inference from analogy, certain considerations of adjustment and organization, method of singing, &c.), *by seraping over a salient portion of the chitinous integument posterior and adjacent*, worked by an internal muscle described by Réaumur, aided by a vertical and lateral movement of the agitated abdomen. (Compare on this subject papers by Solier and Gourreau, Ann. de la Soc. Ent. de France, 1837-38).

The vesicular bladder, often conspicuous in the *Heterocera*, was discovered by Solier in *Chelonia pudica*, and advanced as adequate explanation of the sound this insect was heard to produce on the wing (Ann. de la Soc. Ent. de France, t. vi). It was noticed to bear striæ on its anterior margin both by Solier and Laboulbène, about sixteen to twenty in the male, and eight to ten in the female, some six of which are more elevated than the remainder. The latter author,

who ascribes the sound to the friction of the hind femora over the striæ, also mentions the vesicle as present and well developed in *Chelonia matronula* and *Ærtzeni*, the former of which was observed by Czeruy to produce stridulous sounds, and in *C. flavia* he found the episternum of the metathorax, though denuded, not dilated. The bladder and striæ are perceptible in the indigenous *Phragmatobia fuliginosa*. Guenée (Ann. de la Soc. Ent. de France, ser. 4, t. iv, 1864, Ent. Mo. Mag., i, 223), again describes this identical vesicular inflation, noticed previously by Haldeman in the same Annales (1859), in several species of *Setina*—*aurita*, *ramosa*, *roscida*, *irrorca*, *flavicans*, and *Andereggi*, some of which he describes as producing ticking sounds, although the four or five raised striæ, or rather membranous folds, somewhat distant, placed at the lower angle of the bladder, where it is covered by the hind femur, seem indeed to have escaped his notice. He naturally attributes the sound to the rumpling of the membrane. This latter author, and after him Laboulbène, made dissections of the vesicle in *Setina* and *Chelonia* respectively, and conjointly describe it as empty and divided into a right and left cavity by a membranous partition.

But this crumpled bladder only needs searching for to establish its presence very generally among the species of the *Lithosiidæ* and *Cheloniidæ*, the greatest development inclining towards the former, and attaining a maximum perhaps at the tangential point of the two groups. Though minute, it is beautifully developed in *Mittochrista miniata*, the linear corrugation lying under the hind femur, placed well on the bladder, as in *Setina*, and showing about twenty-five crenations. In the genus *Lithosia*, the metathoracic episternum is less vesicular, but the furrows defined and regular. In *Gnophria rubricollis*, the bladder is well seen, but the striæ nearer the anterior margin are rather wider apart. It is also present in *Nudaria*. In *Callimorpha jacobææ*, the striæ are present in both sexes, but the episternum is scarcely inflated. It would be curious to observe the pairing of these indigenous moths, and on capturing to place them to the ear, to ascertain if at any such time a stridulous motion or perceptible sound could be detected, and ascribed to the stimulus of love, rivalry, or fear. Other *Lepidoptera* have been noticed by Prof. Westwood as possessed of musical organs similar in construction, but situated, as I understand, on the abdomen, and corresponding to the tymbals of the *Cicadæ*. Of this, the genus *Glaucopsis*, in the family *Zygenidæ*, and the genus *Hecastesia*, afford examples, *Hecastesia Thyridon* being known to produce a sound (see the genus

Ageronia in Doubleday's "Genera of Diurnal Lepidoptera"). There is reference in Hagen's "Bibliotheca" to a stridulating *Noctua* of the genus *Orthosia*, and the authority given is Haldeman (Silliman's Journal, ser. 2, vol. v, p. 435); but the name "*Orthosia*" is a misprint for "*Lithosia*." Haldeman says that "*Lithosia miniata*, or an allied species, produces an audible stridulation by vibrating the pleura beneath the wings, this part being marked in recent specimens by parallel lines, apparently indicating the positions of the muscles."

Stridulation in the genus *Haliois* appears also characteristic of the male ("Scottish Naturalist," i, pp. 213—215). "On the evening of 28th May, when mothing in the oak-wood surrounding my house," says Dr. F. Buchanan White, "I noticed what I thought was a beetle, flying round a small oak, and giving vent all the time to a sharp, quick sound, very similar to that produced by the Longicorn beetle *Astinomus* when held between the fingers. Though I failed to catch this individual, I was more successful with another which was behaving in the same manner. When in the net the sound ceased, and I saw to my astonishment that the insect was a moth. It then occurred to me that *Hyalophila prasinana* was said to produce a sound."

"The following morning I tried some experiments with my captive, moving his wings and making him fly, but was not able to elicit any sound from him. I conclude, therefore, that the noise is not produced by the mere mechanical action of the wings, but is dependent on the will of the animal. I then killed the creature, which was a male, and dissected him. On removing the patagia and hairs from the thorax, several small projecting horny plates, both frontal and lateral, were apparent, but I could not discover that the wings produced any sound in connection with them."

"I then directed my attention to the structures between the thorax and hind-body, and from them I believe the sound proceeds. On examining the under-side of the animal, a large semi-lunar opening, immediately behind the metasternum, will be perceived. On dissection, this opening will be found to communicate with a large membranous plate, not flat, but folded at its posterior and inferior edge, and elevated and depressed in other parts, and somewhat semi-lunar in outline. To this plate numerous strong muscles are attached, and by action of these muscles on the plate I think the insect produces the noise in question. This sound-producing structure (if such indeed be its function) is analogous to the 'drum' of the male *Cicada*, and occupies a similar position. The same evening I again

went out to the wood and captured another specimen of the *Hylophila* in the act of 'squeaking.' The sound was quite distinct at a distance of ten feet or more. Next morning I treated him (it was a male) in the same manner as I had the first specimen, and with a similar result. I found that a good imitation of the sound may be made by rubbing the point of a knitting-needle on the closed blade of a clasp-knife"

Dr. Buchanan White has here directed attention to the membrane lining the strongly-marked ventral abdominal thoracic cavity in *Halius prasinana* as a probable medium of sound; for my part, I abandoned the position, since the membrane in the living insect did not seem sufficiently tense, but rather flaccid, besides being apparently destitute of any *lima*, and also because I since find that the elbows on the inner margin of the fore-wing in *H. quercana* and *prasinana* produce a stridulous sound by catching on either lateral piece of the scutellum of the metathorax, to which they lock, as in the *Noctuidæ*, by a callosity. And I ascribe this sound to a *lima-form striation* at the inner side of the anterior edge of the piece, which is distinct in *quercana*.

Lastly, among the *Lepidoptera*, as in the *Colcoptera*, there are certain tiny species that afford indications of stridulation, although they produce little or no sound that can reach the tympanum of the human ear. Thus I once noticed an exasperated little *Tortrix* among a group of *Dierorhampha sequana*, toying round a buttercup in a rank grass plot at Cowes, suddenly place a fore-wing on edge and rapidly rub it over the costa of the hind-wing; and I have since found transverse furrows in this portion of the hind-wing membrane that might by courtesy be termed a *lima*.

Guildford: February 12th, 1877.

DESCRIPTION OF A NEW *HARMA* FROM WEST AFRICA.

BY W. C. HEWITSON, F.L.S.

HARMA HECATEA.

Upper-side: female, dark brown, paler on the basal half of both wings. Both wings crossed beyond the middle by two bands of white, and a sub-marginal band of pale brown lunular spots bordered below by a line of black. Anterior-wing with the first band divided into spots near the costal margin: the second band composed of six separate spots, commencing near the apex in a small spot; the spots becoming large and pyramidal towards the anal angle. Posterior-wing with the first band broad, divided by black nervules, and marked by four black spots: two near the costal margin, one between the first and second median nervules, and the other near the anal angle; the second band of six pyramidal spots, and a lunular spot at the anal angle.

Under-side: pearly-white, clouded with lilac; the base of both wings pale rufous-brown, both crossed near the outer margin by a zig-zac dark brown band, and a sub-marginal band of paler brown. Anterior-wing with some pale brown lines in the cell, and a lunular black spot between the first and second median nervules, and a large quadrate spot of the same colour between it and the inner margin. Posterior-wing crossed before the middle by a rufous-brown band: clouded with brown near the costal margin; marked by three black spots centred with white, with above them two spots of white, and below them three pyramidal white spots: a black spot between the first and second median nervules centred with white, with a white spot above it; a black spot near the anal angle, its centre white, its border above rufous.

Exp. $2\frac{7}{10}$ inch.

Hab. Ashanti.

This beautiful species is from the collection of Mr. Chapman, of Glasgow. It is not nearly allied to any other, but is most like *H. Anitorgis*.

Oatlands, Weybridge:

April, 1877.

DESCRIPTION OF *EUPITHECIA ALBIPUNCTATA*, VAR. *ANGELICATA*.

BY C. G. BARRETT.

A very curious variety of *Eupithecia albipunctata*, Haw., has been submitted to me by Mr. W. Prest, of York, and at his desire I sent it to Prof. Zeller for examination. It appears that Mr. Prest had the good fortune to rear five specimens of this form last May, among a large number of the typical *albipunctata*. Prof. Zeller says of it: "It is a melanitic monstrosity which deserves a proper name with a description." At Mr. Prest's request, I therefore propose for it the name of *Eupithecia albipunctata*, var. *angelicata*.

Fore-wings smoky-black, with all the nervures and the discal spot distinctly blacker, but entirely devoid of the usual faint transverse lines and dots and sub-terminal line of white spots. Cilia smoky and without the usual pale blotches. Hind-wings also smoky, but paler at the base, nervures black. Head, thorax, and body entirely smoky-black.

If captured at large, this form would have been exceedingly difficult of identification; but it has the peculiarly broad fore-wings, dilated at the anal angle, which characterize *albipunctata* and its allies, and thus differs from the more narrow-winged *tresignata*, to which the smoothness of its coloring and the absence of dappled or dotted markings gives it a superficial resemblance. Its larva feeds, as in the type-form, on *Angelica sylvestris*.

Pembroke: April, 1877.

Collections of British Lepidoptera.—In one of the fables, ascribed with more or less probability to Æsop, is the well-known story of the town and country mouse; after describing the peaceful poverty in which the country mouse lived, it tells of a visit which he paid to his town friend, how astonished he was at the display of wealth and luxury, and of the delicacies, to procure which all the shops of the city had been ransacked; but he soon found these things did not bring happiness or content, and returned to his rocks and woods, preferring to eat his frugal meals in peace rather than share the daintiest feast where fear and care were in waiting.

It was with some such feeling that I lately returned from a visit to London, during which I was most kindly allowed to inspect various private collections of *Lepidoptera*, and I was surprised to find that many insects which I have been accustomed to consider British, more by tradition or chance immigration than as truly native, existed in considerable numbers in the metropolitan collections; amongst which I will mention, *Pieris Daphidice*, *Argynnis Lathonia* and *Niobe*, *Sesia sphegiformis* and *vespiformis*, *Deilephila nerii* and *euphorbia*, *Notodonta bicolor*, *Gluphisia crenata*, *Ophiodes lunaris* and *Acontia albicollis*.

I will not deny feeling a vague sense of disappointment that, although I had been a fairly diligent insect-hunter for upwards of thirty years, none of them had ever fallen to my lot: but when I saw that to many of these rarities written histories were attached, that it was deemed needful as it were to apologize for their possession, and that in very, very few cases could the owner say, "I caught the insect myself," my appetite, like the mouse's, failed for such delicacies, for it was evident, as he said, that the shops had been ransacked to provide them, and that care and doubt were part of the purchase. Besides examining the condition of the specimen, enquiry seemed to be needful into the moral character of the seller and each previous holder of the insect, making the formation of a British collection an occupation more suited to a police officer than a naturalist.

I suppose 20/- would be considered cheap for a British specimen of any of the above named insects, and some would probably cost £5, not because they are really rare but simply because the British Islands are near the north-western limit of their distribution. On the same principle a specimen of *Catocala nupta* worth 3d. in Middlesex ought to be worth 20/- if captured in Yorkshire where it rarely if ever occurs; and when the passage, involuntary or otherwise, from Calais to Dover adds 19/11 to the value of *Argynnis Lathonia* and £5 to that of *Deilephila nerii*, and there is no difference of form whatever between a British and a foreign example, the temptation to fraud is obviously very great, and the willingness of British collectors to allow themselves to be thus imposed on has made them the laughing stocks of the students of every other branch of science.

Whatever may formerly have been the case it is now impossible to make a purely British collection of *Lepidoptera*, unless the collector restricts himself to specimens of his own capture. It is a well-known fact that foreign specimens of British species are yearly set in English fashion, imported into this country in large numbers, and sold as British; these are gradually, as collections are dispersed, and all trace of their origin is lost, filtered into every cabinet in the country, and worse, a spirit of distrust is growing up amongst us, injurious to the mind and destructive of that friendship in which the common love and admiration of God's works ought to unite us.

How often have I heard remarks like this, "Yes, it is a fine collection, but what do you think about that row of *Lathonia*?" or "That's the 20th *bicolora* I know of, but I never heard of Bouchard catching more than 4 or 5," and so the character of honorable men is talked away and suspicion and distrust engendered.

Hear an old writer, "Through their beauty and variety of colour and exquisite forme, they do bring to a liberal and gentle minde the remembrance of honestie, comelinesse, and all kinds of virtues; for it would be unseemly for him that doth look upon and handle faire and beautiful things, and who frequenteth and is conversant in faire and beautiful places, to have his minde not faire alsoe."

I remember when Newman reviewed the list of entomologists published in the Annual for 1860, that he made merry over a certain eminent philosopher whose name adorns the list, and who was said to "study, but to have no collection." Perhaps it might have been wiser to have imitated than to laugh, to have followed his steps, however humbly, rather than pursue the *ignis fatuus* of a British collection as so many of us have done. I think it very doubtful if the great majority of the collections of *Lepidoptera* made in England during the last thirty years have done any service to science or their owners. In point of fact, where are they? The once valued treasures of more than half the collectors enumerated in the Annual, have long gone to the moles and bats.

I believe there is but one remedy for the evil state of things which exists amongst us, viz., the *open* admission into our collections of properly labelled continental specimens of our rarer species: this would not only open a field of knowledge to which the great majority of English Lepidopterists are total strangers, and tend to make them something more than mere collectors, but would also enable them, if desired, to obtain British examples at much lower rates than at present, for there would be little or no inducement to mis-state the facts as to the origin of a specimen. The proposed change would also, I hope, tend to mitigate the merciless war now waged against our very limited Lepidopterous fauna, and give new comers a chance of establishing themselves.

Unwillingness to enter upon an almost boundless field has, I believe, deterred many from making an attempt to obtain some knowledge of European insects, but I speak from experience when I say that the difficulties are not serious. I do not advise the making of general collections, but the selection of limited departments, such for instance as the butterflies of Europe; there are 450 species of these, and I have obtained about 400 of them without any expense beyond postage, continental collectors being most willing to send them in return for many common British insects. Foreign entomologists complain of the difficulty they find in getting British specimens, owing to our insular prejudices, and I have little doubt our collectors will be able to turn their now almost worthless duplicates to much better account than they can at present, if they take my advice.

It is not even necessary to understand French or German, though should any of our collectors be induced to study those languages, they will find another and rich reward.—EDWIN BIRCHALL, Woodside, Douglas, Isle of Man: *March 28th*, 1877.

On the occurrence of Heliothis scutosa in Norfolk.—A very interesting addition was made to the list of British *Lepidoptera* in the summer of 1875, and has been passed over almost unnoticed—that of *Heliothis scutosa*, of which one specimen was obtained by Mr. Thornthwaite from Norfolk that year, and a second in the summer of 1876.

As far as I can ascertain, these are the first genuine British specimens observed, since it appears that the supposed Carlisle specimens were only *dipsacea*. The second specimen taken has been sent to me by the kindness of Mr. Thornthwaite, and is in very fair condition. It is really a very different species to *dipsacea*, the ground colour of both fore and hind-wings being *white*, and all the markings *grey*, except a black streak at the origin of the subterminal line on the costa. There is no trace whatever of the olive-ochreous colour of *dipsacea*, and the fore-wings have all three stigmata very large and distinct, resembling in some degree those of *Agrotis corticea* and the base, costal margin, hind margin and a band preceding it, are all clouded with grey. The hind-wings have a large grey central *isolated* lunule, beyond which is a narrow angulated band, followed by the usual broad band with light blotches, at the hind margin.

It seems that Mr. Thornthwaite has been in the habit of collecting by means of more than ordinarily powerful lights, and thereby has attracted species which, either from their rarity or wariness, are seldom obtained. After trying this mode of collecting in Norfolk when visiting, he left the lamps with friends, who have captured and sent on to him (unset) the insects which they have been able to secure. Among them were these *scutosa*, some *Heliolithis armigera*, most of which seem to have damaged themselves by unnecessary activity, and many other species.—CHAS. G. BARRETT, Pembroke: 13th April, 1877.

Re-occurrence of Myelois ceratonix in England.—I am glad to record that *Myelois ceratonix* has been again taken in this country. Mr. Stainton mentions in his "Manual" the capture of but one specimen. For the last three years, however, specimens have been taken by myself, and by one or two friends, in a warehouse in London. I hear, through the kindness of Mr. C. G. Barrett, that Professor Zeller states he has bred it from pods of *Ceratonia siliqua*, but I have reason to believe that the specimens I have taken were from almonds imported from Tarragona and the Island of Iviza.—A. B. FARN, The Dartons, Dartford: 2nd April, 1877.

On a form of Depressaria costosa, Haw.—In June, 1875, I collected in the Botanical Gardens at Cambridge a number of larvæ in spun-up shoots of *Genista tinctoria*, from which I was much surprised to breed a series of apparently unusually dark *Depr. costosa*. These larvæ were tolerably bright green, with dorsal and sub-dorsal stripes distinctly brownish-red; and I therefore concluded that Stainton's brief description of the larva as "grey" was founded upon an illusion. However, in June, 1876, I found in the New Forest a grey larva, indistinctly striped with darker, equally common on furze, broom, and *Genista anglica*. Having concluded that the larva of *costosa* was green and red, I wondered much what these might be: and expected nothing less than the series of ordinary *costosa* which I bred from them.

I have carefully compared these two series, but can only discover the following points of difference: (1) in the first series (from *Genista tinctoria*) the fore-wings are very markedly more suffused with brown than in the second, but the individuals differ a good deal, and the lightest of the first present no difference from the darkest of the second: (2) the hind-wings in the first series are distinctly darker: (3) all the specimens but one of the first series have a tolerably broad black ring towards apex of terminal joint of palpi: those of the second have in no case more than a

fuscous line round the palpi in its place, and are often quite unspotted. However, one specimen of the first series has only the fuscous circular line, so that no absolute line of distinction can be drawn.

It will be seen that these points of distinction are very slight, and might perhaps, by the aid of longer series, be shown to be quite untrustworthy: yet the difference of larva appears to be strongly marked and constant. If I might express an opinion, it would be that the darker specimens afford an example of what Dr. Staudinger denominates a "Darwinian species;" but my object is simply to call attention to the subject, in the hopes that others will investigate it during the coming season.—E. MEYRICK, Ramsbury, Hungerford: 3rd April, 1877.

[This occurrence of a peculiar form of so well defined a species as *D. costosa* on *Genista tinctoria* is extremely interesting. Fischer von Röslerstamm (p. 64) when writing of *D. atomella* in 1834 (before it was differentiated into a broom-feeder and a *Genista tinctoria*-feeder), mentions that von Tischer had obtained several specimens of a peculiar variety from larvæ which, when quite young, were taken from *Spartium scoparium*, and were then fed up to their full size with *Genista tinctoria*. Would it be possible to try similar experiments with larvæ of *D. costosa*, for instance, by feeding up grey larvæ from *Ulex* with *Genista tinctoria*, or by feeding up green larvæ from *Genista tinctoria* with *Ulex*?—H. T. S.]

On mounting Typhlocybidæ, &c.—A simple method of mounting *Typhlocybidæ*, &c., so as to combine the advantages of ordinary carding with facility for examining the under-side of the body and the neuration of elytra and wings, is as follows:—The body of the insect (which is to be taken off the setting-card dry, as mentioned at p. 237 *ante*) should be fixed by means of a very small drop of Canada balsam, previously warmed, upon a piece of thin glass, of a size a trifle longer than would be requisite for a card, so as to leave rather more space behind the insect. The posterior margin of the glass is to be placed in a slit extending in a horizontal direction about half-way through a piece of ordinary cabinet cork about a quarter-of-an-inch square; a pin can then be passed through the cork in the position usual with carded insects, and the whole preparation is fit for the cabinet; the natural elasticity of a sound piece of cork being sufficient to retain the glass in position through all the vicissitudes to which a carded insect is usually liable, but of course it can be fastened with elastic glue if desired.—JAMES EDWARDS, Bracondale, Norwich: 14th March, 1877.

New British species of Psyllidæ.—*Psylla betulæ*, L.—I have discovered this species amongst several others taken by Mr. Douglas, in August last, at Dunkeld on birch trees. It appears to have a position near *Ps. pineti*. The insect which Mr. Douglas exhibited at the Meeting of the Entomological Society, of 5th July last, with a doubt as to its being the true representative of the above, was *Ps. sylvicola*, Leth. Förster does not appear to have known it, but he describes a species under the name of *Ps. ambigua* which agrees pretty well with it.

Aphalara artemisiæ, Först.—On page 67 *ante*, I gave a brief description of this insect, believing that it would be found to occur here, and I have now the gratification to establish its right to be considered a British species, as I have detected it amongst a number of *Psyllidæ* kindly sent by Mr. C. W. Dale for determination. It appears to have been taken so long ago as 27th July, 1843, by his father, and I

think that by a careful examination of *Artemisia maritima* (on which plant probably it was found) between June and September, it is almost certain to be discovered.—JOHN SCOTT, 1, St. Mildred's Terrace, Bromley Road, Lee, S.E. : *April*, 1877.

Note on Trioza juniperi, Meyer-Dür.—This insect, to which I called attention on page 66 *ante*, proves to be *T. proxima*, Flor. The certainty of this is based on types received by me from Dr. Flor himself, as well as the corroboration of Dr. Franz Löw. Dr. Flor took the species on *Pinus abies* at the end of August and beginning of September, and I am now in stronger hope than ever of its being found in Britain.—*Id.*

Laccometopus clavicornis, L., and its relation to Teucrium chamaedrys.—The following note, supplementary to Mr. Douglas' on this subject (p. 236 *ante*) may be useful. *Teucrium chamaedrys* is not a native plant, but is naturalised on old walls in Britain and in sandy fields in Ireland. In Britain it chiefly occurs in the south, as the following abstract of Mr. Watson's remarks on its distribution (*Compendium Cybele Britannica*) will show:—Cornwall; Devon; Somerset; Hauts; Sussex; West Thames; Norfolk; West Ouse; South and North Severn; South-East, South-West, and North Wales; Yorkshire; Tyne; Perth; Forfar; and I have seen it in Aberdeen.—F. BUCHANAN WHITE, Perth: *April*, 1877.

The Entomological Collections of the Dublin Society.—As I see a notice in the *Entomologist's Monthly Magazine* for April, that a portion of the late Mr. E. Brown's British collections were secured for the Royal Dublin Society, the present seems a good opportunity for calling the attention of my own countrymen who are interested in entomology (scarcely a dozen of whom have visited Ireland during the past ten years) to what is to be seen in Dublin in the way of insects. It must not be supposed that this is a merely local museum; it has long been supported by Government, and is at present about to be placed wholly under Government management, and new and extensive museum buildings are projected, although the present museum consists (exclusive of corridor, staircase, &c.) of two magnificent rooms 200 feet long, with a double gallery in the upper one.

The entomological collection is in a separate room, and is at present contained in twenty large cabinets, as follows:—British *Coleoptera* 1, *Diptera* and *Hymenoptera* 1, *Macro-Lepidoptera* 1, other Orders 1. Foreign *Coleoptera* 3, *Lepidoptera* 10, *Orthoptera* 1, *Hemiptera* and *Homoptera* 1, other Orders 1. Several Orders have outgrown the space allotted to them, and additional cabinets are about to be added for their accommodation. The British insects purchased at Mr. Brown's sale consist chiefly of *Hymenoptera*, *Neuroptera*, *Orthoptera* and *Hemiptera*. The most remarkable of the foreign insects in the Society's collection are perhaps the *Hemiptera* (consisting mainly of the late Mr. Curtis's collection), and the *Lepidoptera Heterocera*, which were lately enriched by the purchase of Mr. Sharpe's fine collection of *Sphingidae*. Fine series of insects of various Orders from Sierra Leone, Jamaica, Japan, and other interesting localities, have also been acquired from time to time, thereby adding large numbers of rare and new species to the collection.

I ought, perhaps, to mention that the late Mr. A. H. Haliday's collection did not come to us, but forms part of the Museum of Trinity College, Dublin.—W. F. KIRBY, Museum, Royal Dublin Society, Kildare Street, Dublin: *2nd April*, 1877.

ENTOMOLOGICAL SOCIETY OF LONDON: *14th April, 1877.*—PROFESSOR WESTWOOD, President, in the Chair.

Messrs. C. A. Briggs, J. T. Carrington, and G. Harding were elected Members; and Messrs. E. H. Birchall, Dr. E. Capron, T. D. Gibson-Carmichael, and V. Cluse were elected Subscribers.

The Secretary exhibited a collection of fine species of *Lepidoptera* from near Bangkok, in Siam, forwarded to him by Mr. R. Garner, F.L.S., of Stoke-upon-Trent.

Mr. McLachlan exhibited a specimen of *Ophideres materna*, a brightly-coloured exotic species of *Noctuidæ*, given to him by Mr. R. H. Scott, of the Meteorological Office, with a note to the effect that it was taken at sea, in Lat. $25^{\circ} 24' S.$, Long. $62^{\circ} 10' E.$ (the nearest land being the island of Mauritius, about 360 miles distant), by Capt. Raeburn, of the ship "Airlie." The moth is a common Indian species, but is found also in Africa. A specimen was long ago recorded from Brazil, and Mr. Grote had recently noticed its occurrence in Florida. He also exhibited the cocoon and pupa of a species of *Cetoniidæ* (probably *Diplognathus silaceus*) from Camaroums, sent to Mr. Rutherford. The cocoon appeared to be formed of dark brown earth, but attached thickly to the exterior were oval, slightly flattened, deep black hard bodies (each nearly 5 lines long, by 2 broad), which he thought were probably the dung of some rodent animal.

Mr. Champion exhibited *Stenus Kiesenwetteri* (hitherto only found in this country at Wimbledon), *Gyanusa brevicollis*, *Bembidium nigricorne*, and *Plociomerus luridus*, all taken by him at Chobham, and *Philonthus cicatricosus* from Shoreham.

Mr. H. Vaughan exhibited (on behalf of Mr. Bidwell) an example of *Notodonta teitophus*, taken about the year 1867 by a lamplighter, at Ipswich. Mr. Douglas bred the species many years ago from a larva found near St. Osyth, and there had been other records of its capture in this country, but more or less of vague authenticity.

Professor Westwood read a letter addressed to him by Mr. B. G. Cole respecting the subject of seasonal dimorphism in *Lepidoptera*, and giving the results of an experiment he had made with *Ephyra punctaria*. The greater number of moths, the produce of one brood of eggs, appeared in July, and were of the spotted variety, but the remainder did not emerge till the May following, and resembled their mother in all respects. Mr. Cole alluded to Dr. Knaggs' remarks *à propos* of *Selenia illustraria*, published in Ent. Mo. Mag., vol. iii, p. 238, as bearing upon the same subject. He considered it probable that individuals that remained the longest time in the pupa stage would produce the most highly vitalized imagos. Mr. McLachlan alluded incidentally to the *Lepidoptera* brought home by the Arctic Expedition from the far north ($82^{\circ} N.$ latitude), and said that the larvæ of most of these species must of necessity require more than one season to acquire their full growth, for the short fitful summer was utterly inadequate for the full development of most of the species; and, furthermore, it was probable that the pupa state might habitually last several years.

Professor Westwood read notes on the species of *Stylopidæ*, which had the habit (exceptional for the Family) of living upon a species of *Homoptera*, found at Sarawak; and exhibited drawings illustrating the paper. He also read notes on the genus *Protopistoma*, especially with regard to the species from Madagascar described by Latwille, and of which he possessed the types, which were exhibited.

Mr. Cameron communicated a paper on East Indian species of *Tenthredinidæ*. Mr. A. G. Butler communicated the first portion of an enumeration of the *Lepidoptera* of the Amazons, collected by Dr. Trail in the years 1873—1875. Mr. Baly communicated descriptions of new species of *Halticidæ*. Mr. C. O. Waterhouse read a Monograph of the Australian species of *Lycidæ*. Mr. Smith read descriptions of new species of the genera *Pseudomyrma* and *Tetraponera*.

W. KELLEY,
Washington, D.

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J. W. DOUGLAS.

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R. McLACHLAN, F.R.S.

H. T. STANTON, F.R.S.

VOL. XIV.

“Though you may have searched every spot in your neighbourhood, turned over every stone, shaken every bush or tree, and fished every pool, yet you will not have exhausted its insect productions.”—REV. W. KIRBY.

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ERRATA.

- Page 60, line 23 from top, *for* "the first joint," *read* "the third joint."
 " 62, " 7 " " *for* "somewhat sharply marginate," *read* "not marginate."
 " 72, " 19 " " *for* "head," *read* "third."
 " 72, lines 20 and 29 from top, *for* MÆRODES," *read* "MÆRODES."
 " 201, line 6 from bottom, *for* "September," *read* "December."

Entomologist's Monthly Magazine

VOLUME XIV.

NATURAL HISTORY OF *DREPANA SICULA*.

BY WILLIAM BUCKLER.

I feel extremely obliged to Messrs. W. H. Grigg and W. J. Thomas, for giving me the opportunity of figuring and describing the larva of this rare species; for, although it had been described and figured before, and the description in Stainton's Manual is correct as far as it goes, and one of Hübner's two figures is also correctly drawn, yet as the other of his figures, really representing *falcataria*, has been reproduced under the wrong name in a recently published book of Moths, the importance of a true representation and description has become all the greater.

Mr. Grigg first sent me an egg, which he had obtained June 7th, 1874, from one of two captured ♀'s, kept alive for three days. This egg was fertile, for during the next five days it went through the first changes of colour, but finally shrivelled up. Last year, 1876, at his instance also, Mr. Thomas sent me five eggs, laid on June 19th, by a pinned moth; these eggs, which reached me June 23rd, were deposited—three of them in a little group on a piece of paper, and the other two loose.

From one of the eggs on the paper, the first larva appeared at 11 p.m. June 28th, and a second from one of the loose eggs during the night of June 30th; another of the eggs on the paper never changed colour, and the third, together with the second loose egg, after going through the changes of colour, dried up. Thus I was not very fortunate with the eggs, but most unhappily the young larvæ, after inspiring me with a grand hope, caused me a worse disappointment!

The first that appeared was supplied within twenty minutes of its emergence with a tender leaflet, and a mature leaf, of *Tilia europæa*; but when I looked at it again—that is, on the following morning—it was dead!

Thinking that perhaps I had failed with the first from not giving it time to eat its egg-shell, when the second larva was hatched I took

care to let the empty shell remain with it, and supplied it also with some birch as well as lime leaves; next day, however, it was looking very miserable, unable to stand, and rolling about helplessly, and so lingered till its death on the third morning, having, as far as I could see, eaten nothing whatever since its hatching.

Why I failed so totally I cannot explain, and can only hope that further experiments with the egg may prove more successful.

Fortunately, however, Mr. Thomas, on September 10th, 1875, had found a nearly full-grown larva on lime, and lent it to me on condition of my sending back the imago, if reared; and this I am happy to say I was able to do. I received the larva September 13th; it became full-fed by the 21st; next day began to spin, and the day after was covered-in so as to be hidden, and the moth—a male, and quite perfect—appeared during the evening of 12th June, 1876—the first British specimen reared in captivity.

The egg in shape is roundish oval, the surface very finely pitted; its colour when first laid is pale straw-yellow, changing in four days to pink at one end and a little round the circumferent margin, the centre remaining straw-colour; on the fifth day, the pink parts turn to the rich red of a ripening strawberry, and on the ninth the whole surface becomes purplish-brown.

The newly-hatched larva shows a little of the peculiarity of the adult form, as very slight rudiments of tubercles on the fourth segment can just be detected, and the hinder segment bears no legs and is carried at a slight elevation; the colour is a reddish chocolate-brown, with a darker brown spot on each lobe of the head. After this point I can say nothing till the larva is nearly full-grown; at that time I noticed that it spun many silken threads to keep its food steady, and to secure its own foothold, and that its manner of eating was to take large pieces out from the edges of the lime leaves: at times it rested with the head and both the anterior and the posterior segments of the body elevated, holding on to the leaf only by the ventral legs, but when walking the whole of the segments are carried in a tolerably level line, merely undulating a little in its progress, though the anal one always has a slight upward turn.

The full-grown larva measures one inch in length, and is in proportion moderately slender, with fourteen legs, the anal segment not having legs but much prolonged to a tapering point curving a little upward, the head much larger than the second segment and broadest near the mouth, the crown and lobes erect and deeply cleft, and flattened in front as is the whole face; on the back of the fourth

segment is an elevated process, divided into two blunt-tipped tubercles (Hübner's figure referred to above has *four* pairs of tubercles); the segments generally are moderately defined above, more deeply below and very delicately wrinkled, with three or four subdivisions across the back of each: the head is pinkish flesh colour, and a clear margin of this is left on the ridges of the divided crown, from whence it is relieved below by brown spots on the face and by a dark brown outline of the lobes there, and on the middle of each lobe are three lines of dark spots, *i. e.*, one spot at the side of the cheek, two in the middle, and a few more very minute between and above them, also a dark spot or two about the mouth, the papillæ whitish, the ocelli black; the thoracic segments much suffused with brownish-ochreous, on which both the dorsal and sub-dorsal regions are strongly blotched with dark crimson-brown, the tubercles brown with yellow tips; hence the colour of the back and portions of the sides is a brilliant deep yellow, bearing extremely minute elongated freckles of dark brown, a series of these freckles faintly indicating dorsal and somewhat of sub-dorsal lines, and an assemblage of them close together constitute a dark spot on each side of the twelfth segment near to the only distinctly noticeable spiracle, which is there seen as a faint brown oval outline; a fine hair proceeds from each of the usual localities; on the belly, the legs, and some portions of the sides the ground colour is pink, deeply tinged and freckled above with dark crimson-brown, this fluctuates along the middle segments of the body in two distinct waves on either side from the spiracular region of the fifth segment, and falls again rather lower each time than its previous level, till at the eleventh segment and onward to the anal point it covers scarcely more than the ventral surface; the summits of these dark waves reach high on the back of the sixth and ninth segments in such strong contrast to the yellow as to create something of an optical delusion in regard to the shape of the body.

When the larva prepared for changing it began to spin upon the upper surface of a leaf not very far from the footstalk, and soon contrived to draw upwards a portion of the two sides so as to form a cavity, to which the mid-rib of the leaf would be a support below, though its actual position was not quite in the middle of it; the walls (so to speak) in a short time began to approach each other as the foundations were progressing, which consisted of three or four thick little pads of silk attached on either side opposite each other, drawn from time to time closer and closer together and connected by very short and stout threads; these were presently rendered still shorter

by a few threads drawn amongst them from one to the other at various angles which seemed to contract the opening, and to bring the stud-like fastenings almost together; at this point the larva rested for a while; and next morning I found any further watching was effectually prevented; the cocoon had been made, and the covering of the narrow orifice last spun was of a pale rusty-red colour, which in a day or two became a little darker, while the earlier fastenings I had seen spun turned purplish-brown, looking like dark veins on a decaying part of a leaf.

On examining the cocoon after the exit of the moth, I found it very smooth within, and made of very strong silk, not easily torn open, of a rusty-brown colour like that of the leaf containing it; the pupa skin presented but little to be remarked in its general form; its length a little over half-inch, and diameter three-sixteenths; in figure rounded at the head, and tapering but little till near the anal tip, which was rather prolonged in a blunt point ending with three central curled-topped bristles, with a shorter one on each side of them; where the thorax and another part had been rubbed a little, the rusty-red colour of the pupa skin without gloss and rather rough, could be seen; the rest of the surface was covered with a soft adhesive opaque white powder.

Emsworth: *May 5th*, 1877.

CHARACTERS OF A NEW GENUS, AND DESCRIPTIONS OF TWO NEW SPECIES, OF *COSSONIDÆ* FROM THE SANDWICH ISLANDS.

BY REV. T BLACKBURN, B.A.

ANOTHEORUS, *gen. nov.*

Maxillæ in conspectu positæ.

Antennæ medium versùs rostri insertæ, funiculo 7-articulato, clarè haud eidenter articulatâ.

Oculi in capitis superficie superiore oblique inserti, rostri prope basin, fortiter granulosi.

Pedes mediocres; tibiis omnibus apice unco armatis; tarsorum (tibiis parum breviorum) articulo tertio dilatato sub-bipartito, quarto cæteris conjunctis longitudine æquali.

Coxæ anticæ eidenter, posticæ late (necnon egregie), disjunctæ.

This genus must be placed among the "*Cossonides vrais*" of Lacordaire, having 7 joints to the funiculus of the antennæ, and the

intercoxal projection of the hind-body wide, but not excessively so. The position of the eyes (placed entirely above a lateral line imagined as bisecting the head and rostrum longitudinally, and looking upwards) gives the insect a singular appearance, the eyes in their entirety being visible from above.

A. MONTANUS, *sp. n.*

Rufo-piceus, æneo-nitens, antennis pedibusque obscure rufis; rostro lato, subdepresso, capite longiore, sparsim subtiliter punctato; antennarum funiculi articulo secundo primo longiore angustioreque; thorace elongato, lateribus parum rotundatis, antice fortiter, postice leviter, contracto, fortiter sat crebre punctato; coleopteris ovatis, parum convexis, striatis, striis fortiter punctatis; interstiliis leviter convexis, crebre punctatis.
Long. 5½—6½ mm.

This singular insect occurs in bark, in forests on the mountains of Oahu. As yet I have met with it but rarely.

OODEMAS HALTICOIDES, *sp. n.*

Augustus, æneo-virescens, nitidissimus, antennis genubus tarsisque rufis; rostro capite longiore, lato, rugoso-punctato; capite subtilissime punctato; antennis brevibus crassiusculis, funiculo articuli secundo primo longiore; thorace elongato, antrorsum modice contracto, coleopteris parum angustiore, subtiliter nec crebre punctato; coleopteris oblongis, profunde seriatim punctatis, interstiliis vage subtiliter punctatis.
Long. 4—5 mm.

Very distinct from *O. ænescens*, Bohem. (which is not uncommon here). It is smaller and very much narrower; the rostrum is shorter, broader, and much more strongly punctate; the antennæ are thicker, with the scape shorter and much more strongly clubbed; the basal joints of the funiculus, too, are differently proportioned (the 1st joint being about as broad as long); the elytra are not striated. The superficial resemblance of this insect to a *Haltica* (shared by its congener) is most striking. It has occurred to me (rarely as yet) in bark, in forests on the Oahu mountains.

Honolulu: 17th February, 1877.

DESCRIPTION OF A NEW SPECIES OF BUTTERFLY FROM
 LAKE NYASSA.

BY W. C. HEWITSON, F.L.S.

Mr. Simons, who went out with Lieut. Young's expedition to Lake Nyassa, has sent home a few butterflies, the proceeds of a month's collecting; but as they had been picked at the British Museum before reaching me, I have no idea of the original wealth of

the collection. When it came to me, it was composed chiefly of three species of *Papilio*, viz., *P. Leonidas*, *P. Antheus*, and the till now rare *P. Porthaon*.

One species, which I now describe, is of great interest, from its singular colouring and its proximity to *Alana Amazonula*.

ALANA NYASSA.

Upper-side: dark brown. Both wings crossed near the middle by a broad band of white: curved on the anterior wing where it extends from the costal to the inner margin, and is divided by the nervures, which are black, into eight parts, three of which near the costal margin are minute: the fringe white.

Under-side: anterior-wing as above, except that there are two white spots in the cell, that the costal margin (which is narrow) and the apex (which is broad and intersected by the nervures which are black), are pale yellow. Posterior-wings pale yellow with the nervures from the base to the middle, a minute spot in the cell, a spot near the inner margin, a linear spot at the end of the cell, two transverse sub-marginal bands and the nervures which cross them and the outer margin, all black.

Exp. $\frac{5}{16}$ inch.

Hab.: Lake Nyassa.

Oatlands, Weybridge: *April*, 1877.

ANTISPILA RIVILLEI—THE SUMMER BROOD.

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

Since noticing the re-discovery of this insect (*Ent. Mo. Mag.*, vol. ix, p. 54) a further scrap of information has come to me.

In July, 1876, Professor Rondani met with the larvæ of this species in vine leaves in his garden at Parma, and he noticed that when these larvæ were full-fed and had cut out their oval cases, they attached them to the leaves and branches of the vines, so as to hang perpendicularly. The suspension of the cases noticed by De Riville at Malta in the last century has thus been confirmed. In ten or twelve days the perfect insects began to make their appearance.

Professor Rondani has printed in detail his observations on these insects, with careful notices of both larva and imago; but I know not where this memoir is published; a separate copy of it, sent by the author to the Entomological Society of Stettin, reached me through the kindness of Professor Zeller, but it bears on it no trace of its origin.

Mountsfield, Lewisham *May 10th*, 1877.

DESCRIPTIONS OF SOME NEW SPECIES, AND INDICATIONS OF NEW
GENERA, OF *COLEOPTERA* FROM NEW ZEALAND.

BY D. SHARP, M.B.

(Concluded from vol. xiii, page 272.)

BALCUS NIGER, *n. sp.*

Sat robustus, nitidus, niger, leviter aeneo-micans, obsolete parce punctatus, pilis erectis sparsim vestitus; antennis articulis basalibus posterius testaceis. Long. 8—10 mm.; lat. $2\frac{1}{2}$ mm.

Antennæ moderately slender and long, 3rd joint slender, longer than the 4th, and much longer than the thick short second joint, 9th joint a good deal broader than the preceding ones, longer than broad, 10th as broad as 9th, but rather shorter, 11th sub-oval, acuminate, longer than 9th, longer than broad; their colour is black, but the two or three basal joints are more or less distinctly yellow behind. Head broad and short, its punctuation about the vertex rather closer and more distinct than that of the rest of the upper surface. Thorax as long as broad, much constricted in front and behind, so as to be a good deal dilated in the middle, it is very sparingly punctured. Elytra elongate, shining black with a faint metallic tinge, sparingly and finely punctured, and with whitish scanty hairs; under-surface and legs entirely black.

Christchurch, found by Mr. Wakefield.

I have made another new generic name for this species; it has the antennæ with a three-jointed very loosely articulated club: the labial palpi with the terminal joint very large; that of the maxillary also dilated and securiform. Eyes large and prominent, finely granulated, slightly emarginate in front. Posterior coxæ only slightly separated. Tarsi rather large, apparently only 4-jointed, the basal joint being atrophied above and below, the 2nd, 3rd, and 4th joints with large bilobed membranes, the claws simple. In form, the insect is rather like *Thanasimus formicarius*, and may be placed near that species, but it has the apical joint of the maxillary palpi large, and the basal joint of the tarsi more atrophied.

PHYMATOPHEA HILARIS, *n. sp.*

Læte violacea, nitida, fere impunctata, clytris bulla elevata maculaque laterali flavis; antennis tarsisque nigricantibus, trochanteribus et femorum basibus flavis. Long. 7 mm.; lat. $2\frac{1}{3}$ mm.

Antennæ testaceous, with the basal joint obscurely testaceous behind. Thorax a little longer than broad, the sides distinctly prominent a little behind the middle and thence narrowed to the base, the constricted anterior part elongate. Elytra rather long and narrow, with a double elevation behind the scutellum; behind these scutellar elevations, on each is an elevated bright yellow spot, and again just behind this is a large yellow elevated patch reaching the lateral margin but not the suture; their surface is almost impunctate.

I am indebted also to Mr. Wakefield for this elegant and easily distinguished species; it was found by him I believe at Christchurch.

PHYMATOPHLEA LONGULA, *n. sp.*

Elongata, angustula, nigricans, plus minusve testaceo-signata; capite thoraceque dense punctatis; elytris fortiter punctatis, punctis longe ante apicem desinentibus. Long. 6—6½; lat. 1⅔ mm.

This species is closely allied to *Eleale opiloides*, Pascoe, which is a most variable species: but *Phymatophlea longula* is much more elongate, and has the coarse basal punctuation of the elytra becoming obsolete just behind the middle, whereas, in *E. opiloides*, the coarse punctuation continues till just before the extremity of the elytra, and then leaves a small apical, almost abruptly defined, smooth part. The two specimens of *P. longula* before me differ greatly in colour, and somewhat in punctuation, but I have no doubt belong to one variable species.

Christchurch, discovered by Mr. Wakefield.

Mr. Pascoe's diagnosis of the genus *Phymatophlea* (Ann. and Mag. Nat. Hist., Jan. 1876, p. 50) requires supplementing and correcting, otherwise it will mislead those who have not before them his *P. electa*, for which it was founded. The genus must be referred to the *Enopliides*, and should not be placed near *Scrobiger*, for it has the 4th joint of the tarsi obsolete, their basal joint is short above, but rather elongate beneath, the thickening at the base of the unguiculus should scarcely be called a tooth. The terminal joints of both labial and maxillary palpi are dilated, but not very strongly. The eyes are prominent and finely granulated and more or less emarginate in front. Mr. Pascoe's *Eleale opiloides* differs but little in structural characters from *P. electa*, and may be for the present considered congeneric; it cannot be placed along with the Australian species called *Eleale*, for in these, according to Lacordaire, the 4th joint of the tarsi is not atrophied.

DASYTES WAKEFIELDI, *n. sp.*

Elongatus, angustulus, aureo-aeneus, parce breviterque aureo-pubescentis, sub-nitidus, antennis pedibusque nigris; prothorace in medio ampliato; elytris distincte sat crebre punctatis. Long. 6 mm.; lat. 2 mm.

Antennae black, moderately long and stout, scarcely serrate inwardly, 3rd and 4th joints sub-equal. Head narrower than the thorax, its anterior part not elongate. Thorax a good deal narrower than the elytra, a good deal constricted in front, and with the hind angles very rounded; it is not quite so long as broad, and its punctuation is very indistinct. Scutellum sub-quadrangle. Elytra elongate, rather finely and not closely, but still quite distinctly, punctured. Legs elongate, black, the hind tarsi quite as long as the tibiae, the claws furnished with a large membrane.

Christchurch, found by Mr. Wakefield.

OBS.—Species of *Malacodermata* allied to this are pretty numerous in New Zealand, but the present one can be distinguished from all I have yet seen by its golden-brassy colour and its large unguicular membranes.

MACRATRIA VERTICALIS, *n. sp.*

Elongatus, angustulus, niger, parcius pallido-pubescentis, antennis palpisque fusco testaceis, pedibus testaceis, femoribus apicem versùs p'us minusve infuscatis, capite elongato, oculis prominulis; elytris fortiter seriatim punctatis. Long. 3—3½ mm.

Antennæ slender, infusate, the basal joints a little paler than the others, the three apical joints thicker than the others, yet they are slender, each of them considerably longer than broad, the 11th being longer than the 10th; palpi yellowish, with the apical joint infusate. Head scarcely so long as the eyes which are quite prominent, the sides behind them gradually narrowed, and with the occiput very convex, the surface is sparingly but distinctly punctured. Thorax considerably longer than broad, the sides a little contracted in front of the base, and at the front gradually rounded away to the neck, the surface with rather coarse and close punctures. Elytra elongate and narrow, quite parallel, with the shoulders well marked; they are covered with series of closely-placed coarse punctures, which are wanting however at the apex, and they bear a fine, scanty, upright, whitish pubescence. The legs are yellow, with the femora, especially the hind ones, infusate towards the apex.

Sent from Auckland by Captain Broun and Mr. Lawson.

COTES VESTITA, *n. sp.*

Elongatus, angustus, fulvus, densius flavo-tomentosus, opacus, obsolete punctatus; antennis pedibusque elongatis, illis crassiusculis.

Long. 5 mm.

Antennæ stout, 2½ mm. long., 2nd joint a good deal shorter than the others, only about half as long as 3rd, 11th elongate, rather longer than any of the others. Head not punctured, but covered with a fine pubescence like the rest of the surface; it is slightly broader than the thorax. Thorax elongate, deeply constricted just behind the middle, its punctuation and pubescence similar to those of the head. Elytra elongate and narrow, narrowed towards the shoulders, bearing on the basal portion some series of fine indistinct distant punctures, which are made still more indistinct by the dense fine pubescence.

Riccarton, found by Mr. Wakefield in November, 1873.

This species presents the following structural characters, so that I have been induced to give it a distinct generic name. Head short, abruptly truncate, distinctly exerted and furnished with a stout neck,

eyes prominent, coarsely faceted. Thorax elongate, deeply constricted in the middle. Hind coxæ separated by a broad process of the basal ventral segment; basal ventral segment very elongate; legs elongate, femora simple and not clavate. Elytra not covering the pygidium. The insect is most allied to *Tomoderus compressicollis*, and should be classed between *Formicomus* and *Tomoderus*, in the *Anthicides*.

PACHYCOTES VENTRALIS, *n. sp.*

Fusco-ferrugineus, opacus, crassiusculus, subcylindricus, elytris minus elongatis, crenato-striatis, interstitiis rugosis, parte apicali setis parvis erectis fulvis instructâ. Long. $4\frac{1}{2}$ mm.; lat. 2 mm.

Antennæ moderately long, basal joint elongate, 2nd very short, 4—7 very short and very closely packed, 8—11 forming a rather large but little flattened acuminate club. Head very short, large, rather coarsely and closely punctured. Thorax about as long as broad, a good deal narrowed towards the front, coarsely punctured, with a very narrow space along the middle forming an obsolete carina. Elytra rather short, coarsely sculptured, the apical part bearing distinct erect tawny hairs.

Riccarton, a single individual found by Mr. Wakefield.

After an examination of this specimen, which belongs to the *Scolytidæ*, its exact affinities appear to me so doubtful that I have given it a new generic name. The club of the antennæ is rather large and but little flattened, covered with hairs, but these do not extend over the whole surface, so that the four joints can be discriminated. Eyes moderately coarsely granulated, very distant on the vertex, transverse, separated from the antennæ by a rather deep constriction. Anterior coxæ distinctly separated, middle coxæ broadly separated. Ventral segments rather short, the basal one peculiarly prominent, as long as the three following short ones together, these being about equal *inter se* and separated by very deep sutures. Tibiæ not stout, moderately broad at the apex, with their outer edge and apex denticulate, their front face rough, their posterior one pubescent (not smooth or excavate); tarsi slender, lobes of the third joint but little developed. The insect has the form and appearance of *Hylurgus ligniperda*, but is rather shorter and thicker, but the granulation of the eyes is distinctly coarser, and the peculiar prominence of the basal abdominal segment suggests an early stage of *Scolytus*-differentiation, to which genus however its relationship is otherwise quite remote; I think for the present it may be placed near *Hylurgus ligniperda*.

REMARKS ON SOME BRITISH *HEMIPTERA-HETEROPTERA*.

BY O. M. REUTER.

Messrs. Douglas and Scott have lately compiled "A Catalogue of British *Hemiptera*" (being part of a proposed general catalogue of the insects of the British Isles, published by the Entomological Society of London); and Mr. E. Saunders has published a "Synopsis of British *Hemiptera-Heteroptera*" (Transact. Ent. Soc., 1875 and 1876), which is distinguished by a critical examination of the species and concise diagnoses. These works have many differences in the nomenclature and limitation of the species. Since my journey last summer in Britain, I am especially interested in the Hemipterous Fauna of the country, and now offer some observations upon the denominations of some of the species; and although I do not approve the system of classification adopted by Messrs. Douglas and Scott, I follow it in presenting my remarks.

PENTATOMA BACCARUM (Catal., 4, 2) is not the true *Cimex baccarum*, L., which, according to the examination made by Mr. Dallas, is *P. fuscispina*, Boh., and the above-mentioned species must be named *P. verbasci*, De Geer. According to Mr. Saunders, *P. nigricornis*, Dougl. and Scott (Brit. Hem., 78, 1), is synonymous with *P. baccarum*, L., Dall. I have not seen the typical specimens of the species described by the English authors, but it seems surprising that the right *nigricornis*, Fabr., should not occur in Britain. It is rather common in Finland, where *P. baccarum*, L., Dall., is not yet found.

[Linne's description of *Cimex baccarum* in the "Fauna Suecica," 2nd edition, is comprised in these words: "ovatus griseus; abdominis margine nigro maculato. Fn. 650." This No. 650 refers to the "Fauna Suecica," 1st edition, where the words are the same except that "ovatus" is there omitted. But in this 1st edition is added: "Deser. Thorax non prominat utrinque in acumen laterale uti in specie exoticæ." In the citations, in both editions, from the synonymous descriptions by other authors is given:—"List. mut., p. 396, n. 36. Cimex ex luteo virescente infuscatus *corniculis maculatis* similiter ad alvi margines nigris maculis eleganter interstinctus." All this cannot apply to *P. fuscispina*, Boh., nor to *P. nigricornis*, Fab., where the lateral angles of the pronotum are very prominent and the antennæ black. In the citation, "Raj. ins. p. 54, n. 2," the words "scapulis magis exstantibus" must be taken as comparative with the preceding species, No. 1 (*P. juniperina*). Of the figures referred to, "Jonst. inst., t. 17, f. 9" is not recognisable as any species, and "List. mut., t. 31, f. 19," although very rude, does not represent *P. fuscispina*, the lateral angles being rounded. So far then the evidence is in favour of *P. baccarum*, D. and S., being the *Cimex baccarum*, Lin. On the other hand, the citation in the "Systema Naturæ," 721, 45, of "Scop. earn., 360," in which occur the words "*Mari* antennæ unicolores . . . *Feminae* antenn. articulo duo ultimi basi flavescens," seems not only not to refer to our *baccarum*, but to apply to two different species.

In the Linnean collection are three examples of (as I suppose) *P. fuscispina*, Boh., with a label attached to one of them on which is written "34. *baccarum*," and one example (which is our *baccarum*) labelled "135. an *baccarum*?" If the evidence of the first mentioned example can be held to be decisive of the question, although it does not accord with the descriptions adopted by Linné, I have only to say that I do not concur. The evidence afforded by an author's collection is admissible when it corroborates or elucidates his description of a species, but not when opposed to it; and this position is doubly strong in the case of the Linnean collection, which, it is well known, is not in the condition in which Linné left it. It is easy to see that the accidental transposition of the labels above referred to would make all the difference in the testimony, but whether there has been any such change or not I think the collection will have to be left out of reference, and I believe that the majority of the old authors are right in their determination of *Cimer baccarum*, Lin.

Dr. Reuter appears to believe that *P. fuscispina*, Boh., and *P. nigricornis*, Fab., are distinct, but Fieber wrote (Wien. ent. Monats., vii. 55):—" *Pentatoma fuscispinum*, Boh., ist einer der vielen Abänderungen in der Färbung von *Mormidea nigricornis* " und zwar die gemeinste, von bleicher, schmutzig-gelblicher Färbung, mit ungflecktem " Connexivum und eckigen Schultern."—J. W. D.]

NEIDES PARALLELUS (Catal., 12, 1).—This species is only the *forma brachyptera* of *N. tipularius*, L. (*vide* Reut. Rem. synonym. sur quelques Hémipt., in Ann. Soc. ent. de France, Sér. 5, iv).

[*Neides parallelus*, Fieb., may be only the imperfectly developed form of *N. tipularius*, but it can hardly be termed brachypterous, for it has fully developed elytra, the wings only being short. It is curious that the two forms do not occur, with us, in the same localities.—J. W. D.]

BERYTUS SIGNORETI (Catal., 11, 2) is mentioned as British by Messrs. Douglas and Scott, but not by Mr. Saunders, who says (Synops., 136, 2) that *B. Signoreti*, D. and S. (not Fieb.), is synonymous with *B. pygmaeus*, Reut. (Öfv. Vet. Akad. Förh., 602, 5, 1870). I have obtained from Mr. Saunders one specimen of the last species, taken in England; and I found another specimen near Aberdeen. But as Messrs. Douglas and Scott enumerate also this species, perhaps both (*pygmaeus*, Reut., and *Signoreti*, Fieb.) occur in Britain. (Mr. Saunders has, however, communicated in his letters to me that the *B. Signoreti*, D. and S. (*nec* Fieb.), and *B. pygmaeus*, Reut., are without doubt identical.)

[The original English examples were named *Berytus Signoreti* by Fieber; in a subsequent letter (10th Sept., 1863) is this line:—" Es war eine Irrthum dass ich den Namen *Signoreti* statt *pygmaeus* setzte;" but still later (12th December, 1863) he wrote:—" *Berytus Signoreti*, Fieb., ob var. vom *pygmaeus*, Fieb.?" I could not find that Fieber had described a species under this latter name, and I therefore concluded that he had ceased to believe that *pygmaeus* was distinct from *Signoreti*, but not

knowing the typical *Signoreti*, I offer no opinion on the matter. Curiously, Dr. Reuter's *pygmaeus* appears to be the same as Fieber's, although the latter is not alluded to.—J. W. D.]

SCOLOPOSTETHUS ADJUNCTUS (Catal., 14, 2) is supposed by Mr. Saunders (Synopsis., 144, 2) to be a variety of *Sc. pictus*, Schill. This supposition seems to me to be without reason. *S. adjunctus*, D. and S., is much smaller and differs too much in the structure and colour of the antennæ to be taken only as a variety of *Sc. pictus*, the latter also lives solely on the shore. With much more reason, *Sc. adjunctus*, *affinis*, Schill., and *pilosus*, Reut., could be regarded as varieties of *one* species; all these are dimorphous; *Sc. pictus* on the contrary is always developed.

SCOLOPOSTETHUS AFFINIS (Catal., 14, 3).—Mr. Saunders has kindly sent me specimens of the species described under this name by British authors. This is the same that I have named *S. affinis*, Schill. (*vide* Remarques synon. in Ann. Soc. ent. de France, Sér. 5, iv, p. 561, 8); but it is not synonymous with *S. affinis*, Thoms., as cited by Messrs. Douglas and Scott (*l. c.*). *Sc. affinis*, Schill., Reut., has the elytra finely pubescent, as also Mr. Saunders says in his diagnosis of the species (Synopsis., 145, 3); *S. affinis*, Thoms., which I have called *S. pilosus* (Rem. syn., 562, 10) has them on the contrary with long, upright hairs. I possess this species from Finland, Sweden, Russia, Siberia, and Madeira; probably it will also be found in Britain. It lives in *damp* places.

SCOLOPOSTETHUS ERICETORUM (Catal., 14, 4, and Saund. Synopsis., 145, 4).—In the Ann. Soc. ent. de France, Sér. 5, iv, 561, 7, I have shown this species to be the true *decoratus*, Hahn (Wauz. Ins., i, 139, fig. 71).

[The antennæ of *Scolopostethus ericetorum*, Leth., are deep black, the second joint only usually having its extreme base pale. Yet Dr. Reuter, while he admits *S. affinis* of British authors to be *S. affinis*, Schill., sees that *S. ericetorum* is *decoratus*, Hahn (which, however, Hahn acknowledged was *affinis*, Schill., but changed the name because Schilling knew only the brachypterous form!), which is described as having "the antennæ black-brown, the first joint at the end and the second at the base "reddish-yellow." This is certainly not the character of *S. ericetorum*, Leth.—J. W. D.]

TRAPEZONOTUS DISTINCTUS (Catal., 15, 1).—This species is without doubt only a variety of *Tr. distinguendus*, Flor. Mr. Douglas has, in

the Ent. Mo. Mag., Nov., 1875, p. 136, published a note on *Trapezonotus distinguendus*, Flor, and its allies, where he says: "According to descriptions, there are four allied species of *Trapezonotus*, viz.: 1. *distinguendus*, Flor, *nee* auct. (= *convivus*, Stål, *sec.* Thoms.); 2. *distinguendus*, Fieb., Stål, Saund., *nee* Flor; 3. *distinctus*, D. and S., Fieb. (= *distinguendus*, Flor, *sec.* Saund.); 4. *convivus*, Stål, *nee* Thoms." But I think that all these are to be reduced to two species. *Pachymerus distinguendus* was described by Flor as having black antennæ, with the *second* joint yellowish-red in the middle; but Fieber, having seen the type of Flor, corrected the description of Flor, by saying: "the *third* joint of antennæ red in the middle." There does not exist any known species with *only* the second joint red in the middle. I have, however, examined one specimen from Finland, belonging to the var. *distinctus*, and in other respects quite agreeing with the diagnosis of Mr. Saunders (Synops., 148, 1), but differing in having the third joint yellowish-red, both ends being narrowly black (*articulo tertio fere toto rufo*, Thoms., Opusc. Ent., ii, 172, 28) and the second joint before the middle with a narrow, dark red ring; this belongs without doubt to *Tr. distinguendus*. *Tr. distinctus*, D. and S., is only a paler ochreous variety; one specimen, obtained from Mr. Douglas under the name of *distinctus*, is, however, quite as dark as the true *distinguendus*, and in no respect differing from it. *Tr. convivus*, Stål (Stett. Ent. Zeit., xix, 181, 23), is a good, distinct species, occurring in Siberia but not yet found in Europe, having the second and third joints of the antennæ, largely red in the middle, the elongate triangular spot on each side of the scutellum much longer and confluent with the yellow apex of the scutellum, the elytra scarcely darker towards the apex, &c. I have seen a great many specimens of this very little-variable species.

[*Trapezonotus distinctus*, Fieb., as now elucidated, may be only a variety of *T. distinguendus*, Flor, yet it is curious that Fieber, who had before him at the same time the original example of each, does not hint at the possibility, but compares *T. distinctus* with *Peritrechus nubilus*, Fall., and *P. angusticollis*, Sahlb. (Wien. ent. Monats., viii, 215).—J. W. D.]

PLINTHISUS BIDENTULUS (Catal., 17, 2, and Saund., Synops., 154, 2) is only a long-winged form of the *Pl. brevipennis*, Latr.

[*Plinthisus bidentulus*, I think, may be accepted as the macropterous form of *P. brevipennis*, Latr. (*vide* p. 19 *post.*)—J. W. D.]

(To be continued.) °

Melanochroism, &c., in Lepidoptera.—Mr. Fetherstonhaugh (E. M. M., xiii, 215) and Mr. Tugwell (*id.*, 256) have suggested that variation is produced by the impression the surrounding colour has upon the female insects, especially during “*the period of generation.*” It would not be difficult to find many arguments against this theory (*e. g.* the case of nocturnal species, on which colour can probably have little influence), but as it ought to be capable of experimental proof, I leave to its authors the onus of proving it by experiments on insects in confinement, and hope that they will let us know the result.

The cases of the prevalence of melanochoic forms in the manufacturing districts of Yorkshire, &c. (if, except in the case of one or two species, such prevalence is a fact) may be induced by chemical causes (the impregnation of the air and soil, and consequently of the food-plants, by the various gases discharged from the chimneys of the factories, &c.), and continued and intensified by “*natural selection,*” for, in a region where all things are blackened, a dark individual will have more chances of escaping detection by enemies, and hence of propagating the species and producing a melanochoic race. The same would be the case with the *var. perfumaria* of *Boarmia rhomboidaria*, which might escape a sharp-eyed sparrow when a lighter-colored typical specimen would be seen and gobbled up.

Mr. Tugwell brings forward *Gnophos obscuraria* as the best insect to illustrate his view, and points out that on light soils it is light and on dark it is black. To my thinking, this insect is the worst he could have selected to support his theory, for in it we have a most brilliant example of *natural selection.* *Gnophos obscuraria* always rests on or near the ground, often on rocks or stones. On a light soil dark specimens would be conspicuous and thus liable to observation by enemies. So in generation after generation the darkest colored individuals would be weeded out before they had time to propagate, and the breed would get lighter and lighter till that exact shade of colour best suited for securing non-detection is attained. On a dark soil, the reverse would take place, till, as Mr. Tugwell remarks, in the New Forest we get specimens “*harmonizing with the soil.*”

Mr. Fetherstonhaugh says that I appear to reject Mr. Birchall's notion that cold damp climates, with absence of sunshine, may be the cause of the melanochoism, and that I suggest meteorological causes; but do not cold, damp, and absence of sunshine belong to meteorology? I consider that they certainly do, and in suggesting that the meteorological differences of one year from another, cause a varying amount of variation in a single locality, I meant the different degrees of humidity or dryness, heat or cold, sunshine or its absence, that occur in one locality in various years, the amount of difference being sometimes very great. If these are the causes why the individuals of one year vary from the individuals of another year in one and the same locality, it is probable that in two localities, more or less widely separated, and hence differing in their meteorology, individuals of the same species will vary in opposite directions, and the variation in course of time become permanent, and hence (let us suppose) in one locality a melanochoic race is established, in the other a leucochoic. That the degree of heat or cold has an influence of the most appreciable character has been conclusively shown by Dr. Weissmann (“*Studien zur descendenz Theorie,*” vol. i), and by Mr. W. H. Edwards on certain American butterflies (alluded to by Prof. Westwood in his Address to the Entomological Society, 1877). Further researches on this subject, by Mr. Edwards, will be found in

the "Canadian Entomologist" for this year, in which he records experiments upon *Phyciodes Tharos*, a polymorphic butterfly.—F. BUCHANAN WHITE, Perth: April, 1877.

Melanism in Lepidoptera.—After Mr. Birchall's and Dr. Buchanan White's notes on this subject (vol. xiii, pp. 130 and 145), and the very feasible explanation the theory of natural selection gives of the prevalence (though not the *cause*) of these dark varieties, I was somewhat surprised to see what may be called the "birth-mark" theory revived to account for them by Mr. Fetherstonhaugh (p. 215), and subsequently supported by Mr. Tugwell (p. 256). It is almost impossible to one having any physiological knowledge to see how any impression on the sensorium of the parent can produce any permanent change (except perhaps a deficiency in some parts) in the structure of its offspring. As, however, one fact is worth a hundred theories, I may perhaps be allowed to quote here a passage from Darwin's "Animals and Plants under Domestication" (1st edit., vol. ii, p. 263), which seems to me to be decidedly "ad rem," as regards the subject under discussion. He says "it was formerly a common belief, still held by some persons, that the imagination of the mother affects the child in the womb. * * * Dr. William Hunter, in the last century, told my father that during many years every woman in a large London lying-in hospital was asked before her confinement whether anything had specially affected her mind, and the answer was written down: *and it so happened that in no one instance could a coincidence be detected between the woman's answer and any abnormal structure*; but when she knew the nature of the structure, she frequently suggested some fresh cause!" Natural selection perfectly explains the facts alluded by Mr. Tugwell about *Gnophos obscuraria*, for of course on a dark soil the darker individuals, on the light the lighter ones, will be best protected by their colours and will therefore have a better chance of escaping the notice of their enemies. That the dark colour of the soil can hardly be the true cause in *producing* these variations is, I think, pretty certain, from their occurrence in many places where the soil is not conspicuously dark, e.g. the Highlands of Scotland and the Alps.* I have just been looking through Dr. Staudinger's catalogue, and was much struck by the fact that in nearly every case where a local form (whether a "var." or "ab.") from the Alps is noticed, it is characterised as being "obscurior," or "multo obscurior," or with some of the markings "obsoleta." The great number of normally dark or black species of *Lepidoptera* in the Alps, as, for instance, the *Erebia*, *Psodos*, and some *Pyralides* (cf. Jordan, vol. xiii, p. 60), seems to me also to be worth notice in connection with this subject. In a few cases, Alpine insects are only sexually melanic, e.g. *Pieris napi*, ♀, var. *bryonia*, *A. Paphia*, ♀, var. *Valezina*, *Polyommatus virgaurea*, ♀, var. *Zermattensis*. These cases are explicable, on the theory, that supposing sexual selection to have been such an efficient agent in modifying species as Mr. Darwin believes, it may have been more important for the males in the struggle for life to preserve their good looks than to have acquired sounder constitutions at the expense of the former. That the prime agent in this tendency to melanism is some unfavourable meteorological element, probably connected with an excess of moisture and reduced amount of sunshine, is strongly suggested by the fact that, as noticed by

* Conversely, too, one would expect, if this theory were true, to find more melanic vars. on the very dark soil of peat-mosses and fen-lands, than is actually the case.

Messrs. Birchall and White, these dark forms are most frequent in the North of England, Scotland, Ireland, and, as I have stated, the Alps. Nor is this tendency confined to *Lepidoptera*. L. de Tschuli, in his "Monde des Alpes" (2nd edit., 1870, p. 394), says, "Les différences d'altitude produisent encore sur les insectes des modifications d'une nature particulière. Une des choses qui frappent le plus celui qui visite nos Alpes, c'est l'obscurissement des couleurs dans les coléoptères alpins, comme en général dans un grand nombre d'insectes. Plus nous nous élevons, plus nous voyons les scarabées qui vivent dans les trous, comme ceux qui habitent sur les plantes, dans les fumiers ou dans l'eau, devenir unicolores. Ceux qui sont les plus répandus dans les Alpes sont en général noirs ou d'un brun foncé; et ceux qui dans les zones inférieures sont ornés de couleurs à reflets métalliques deviennent dans les hauteurs d'un noir uniforme. Une foule des coléoptères verts et cuivrés sont sur les hautes Alpes d'un noir pur, un petit nombre seulement d'un bleu d'acier, et d'un bleu foncé: ceux qui sont bruns, olivâtres, et d'un vert doré, passent également au noir pur ou au noir bleuâtre: même la *Chrysomela alpina* jaune, devient noir sur les Alpes." He then goes on to suggest as the probable cause of this, the fact that Alpine species live and undergo their metamorphoses for a great part of the year under a thick bed of snow, and consequently in profound darkness. A similar darkening in the coloration of some of our English *Coleoptera* may be seen as we go northwards, e.g. the Highland dark forms of *Carabus catenulatus*, and the mountain *Calathus nubigena*. It would be interesting to hear if similar cases occur in other orders. The most probable conclusion seems that darkness of coloration is in some mysterious way correlated with a constitution better fitted to encounter unfavourable conditions of life, more especially meteorological.—W. A. FORBES, Cambridge: April 15th, 1877.

Heliolithis scutosa.—I was not a little astonished to read (vol. xiii, p. 280) the statement of my esteemed friend (C. G. Barrett) that this species had been first added to the British list in 1875. In reference to the Carlisle specimens of *H. scutosa*, I should like to know what amount of evidence would be required to convince some of the readers of the Magazine.

I saw three at least of the Carlisle specimens a week or two after their capture and possessed two of them. One is now in the collection of the Rev. H. Burney, and the other in that of Mr. Sidebotham: they can surely testify if I have sent them *H. dipsacea* instead of *H. scutosa*.

Just fancy me not knowing *H. scutosa*! Why I have known it for forty years clearly and unmistakeably. It is figured in the additions in Wood's "Index Entomologicus." My father is still living and can say, if asked about the specimens, my eldest brother and James Cooper can speak to the point. Mr. Armstrong, of Carlisle, can testify that he sent me, after Mr. Heysham's death, the specimen he had to name for my father, which is mentioned by Curtis as having been taken at Skimburness. Mr. Rothwell, the captor of them, still lives, and if he cannot remember the species he can no doubt remember what a prize he had taken.

H. dipsacea never occurred in Cumberland, so that it could not be specimens of that insect which were mistaken for *H. scutosa*. I do not want to occupy more space than necessary, but, for the benefit of your readers, I will give Curtis' remarks about it and see whether he considered it *dipsacea* or not—here it is: (*scutosa*, Hüb.,

Curtis—Brit. Ent., pl. 595, ♀). For the loan of this fine addition to our *Lepidoptera*, accompanied by the following memorandum, I am indebted to T. C. Heysham, Esq., of Carlisle: I have availed myself of the first opportunity to send you the *Noctua* “which I take to be a specimen of *Heliothis scutosa*: it was taken on the banks of the “River Caldew, a little below the village of Dalston, in July last. I have also seen a “male which was captured in August, 1834, on the coast not far from Skinburness, the “specimen however was much wasted. No other species of the genus has been met “with in the vicinity to my knowledge.” Curtis goes on to say—“The figures I have “seen of this moth are much lighter than Mr. Heysham’s specimens, as is also a male “presented to me with several other interesting insects by Dr. Dowler, of Richmond, “who took it, I believe, near Odessa; the caterpillar feeds on *Artemisia campestris*, “and most likely on other plants of the same genus; the moth appears in May and “June on the continent, and again in July and August.”

The Skinburness specimens were brought home by Mr. Rothwell at the Midsummer vacation. Mr. Barrett’s characters are excellent, particularly the *corticea*-like stigmata; the white nervures on the upper wing give it the appearance of the antler-moth, *Charax graminis*. I may add that, the food-plant *A. campestris* (Wormwood) grew plentifully on the waste grounds about Dalston. I saw a great patch on the River Caldew about two years ago when I was at Carlisle.—J. B. HODGKINSON, 15, Spring Bank, Preston: April 29th, 1877.

Trachea piniperda.—Whilst walking on the shore a short distance from Southport on the 27th of last month, I was rather surprised to find a specimen of *Trachea piniperda* on some palings facing the sea. There did not appear to be any trace of pine or fir in the district; indeed, the spot is almost barren of trees, except willows and dwarf sallows, growing in such a wilderness of land. Has *piniperda* been noticed in such a situation before?—GEO. T. PORRITT, Highroyd House, Huddersfield: May 7th, 1877.

A species of Trichoptera new to Britain.—When working out the *Leptocerida*, for Part vi of my “Revision and Synopsis,” I discovered amongst my British species a ♂ of the insect that appears in the “Revision” (p. 335, pl. xxxvi) as *Ecetis notata* (*Mytastacida notata*, Rambur). This was taken by myself on August 1st, 1873, not far from Outlands Park, Weybridge: no doubt it is an overlooked species, both here and on the continent, for the list of European localities I have been able to give for it is short. Without reproducing the detailed descriptions I have just given, it would be impossible to present any intelligible idea of the species. Its nearest British (or European) ally is *testacea*, Cur., the males of both having the dorsal segments of the abdomen partly modified in texture. Misled by a “type” I introduced *notata* as British in the “Entomologist’s Annual” for 1862, p. 33; the insects there alluded to were *lacustris*, Piet. (Compare my “Trichoptera Britannica,” p. 119, 1865).—R. McLACHLAN, Lewisham: May, 1877.

A species of Stylopidea fossil in Amber.—The numerous insects entombed in Amber have always proved of great interest as giving us, preserved in a medium that may be compared to the canada-balsam of the microscopist, a clear idea of the entomology of a comparatively recent geological period. Probably there is no case in which an insect in Amber has been held to be absolutely identical with one now

existing, but there seldom remains much difficulty as to fixing the exact position of these fossils, and evidence, either direct or collateral, is abundant to prove that the insects entangled in the resin to which, in its fossil condition, we apply the term "Amber," were extremely similar to those of the present time. An important notice by Menge (in the *Schriften der Naturforschenden Gesellschaft in Danzig, neue Folge, Band i, 1866*) has not been under consideration by any of the recent writers on *Stylopidae*. Menge recorded the finding of a species, to which he gave the name *Triæna tertiaria*, and wood-cuts illustrated his notes. In many respects it is closely allied to the genus *Stylops*, but differs in the antennæ, and, from all existing genera, in its 5-jointed tarsi. This discovery was of more than ordinary interest, because the family, as it now exists, is of such small extent, and (although we have recently heard of some extraordinary captures) of habits such as to make it a noteworthy event for the males to be taken at large. Was the group more extensive and common in former times? or, is the finding of this solitary example to be placed in the category of lucky chances? It is scarcely necessary to say that the collateral interest attached to this almost overlooked discovery relates to the Hymenopterous Fauna, and the corresponding condition of the Flora, of the Amber age. There appears to be no doubt that the resin was that of a Conifer, and that the aspect of the then-existing district was somewhat of the barren nature of our fir-forests. So far as has been recorded, the Amber-insects do not give any evidence of abundance of honey-producing flowering-plants.

Notes on "Die Hemipteren-Gattung Plinthisus (Westw.) Fieb.," by Dr. G. v. Horváth.—Under the foregoing title, in the "*Verhandlungen der k. k. zool.-botan. Gesells. Wien,*" xxvi, pp. 721—36 (1876), Dr. Horváth gives an excellent memoir on the species of the genus *Plinthisus*, which is made to include, as subgenera, *Plinthisus*, Fieb., *Plinthisomus*, Fieb., and *Isioscytus*, Horv. Thirteen species are enumerated; the synonymy is copious, several species previously described as distinct being referred to others still older, in some cases by the identification of the macropterous and micropterous forms of a species. Thus our British *P. bidentulus* is placed as the macropterous form of *P. brevipennis*; and I fully believe this is correct. It is, however, only just to Herrich-Schäffer, who first described *P. bidentulus*, to cite his remark (*Wanz.* vi, 31, 1812): "Fast möchte ich glauben, dass gegenwärtige Art der vollständig entwickelte *P. brevipennis* ist, welcher in Grösse, Farbe und Umriß des Thorax ziemlich abändert." One species, *P. minutissimus*, Fieb., said, on the authority of Dr. Puton, to live exclusively in society with ants, has hitherto been found only in the south of France and Upper Italy, and always with rudimentary elytra and wings (Flugorgane): but Dr. Puton obtained in Algiers a *Plinthisus* with fully developed elytra, which Dr. Horváth, after close examination, holds to be the macropterous form of this species.

Dr. Horváth makes the following remarks on the genus: "The genus *Plinthisus* forms a small, well-characterized group of the *Lygæidæ*, sub-family *Mydolochildæ*. The most conspicuous character consists in the rudimentary development of the elytra and wings (Flugorgane). All the species have the elytra more or less shortened; the clavus and corium are unanastomosed, and the membrane is either entirely wanting or at the most is reduced to a small, narrow marginal rudiment. In the former case the elytra are so much abbreviated that they leave at least the last three dorsal segments of the abdomen uncovered."

"But in five species, namely, *P. minutissimus*, *pusillus*, *major*, *flavipes*, and *brevipennis*, individual examples occur with fully-developed elytra; these species are therefore dimorphous. The perfect development of the organs of flight has not only a biological but also an important morphological signification. According to the laws of correlation of single organs, the perfect formation of the elytra and wings, for example, is always associated with an essential variation of form of the entire body. The bundles of muscles situate in the thoracic cavity, whose function is to move the wings, are in consequence more massive and stronger, the thorax must therefore be wider and deeper, and the sequence of this is that the entire body is broader and more robust, and instead of being oblong and parallel, approaches more to an oval form. The pronotum, which otherwise is posteriorly only as broad or often still narrower than anteriorly, in this case is broader behind than in front,—that is, trapezoidal."

Dr. Horváth says nothing about the probable cause of the occasional alar development in some individuals of a brood. I have on a former occasion (Ent. Mo. Mag. vi, 10, 1869), suggested that such development occurs by a provision of Nature to prevent deterioration of race by breeding "in and in," by enabling some of the "fittest" examples of a species to migrate either to "fresh fields and pastures new," or to mingle with other stocks. But what it is that makes this provision usually latent, or, on the other hand, instigates its exceptional action, is a mystery remaining to be elucidated. Or if it be held that the macropterous form is normal and requires no explanation, the question then is why, as in the genus *Plinthisus*, the abnormal micropterous condition exists in the majority of species and individuals?—J. W. DOUGLAS, *Lee*: 26th March, 1877.

On the identity of Trioza abieticola, Först. with Chermes rhamni, Schrank (in a letter to Mr. Douglas).—After your summary (Ent. Mo. Mag., xiii, p. 255) of all that has hitherto been published concerning those species of *Psyllidæ* which live upon *Rhamnus*, and the possibility of any of them being identical with *Chermes rhamni*, Schrk., you come to the conclusion that it is rather premature to apply Schrank's specific name "*rhamni*" to any species, because you are of opinion that absolute certainty is wanting. I say that we have this certainty, and that the insect described by Schrank as *Chermes rhamni* is without doubt nothing but the larva of *Trioza abieticola*, Först., whereof you may assure yourself by observing the larva of this species on the leaves of *Rhamnus catharticus* in the month of May.

Above all, it is necessary to be convinced that the larva described by Schrank can only be that of a *Trioza* and not of a *Psylla*, a matter that is easy to be decided by any one who has ever bred insects of these two genera. Schrank says that the whole margin of the body and of the wing-cases of his *Chermes rhamni* is fringed, which is the case with the larvæ of the genus *Trioza*, these fringes being the principal character in which the larvæ of this genus differ from those of the genus *Psylla*, the body of which is frequently bordered with hairs but never fringed. Therefore, only the species of *Trioza* can be taken into consideration, those of *Psylla* (*Ps. rhamnicola*, *alaterni*, &c.) being in this case quite out of the question.

Among the *Triozae* there are only two species feeding upon *Rhamnus catharticus*, viz., *T. Walkeri* and *T. abieticola*, and of these the larva of the latter only agrees

with Schrank's description, which, although brief, is yet sufficient easily to recognise the species. If you have but once seen the larva of *T. abieticola* in a developed stage, you will, like me, not have the least doubt of it being identical with the insect which Schrank had before him. This identity is also rendered all the more probable because Schrank says nothing about his *Chermes rhanni* living in a deformation of the leaves as the larva of *Trioza Walkeri* does, and also because *T. abieticola* is one of the most common *Psyllidæ* in South Germany.

Frauenfeld's opinion that *Chermes rhanni*, Schrk., is identical with *Trioza Walkeri*, Först., was an error, of which he himself seems to have been aware, and which he would not have made if he had known the larva of *T. abieticola*.—
Dr. FRANZ LÖW, Vienna: 19th April, 1877.

Reviews.

PROCEEDINGS OF THE NATURAL HISTORY SOCIETY OF GLASGOW, Vol. iii, Part i. Glasgow, published by the Society. 1876.

This Part extends to nearly 100 pages, and in all respects is extremely creditable to the Society. The contents are varied, and valuable, as usual; possibly, however, there is a paucity of entomological matter. Mr. Binnie gives useful notes on the *Leptoceridæ* of the Glasgow district. Mr. Cameron has two Hymenopterous papers: one is (that which it professes to be) a Monograph of the British species of *Phænusa* (and supplement thereto) and *Cladius*; the other consists of notes on the *Hymenoptera* of Kingussie, full of useful notes, amongst which is the remark that *Trichosoma lucorum*, when circling round the tops of birch trees, makes a buzzing like that of the humble-bee.* The only other paper that comes within our province consists of notes on the Honey-Bee, by Mr. R. J. Bennett.

In connection with this Society we should not omit to mention the handsome little volume on the Fauna and Flora of the West of Scotland (Glasgow: Blackie and Son), published on the occasion of the Meeting of the British Association in 1876. The entomological portion is worked out by Messrs. Cameron, Binnie, and King, the latter cataloguing the *Lepidoptera* in a very complete manner. It is to be regretted that the *Coleoptera* are not represented, especially as there is more than one competent Coleopterist in the district.

TRANSACTIONS OF THE GLASGOW SOCIETY OF FIELD NATURALISTS, Part iv, Session 1875-6; published by the Society. 1876.

Possibly this notice should have been incorporated with the foregoing remarks. Glasgow supports two non-antagonistic Societies, and the favours of leading local Naturalists appear to be bestowed upon both. We may, perhaps, reprint the chief entomological paper appearing in these "Transactions," viz.: Mr. Binnie's notes "On Dipterous Gall-makers and their Galls," which deserve to be more widely known.

* I can confirm this from observations made at Rannoch in 1865. In the hot sunshine the insects always kept buzzing about the tops of young birch trees, so that it was almost impossible to capture them. But I procured enough examples early in the morning by giving the birch trunks a sharp kick which dislodged the insects, and, in falling, they "buzzed" as loudly as when flying voluntarily in the sunshine.—R. McL.

Obituary.

George Bedell. In the death-roll of the "Times" is this record:—"On the 2nd May, 1877, at 95, Coburg Road, Old Kent Road. Mr. George Bedell, aged 72." Although scarcely known to the present generation of entomologists, George Bedell was in former time one of the most assiduous and intelligent of British Lepidopterists, not only as a collector of the perfect insects, but as a finder and investigator of their preparatory states, more especially of the *Tineina*; indeed, he was one of the first in this country who gave continuous attention to the elucidation of the life of these small creatures. He maintained his devotion to them as long as circumstances permitted, and when no longer able "to follow to the field," he still preserved his interest in the natural history of tiny moths. He communicated notes of captures, &c., to the "Entomologist," 1842, to the "Zoologist," 1843, 1844, and 1845; and in the latter work in 1848, page 1986, he described *Microsetia* (*Nepticula*) *quinquella*, a new species discovered by himself. The genus *Bedellia*, Stainton, was dedicated to him as a recognition of his merits as an investigator, and *Elachista Bedellella*, Sircom, was also named in honour of him.

Born in London, and working in it daily in mercantile employment up to last June, he was a remarkable instance of the existence and continuance of an intense love of Nature in all her forms, under circumstances never favourable to its inception or exercise. His holidays were few, short, and far between, and his free time so little that few men would have tried to utilize such remnants. Yet such was his ardour that he never seemed tired; though he never left his office until six o'clock, he would then often go many miles to a collecting-ground to get, for instance, *Nepticulæ* by lantern-light! He might, indeed, have well been the original "London merchant's douce and portly clerk" depicted in "Glaucus" by the late Canon Kingsley:—"When he took you to his house and showed you the glazed and corked drawers full of delicate insects, which had evidently cost him in the collecting the spare hours of many busy years, and many a pound too out of his small salary, were you not a little puzzled to make out what spell there could be in those 'useless' moths to draw out of his warm bed twenty miles down the Eastern Counties Railway, and into the damp forest like a deer-stealer, a sober white-headed Tim Linkinwater like him, your very best man of business?"

Of him as a man, it is not our business here to speak, further than to sum up his character by saying that he never thought it any trouble to do his best to serve another, and that he could in all circumstances be thoroughly relied on. Would there were more such men! *Fare!*—J. W. D.

ENTOMOLOGICAL SOCIETY OF LONDON: 3rd May, 1877.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the Chair.

Messrs. J. W. Slater, H. J. Adams, and C. Adams were elected Ordinary Members of the Society.

Mr. J. Jenner Weir exhibited a bag-like structure, about the size of a man's fist, formed of a thin but tough silky texture, without any orifice, which on being cut open was found to contain many pieces of stick, some of which were two inches long, leaves, and fragments of beetles, lying more or less loosely connected by silken threads, and in the midst a closely-spun small bag, containing among the floss a

number of very small, dead young spiders. The assumed parent escaped when the nest was taken, according to the account given to Mr. Weir by the finder, who obtained it at the Cape of Good Hope.

Mr. Weir also exhibited a smaller spider's-nest, from Montserrat, made into a bag and bound with ribbon round one open end, being so made up by the ladies of the country, the toughness of the silky material admitting of this use of the nests.

Mr. F. Grut exhibited a living *Chelifer*, found in crevices of rock in the North of Spain; it was of large size and of an undetermined species.

Sir S. S. Saunders exhibited an example of the spider *Atypus Sulzeri*, taken at Hampstead, in its peculiar, silky tubular nest, which projected four inches above the ground and extended ten inches below the surface.

Mr. Champion exhibited an example of the fine elateroid beetle *Alaus Parreysi*, which was found in a rotten fir stump at the Island of Thaso in the Mediterranean, by Mr. J. J. Walker, of H.M.S. "Swiftsure."

Mr. C. O. Waterhouse exhibited an example of *Dohrnia miranda*, Newm., from Tasmania, a beetle so rare that this was the only one he had seen. He also exhibited a species of *Staphylinidæ* and a *Forficula*, both from Tasmania, which had a mimetic resemblance to each other; but in the absence of information of their respective habits he could say nothing of the purpose the resemblance might serve.

Sir S. S. Saunders communicated a paper "On the adult larvæ of *Stylopidæ* and their puparia;" and Mr. H. W. Bates read a memoir "On *Ceratorhina quadrimaculata*, Fab., with descriptions of two new allied species;" the latter paper illustrated by an exhibition of all the insects mentioned, furnished by Mr. F. J. Horniman to Mr. Bates.

The Chairman took the opportunity of recommending to Members who read papers at the meetings, to exhibit at the same time the insects described, as adding greatly to the interest of the subject brought forward.

DESCRIPTIONS OF NEW COLEOPTERA FROM VARIOUS LOCALITIES.
BY CHAS. O. WATERHOUSE.

The species here described are chiefly from Australia. Mr. E. D. Atkinson, of Tasmania, has recently sent to the British Museum a series of insects, and among them I have detected two or three of the new species. This collection also contained specimens of *Dohrnia miranda* of Newman, an insect which, I believe, has scarcely ever been seen except by the describer.

GEODEPILAGA.

DAMASTER FORTUNEI, *Adams.*

A beautiful variety of this species has just been received from N. Japan. It differs from the ordinary form in having the head and thorax bright coppery, and the elytra dull olive-green. The head is not narrowed behind the eyes; the transverse rugæ of the thorax are very distinct; the elytra are unusually constricted below the shoulders, distinctly but not very much produced at the apex, and the surface, besides the usual larger and smaller granulations, is distinctly punctured.

Length, 19 lin.

As the specimens of this genus vary much, I do not consider it advisable to note this otherwise than a variety of *D. Fortunci*, which it more nearly approaches than *D. rugipennis*.

BRACHELYTRA.

LEPTACINUS BREVICEPS, *sp. n.*

Niger, nitidus; clytris obscure testaceis, saturâ regioneque scutellari nigris; capite latitudine viæ longiori, utrinque parce fortiter punctato; antennis pedibusque piceis. Long. $2\frac{1}{2}$ lin.

Very closely allied to *L. parumpunctatus*, but a little smaller, and the head distinctly shorter. Head not perceptibly longer than broad, a little narrowed in front, less strongly punctured at the sides than in *L. parumpunctatus*; thorax in all respects as in that species, with the dorsal line and lateral punctures the same. Elytra pitchy-testaceous, with the scutellar region and the suture blackish, very smooth, with a few punctures in a line at the suture, a line of very fine punctures from the shoulder to the apex, and two or three fine punctures at the apical angle. Abdomen nearly smooth, with a few obsolete punctures.

Hab.: S. E. Africa, Zambesi.

STENUS CÆRULEUS, *sp. n.*

Nigro-ceruleus, nitidus; clytris abdominisque basi late cæruleis. pedibus testaceis, abdomine hand marginato. Long. $2\frac{1}{3}$ lin.

Head greenish, deeply excavated, distinctly but not very closely punctured, with a slightly raised smooth mesial line. Thorax blue, elongate, very little enlarged in the middle, strongly and thickly punctured. Elytra one-third broader than the thorax, as long as broad, convex, as strongly but not so thickly punctured as the thorax. Abdomen not margined, sub-cylindrical, bluish at the base, blackish at the apex, very finely and sparingly punctured. Legs entirely pale testaceous; penultimate joint of the tarsi bilobed, rather broad.

Hab.: Port Bowen.

STENUS GUTTULIFER, *sp. n.*

Niger, parum nitidus, crebre rugoso-punctatus; clytris sat brevibus, singulis guttulâ flavâ marginali notatis; abdomine tenuissime marginato, segmentis 1-4 lineâ medianâ nitidâ; femorum basi tarsisque obsolete picescentibus, his articulo penultimo bilobato. Long. $2\frac{1}{2}$ lin.

Head thickly and rather strongly punctured, moderately excavated, with two longitudinal impressions between the eyes. Thorax a trifle longer than broad, gently arched at the sides, a little more narrowed behind than in front, very convex, the surface rather uneven, very thickly but not very strongly punctured. Elytra scarcely as long as broad, rather depressed, a little narrowed at the base, a little broader than the thorax, shoulders distinct, the surface rather uneven, very thickly but not very strongly rugose-punctate; each elytron with a small oblong yellow spot on the side, a little behind the middle. Abdomen sub-cylindrical, scarcely narrower than the elytra, the margins indicated by a fine line, a little less thickly and strongly punctured than the elytra, the four basal segments with a smooth mesial line. Legs black, the base of the femora and tarsi scarcely pitchy; the tarsi slender, the penultimate joint strongly bilobed.

Hab.: King George's Sound.

STENUS BIFRONS, *sp. n.*

Niger, nitidus; capite creberrime subtiliter punctato, lineâ parum elevatâ brevi medianâ laevi, et utrinque ad antennarum basin carinâ brevi nitidâ; antennis piceis, apice infuscato; thorace latitudine paulo longiori, convexo, sat crebre evidenter punctato, lateribus leviter arcuatis; elytris thorace $\frac{2}{3}$ latioribus, quadratis, convexis, sat crebre fortius punctatis; abdomine subcylindrico, elytris bene angustiori, haud marginato, sat crebre subtiliter punctato; palpis, femorum basi tarsisque piceis, tarsorum articulo penultimo angusto, bilobo. Long. $2\frac{1}{2}$ lin.

Head slightly impressed on each side, the forehead with a mesial, smooth, slightly raised line; there is also a very short smooth ridge at the base of each antenna. The thorax is not much narrower than the head and eyes, a little narrowed in front and behind, the punctuation very distinct, rather strong and close. The elytra are very broad, convex, not quite so long as broad, with two slight impressions on each, the punctuation very distinct and strong, and moderately close, their sutural margins strongly incrassated. The abdomen is much narrower than the elytra, finely and rather closely punctured, the 2nd, 3rd, and 4th segments constricted near the base, transversely impressed above (as if they had been tied round with a string); penultimate segment deeply triangularly notched below.

Hab.: Zambesi, S. E. Africa.

Allied to *S. cicindeloides*, but very distinct. Very shining, black, smooth; head, thorax, and abdomen much narrower; thorax longer and much less strongly punctured, broadest in the middle. Elytra more quadrate, broader, more convex, the punctuation similar. Antennae with the apical joint distinctly larger than the preceding.

STENUS TREPIDUS, *sp. n.*

Niger, nitidus; capite crebre subtiliter punctato, haud excavato, medio parum elevato, utrinque ad antennarum basin tuberculo instructo; thorace capite parum angustiori, latitudine vix longiori, convexo, minus crebre evidenter punctato; elytris thorace $\frac{1}{3}$ latioribus, subquadratis, postice parum ampliatis, sat convexis, crebre fortius punctatis; abdomine subcylindrico, elytris paulo angustiori, haud marginato, parce subtilissime punctulato, segmentis 2—4 ante basin parum constrictis, basi crebrius punctatis; antennis, palpis, pedibusque piceo-testaceis, femoribus quatuor posticis apice infuscatis; tarsis minus angustis, articulo penultimo bilobo. Long. $2\frac{1}{2}$ lin.

Closely allied to the preceding. The punctuation throughout is much less strong, although very distinct. There is a small tubercle at the base of each antenna (not a short carina); the surface of the thorax is even, its broadest part is a little before the middle; the elytra are longer and a little less broad, with the punctuation less strong, and moderately close; the abdomen is relatively broader, nearly smooth, the 2nd, 3rd, and 4th segments less strongly constricted, finely and not very thickly punctured at their base; penultimate segment below with a deep narrow incision.

Hab.: S. E. Africa, Zambesi.

PROSTOMIS ATKINSONI, *sp. n.*

Statura P. mandibularis, at major, rufo-piceus, depressus, nitidus; antennarum articulo tertio sat elongato; capite thoraceque parce subtiliter punctulato, his lateribus vix areuatis, elytris striato-punctatis, striis haud basin vel apicem attingentibus. Long. 4 lin.

This species is separated from *P. mandibularis* by its much larger size, by the much less distinct punctuation, &c.; and from *P. morsitans* by the much less strong punctuation, and by the sides of the thorax being less straight. The third joint of the antenna is rather elongate, about one-third longer than the preceding. Mandibles very large, strongly angular on the outside in the middle, sparingly and finely punctured. Head sparingly punctured on the sides and in the posterior transverse channel. Thorax sub-quadrated, very smooth, sparingly and delicately punctured, with scarcely any trace of mesial line. Elytra at their base a little broader than the thorax, narrowed posteriorly, with lines of not deeply impressed punctures, the lines not reaching the base or apex. Lateral spurs of the jugula approximate towards their apex, somewhat sinuous.

The female differs from the male in having the mandibles simply arched at the sides, and thickly and distinctly punctured, and the sculpturing throughout more distinct; the thorax also is distinctly constricted behind the anterior angles.

Hab.: Tasmania (E. D. Atkinson, Esq.).

PROSTOMIS CORNUTUS, *sp. n.*

Statura P. mandibularis; rufo-testaceus, nitidus; jugulæ calcaribus lateralibus antice haud approximatis, desuper apparentibus; fronte unice foveolâ impressâ; elytris eviderter punctato-striatis. Long., 3 lin.

Form, colour, and appearance of *P. mandibularis*, but at once distinguished from it and the other species of the genus by the lateral spines of the jugula being at right angles to the base, not approximate at their apices, so that they are distinctly visible from above. The thorax has a shallow fovea on each side, a little before the middle.

Hab.: S. Australia.

BESSAPHILLUS, *gen. nov.*

General form and appearance of *Prostomis*, but with the head formed somewhat as in *Cucujus*.

Antennæ as in *Prostomis mandibularis*. Clypeus marked off from the forehead by a deep channel, narrowed anteriorly, truncate in front. Lateral lobes of the jugula short, somewhat acute; mandibles small, much curved, bifid at the apex; apical joint of the maxillary palpi slightly fusiform, as long as the two preceding joints taken together. Prosternum very broad and flat, joined to the flanks behind the coxæ, as in *Prostomis*. Metasternum very long. Tarsi as in *Prostomis*, with only four visible joints.

BESSAPHILUS CEPHALOTES, *sp. n.*

Elongatus, depressus, parallelus, picco-testaceus, nitidus; capite magno, triangulari, postice transversim fortiter impresso; thorace capite parum angustiori, latitudine paulo longiori, antice parum angustato; elytris planatis, utrinque subcarinatis, intra carinam longitudinaliter impressis, parce, obsolete, subtiliter punctulatis. Long. 2½ lin.

General form and appearance of *Prostomis mandibularis*, but with the head nearly equilaterally triangular; clypeus trapeziform, truncate in front; the punctuation of the head and thorax is not close, and is very fine. Thorax a little longer than broad, a little narrowed in front, the sides gently arcuate. Elytra as broad as the head, with a lateral carina as in *Cucujus*, and with a faint longitudinal impression within this carina; the punctation is very fine and obscure.

Hab.: Tasmania (E. D. Atkinson, Esq.).

MALACODERMATA.

DASCILLIDÆ.

HELODES ATKINSONI, *sp. n.*

Oblongus, piceus, griseo-pubescentis; thorace fere semicirculari, basi late bi-emarginato, elytris haud lineatis. Long. 3 lin., lat. 1¼ lin.

General form of *H. lividus*, but with the thorax nearly semicircular, a little narrower than the elytra, broadest at the posterior angles, which (although their extreme point is a little blunted) are a little less than right angles, the lateral margins are a little impressed, the base is broadly but not deeply bi-emarginate, the two emarginations occupying the whole base. The scutellum is a trifle longer than in *H. lividus*, not raised in the middle, extremely closely and rather finely punctured. The elytra have no traces of raised lines. The head is very closely and finely granulate-punctate; the three basal joints of the antennæ are pitchy, the rest nearly black. The punctation of the thorax is extremely close and very fine; that on the disc of the elytra is less close and less fine, and quite distinct, that on the sides is much finer and more close, especially posteriorly, where it becomes less distinct. The epipleural fold of the elytra is at right angles with the side of the elytra, slightly concave at the base, finely and rather thickly punctured.

Hab.: Tasmania (E. D. Atkinson, Esq.).

HELODES MACULATUS, *sp. n.*

Elongatus, picco-testaceus; thorace transverso, convexo, rufo-testaceo, confertim subtiliter punctato, ante apicem angustato, angulis anticis deflexis, rotundatis, lateribus arcuatim rotundatis, haud reflexis, angulis posticis rotundatis, basi utrinque oblique leviter sinuato, medio lobato; scutello elongato-triangulari, confertim subtiliter punctulato; elytris thorace paulo latioribus, et quadruplo longioribus, sat parallelis, utrisque lineis tribus obsoletissimis sub-elevatis, vittis quatuor nigro-piceis a fasciis tribus griseo-pubescentibus transversim interruptis notatis, callo humerali saturate testaceo. Long. 2½ lin., lat. 1¼ lin.

An elongate narrow species, with reddish-testaceous thorax, and with the elytra obscurely spotted. Head very closely and finely granulated, with two very slight impressions on the forehead. Thorax (when seen from above) narrowed rather suddenly just before the anterior angles, very closely and very finely granular, the anterior angles are broadly rounded, the sides gently rounded, the posterior angles a little rounded, the base is gently obliquely sinuate on each side, lobed in the middle. Elytra rather more than four times the length of the thorax, parallel-sided, very closely and very finely asperate-punctate; each elytron has faint indications of three oblique raised lines, the outer one only seen towards the apex; there are four slightly oblique dark stripes which are broken up into oblong spots by transverse patches of yellowish-grey pubescence. The epipleural fold of the elytra forms a slightly obtuse angle with the margin of the elytra, it is only slightly impressed at the extreme base, and is very thickly and finely granulated.

Hab.: Tasmania (E. D. Atkinson. Esq.).

TELEPHORIDÆ.

POLEMUS BASALIS, *sp. n.*

Ater, opacus, brevissime pilosus; antennis brevibus, sat latis; thorace longitudine vix duplo latiori, parum convexo, marginato, ante medium bene angustato, apice retundato, ante angulos posticos leviter inciso, basi medio leviter emarginato; elytris thoracis basi haud latioribus, obsolete binervis, lateribus dimidio basali ferrugineo-rufis; coxis piccis.

Long. $5\frac{1}{2}$ lin., *lat.* 2 lin.

The 3rd joint of the antennæ is triangular, a little longer than broad, the 4th to 8th joints are nearly the same form, but a trifle broader, the 9th is narrower, the 10th oblong, the 11th elongate-ovate. The thorax has a central impressed ferrugineous line; the margins are a little thickened just behind the middle. The penultimate joint of the tarsi is very slightly bilobed, and the claws have scarcely an indication of a tooth at the base.

Hab.: Borneo.

This insect has a remarkable resemblance to some species of *Calochromus* among the *Lycide*.

HETEROMERA.

PEDILIDÆ.

ISCHALIA BASALIS, *sp. n.*

Nigro-picca; capite thoraceque piccis, nitidis; antennis nigris; elytris confertim subtiliter punctatis, dimidio basali flavo. *Long.* $2\frac{3}{4}$ lin.

Form and appearance of *I. indigacea*, but smaller, pitchy-black, and with the basal half of the elytra yellow, the line of demarcation between the yellow and the dark portions oblique. The head and thorax are pitchy, and very shining, the latter has the dorsal impressions slightly different, there being two round punctures on each side of the mesial carina. The sculpture of the elytra and the lateral carinae are as in *I. indigacea*.

Hab.: Java.

(To be continued.)

ON STRIDULATION IN THE *HEMIPTERA-HETEROPTERA*.

BY A. H. SWINTON.

The stridulation of certain *Hemiptera-Heteroptera* has been already established;* but caution is needed in following up the investigation of the means of its production, because there is a tendency in the integument of these insects to run into wrinkles in places where a frictional surface could not be supposed to be liable to be called into action. Again, species have been enrolled as stridulators, and stated to possess on the ventral surface of the segments of the abdomen, linæ, which are played on by the hind legs, but without any appended notice of their having been seen or heard performing. The stridulation of the genera *Pachycoris*, *Scutellera*, *Stiretrus*, *Oplonus*, *Caloglossa*, *Arctocoris*, and *Psacasta*, thus wants confirmation (N. Westring, Götheborg's Kongl. Vetén. och Vitter. samh. Handl., iv, p. 47; Amyot et Serville, Hist. Nat. des Ins. Hémiptères, pp. 27, 37; Schiölte, Naturh. Tidsskrift, iv, p. 334).

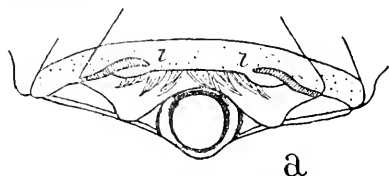
On the other hand, there are true musical *Hemiptera*. Among the land bugs (*Geocorisæ*), the stridulation, while held in the hand, of the strongly rostrate species of *Reduviidæ*, such as *Reduvius personatus* and congeners, and *Coranus subapterus*, produced by the rubbing of the extreme point of the rostrum in the obliquely striated channel of the prosternum, has been most ingeniously established by Herr Westring (*l. c.*) and Dr. Reuter† (Mitth. schw. ent. Gesells., iv, 159); *Reduvius testaceus*, rare at Malta, possesses a very marked power of stridulation (J. J. Walker, Ent. Mon. Mag., xii, p. 81); *Pirates stridulus* (Frisch, Beschr. v. all. Ins. in Deutschl., 1766), and other species of the genus *Pirates* perform in the same fashion, and probably by the same means (Naturh. Tidsskrift, i, p. 57, 1844-45; Westwood, Mod. Class of Ins., p. 473, 1839-40). The sound emitted by several species of the *Geocorisæ* intimates, I think, the possession of a sense akin to fear.

In the water bugs (*Hydrocorisæ*) the pronotum is often prolonged backwards over the mesonotum, as in the Longicorn *Coleoptera*, but though the stridulation such a configuration might postulate has been noticed, the existence of linæ on the mesonotum to effect it has, apparently, escaped attention. When pondering on a remark of J. L. Frisch, that the male of the broad water-bug (which, from

* In the *Heteroptera*, both sexes stridulate, in this particular contrasting with the *Homoptera*, in which the males only are musical.—A. H. S.

† Kirby and Spence, in their "Introduction to Entomology," 7th ed., p. 492, say: "*Cimex (Coranus) subapterus*, De G., when taken, emits a sharp sound, probably with its rostrum, by moving its head up and down" (De Geer, Mém., iii, 289). Ray makes a similar remark with respect to *Reduvius personatus*, the cry of which he compares to the chirping of a grasshopper (Ray, list. Ins., 56.)—EDS.

the accompanying figure of nymph and imago, appears to be *Naucoris cimicoides*, Lin.), produces, with its neck, a noise like that made by



a. Mesothorax of *Naucoris cimicoides*, front view,
l. l. limæ.

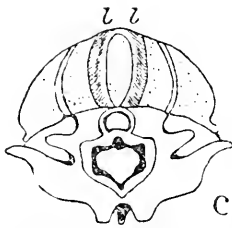
the Longicorn beetles (Beschr. von. all. Ins. in Deutsch., 1766); I dubiously experimented on some specimens of *N. cimicoides*, and, finding a faint sound like that produced by the scratching of a needle point would at times

ensue when the overlap of the delicate, yet tense, pronotum, was moved to and fro, and slightly pressed on the mesonotum, I was led to examine the lateral front angles of the latter, where I detected a minute *f*-shaped lima, thickly set with striæ, the limæ being more distinct in the male.

I next investigated a specimen of the water scorpion, *Nepa cinerea*, Lin. (very kindly sent me, with some other named *Hemiptera*, by Mr. Douglas), and finding the edge of the pronotum, if depressed and worked over the mesonotum, elicited a still sharper click or crackle, I proceeded to inspect the superior lateral angles of the latter, and discovered there two triangular, convex, striated surfaces, resembling, in all respects but position, the limæ of many Longicorn beetles, although, as in all the *Hemiptera* I have chanced to examine, desiccation had somewhat impaired their symmetry and potency.

In *Corixa Panzeri*, Fieb., the limæ are again seen, *f*-shaped and elongate; and the sinuated sides of the sub-triangularly produced pronotum appear faintly depressed, so as to work over them. One of this genus, *Corixa striata*, Curt., it will be seen, by referring to the Report of the British Association for the Advancement of Science for 1845, pp. 64, 65 (1846), has been recorded as a stridulator. "Mr. Ball noticed the fact of one of the *Notonectidæ* (*Corixa striata*, Curt.) emitting loud and powerful sounds, somewhat like those of a cricket. These sounds were given out while the animal was about two inches and a half under water, and so loud as to be distinctly audible in an adjoining room through the closed door. The first observation of this fact was made about two years since, by Miss M. Ball, who has since frequently verified the original observation. Mr. Ball stated that he had himself heard, on the 15th June, this remarkable sound. It is probable the sound is only emitted by the male: it has, as yet, only been heard in the months of May and June."

Lastly, I have examined a specimen of *Notonecta glauca*, Lin.,



c. Mesothorax of *Notonecta glauca*, front view.
l. l. limæ.

and the melanic variety *furcata*, Fab., and here also, finding the projecting pronotum if moved over the mesonotum elicited a sharp, high creak, I submitted the more rounded surface of the mesonotum to a high magnifying power, and found the cause to exist not as before, in lateral limæ, but in an obliquely striated band, lying along either side of the central lenticular depression, well seen in the dark variety, *furcata*, contrasting, as in other cases, by its whitish appearance with the otherwise polished, punctured surface.

The sounds emitted by these bugs seem low when compared with those that can be reproduced in many Longicorn beetles. I am not aware that any of the species stridulate when seized, and although many emit clicking sounds when confined in a glass vessel, I never could detect an instance in which their production was not accompanied by the head striking on the bottom or sides of the receptacle. To examine the limæ in these and other insects, especially when they are minute, a dull, cloudy day, when there is reflected light, should be selected.

Guildford: 23rd March, 1877.

DESCRIPTION OF A NEW SPECIES OF *TRIOZA*.

BY JOHN SCOTT.

TRIOZA DALEI.

♂. Dark brown. *Head*—*crown* dark brown, slightly paler next the eyes; posterior margin slightly concave; *face*: lobes dark brown, almost as long as the crown down the centre, apex somewhat acute; *antennæ* white, about as long as the crown and thorax together, 1st joint dark brown, 2nd at the base brown, apex of the 8th, 9th, and 10th black.

Thorax—*pronotum* yellow; *mesonotum* dark brown, central portion on the sides, at the insertion of the elytra and wings, yellow, on each side of the centre two somewhat indistinct yellowish longitudinal lines, posterior or scutelliform portion yellow. *Elytra* slightly turbid, about two and a half times as long as broad; costal margin, from the base to the apex, almost in a continuous curve, apex scarcely acute; nerves yellow at the base, towards and at the apex brown; radius short, straight, terminating considerably before the apex, base wide; apical fork of the cubitus small; outer arm of the dorsal fork describing a curve about equal to one-sixth of a circle. *Legs* yellow; *tarsi*: 2nd joint and *claws* black.

Abdomen dark brown, posterior margin of the segments narrowly yellow; genital plate with a brown band across the middle of the upper side; the tongs-like processes (*zangen*) viewed from the sides, not two-thirds the height of the posterior margin of the genital plate; apex black, broad, flat.

♀. Yellow. *Mesonotum*: central portion with two brown longitudinal lines on side. *Legs* yellow; *thighs* more or less broadly dark brown at the base. All the other characters as in the ♂. Length, 1 line (barely).

Belongs to the same section as *T. galii*, through the short, straight radius, but distinct from all other species known to me in the form of the bifurcation of the cubitus.

The only specimens I have seen were taken by the late J. C. Dale, Esq. (after whom I have named the species) in October, 1868, in the Isle of Wight, on thrift (*Statice armeria*), and also in November, 1871, below dead plants—I suppose also of thrift.

Lee: 17th May, 1877.

REMARKS ON SOME BRITISH HEMIPTERA-HETEROPTERA.

BY O. M. REUTER.

(Continued from page 14.)

NYSIUS BRUNNEUS (Catal., 19, 3, and Saund., Synops., 142, 1).—I cannot find any essential difference between this species and *N. helveticus*, H.-Sch. (*N. maculatus*, Fieb. (Catal. 19, 2), is considered by Mr. Saunders, *l. c.*, p. 143, to be only a dark variety of the very variable *N. thymi*, Wolff. I have not seen any specimen of *N. maculatus*.)

[*Nysius maculatus*, Fieb., may possibly prove not to be distinct from *N. thymi*, Wolff; this has yet to be decided, the smaller size, shorter and darker antennæ, and black thighs of the former, are perceptible differences. Fieber pronounced the English examples sent to him to be his species.—J. W. D.]

TERATOCORIS BORSALIS (Catal., 26, 1) is *T. antennatus*, Boh. (as Saunders in Synops., 260, 1). This species varies much in colour, being more or less marked with black; the ♀ is sometimes almost unicolorous green. I have examined the types of Boheman.

PHYTOCORIS DUBIUS (Catal., 27, 3) is recorded by Mr. Saunders (Synops., 264, 3) as identical with *Ph. populi*, L., but to my mind it is a distinct species, differing from *Ph. populi* in being somewhat smaller, and in having the first joint of the antennæ a little shorter and mottled, not longitudinally streaked with black, as also in the pale

varieties of *Ph. populi*, the vertex broader between the eyes, which in the ♀ are less prominent, and the pronotum more shining. But this species was previously described by Kirschbaum (Rhyneh. Wiesb., 122, 2) under the name of *Ph. dimidiatus*, which is therefore to be retained.

PHYTOCORIS MARMORATUS (Catal., 28, 6) is cited by Mr. Saunders (Synops., 265, 4) as a dark variety of *Ph. tiliæ*, L., and I think he is right. In describing the species belonging to this genus, and also to many other genera, Messrs. Douglas and Scott have had regard mostly to the colour and the markings, which, however, in this genus are extraordinarily variable. On the contrary, they mention scarcely a single character, taken from the structure of the body; and concerning this last I have not found any difference between *Ph. tiliæ* and *Ph. marmoratus*. On the other hand, I have seen the first species showing a series of transitions from pale, very little marked varieties, to dark with black spots more or less enlarged. *Ph. marmoratus* is the extreme form in this particular.

PHYTOCORIS DIMIDIATUS (Catal., 28, 7) is not the species described by Kirschbaum under this name, but *Ph. longipennis*, Flor, under which name it also is described by Saunders (Synops., 264, 2). It differs from the true *dimidiatus*, Kirschb., in having the joints of the antennæ a little longer, the vertex more narrow (the vertex of the ♂ is almost twice as narrow as the large prominent eye), the pronotum not shining, and the colour generally much paler. The extreme apex of the cuneus is pale red.

PHYTOCORIS CRASSIPES (Catal., 28, 8) is not the species of Flor (Rh. Livil., ii, 606, 8), which latter is *Ph. pini*, Kirschb. (Rh. Wiesb., 123, 3). The species of Douglas and Scott has the first joint of the antennæ distinctly longer, and Mr. Saunders has had the kindness to name it *Ph. Reuteri* (Synops., 265, 5). Concerning *Ph. crassipes*, Flor expressly says:—"Glied 1 kaum etwas kürzer als das Pronotum, verhältnissmässig dicker als bei den nahe verwandten Arten." In *Ph. crassipes*, Flor (*rectius pini*, Kirschb.), the apex of the clypeus reaches to the middle of the first joint of the antennæ, but in *Ph. crassipes*, D. and S. (*Reuteri*, Saund.), it reaches only to about the first third of this joint.

PHYTOCORIS FLORALIS (Catal., 28, 9) and *Ph. ulmi* (Catal., 28, 10).—According to my idea, *Ph. floralis* must be named *Ph. ulmi*, L. This species is much more common in the country of Linné; it is also

described by Fallén under this name, and accepted by Thomson (Opusc. Ent., iv, 418, 1). *Ph. ulmi*, D. and S., *l. c.*, is, on the contrary, very scarce in Sweden, and lives specially on dry hills, among *Calluna* and *Galium*, and on brambles, etc.; it seems to me, therefore, not correct to name it *Ph. ulmi*, but it must be called *Ph. varipes*, Boh. (Ent. ant. södra Sverige, p. 107).

(To be continued.)

APTEROUS MALES IN THE COCCIDÆ.

BY JULES LICHTENSTEIN (OF MONTPELLIER).

Dr. Le Baron, in his First Report for the State of Illinois in America, page 88, says:

“Nature, in the universality of her providence, takes them (the motionless female Coccæ) in her charge, and ministers to their necessities, and no unloved or unfruitful virgin is permitted to languish in the halls of the *Coccidæ*.”

This was said of the *Pine-leaf scale-louse*, and Riley, in the Insects of Missouri, Fifth Report, 1873, p. 73, gives also a very full and interesting account of another Scale-louse, “*Mytilaspis pomicorticis*,” in which the natural history and complete biology of the acrian *Coccidæ* are well elucidated. Since then, Prof. Signoret in his monograph has described a quantity of males, among which I had the good luck of finding some new ones, but all *winged*.

Now there is a very common large Coccidian (noxious in our country), which lives underground, sucking the roots of grain-plants, such as *Avena*, *Triticum*, *Hordeum*, &c., known long ago, and it most likely is that already described (if it can be called a description) by Fabricius, under the name *Coccus phalaridis*, which “*habitat ad graminum radices*;” and after that it was more accurately examined by Boyer de Fonscolombe (Ann. Soc. Ent. Fr., 1834); Bärensprung, Journ. Zool. and Paleont. 1848; Targioni Tozzetti, 1867; and Signoret, 1874; although the last seems not to have had in view the same species, but an allied one (*Aclerda*).

Of course the females only are noticed by all these authors, as “a large mealy-bug, exuding a white cotton-like secretion, which forms a bag around and behind in which the eggs are deposited.”

It is rather a large insect for the family to which it belongs; its length is about 6 millimetres by $2\frac{1}{2}$ to 3 wide, of an oval form, with 6-jointed antennæ and well-formed legs, *which the animal preserves until death*.

Now, as I found some days ago that these females began to fix themselves to form their egg-bags, I supposed it was the moment to look for the males, and I had the good fortune to find one. It is quite different from the female, its size being only 0.75 mm., or $\frac{3}{4}$ of a millimetre; the head is rounded, with two eyes on the side, and two eye-like black spots under in place of the mouth parts, which are wanting; the 9-jointed antennæ are 0.29 m., or $\frac{1}{4}$ of a millimetre, the thorax and abdomen elongated and much in the same form as in all other males in the *Coccidæ*, but the wings are totally wanting and only very short, little, rounded appendices indicate the place where the wings should be. At the end of the abdomen, two little hairs on each side support a snow-white elongated caudal seta, which is half a millimetre long, but as it is formed only by secretion it disappears when put into liquid under the microscope; between these two white tails is the pointed and rather incurved penis.

The insect takes its place in classification close to *Gossyparia*, Sign. (the *Coccus ulmi*, auct.), where the male is also wingless; although Signoret describes it and gives the figure as being a nymph, I am sure it is a well-formed male, having seen the act of pairing many times. I would suggest for the "*grass-root mealy-bug*," which can no more remain as a true *Coccus*, the name of *Fonsecolombia graminis*, in honor of the author who first described it in 1834, under the rather long name of *Coccus radicum graminis*.

La Lironde, Montpellier: June, 1877.

OCCURRENCE OF TWO SPECIES OF *TRICHOPTERYGLA* NEW TO
BRITAIN (INCLUDING ONE NEW TO SCIENCE).

BY THE REV. A. MATTHEWS, M.A.

Several specimens of the *Trichopteryx*, which I now describe under the name of *T. seminifera*, have long been standing in my collection as doubtful examples of *T. attenuata*.

But having recently examined them very carefully, I feel convinced that they belong to a species distinct from any yet known. I have also seen examples of this form in collections which have been sent to me for examination, and in all such cases have returned them named "*T. attenuata?*"

Any one, therefore, who possesses a specimen so named by me, will probably find that it agrees with the description I give of *T. seminifera*.

Except the single example which I found in Sherwood Forest, I have seen no *Trichopteryx* which really agrees with Gillmeister's description of *T. attenuata*.

TRICHOPTERYX SEMINITENS, *n. sp.*

L. c. $\frac{5}{10}$ *l.* = *vix* 1 *mm.* *Oblongo-ovalis valde convexa nigra nitidissima, pilis pallidis parvis induta; capite magno, oculis magnis prominentibus; pronoto sat magno, postice dilatato, ad basim latissimo lateribus leviter rotundatis, tuberculis sat magnis ordinibus sinuatis sat remote dispositis, interstitiis nitidissimis vix reticulatis ornato; elytris brevibus capite atque pronoto multo brevioribus parum angustioribus, postice attenuatis, ordinibus sinuatis sat remotis sat profunde asperatis, apicibus latis leviter rotundatis; abdomine longius exserto apice sat obtuso; antennis sat brevibus piceis; pedibus robustis brevibus obscure flavis.*

Head large, very shining, produced triangularly in front, minutely and remotely tuberculate. Eyes large and prominent. Antennæ rather short, slender, piceous.

Thorax large, very convex and very shining, much longer and wider than the head, much dilated posteriorly, widest at the base, adorned with rather large tubercles disposed in remote sinuated rows, with the interstices very shining and very faintly reticulated, sides margined and slightly rounded, posterior margin depressed, pale, and rather deeply sinuated, with the angles broad and much produced. Scutellum large and broad triangular, deeply and closely asperate. Elytra short, attenuated posteriorly, much shorter and rather narrower than the head and thorax, rather deeply asperated in remote sinuated rows, with the interstices shining, sides almost straight, apices broad, slightly rounded, narrowly paler, with the extreme edge white.

Abdomen much exserted, rather obtuse, with the apex minutely bidentate. Legs rather short, robust, dark yellow. Under-parts black, with the mouth and coxæ yellow.

Differs from *T. fascicularis* in the greater convexity of its form, the shining surface and remote sculpture of the thorax and shorter piceous antennæ, from *T. attenuata* in its larger size and much greater convexity, shorter antennæ, and in the sculpture of the thorax.

PTILUM MARGINATUM, *Aubé.*

I have found four specimens of this species among some insects which had been taken by myself and Mr. Crotch during an excursion into the fens of Cambridgeshire and Norfolk in 1868, and subsequently reserved for further examination.

Pt. marginatum may be known from *Pt. Spencei* by its usually larger size, the greater width and closer sculpture of the thorax, which is widest at the base, with the basal margin evidently reflexed.

Gunley: May, 1877.

THREE NEW SPECIES OF LONGICORN COLEOPTERA FROM JAPAN.

BY H. W. BATES, F.L.S.

I have been favoured by Mr. George Lewis with the opportunity of describing the following three interesting new species of Longicorns from Japan, which increase the total number recorded from those islands to 214.

ALLOTREUS, *nov. gen.*Sub-fam. *Phoracanthinæ.*

Corpus elongatum, angustum, supra planatum. Caput breve; oculis prominulis profunde emarginatis. Tubera antennifera vix elevata, obtusa. Antennæ (♂ ?) corpore paulo longiores, setaceæ, articulis 2—7 subtus longe ciliatis, articulo 4^{to} præcedenti et sequenti paulo breviori, tertio supra canaliculato, 3—6 apicibus intus breviter spinosis. Thorax oblongus, medio paululum dilatatus, supra quadrilobosus. Elytra omnino punctata, apice utrinque juxta suturam emarginata et bispinosa. Femora modice clavata; tibiæ posticæ haud canaliculatæ; coxæ anticæ rotundatæ, haud exsertæ; prosternum et mesosternum sublata, plana.

A genus in some degree intermediate between Lacordaire's "Groupes" *Phoracanthides* and *Sphæronides*; agreeing with the latter in facies, but in most of its characters with the former, which consists solely of American species.

ALLOTREUS SPHERIONINUS, *n. sp.*

Elongatus, sparsim pubescens, vix nitidus, testaceo-rufus, antennis pedibusque nigris; supra crebre at discrete punctatus, thoracis spatio dorsali lævi, nitido; elytrorum apice prope suturam breviter emarginato et bispinoso. Long. 7 lin.

LEPTOXENUS, *nov. gen.**(Sub-familæ Eligmodermiarum affinis)*

*Corpus lineare. Tubera antennifera vix elevata. Antennæ (♂) corpore paulo longiores, filiformes, nudæ, teretes, articulo tertio quinto breviori, quarto paulo longiori. Thorax breviter cylindricus, elytris angustior, lateribus utrinque unilobosus, dorso inæqualis. Elytra valde elongata, apice rotundata ut in speciebus nonnullis generis *Ibidion* figurata. Pedes graciles, femora vix incrassata, tarsorum articulo primo valde elongato. Coxæ anticæ exsertæ, prosternum mesosternumque angusta.*

This genus, like *Allotreus*, resembles Tropical American much more than Old World forms. It scarcely comes within the definition of Lacordaire's Groupe *Eligmodermides*, owing to its depressed antenniferous tubers.

LEPTOXENUS IBIDIIFORMIS, *n. sp.*Sub-fam. *Pogonocherinae.*

Linearis, subopacus, fulvo-testaceus, thorace plagis duabus dorsalibus atro-fuscis, elytris fasciis tribus pallide-testaceo-fuscis, apice fasciæque obliqua flexuosa ante apicem albo-testaceis. Long. 6½ lin.

Elongate, linear, elytra very long relatively to the head and thorax; legs slender, hind thighs reaching the apex of the abdomen. Head, thorax, and apical portion of the elytra clothed with a fine hoary pubescence, which on the tuberculated disc and sides of the thorax forms whitish streaks; on each side of the dorsal line of the latter is an elongated dark patch. The elytra are of a general tawny-testaceous hue like the underside of the body, head, antennæ, and legs; they are closely and finely punctured except towards the apex, and crossed from the base with four fasciæ of irregular width, alternately paler and darker; a whiter and more oblique fascia succeeds the fourth, and this is followed by a tawny belt leaving the apical portion again whitish; the posterior fasciæ are all narrowly margined with fuscous.

This interesting species bears a strong general resemblance to certain species of the South American group *Ibidiinae*, such as *I. polyzonum*, *Sommeri*, *vanum*, &c.

RHOPALOSCELIS MACULATUS, n. sp.

Cylindricus, thorace basi angustato, atro-fuscus, pilosus, elytris castaneo-rufis, macula utrinque laterali apiceque late atro-fuscis, basi utrinque penicillatis; antennis pedibusque rufo-testaceis, femoribus fuscis.
Long. 2 lin.

Agrees very well with Blessig's genus *Rhopaloscelis*, founded on an East Siberian insect allied to *Pogonocherus*, but does not possess the dilated anterior tibiæ, which, however, is but a slight character and may well be specific. The fine erect hairs which cover somewhat thinly the surface of the body do not conceal the punctation of the elytra, which is coarsely and sparsely distributed over their whole surface. The antennæ are finely fringed beneath.

Kentish Town: *June, 1877.*

Note on capture of Leistotrophus cingulatus in Devonshire; with Obituary notice of the Rev. H. Matthews.—A fine specimen of this beautiful insect was taken by my late brother, the Rev. H. Matthews, during an excursion (the last he ever made) into the north of Devonshire, in August, 1874. He had collected chiefly in the neighbourhood of Westward Ho and Ilfracombe, and near one of those places must have found the *Leistotrophus*. In Devonshire, he was attacked by the malady which eventually put an end to his life. During his long illness, his captures were laid aside; and it was only in this last summer that I began to examine them. I have not seen a type of *L. cingulatus*, but from the very clear differential characters pointed out by its describer, Gravenhorst (*Coleoptera Microptera*, p. 166), feel sure that the specimen taken by my brother must belong to that species, and as such can only at present be regarded as accidentally introduced into this country; although its occurrence in a locality so far removed from commerce is somewhat singular.

While thus recording his last important capture, I think I may be excused for adding a short notice of the entomological work of my late very dear brother. As

a collector but few have ever been more successful, he seemed intuitively to recognise any strange form instantly on its appearance, and many of the best species recorded by myself in the pages of the Ent. Mo. Mag. and other publications have been the result of his labours. Assisted by another brother (Mr. J. B. Matthews), in Vancouver's Island he amassed a vast number of rare *Coleoptera*, including *Zacotus Matthewsii*, *Amphizoa Lecontei*, *Amphizoa Josephi*, and many others new to science. Of these collections, which he brought with him on his return from Vancouver's Island in 1869, and of my brother's work, Dr. Le Conte, in the Annals and Mag. of Nat. Hist., Dec., 1867, speaks in terms of the highest praise. "They have," he says, "with great zeal explored the wildernesses of British Columbia and Vancouver's Island, and, in fact, have obtained the best material yet procured for a study of the distribution of species in those regions, which remain, in a scientific sense, the most unexplored portions of North America." The difficulties with which an entomologist has to contend in those regions will be more clearly understood by the fact, that several expert collectors, including the late Mr. G. R. Crotch, have since failed in the attempt to emulate my brother's work.—A. MATTHEWS, Gumley: 27th Jan., 1877.

[*Leistotrophus cingulatus* has only hitherto been recorded from North America.—Eds.]

Note on Osphyra bipunctata.—I have two specimens of *Osphyra*, apparently ♂ & ♀, of a very peculiar description. They combine the colour of the ♂ *O. bipunctata* with the ♀ form, and are not more than one-quarter of the usual size of that species. They were taken during an excursion to the Fens near Whittlesea, in which, as a boy, I accompanied my father in 1830; at the same time we also captured a single ♀ of the normal form of *O. bipunctata*. They were all subsequently shown to the late Mr. Curtis, who figured the larger and one of the smaller specimens in his "Illustrations of British Entomology," suggesting a doubt as to whether the latter, which had been named "*marginalis*" by my father, was truly distinct. I now mention this circumstance, in order to record the occurrence of this form in *Osphyra bipunctata*, for I cannot find any characters to justify its separation from that species.—ID.

[I can fully endorse Mr. Matthew's record of the extreme variability in structure and colour of this species, which is well described by Redtenbacher, and has indeed caused it to be named by various authors *prausta*, *anceps*, *clavipes*, and *bimaculata*. In a considerable series of recent examples from Monks Wood I found many forms, as is to be expected where a marked sexual disparity occurs. See my "British Beetles," 1866, p. 164.—E. C. R.]

Supplementary note to Dr. Sharp's descriptions of New Zealand Coleoptera.—Since my last paper on New Zealand *Coleoptera* was sent to the Editors of this Magazine, descriptions of two of the species have appeared elsewhere, so that *Phymatophæa hilaris*, Sharp, is a synonym of *Mathesis guttigera*, C. O. Waterhouse, Trans. Ent. Soc., April, 1877, p. 8, and *Macratrìa verticalis* is a synonym of *Macratrìa exilis*, Pascoe, Ann. and Mag. Nat. Hist., Feb., 1877, p. 8.—D. SHARP, Thornhill: June, 1877.

Colias Edusa at Lewisham in June.—On the 7th inst., two *C. Edusa* came into my garden here; on the 10th there were several: many others have been seen in the neighbourhood. This is about the last insect I would have expected to find in my garden at this time of year. Truth is certainly sometimes stranger than fiction. It is often supposed that stray examples captured in the spring have hibernated. Possibly this may sometimes be the case: but some other explanation must be sought for the present anomalous (for England) appearance. Either they are examples that should have come out last autumn, but were checked by uncongenial weather, or they have remained in the pupa-state for a protracted period, or perhaps there is a little of both these causes. To my idea, the latter may probably be the more potent of the two if both time and *place* be taken into consideration. I have this June seen more *C. Edusa* here in two days than in eight years, even at their usual period. Of course it will be very interesting to have a series of records from other parts of the country.* The present apparition shows us how little we really know of the habits of our species of *Colias*.—R. McLACHLAN, Lewisham: 13th June, 1877.

Colias Edusa in London.—To-day I saw this butterfly flying wildly not far from Buckingham Palace.—ID.: 16th June, 1877.

Colias Edusa near Taunton.—Two specimens were flying about my garden this morning. *Tanessa cardui* is very abundant, and in splendid condition.—MURRAY A. MATHEW, Bishop's Lydeard, Taunton: 15th June, 1877.

Colias Edusa in Hampshire.—In this neighbourhood during the past and present week, *Edusa* has appeared in great numbers, culminating perhaps on the 11th inst., when they were seen in all directions.

The fields of clover and *Trifolium* in blossom seemed very attractive to these butterflies, and it was not uncommon to see them flying at each other; once on that day I saw as many as six together in a confused flight, rising and falling by turns as they seemed battling together. I also saw one captured by a swallow.

But on the 12th, a very interesting fact (not, I think, hitherto specially recorded) concerning a food plant selected naturally for its offspring by this butterfly, was brought to my notice by the Rev. E. T. Daubeny, of Bedhampton, who watched a female alight on a sprig of *Lotus corniculatus*, and distinctly saw her lay a couple of eggs on it, whereupon he captured, and kindly brought her alive to me, together with part of the plant bearing the eggs.

Placed on a fresh plant of this bird's-foot trefoil within a glass cylinder, and set in the sunshine, this female re-commenced laying, and, within a few hours, deposited a large number of eggs. This individual female seemed certainly worn; nevertheless, I strongly incline to the belief, that by far the greater number of those I saw on the wing must have passed the exceptionally mild winter in the pupa state.—WILLIAM BUCKLER, Emsworth: June 15th, 1877.

* In "The Field" for 17th and 24th June, the following localities and dates are recorded for *Colias Edusa*:—Jedburgh, Roxburghshire, 17th; Wolsingham, Durham, 3rd; Bishop Auckland, 16th; Masham, 10th; Chester, 12th; Worksep, 4th; Repton, 15th; Llandudno, 17th; Hanworth, Norfolk, 18th; St. Albans, 4th; Reading, 18th; East Moulsey and Eltham, 7th; Regent's Park, 10th; Bighbury, 13th; Farringdon Street, 14th; Brighton, with *C. Hgale*, 4th; Portsmouth, 6th; Sidmouth, 5th; Dartmouth (with var. *Helice*, 4th; St. Ives, 9th; all in the month of June. One instance, from Newbury, S. Devon, is on 31st May. In many of these cases, the continued appearance of the butterfly from the date given is especially noted, as also is the freshness of the specimens. Of those seen at Brighton, Mr. H. C. Mallen says:—"they had apparently just landed from France, and were easily caught; they were flying inland for several days; the females were by far the most numerous."—E. C. R.

Colias Edusa in Hampshire.—Is it not very early for *C. Edusa*? I saw one on June 5th, and have heard of several being seen since in this neighbourhood. I do not remember having ever seen them in June before.—L. M. S. PASLEY, Shedfield, Botley, Hants: June, 1877.

Colias Edusa at Chatteris.—The occurrence of *Colias Edusa* as early as June 4th is perhaps worth recording. The insect (a large and rather worn male) flew across the corner of the court in which I was playing lawn-tennis. Judging from the time of its appearance, its worn condition and the great heat of the day (76° in the shade), I should say it was no doubt a hibernated specimen.—HERBERT FORTESCUE FRYER, Chatteris: June 9th, 1876.

Chærocampa neri.—I have just had the pleasure of adding to my collection the specimen of *Chærocampa neri* taken at Hemel Hempstead, Herts, on the 13th of October last. It is a fine large ♀ specimen, but is short of a small piece of the lower left wing, which was unfortunately taken out whilst the man was capturing it. Its British authenticity is thoroughly established.—GEO. T. PORRITT, Highroyd House, Huddersfield: June 4th, 1877.

Collections of British Lepidoptera.—It is encouraging to see at last a well-known name like that of Mr. Birchall to an article on our insular prejudice against insects of continental origin. It must indeed need a large amount of infatuation to believe that a large portion of the rarities shown in cabinets are British captures, and when really such, what do they after all prove in most instances? Nothing. No new species, in the true sense of the word, has been added to the British list, but merely a foreign insect has lost its way and had the melancholy distinction of being pinned on British soil. No doubt some additional value is thus given to such a specimen, but not the exaggerated one so universally set.

Amongst the general body of collectors, how lamentable is the ignorance on any point, not purely of insular interest; and yet, by a slight study of the European Fauna, how much those who have some little deeper aim than merely the desire of acquiring a number of insects, would find their means enlarged of taking an extended and comprehensive view of their favourite subject! There is much to interest in the comparison of foreign with English specimens of the same species, and also in finding the gradual passage from one genus to another much more completely illustrated than can be seen by the limited British list. Amongst the *Noctuidæ*, for instance, how little the beauty of some species is known to the ordinary British collector. Few are aware that our sober coloured *Cucullia* pass by steady gradations to the brilliant light green and silver of the common South German *Cucullia argentea*; that the genus *Heliothis* includes the rich magenta-tinted, but equally common German *delphinii*, or the rarer delicate rose-pink of *Treitschki*; that our handsome *Plusia* are rivalled by several common French and German species, or that the large subdivision of the yellow underwinged *Catocala* will bear contrast with our own richly coloured species. All this and much more they might learn if they would enlarge their present limited range of study!

Mr. Birchall rightly hints, it is a want of liberal ideas rather than the difficulty of obtaining continental insects. Like him, I can say their acquisition is not difficult. My special study is that of the European *Noctuidæ*, and out of the total number of about 850 species in Europe I have obtained about 500 with little more trouble and expense in getting the continental than the British. I also add specimens from various parts of the Continent to my series of British species, and am much interested

in the comparison of the frequent variations. I hope other men, better known to your readers than me, will take up the subject and urge it upon general attention, for want of interest in all things continental is at present justly a reproach to us.—N. T. DOBRÉE, *The New Walk, Beverley: May, 1877.*

Description of the larva, &c., of Earias chlorana.—On July 7th, 1875, Mr. A. Thurnall sent me for identification three larvæ, which he had found in little bundles of leaves on the topmost twigs of osiers. I had never seen the species in this stage before, and did not at once remember what I had read of it, nor was it till the larvæ, on spinning up against the side of their cage, gave me a further clue to their identity, that I looked at the right page of Stainton's Manual, and found all I wanted: I had before been looking for them among the *Bombycina*, thus unconsciously paying tribute to the correctness of the new arrangement, which places *Earias* in that family; and I have noted below the little points which all tended to give me that impression.

I should say I bred the moths on June 11th and 13th, 1876.

When full-fed this larva was from $\frac{2}{8}$ to $\frac{3}{8}$ inch long, with sixteen legs, stout and thick in figure, thickest in the middle and front segments, less so behind; when it is at rest, and is viewed sideways the back is seen to rise gradually from the second segment to the sixth, and thence to fall as gradually to the eleventh, then to rise again on the twelfth and fall to the end of the thirteenth; the head fits into the second segment, within which it is often withdrawn as in *vinula*; on the third, fourth, and sixth segments occur pairs of rather pointed tubercles, small on the third and fourth, conspicuously larger on the sixth; again on the back of the twelfth are two prominent tubercles blunt-tipped as in *camelina*; the anterior segments more deeply divided than the others, the skin soft and wrinkled transversely on the back as far as the spiracles as in *caecullina*; the ventral and anal legs of thick proportions: in colour the head is lightish green with a large round blackish frontal spot on each lobe, a blackish transverse streak above the mouth which is itself dark brown, the papillæ whitish: the ground colour of the back is whitish, in one variety pinkish, with a thin dorsal line and a broad sub-dorsal, lateral and spiracular stripes of light rust-brown, the sub-dorsal stripe being broadest and suddenly very much darker brown at the tubercles on the sixth segment, continuing thence dark towards the head; the tubercles and front portion of the sub-dorsal stripe on the twelfth segment also equally dark rust-brown; the spiracles are black surrounded broadly with whitish, and close beneath them runs an inflated stripe of pure white, the belly and legs very pale bluish-green, their hooks dark brown; in addition to the more conspicuous tubercles mentioned the other usual situations have whitish wart-like spots, each bearing a fine soft hair. Just before spinning one of the larvæ became of a light olive-greenish tinge all over—the other a pinkish flesh-colour.

The cocoon is about $\frac{3}{8}$ inch in length by $\frac{3}{16}$ in width, closely and firmly attached to the surface on which it is made, its shape suggests the idea of a broad boat turned bottom upwards and rather prominently keeled at one end by what is really a bluntly beaked projection inclined a little upward, while at the rounded-off opposite end are two rather long silken moorings, the base and sides of each converging into tapering points which seem outworks of additional security; the colour of the cocoon is naturally of a light drab, the projection dark greyish-brown; but like *vinula* the larva, in finishing off the exterior, picks up particles from the neighbouring

surface on which it is constructed, and contrives, by sticking them on its work, to make it harmonize with its surroundings; I noticed that, as in the case of *vinula*, the moth makes its escape by a small orifice at the top, while the rest of the cocoon remains so hard and tough that one must use the forceps to pull it further open; the inside is lined with a smooth cloth-like substance.

The pupa-skin measures $\frac{5}{16}$ inch in length, thick and dumpy in its proportions, the wing-covers and antennæ-cases long, the end of the abdomen very bluntly rounded with, on each side near to the previous segmental division, two slightly projecting and divergent minute points; the colour of the upper surface darkish brown, deeply tinged on the thorax and back of abdomen with dark purple, the wing-covers and all the under parts light brown, the whole surface entirely without gloss.—WILLIAM BUCKLER, Emsworth: *June 11th, 1877.*

Biston hirtaria: which sex possesses the power of attracting the other?—My attention has been drawn for the last two years to the above question by observing that the males, after drying their wings and finding a suitable place to rest, remain on or about the same spot until they pair, which, in one instance that came under my notice this season, was on the thirteenth day, whilst the females seldom remain more than one or two days on the same spot. Thinking that perhaps the male possessed the power of attracting the female, I tested it with the following result. On Tuesday morning, April 3rd, I saw two males on a row of lime trees in the Hampstead Road, and after clipping a piece off the wing and drawing a pencil mark round them I left them till the following morning, when they were both *in cop.* with females, which I am certain were not on the trees the previous evening. In one pair, the male just rested on the pencil mark, having moved a space of about two inches; while in the other pair he had not moved half-an-inch. The following week, I pinned three females and two males to the same trees, but these were removed by some one before the following morning. The following afternoon, I pinned one male and two females to some poplar trees in Regent's Park, and the next afternoon the male was *in cop.*, whilst one female had deposited her eggs, and the other remained for three days without any change, when I removed her. The weather being so cold, I did not see any more till the last week in April, when I took two males and two females all fresh, and the same evening I placed them on two lime trees in Camden Town, a pair on each tree, the males as high as I could reach, the females about two feet from the ground. I notched all their wings but did not pin them. The following morning, one male was *in cop.* with an unmarked female, whilst the one I had marked and also another were on the same tree. The other pair which I had marked were *in cop.* Since then I have not seen any, and do not expect to see any more this season, and although the evidence which I have here given seems quite satisfactory to me, I do not lay it down as a rule, but rather as a hint to see if any one has had any idea or knowledge of the fact of the male possessing the attracting power, which seems quite contrary to the general rule in *Lepidoptera*.—H. SILCOCK, West London Entomological Society: *May 4th, 1877.*

A Lepidopterous enigma.—Rennie, in his "Insect Architecture," 2nd edit. ii, 156 (1845), after stating that he had reared three examples of *Drilus flavescens* from larvæ which fed on the body of a snail (*Helix aspersa*), found in the summer of

1829 at Blackheath, continues thus:—"In the following autumn we found a shell of the same species with a small pupa-shaped egg deposited on the lid. From this a caterpillar was hatched which subsequently devoured the snail, spun a cocoon within the shell, and was transformed into a small moth (of which we have not ascertained the species) in the spring of 1830." It would be interesting to learn if this very curious statement has ever been practically tested, and with what result. It would seem that the caterpillar fed on the living snail, but, as far as I am aware, parasitism on soft living animal structure is not known to pertain to any Lepidopterous larva. Some phytophagous caterpillars have a propensity to attack other caterpillars voraciously, but this is an abnormal appetite. The larva of the moth *Epipyrops anomala*, Westw., which lives attached to the body of *Fulgora caudataria*, there is good reason to believe feeds, not on the substance of the body of its fosterer, but on the waxy secretion thereof. (Trans. Ent. Soc., 1876, p. 521). The only approximate instance of Lepidopterous larvæ feeding on living animals that I can find recorded is reported in the Proceedings of the Dublin University Zoological Association, 21st December, 1856 (Nat. Hist. Review, iii, proceed., p. 23), when there were exhibited horns of the antelopes *Oreas Casana* and *Kobus ellipsiprymnus* which were perforated, while on the living animal, by numerous larvæ, which the evidence alluded showed were of some species of *Tineidæ*, but none had survived to the perfect state. Mr. Haliday observed that the most remarkable point was that the larvæ fed in the horns while the antelopes were living. It was also reported to the meeting that some horns of the Gayal, in the University Museum, were perforated by similar larvæ even more extensively than the others above mentioned. The subject was alluded to at the Meeting of the Entomological Society, November 18th, 1867 (Trans. Ent. Soc., 3 Ser. v, proceed. cv). The moth was described by Zeller as *Epilocamus vastellus*, and by Stainton as *Tinea gigantella*.—J. W. DOUGLAS, Lec: 3rd May, 1877.

Dimorphism and alternation of generations in Cynipidæ.—Without further comment, we call attention to what appears to be an extraordinary discovery, as noticed in the "Petites Nouvelles Entomologiques" for June 15th. M. Lichtenstein has announced to the French Entomological Society, on the authority of Dr. Adler of Schleswig, that *Spathegaster baccarum* which is produced from "currant galls" on the oak, and of which both sexes are known, is only a condition (or *vice versa*) of *Neuroterus lenticularis*, which latter (all females) is produced from eggs laid by the females of the *Spathegaster* deposited in the young leaves. The *Neuroterus*, in its turn, lays its eggs in the buds of the oak, which eggs produce the *Spathegaster*.

P.S.—A fuller report of this communication is printed in the Bulletin of the French Entomological Society, Meeting of May 23rd, 1877. In addition to the above-mentioned, the following are declared to be connected in the same manner, viz.:—*Neuroterus fumipennis* and *Spathegaster albipes*, *N. numismatis* and *S. vesicatorix*, *Dryophanta scutellaris* and *Trigonaspis cristalis*, *D. longicentris* and *Spathegaster Taschenbergi*, *Aphilothrix radialis* and *Andricus noduli*.—EDS.

Homoptera near Norwich.—In March last I beat from spruce fir *Gnathodus punctatus*, *Typhlocyba 10-punctata*, and several examples of *T. liliæ*; and, on the 28th May, I obtained at East Carlton near here, from mistletoe, three examples of a *Psylla*, which agrees with the description of *Ps. rosei*, Curt.—JAMES EDWARDS, Bracondale, Norwich: 7th June, 1877.

Review.

NINTH ANNUAL REPORT ON THE NOXIOUS, BENEFICIAL, AND OTHER INSECTS OF THE STATE OF MISSOURI; by CHARLES V. RILEY, State Entomologist. Svo, pp. 129. Jefferson City, 1877.

The pleasing duty of noticing Prof. Riley's Annual Report again devolves upon us. In this 9th Report the author, in giving full scope to his keen powers of observation, minuteness of detail, and the skill with which he uses his pencil, and at the same time in shewing a regard for that scientific accuracy unfortunately too often neglected in works on economic Natural History, maintains his right to be termed the foremost economic entomologist of the day. The contents of this Report are very varied—more so, perhaps, than those of any of the preceding. As a commencement, there is a chapter on currant and gooseberry worms, beginning with a moth (*Euflechia ribearia*), which, in its habits and larva-state, greatly resembles our *Abraaxas grossulariata*, but which, nevertheless, is apparently not congeneric with it: then follows our too-familiar gooseberry saw-fly, imported into America, and proving as great a pest there as with us; and the chapter is concluded by a notice of a native saw-fly (*Pristiphora grossulariæ*) which is also destructive to currants and gooseberries. A saw-fly (*Emphytus maculatus*) that injures strawberries is briefly alluded to, as are also two species of the pine-destroying genus *Lophyrus*. The Colorado potato-beetle figures as conspicuously as heretofore, and Prof. Riley still maintains his opinion that if it should once get a footing in these islands, it will rather enjoy our climate than otherwise. Considerable space is devoted to an "Army-worm" (*Leucania albilinea*) which has suddenly made itself obnoxious, and destructive to wheat in the ear. There are notes on two "Innoxious Insects," *Corydalis cornutus* and *Megathymus yuccæ*, of the former the eggs are described, proving that those formerly considered to pertain to *Corydalis*, were more probably those of the enormous water-bug—*Belostoma grandis*. But more than half the volume is occupied by a most extended Report on the Rocky Mountain Locust, which has already become an object of legislative solicitude, Congress having passed acts relating to its destruction, applicable to the states of Missouri, Kansas, and Minnesota; in addition to a multitude of wood-cuts, a capital map shewing, by dark shading, the districts in which it proved destructive in 1876, is given. Most interesting are the detailed results of experiments of freezing and thawing, moisture, burying at different depths, and exposure to free air, upon the egg-masses: the results appeared to shew that:—(1) frost has no injurious effects; (2) alternate freezing and thawing is far less injurious than was generally supposed; (3) the breaking open of the egg-masses and exposing them to free air is the most effectual means of destroying them, hence the importance of harrowing; (4) moisture has little effect, excepting where land can be flooded for two or three days at the time the young are hatching. We hear at this moment what the Report does not tell us, viz.: that a "Grasshopper Commission," has been instituted, with government aid, and that Prof. Riley has been appointed chief commissioner, and with him are Dr. Packard and Prof. Thomas the well-known Orthopterist, each taking certain districts, and certain distinct branches of investigation. It is expected that the meteorological department will act in unison, and it is hoped that the co-operation of the Canadian government will be obtained.* Probably there has never before been so marked an instance of a country using exhaustive endeavours to combat an insect pest.

* Since these remarks were written, we have received No. 1 of a periodical, styled the "Bulletin of the United States Entomological Commission," referring to the means of destroying the "young or unfledged" Locusts.

We have already exceeded the space usually devoted to bibliographical notices, and, as heretofore, heartily recommend Prof. Riley's Reports to all who take an interest in economic entomology.†

ENTOMOLOGICAL SOCIETY OF LONDON: 6th June, 1877.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the Chair.

Monsr. René Oberthür, of Rennes, was elected a Foreign Member.

Mr. Douglas exhibited 16 species of *Psyllidæ*, taken by him in the latter part of last year, four of which were new to Britain, viz.:—*Psylla betulæ*, L., on birch-trees, Dunkeld, August; *Ps. peregrina*, Först., on mountain ash, Perth, August; *Ps. pyricola*, Först., on pear-trees, Perth and Rosslyn, August; *Ps. Scotti*, Löw, on fir, Addington, October. He called attention to the wide and little occupied field the *Psyllidæ* offered for the discovery of new species and the observation of economy, some rolling or deforming leaves, some exuding a waxy secretion, and others living free. The natural history of many species is quite unknown, and the rearing of any from the egg or larvæ was commended to the special attention of those who have reared *Lepidoptera* as being quite as easy as in insects of that order, and equally interesting.

Mr. Grut exhibited a large cottony substance formed round the stem of a shrub in Jamaica, which was evidently the mass of cocoons of some species of *Proctotrypidæ*, perfect examples of which were contained in it. It was suggested that it had originally been formed round the body of some large larva, which had dropped out of the cottony cylinder.

Mr. Goss exhibited a dark variety of *Cleora glabraria*.

Mr. C. O. Waterhouse exhibited a magnificent Dragon-fly of the Family *Æschnidæ* from Borneo. It pertained to the genus *Gynacantha*, and was 6½ inches in expanse; being especially remarkable for the wings having the costal margin broadly brown as far as the pterostigma, and with a very broad band of the same colour across the wings just before the apex. He proposed to call the insect *Gynacantha plagiata*.

A letter was read from Dr. Buchanan White asking entomologists to assist him with specimens of exotic *Hemiptera*, he being engaged in working at the Order.

Dr. Sharp communicated remarks on some species of Rhyncophorous *Coleoptera* from New Zealand.

Mr. J. W. Slater communicated a paper on the food of gaily coloured caterpillars, in which the author attempted to show that brightly coloured larvæ usually fed upon poisonous plants. He was followed by Mr. Meldola who expressed an opinion that some species of *Lepidoptera* preserved their distasteful qualities after they were dead and dry, as evinced by an old collection which had been neglected, and, the only examples not destroyed by mites were all "protected" species, such as *Euplexa*, *Danaïs*, &c. Considerable discussion ensued on both questions. With regard to the latter Mr. McLachlan called attention to the fact that dried *Cantharides* were well-known to be devoured by beetles.

The Rev. A. E. Eaton said that, a few days previously, he had seen *Colias Edusa* in Dorset. Mr. S. Stevens said it was common near Gravesend on the 4th.

† From a private letter we learn, with regret, that this Ninth Report is likely to be the last.

LIST OF *HETEROCEROUS LEPIDOPTERA* RECENTLY COLLECTED
BY THE REV. T. BLACKBURN IN THE HAWAIIAN ISLANDS.

BY ARTHUR G. BUTLER, F.L.S.

The seventeen species enumerated below, as might be expected, have an intermediate character between the *Lepidoptera* of Australia and North America; most, if not all, of them were probably collected at Honolulu, where Mr. Blackburn is at present; they were forwarded by him to Mr. N. C. Tuely, who has kindly presented them to the National Collection.

Family SPHINGIDÆ.

Sub-family CHEROCAMPINÆ.

DEILEPHILA LIVORNICA, Esper (No. 13).*

Five examples of this widely-distributed species, differing in no respect from the typical form.

Sub-family SPHINGINÆ.

PROTOPARCE CINGULATA, Fabricius (No. 2).

One fine example of this American species.

Family LEUCANIIDÆ.

LEUCANIA DISLOCATA, Walker (No. 6).

One specimen rather darker than the type. This species is probably endemic; it was described from the same group of Islands.

Family XYLOPHASIIDÆ.

PRODENIA INGLORIA, Walker (No. 9).

Evidently common and somewhat variable (of the five examples collected, no two are quite alike, whilst one example is not at all unlike *P. bipars* of Walker); the type was described from Moreton Bay, and the species probably occurs in other parts of Australia.

Family PLUSIIDÆ.

PLUSIA VERTICILLATA? Guénée (No. 3).

One specimen. It closely approaches *P. precatonis*, from N. America, and *P. eriosoma*, from New Zealand. I do not feel certain of Walker's identification of Guénée's species.

Family HYPENIDÆ.

HYPENA OBSOLETA, *n. sp.* (No. 14).

Primaries above reddish-brown, mottled with black, faintly shot with lilac,

*The numbers are retained for the benefit of the Collector.

becoming bronzy towards the outer margin; a broad paler band crossing the basal half of the wing from the costal vein to the inner margin; this band is excavated on both sides (or gradually constricted) upon the interno-median area, it is followed by a broad ill-defined externally dentated dark brown belt, most clearly defined towards the inner margin; an irregular discal series of black spots from the costa to the second median branch, white-speckled towards the costa; fringe pale reddish-brown, intersected internally by two almost confluent dark grey parallel lines; secondaries smoky-brown with a faint lilacine shot; fringe whitish-brown, with two internal lines as in the primaries, the outer line double the width of the inner: palpi pale reddish-brown; head whitish-brown; collar and thorax pale reddish-brown; abdomen smoky-brown; primaries below pale grey, shot with opaline; the discoidal cell brownish; costal border sandy-yellowish, mottled with black; secondaries sordid whitish with a lilacine gloss, densely mottled with grey; fringes of all the wings whitish, spotted with grey at the termination of the veins, and with traces of the double lines of the upper surface; body below whitish-brown: expanse of wings, 1 inch 1 line.

Two examples.

HYPENA INSIGNIS, *n. sp.* (No. 14).

Wings above pale grey, with a feeble lilacine gloss; primaries with a spot at the end of the cell, a broad sub-quadrate slightly-constricted belt from the external half of the median vein to the inner margin, and a series of discal spots, black-brown: body pale brown: wings below whitish with feeble grey mottlings; body below whitish, legs pale testaceous: expanse of wings, 1 inch.

One example.

Mr. Blackburn seems to have regarded this as a variety of the preceding, but it is so extremely different in coloration and even in the position of the markings, that I cannot believe them to be the same.

Family HERMINIDÆ.

HERMINIA CENEUSALIS, Walker (No. 53).

This species was originally described, from an example taken at Moreton Bay, as a *Sophronia*?; it is allied to *H. nemoralis*: two specimens were sent home.

Family BOTIIDÆ.

BOTYS BLACKBURNI, *n. sp.* (No. 32).

Primaries testaceous, crossed in the middle by two widely-separated strongly-angulated greyish-brown lines which diverge towards the costa, the angle of the inner one upon the median vein, that of the outer one on the first median interspace, the band enclosed by these two lines margined on each side by a diffused sandy-whitish line; outer margin dotted with black; secondaries pale greyish-brown; discocellulars dusky; a dusky angulated line beyond the middle, nearly straight from the first sub-costal branch to the second median, then abruptly inarched and running to near the extremity of the sub-median vein; disc whitish, slightly tinted with reddish

externally, with a central sub-marginal broad greyish nebulous belt; a marginal series of blackish spots: thorax testaceous, abdomen whitish: under-surface uniformly creamy-whitish: expanse of wings, 1 inch, 5 lines.

There is one example of this species; it and the following will form a peculiar group in the genus: *B. Blackburni* has the aspect of *Cledeobia* and *B. accepta* of *Pionia*, but in structure they altogether agree with *Botys*.

BOTYS ACCEPTA, n. sp. (Nos. 17 & 18).

Wings above grey. Primaries with a black dot in the cell; a zigzag oblique line across the centre of the wing, its upper portion crossing the discocellulars (and traversed by two black dots), the longitudinal portion on the median vein, whence it turns off abruptly at the origin of the first median branch, the upper part blackish, the lower part black; a second undulated line, angulated at the second median branch, sordid white, margined within by a black line, and externally by a diffused blackish belt; a white sub-marginal line, bounded internally by a series of elongated black spots, and externally by a black line; fringe white; veins, and a transverse line bounding the inner transverse line, white; secondaries with the discocellular, a post-median straight line (bordered externally with sordid white), a diffused discal belt and the sub-marginal spots and marginal line as in primaries, black; veins, sub-marginal line, and fringe sordid white; body grey, abdomen banded with sordid white; under surface grey; palpi, legs, and margins of wings sordid white; a sub-marginal series of black dots. Secondaries with a black dot on the discocellulars; a dusky diffused belt across the disc. Expanse of wings, 11 lines.

Three examples.

Family PYRALIDÆ.

PYRALIS ACHATINA, n. sp. (No. 26).

Basal third brown, bounded externally by a white and a dusky zigzag line; central area sordid whitish, irrorated with grey, and bounded externally by a dusky and white irregular transverse line; discal or external area sordid whitish, irrorated with grey, especially on the primaries; a marginal series of whitish spots, bounded on each side by black dots; fringe greyish; primaries with the costa black spotted; a black spot at the end of the cell; body whity-brown; under surface whitish, primaries with the basal two-thirds grey, immediately followed by an arched discal grey line, which also occurs on the secondaries; a black spot at the end of the cell; all the wings with sub-marginal and marginal series of grey spots, the inner series partly confluent: expanse of wings, 7—10 lines.

Two examples.

This species has the general coloration of *Ephestia*, but agrees in structure with *Pyralis*; its nearest ally seems to be *P. farinalis*.

Family ENNYCHIDÆ.

RHODARIA DESPECTA, n. sp. (No. 27).

Primaries testaceous, shot with lilacine; the costa clay-coloured, spotted with

grey towards apex ; a slightly angulated transverse grey line near the base ; the two ordinary grey spots in the cell indicated by grey outlines, the reniform rather large ; an irregularly dentated transverse line from the costa to the second median branch, along which it runs to near its origin, and thence in a somewhat sinuous line to inner margin ; a nearly marginal series of black dots ; fringe silver-grey ; secondaries pale shining brown ; head and palpi ferruginous, remainder of body above brown, below white with lateral series of black dots on the venter ; wings below whitish ; a series of marginal black dots ; primaries with costa ochraceous, with four black dots towards the apex ; discoidal cell, and the area below and beyond it, dusky ; a blackish spot closing the cell, and a curved discal series of dark grey spots ; secondaries with two black dots at the end of the cell ; a discal series of pale grey spots. Expanse of wings, 9 lines.

One example.

This species somewhat resembles some of the smaller species of *Botys*, particularly in the marking of the primaries.

Family ASOPIDÆ.

HYMENIA RECURVALIS, Fabricius (No. 25).

Two specimens of this almost cosmopolitan insect.

Family PHYCIDÆ.

EPIHESTIA ELUTELLA, Hübner (No. 24).

One specimen of this widely distributed insect.

Family GELECHIIDÆ.

DEPRESSARIA CONVICTELLA, Walker (No. 39).

Two examples of this little Australian species. It seems allied to *D. capreolella*.

Mr. McLachlan kindly assisted me in determining the genera of the two following species ; but, as they may possibly exist in North America, I prefer to avoid the chance of adding to the synonymy by giving them distinctive names.

Family ARGYRESTHIIDÆ.

ARGYRESTHIA *sp.* (No. 42).

Two examples.

Family ELACHISTIDÆ.

LAVERNA *sp.* (No. 48).

One example.

Nearest to *L. conturbatella*, but darker, rather different in pattern, and with the palpi rather longer.

DESCRIPTIONS OF FOUR NEW SPECIES OF *ACRÆA* FROM LAKE NYASSA.

BY W. C. HEWITSON, F.L.S.

I have again received several hundred butterflies from Lake Nyassa, and anticipating, as was natural, from such an entirely unexplored district, many new and remarkable species, have been again grievously disappointed. The season, which may be partly to blame, has been, even in Africa, as we learn from Mr. Monteiro, at Delagoa Bay, exceptional. Messrs. Thelwall and Simons, from whom I have received the collections, describe the district of Livingstonia as very dry. The four species of *Acræa* which I have described are, with the exception of two or three species of *Satyridæ*, and as many of *Hesperiidæ*, the only new things. There are no *Charaxes* or *Romuleosoma*, with the exception of *R. Neophron*, the only species which we have yet seen from East Africa. The two most remarkable, *Acræa Derbela* and *A. Ventura*, are unique, from the collection of Mr. Simons; the others are from both collections, *A. Caldarena* in abundance, *A. Asema* rare.

ACRÆA DERBELA.

Upper-side dark brown. Anterior wing with the costal margin, from its base to the middle, the median nervure, and its first branch and the inner margin, rufous. Posterior wing with the base, which is marked by a large trifid spot and a sub-marginal series of sagittate spots, rufous.

Under-side as above, except that the anterior wing has the apex broadly rufous, and that the sagittate spots reach to the outer margin.

Exp. $2\frac{5}{10}$ inch.

Completely unlike anything we know.

ACRÆA VENTURA.

Upper-side rufous-orange, with the outer margins broadly dark brown, marked by a series of rufous-yellow spots, chiefly triangular. Anterior-wing with a large, rufous-yellow, sub-apical spot, bordered with dark brown, the brown border broken on its inner margin.

Under-side: anterior wing rufous-orange, a spot at the end of the cell, and the nervures near the outer margin dark brown. Posterior wing yellow, a rufous spot and three black spots near the base, a band of three rufous spots bordered above and below with black spots before the middle; a sub-marginal series of pyramidal spots, broadly bordered above, except between the discocellular nervules, by rufous spots intersected by spots of yellow.

Exp. $1\frac{9}{10}$ inch.

Much like *A. serena* on the upper-side. Unlike anything else on the under-side.

ACREA CALDARENA.

Upper-side fulvous, sometimes tinted with carmine. Both wings with several black spots; anterior wing with a spot near the base, a spot in the cell, another at the end of the cell, two spots below these, and a band of four spots towards the apex, which is broadly dark brown. Posterior wing clouded with brown near the base, which is marked by some indistinct brown spots, two spots below these, and an irregular band of six spots, the outer margin dark brown, traversed by a series of indistinct fulvous spots.

Under-side as above, except that the anterior wing has two black spots at the base of the costal margin, and is without the brown at the apex, and that the marginal spots of the posterior wing are large and lunular.

Exp. $2\frac{7}{10}$ inch.

The sub-apical spots which I have described as four, are sometimes reduced to two or three in number.

This species had also been previously received from the Transvaal, sent by Mr. Bradshaw.

ACREA ASEMA.

Upper-side fulvous. Both wings marked by several black spots. Anterior wing with a spot near the base, a spot in the cell, and another at the end of the cell, a short macular band from the costal margin beyond its middle, a spot below the median nervure (near it), two spots (apart from this), and a sub-marginal series of five spots, *the first three of which near the apex are in a straight line*, the apex dark brown. Posterior wing with several black spots between the base and the middle, more easily counted on the under-side, the outer margin broadly dark brown, traversed by a series of seven fulvous spots.

Under-side as above, except that the apex of the anterior wing has three pale spots instead of the dark brown, and that the posterior wing has seventeen black spots, and the marginal spot larger.

Exp. $1\frac{9}{10}$ inch.

In general appearance, like *A. Oncaea*.

Oatlands, Weybridge: July, 1877.

LIST OF RHOPALOCERA OF THE CHEKIANG AND KIANGSOO PROVINCES, CHINA.

BY W. B. PRYER.

Papilo Pammon (Lin.), *Mencius* (Feld.), *Xuthus* (Lin.), *Xuthulus* (Lin.), *Machaon* (Lin.), *Diphilus* (Esper). *Sericinus Montela* (Gray). *Gonopteryx Aspasia* (Ménétr.). *Colias Hyale* (Lin.). *Terias Mandarinina* (De L'Orza), *leta* (Boisd.)[?], *hecuboides*, (Ménétr.), *vagans* (Wall.), *Anemone* (Feld.). *Anthocaris Scolymus* (Butler), *bambusarum* (Obert). *Pieris sordida** (Butler), *claripennis** (Butler), *Gliciria* (Cram.),

crucivora (Boisd.). *Danaüs Chrysippus* (Lin.), *Tytia* (Gray). *Argynnis Sagana* (Doubl.), *rorar** (Butler), *Niphe* (Godart), *japonica* (Ménétr.), *Ella* (Brem.), *flavescens* (Butler). *Vanessa Angelica*, *cardui* (Lin.), *Callirhoe* (Hübner), *Charonia* (Drury). *Junonia Almana* (Lin.), *Asteria* (Lin.). *Isodema Adelpa* (Feld.). *Apatura Here* (Feld.). *Charaxes Nareæus* (Hewits.). *Neptis sangaica** (Moore), *Pryeri** (Butler), *Eurynome* (Westw.). *Athama Pryeri** (Moore), *Sulpitia* (Cram.). *Hestina assimilis* (Lin.). *Arge meridionalis* (Feld.). *Neope Muirheadi*. *Mycalesis Gotama* (Moore), *Perdiceas* (Hewits.), *sangaica** (Butler). *Iphthima Motschultskii*, *Zodia** (Butler), *megalomma** (Butler). *Palæonympha opalina** (Butler). *Lethe Sygreis*, *lanaris** (Butler), *satyrina** (Butler). *Zameros Flegyas* (Cram.). *Lycæna Argia* (Ménétr.), *Helotia* (Ménétr.), *Argiolus* (Lin.), *batica* (Lin.), *Praxiteles* (Feld.). *Miletus Hamadas* (Druce). *Nephanda fusca* (Ménétr.). *Chrysophanus chinensis* (Feld.). *Dipsas micans* (Ménétr.). *Thecla Eretria* (Hewits.), *Aridiena* (Hewits.). *Anops Bulis* (Hewits.). *Pamphila Mathias* (Fabr.), *guttata* (Brem.), *Mencia** (Moore), *pellucida*, *subhyalina* (Ménétr.), *Dara*, *Maro*. *Hesperia Mangala* (Moore), *Occia* (Hewits.), *Benjamani* (Guér.), *Alexis*. *Antigonus Vasava* (Moore). *Pyrgus maculatus*, *sinicus** (Butler), *Inachus* (Ménétr.). *Nissoniades montanus* (Brem.), *rusticanus* (Butler). *Plesioneura Phodiceus* (Hewits.), &c.

Eighty-six species altogether, of which those marked with an asterisk, fourteen in number, have been described from specimens of my own capture. I am persuaded that there are many more to be obtained in these two provinces; but, during my twelve years' stay in China, from one cause or another, chiefly from pressure of business, I was unable to have more than ten days' collecting altogether in any place except the neighbourhood immediately around Shanghai, where—owing to the want of variety of the vegetation, every inch of the ground being cultivated chiefly with paddy (rice), and there being no woods, waste places, or hedges even, and scarcely a bush—the species of butterflies are very few, and are all to be obtained in one season. The bulk of the business in Shanghai has to be done during the summer six months, and during the winter six months (the two seasons being clearly defined, almost to a day, by the change of the monsoon), when there is a little leisure, there is not an insect to be got. For the benefit of people at home, who think that residents in China have an easy time of it, I may mention that, during the tea and silk seasons, it is a continual drive, from early morning till all hours of the night.

Only twice was I able to get off on entomological excursions, the first time was early in the summer just after the change of the monsoon. I managed to snatch a day or two before the tea market was opened, and availed myself of it to take a run to the hills in the next province (Chekiang); I was only there three days, but was positively astounded at the richness of the country in zoological specimens of all sorts. It was some years before I could go again, but at last I managed to obtain another short holiday in May, and went down better prepared this time. Leaving Shanghai in the afternoon in a large and comfortable American-built steamer, the *cuisine* of which, as well as the handsome and spacious saloons, offer no sort of comparison to any boats I have seen leaving London either for the continent or Scotland, we arrived in the Ningpo river at daylight next morning, where we, three in number, chartered a little boat furnished with bunks, cooking apparatus, &c. Having seen all the provisions, &c., shipped, we started on the tide in the afternoon, and went as far as we could go, till we reached in the middle of the night the foot of the long-wished-for hills. At daylight next morning, we despatched the provisions on the backs of a train of forty coolies, in charge of one of our boys, to our destination, and, with another boy, we started to walk round by some waterfalls, twenty miles off, where we intended to hire mountain chairs in which to be carried the rest of our journey to the Snowy Valley. The first part of the programme went off all right; very tired, but in good spirits we arrived at, and duly admired, the falls; and then, to our horror, found there were no chairs to be had, so had to walk the remaining fifteen miles, principally up hill, and through the rain as well. The commonest butterfly was one of the *Satyridæ*, which subsequently turned out to be not only a new species, but a new genus, *Paleonympha opalina*; the country was quite alive with *Lepidoptera*, many of them fresh to me, nearly all of them rare in European cabinets; the next commonest one to *P. opalina* was a *Neptis*, also a new species, which has not in fact yet been described. We were tired enough on arriving at the temple where our baggage was awaiting us; but the next morning, after a refreshing bath under a cascade, thirty feet high, just at the back of the temple, we sallied out to view the land. To give anything like a proper description, either of the country or of its fauna, would be simply impossible; suffice it to say, I have never seen anything in all my wanderings to come up to the beauty of the scenery, or to approach the number and variety of the insects of all orders; with one sweep of my net, I caught nineteen of the rare *Argynnis Ella*, and half-a-dozen different species

of butterflies were nearly always in sight at once, the grass and under-wood abounded in small *Noctuæ* (*Erastria*, &c.) and *Pyrales*, beautiful little *Cataclystæ* and *Hydrocampæ* swarmed at the edges of the streams, queer-shaped *Hemiptera* were constantly found, the variety of *Hymenoptera* would have charmed Mr. Smith, and as for *Coleoptera*, there was no attempting them at all. My companions were constantly dragging me on with them, which was a good deal against entomologizing, but one of them gave some attention to the ferns, and was perpetually going into raptures over fresh discoveries; I forgot how many species he collected, something remarkable I know. As for the country itself, there is no attempting to describe it: waterfalls and cascades in every variety and of all heights, from 4 to 400 feet, the highest one 420 feet by accurate measurement; woods, ravines, hill sides, rocks, valleys, cultivated ground or hill tops; and everywhere profuse and luxuriant vegetation, rhododendrons, wistarias, and fifty other flowers all being in full bloom, the azaleas in particular were in such profusion as to appear one mass of colour when seen from a distance. Two days here only, and I had to return to Shanghai, laden with spoil. I had been capturing insects right and left at random, and on going over my boxes carefully, found many more species than I had any idea I had got.

The fondly cherished hope of once more visiting this beautiful and prolific region has never yet been realized.

London: June, 1877.

NOTES ON THE BRITISH SPECIES OF *BLENNOCAMPA*.

BY P. CAMERON.

Having to describe two new British species of *Blennocampa*, I think it will be as well to enumerate at the same time all the native species of that genus, so far as they are known to me, and I do so the more especially as the previous lists contain many errors. In *Blennocampa*, I include Hartig's section *Monophadnus*, as I do not consider the only character in which it differs from *Blennocampa*—the possession of a medial cell in the posterior wings—sufficient to raise it to generic rank; and, moreover, in some of the species the females have a medial cell and the males none, so that the one sex would belong to *Monophadnus* and the other to *Blennocampa*.

1. *Assimilis*, Fallén, = *hyalina*, Klug.

2. *Betuleti*, Klug. This species has been bred by Mr. J. E. Fletcher, of Worcester, from a larva which fed externally on birch.

3. *Nana*, Klug.

4. *Pusilla*, Klug.

5. *Subcana*, Zaddach, Beschr., p. 34.

Black, shining, knees slightly, and posterior tibiæ, white; anterior tibiæ white in front, black behind; apex of posterior tibiæ and all the tarsi deep fuscous. Head covered with a grey pile; clypeus slightly emarginated at apex; antennæ as long as the abdomen, a little attenuate at apex, the joints distinctly separated from each other and slightly produced at the apex beneath, the third joint a little longer than fourth, the last thinner and longer than eighth. Wings clear hyaline, marginal nervure interstitiate. Tegulæ black. Sheath of saws largely projecting. Cenchri large, clear white.

The ♂ has the antennæ nearly as long as the abdomen and half the thorax, the joints more distinctly separated than in the ♀, and the tibiæ more or less suffused with fuscous.

From *B. pusilla* this species is readily distinguished by its much larger size, stouter form, longer and stouter antennæ, the joints being more sharply divided, more obscure colour of the legs, black tarsi, and generally more deeply coloured costa and stigma. From *cinereipes* it is known by its longer but less oblong body, lighter coloured tibiæ, clearer wings, interstitiate marginal nervure, and more projecting terebra. From the more or less similarly coloured species of *Monophadnus* it is easily known by not having a medial cell in posterior wings. *Alterripes* may be known from it by having the antennæ not much longer than the thorax.

Length 3 lines; alar exp. 6 lines.

In some males the tibiæ are nearly quite black.

Commonly distributed, appearing in May among herbage.

6. *Cinereipes*, Klug.

7. *Fuliginosa*, Schr.

8. *Ephippium*, Pz. According to Thomson, this is a form of *B. aethiops*, Klug and Hartig, *nee* Fab., with part of the thorax blood-red. It is possible that this is the case, but I have not yet been able to find a British specimen of the black variety. Nothing definite is known regarding its early history. Apart from the red colour on the thorax (in the type), *ephippium* is easily known from *fuliginosa* by its smaller size, shorter antennæ, much longer third sub-marginal cellule, and distinct pentagonal area; from *cinereipes* by its narrower, more rounded body, distinct pentagonal area and punctured scutellum.

9. *Fuscipennis*, Fall. = *luteiventris*, Kl.

10. *Melanocephala*, Fab.

11. *Bipunctata*, Kl.

12. *Lincolata*, Kl.

13. *Alchemille*, Cameron. I believe it will be found that this apparently common species passes current for *uncta*, Klug, which, however, it cannot be, since the true *uncta* in the ♂ (the only sex

described) has the antennæ shorter than the abdomen, while in my insect they are nearly as long as the whole body in the ♂, and longer than the abdomen in the ♀. *Uncta*, it may be added, is omitted by Kirchner in his "Catalogus Hymenopterorum Europæ," but for what reason I know not.

14: *Subserrata*, Thomson, Opusc. Ent., 285, 22, Hymen. Scand. i, 220, 25. One specimen taken by Mr. J. E. Fletcher at Worcester. Thomson (*l.c.*) quotes doubtfully *lincolata* as identical with *subserrata*, but the two are quite distinct (on this point see Proc. Nat. Hist. Soc. of Glasgow, vol. iii).

15. *Albipes*, Gmel.

16. *Geniculata*, Htg. *Tenthredo geniculata*, Hartig, Blatt- u. Holz- wesen, 274, 31, Eversmann, Bull. de la Soc. Imp. des Nat. de Moscou, i, p. 31, 9. *T. longicornis*, Hartig., *l.c.* 257, 32; Eversmann, *l.c.*, No. 10 ♂. *Blennocampa geniculata*, Thomson, Opusc. Ent., 282, 11; Hymen. Scand., i, 218, 21. *Monophadnus geniculatus*, Kaltbach, Pflanzenfeinde, pp. 237, 241, and 242 (larva). Common.

17. *Micans*, Klug. Not common. One specimen taken by Dr. Sharp at Dalry, and two by Mr. Joseph Chappell of Manchester. As this species is very little known, and has only been described by Klug and Hartig, I give a more detailed description of it here.

♂ black, almost shining, head, sides of abdomen, and legs thickly covered with long, closely pressed hairs. Knees and anterior tibiæ pale testaceous. Antennæ a little longer than head and thorax, stout, thickly and closely covered with a stiff black pile; the basal joints distinctly separated from each other, the apical more closely pressed together, the third joint a quarter longer than fourth, the fourth a little longer than 5th, the ninth bluntly conical; the antennal furrow very large, deep, somewhat projecting; frontal sutures distinct, apex of clypeus and labrum truncate; cœluri large, pale white; blotch distinct; sheath of saw a very little projecting. Wings pale smoky, costa and stigma dark fuscous, first recurrent nervure received in the middle of second sub-marginal cellule; second sub-marginal nervure slopes sharply towards the base of wing, the third slightly towards the apex. Head thick, as broad as mesothorax.

Length $2\frac{3}{4}$ —3 lines.

Micans is closely allied to *nigrita*, but is smaller, the wings are clearer, and not much darker at the base than at the apex; there is no horny point in the second sub-marginal cellule; the first sub-marginal nervure is more distinct; the frontal and antennal sutures are deeper and more distinct; the head, legs, and sides of abdomen more densely pilose, and generally the body is more shining.

In the ♂ the antennæ are much shorter than in *nigrita*, the joints are more distinctly separated and not so flattened, the third joint is

decidedly longer than the fourth; while in *nigrita* they are equal, the fifth being if anything longer than the fourth, while the mesonotum in *micans* is densely pubescent, and scarcely so in *nigrita*; also in the latter the knees only of the anterior legs are testaceous; in *micans* the whole of the anterior tibiæ in front is testaceous.

B. sericans again is much larger, has the wings deeply smoky, the antennæ very short compared to the size of the body; the third joint is double the length of the fourth, the second sub-marginal nervure does not slope towards the base of the wing, but is nearly straight, while the second sub-marginal cellule has a distinct horny point: the anterior knees only are testaceous.

18. *Nigrita*, Fab. = *nigerrima*, Kl.

19. *Sericans*, Hartig.

20. *Aterrima*, Klug. *Tenthredo aterrima*, Klug, Berlin. Mag., viii, 81, 79. Hartig, Blatt- u. Holz-w., 276, 36; Eversmann, l. c., 31, 11. *T. fuliginosa*, Fallén, Acta, 1808, 109, 45. *Phymatocera aterrima*, Van Vollenhoven, Tijds. voor Ent., v, pp. 55—59; Zool., 9471—74; Taschenberg, Entomologie für Garten, 161; Kaltenbach, Pflanzenf., 723. *Selandria Robinsoni*, Curtis, Trans. Linnæan Soc., xxi, pp. 39—41, 1855. Described also by Bouché in his Naturgeschichte der Insecten as *Tenthredo fuliginosa*.

21. *Fuscula*, Klug (see Ent. Mo. Mag., xi, 253).

Several other species have been recorded as British, but apparently in error, although no doubt a number of them will yet be found if sought. Thomson describes twenty-eight Scandinavian species.

Glasgow: 6th June, 1877.

DESCRIPTION OF A NEW SPECIES OF *NEMATUS* OF THE *LUTEUS* GROUP FROM SUTHERLANDSHIRE.

BY P. CAMERON.

NEMATUS ANTENNATUS, *sp. n.*

N. rufo-luteus, *capitis maxima parte, antennæ, mesonoti maculis 3 magnis, scutello, metanoto, maculaque magna pectoris, nigris; alis fere hyalinis, stigmatibus rufo-testaceo, basi nigro. Long. fere, 3½ lin.*

Belongs to the *luteus* group (see E. M. M., xiii, 177). From all the species (except *abdominalis*, which is abundantly distinct otherwise) it differs in the colour of the head and antennæ, which, in the species hitherto described, are for the greater part, if not entirely, reddish-yellow. It agrees with *bilineatus* in having black marks on the meso-

notum, but it has these very much larger, occupying nearly the whole surface, the mark on the sternum is much larger, the pleuræ beneath the wings are marked with black, the thorax generally is not so deeply punctured, the incision in the clypeus is not so deep, the mouth is dirty, not clear, white, the stigma is broadly black at the base, and the 3rd sub-marginal cellule is very much shorter, more so indeed than in any species in the group, while the 2nd recurrent nervure is farther removed from the 3rd sub-marginal: the nervures are darker, and the legs not pale at the base.

The antennæ are not much longer than the abdomen and metathorax, the 3rd and 4th joints are of nearly equal length; the last is pale brown beneath. On the head, the orbits of the eyes, and the face below the antennæ are reddish-luteous, the clypeus sordid white; the mandibles dark piceous. Cenchri and blotch large, pale white. There are two small dots on the apex of the abdomen above, and two larger ones on the 5th segment beneath. In the form of the abdomen, &c., it agrees with the other species.

I captured the above either on alder or birch, at the foot of Ben Clibrick, Sutherlandshire, at the end of last month (June). The four other species of this section were also met with in Sutherlandshire.

31, Willowbank Crescent, Glasgow :
11th July, 1877.

ADDITION TO THE LIST OF BRITISH HEMIPTERA.

BY EDWARD SAUNDERS, F.L.S.

ARADUS LAWSONI, *sp. n.*

Fuscus. Thoracis marginibus integris, rugulosis, clytrorum humeribus pallide variegatis. Abdominis segmento apicali utrinque albobaculato, reliquis angulis posticis piceis, pedibus albidis, fusco cingulatis. Antennis nigris, articulis 2^{do} et 3^{tio} sub-æqualibus.

Head and thorax dark brown, covered with granular rugosities; the latter with four longitudinal granular carinæ, the two inner ones extending to the anterior margin, the two outer ones abbreviated; anterior margin straight, its angles slightly produced and reflexed, sides widely reflexed and rounded posteriorly, much as in *A. depressus*, but their margins almost entire and very finely rugose; base very slightly sinuate. Scutellum transversely rugose, sides and base raised and granular. Elytra brown, the dilated humeral portion variegated with pale ochreous, the clavus also with a few ochreous markings; membrane dark. Abdomen oval, connexivum brown, rugose, the apical margin of each segment, especially at the outer angle, pale; apical segment with a white spot on each side. Legs whitish, femora and tibiæ with darker bands. Antennæ black, rugose, 2nd and 3rd joints subequal.

Length, 2½ lines.

One specimen, without locality, from Mr. Lawson's collection.

Allied to *A. depressus*, from which the different coloration, the almost entire lateral margins of the thorax, the abbreviated lateral carinae, the longer anterior margin of the thorax, and the longer antennae, at once distinguish it.

From *A. corticalis*, the comparative lengths of the joints of the antennae easily separate it.

Wandle Road, Upper Tooting :
12th July, 1877.

REMARKS ON SOME BRITISH HEMIPTERA-HETEROPTERA.

BY O. M. REUTER.

(Continued from page 34).

LITOSOMA VIRIDINERVIS (Catal., 31, 1) is cited by Mr. Saunders (Synops., 291, 3) as synonymous with the species described by him under the name of *Orthotylus prasinus*, Fall. I am convinced that this is so, Mr. Saunders having seen the typical specimens of Messrs. Douglas and Scott, and I having received one specimen (♀) from Mr. Saunders; but in examining this, I have found that the species of the British authors is neither *Capsus viridinervis*, Kirschbaum, nor *Phytocoris prasinus*, Fallén. It differs from *O. viridinervis*, Kirschb., in having the vertex (at least in the ♀) not marginate posteriorly, and the antennae with the first joint three-fourths as long as the second; also, the clytra are brighter green. *O. viridinervis*, Kirschb., is, however, described by the following characters: "Scheitel mit flacher Quervertiefung vor dem etwas erhabenen Hinterrand," and "Fühlerglied 2 etwa 4-mal, 3 etwa doppelt, 4 kaum so lang als 1;" and in the synopsis of the species (p. 77), Kirschbaum says: "Fühlerglied 2 fast doppelt so gross, 4 mindestens halb so gross als 3."* But the aforesaid British species differs from this, and also from *O. prasinus*, Fall., in having the "apical joint (of the antennae) not nearly half so long as the third" (vide Saunders, l. c.). *Phytocoris prasinus*, Fall., of which I possess a typical specimen, has, however, the fourth joint about half as long as the third. Under the name of *O. diaphanus*, Kirschb., I have received from Dr. Puton and Dr. Frey-Gessner a species, which is in the structure of antennae very similar to *O. prasinus*, Saund., nec Fall. (*viridinervis*, D. & S.), but this is much more finely, and whitish, pubescent. The British species is probably to be regarded as new, and I propose for it the name *Orthotylus Scotti*.

* I found, near Forres, a species which seems to me to be the true *viridinervis*, Kirschb.—O. M. R.

LITOSOMA DIAPHANA (Cat., 31, 2). Under this name I have received specimens from Messrs. Saunders and Douglas. But that sent by Mr. Douglas (a male) is not similar to that from Mr. Saunders, the former being clothed above with fine whitish hairs, and with black ones densely intermixed, and having the apical joint of the antennæ only (nearly) a third part as long as the third joint; whereas, the true *Capsus diaphanus* of Kirschbaum (Rh. Wiesb., 145, 15), is clothed with whitish hairs only, and seems also otherwise to be different. Also the specimen sent by Mr. Saunders (a ♀) differs from the specimens which Drs. Puton and Frey-Gessner have sent me, especially in the fourth joint of the antennæ being "half as long, or nearly half as long, as the third" (*vide* Saund., Syn., p. 290). *Capsus diaphanus* of Kirschbaum has, however, the same joint, not nearly half so long as the third, even as *O. prasinus*, Saund., *nec* Fall. Kirschbaum says, in the description of *C. diaphanus* (p. 146): "Glied 2 beim ♂ 4-mal, beim ♀ über 3-mal, 3 etwa 3-mal so lang, 4 etwa länger als 1;" and in the synopsis (p. 78): "Fühler wenig kürzer als der Körper, Fühlerglied 2 nur anderthalbmal so gross, 4 *weniger* als halb so gross als 3." These characters accord with the specimens obtained from France (Puton), Switzerland (Frey-Gessner), and also from Spain, but not with the *O. diaphanus* of Mr. Saunders.

The allied species could be arranged according to the following scheme. I beg Hemipterists in Britain to direct their attention to these green species with somewhat transparent elytra and green cell-nerve, and to collect a great many specimens, the distinction of the species being recognised with certainty only after comparison of many examples of both sexes:

- 1 (10). Upper-side of the body clothed only with pale hairs.
- 2 (7). Upper-side clothed with rather longish, not adpressed, ochreous hairs.
- 3 (6). Apical joint of antennæ about half as long as the third.
- 4 (5). First joint of antennæ as long as the head, fourth joint scarcely longer than the first, and more than half as long as the third, this being about half as long as the second; vertex posteriorly rather sharply marginate; genital segment of ♂ not wider than the others. ♂ ♀. (*On Ulmus*).
 1. *viridinervis*, Kirschb.; *nec* D. & S.
- 5 (4). First joint of antennæ not so long as the head, fourth joint distinctly longer than the first, and half as long as the third, this being (at least in ♂) about one-third shorter than the

- second; vertex very indistinctly marginate (δ $\text{\textit{f}}$); genital segment of δ wider and longer than the others. δ $\text{\textit{f}}$. (On *Corylus*.) 2. *prasinus*, Fall., *nec* Saund., *nec* D. & S.
- 6 (3). Apical joint of antennæ not nearly half as long as the third; first joint shorter than the head, fourth joint not longer than the first, and not nearly half as long as the third; vertex posteriorly somewhat sharply marginate. $\text{\textit{f}}$. (On plum-trees?)
3. *Scotti*, n. sp. (*viridinervis*, D. & S., *prasinus*, Saund.).
- 7 (2). Upper-side finely covered with whitish or pale yellowish hairs; first joint of antennæ much shorter than the head, third joint about three-quarters as long as the second.
- 8 (9). Antennæ longer and finer, apical joint not nearly half so long as the third, and as long as the first; vertex (at least of δ) marginate; upper-side very finely whitish-pubescent. δ $\text{\textit{f}}$. (On *Salices*?)
4. *diaphanus*, Kirschb., *nec* Saund., *nec* D. & S.
- 9 (8). Antennæ shorter and stouter, apical joint only nearly half as long as the head, and a little longer than the first; vertex marginate. $\text{\textit{f}}$. (On ?)
5. n. sp. ? (*diaphanus*, Saund., *nec* Kirschb., *nec* D. & S.).
- 10 (1). Upper-side of the body clothed with fine whitish and black hairs, densely intermixed; apical joint of antennæ as long as the first and only a little more than a third part as long as the third, this being more than three-fourths of the second, or only little shorter; first joint shorter than the head. δ . (On ?)
6. n. sp. ? (*diaphanus*, D. & S., *nec* Kirschb., *nec* Saund.).

(To be continued).

DESCRIPTIONS OF TWO NEW SPECIES OF HEMIPTERA-HETEROPTERA
FROM WEST AFRICA,
IN THE COLLECTION OF F. J. HORNIMAN, Esq.

BY W. L. DISTANT.

TESSERATOMA ÆTHIOPS.

Above ochraceous, clouded, somewhat shining, thickly and finely punctured. Head with margin narrowly edged with black. Thorax with the lateral margins rounded, reflexed, narrowly edged with black. Apex of scutellum somewhat narrowed. Membrane of the elytra brassy, wings dull violet. Back of the abdomen deep reddish-orange, with the margins chocolate, narrowly edged with black.

Abdomen beneath pitchy-black, central and sternal keels shining chocolate-brown.
 Legs, rostrum, and antennæ black. Long. ♂, 15 lin., ♀, 17 lin.

Habitat: Isubu, Monyo-ma-Lobah.

TESSERATOMA HORNIMANI.

Ochraceous, pitchy, somewhat shining above, thickly and finely punctured. Head with margin narrowly edged with black. Thorax with lateral margins rounded, somewhat broadly reflexed, narrowly edged with black. Apex of scutellum visibly hollowed, with a slight, central, elevated, longitudinal stria. Membrane of elytra brassy, wings violet. Back of the abdomen pitchy-black, somewhat shining. Abdomen beneath, legs, rostrum, and antennæ black. Thighs armed with a pair of acute spines near the apices. Long. ♂, 16 lin., ♀, 18 lin.

Habitat: Camaroons. (D. G. Rutherford).

But one African species of this genus has hitherto been described, *T. Afzeli*, Stål, from Sierra Leone. The three species may easily be separated—apart from size and structure—by the aid of the following synopsis:—

Species more or less ochraceous above.

Thighs unarmed.

Abdomen concolorous. Basal joint of antennæ not black .. *T. Afzeli*

Abdomen not concolorous. Antennæ wholly black *T. aethiops*

Thighs armed *T. Hornimani*

West Dulwich :

June 19th, 1877.

Colias Edusa near *Darlington*.—On the 11th of June, I had the pleasure of seeing *Colias Edusa* on the wing for the first time in my life. It was a male specimen, which rose almost from under my feet, as I was walking along the bank of the river Tees near the town. It circled round me twice, quite close, and gave me a good view of both upper and under sides, and then, no doubt thinking that it had done all that could be expected of it, it pelted off as hard as it could.

Several have since been taken here, and many more seen. On June 17th, I received a nice male alive, taken by my brother near Barnard Castle, with the information that about thirty had been seen, and that it was quite plentiful. The next news I heard of it was at Wolsingham, a high moorland district, about twenty miles to the north of this; there I saw Mr. A. Pickard, who beat everything I had previously heard by the startling information, that about 100 had been seen in that neighbourhood, and a good many of them taken; some in the valleys, and some *all over the moorland, even on the highest hills*, which are very bleak in that part of the country!

Where can they all have come from? Some of them are very fine and fresh looking, but I think they are all hibernated specimens.

Some years there have been two or three taken near here in August, in very favourable seasons, but such an invasion as this in our part of the world was never heard of before.—JOHN SANG, Darlington: June 25th, 1877.

Colias Edusa at Huddersfield.—We have had quite a little company of *Colias Edusa* visiting our neighbourhood during the last fortnight. Mr. S. L. Mosley recorded it a few days ago from Primrose Hill. A gentleman brought one to the Naturalists' Society for exhibition and naming which, after considerable difficulty, he had captured at Kirkheaton. He had also noticed one at Dalton passing fleetly on the wing.

Another gentleman described a butterfly he had chased at Birkby, but failed in netting, or I should say hatting. From the description he gave me of the insect, I should not hesitate in pronouncing it *Edusa*. I had the good fortune also to see one scamping heedlessly over some clover fields a little outside the town of Kidderminster. We can but hope our visitor will ultimately prove a resident. What about the Septennial theory?—S. D. BAIRSTOW, Woodland Mount, Huddersfield: *June 20th, 1877.*

Colias Edusa near Manchester.—In the first week in June, a specimen of *Colias Edusa* flew past me as I was walking to the city.—F. KENDERDINE, Morningside, Old Trafford, Manchester: *4th July, 1877.*

Colias Edusa in Worcestershire.—This insect, so far as my experience extends, is by no means common here; I have seen not more than thirty specimens in as many years' collecting. The first seen occurred in June, 1858, a ♂ and a ♀; the female worn, the male with its wings reduced to a few strips, rendering its flight a mere flutter about a foot above the earth. The species was rather common at the end of the summer and autumn of the same and following year (1859). One male (the largest I ever saw) was seen by me in September, 1867, close to the town; one male caught on the 14th September, 1876; and one, also a male, in good condition (this I could see, as it was hovering at a flower about four feet from me) seen on the 11th June last.—J. E. FLETCHER, Pitmaston Road, Worcester: *July 6th, 1877.*

Colias Edusa and Hyale in Cumberland.—*Colias Edusa* has been very common here during the latter half of June. On the 30th, I caught two specimens, both males, and in very fine condition, many which I saw both before and after were also in excellent condition. On the above-mentioned date, I took also a battered specimen of *Hyale*. On the 5th July, the day being very fine and warm, I visited the places where *Edusa* seemed specially abundant, but did not see one.—ALFRED THORNLEY, Workington, Cumberland: *July 14th, 1877.*

[We presume that our correspondent is quite sure that he has not mistaken the var. *Helice* of *C. Edusa* for *Hyale*.—EDS.]

Colias Edusa in Pembrokeshire.—After an exceptionally mild, wet winter, and a long, chilly, disheartening spring, the weather began to improve with the beginning of June, and, on the 1th, our first warm day, *Colias Edusa* made its appearance. It was in a warm sheltered valley in the hill country, nearly twenty miles from here and ten from the sea, that I found the first specimens (two ♀ and a ♂) just out and exquisitely perfect, one ♀ very large and strongly dusted with black on the basal portion of the anterior wings. Two days later, I found several more in one of the deep limestone quarries near the coast, and from that time until the 4th July, they were to be found in moderate numbers all over the country on every sunny day.

When they first appeared, every specimen was in the most perfect condition, but after the first week, the females began to get worn, and very soon were reduced to a pitiable state, the margins of the wings being actually worn off from their constant fluttering about among the grass and *Lotus corniculatus* at the road sides. I hardly saw any in the clover fields. The males, from their habit of flying higher and clear of the herbage, were in good order much longer. The last female I saw (a wretched *Helice*) was on June 27th, but half-a-dozen males flew past me along the roads on July 4th. The proportion of the sexes seen here was almost three males to one female; but of captures, the proportion would be very different, from the wildness and swift flight of the males.

I know that these observations are hardly more than repetitions of what has been observed and noticed by others, but I venture to record them, partly because the appearance of a June brood of *Colias Edusa* is so unusual in this country, that every item of intelligence should be recorded, and more especially, because a clue seems to be afforded by it to an unexpected habit of the species in these islands. I may point out that this county of Pembroke occupies a sort of isolated position, being cut off by the mountainous portion of Wales, so that the immigration of insects from the east is discouraged, while any continental specimens that might cross the sea from the south would be intercepted by the more tempting and favourable districts of Devon and Cornwall, and Ireland on the west is hardly likely to furnish immigrants belonging to sun-loving species. We may therefore, I think, safely be believed to breed our own *Edusa*.

In the autumn of 1875, I saw only one or two specimens, and as many in June of last year; but, as I have already recorded, a tolerable sprinkling of specimens was observed last autumn. Of these, all the females that I saw was fluttering about the grassy road-sides among *Lotus corniculatus*, apparently depositing eggs; therefore, I conclude that they had no intention of hibernating. They were out from August 24th till October 7th, at which date the remaining specimens were much worn, and I do not think that there was any sudden check, such as would cause the larger portion of the brood of that season to hibernate in the pupa state. This early summer brood has been much more numerous, the specimens larger, and the females, instead of the dark borders with small spots recorded last autumn, had the spots large and strongly marked, sometimes remarkably so, and from their fine condition did not look at all as though "just landed from France."

From these circumstances, it seems possible that our knowledge of the economy of *Colias Edusa* is incomplete, and that instead of hibernating, the females occupied themselves in the autumn fine weather in laying eggs; that the eggs soon hatched; and that the unusual mildness of the winter allowed the larvæ to feed up, assuming the pupa state sometime in the winter or spring, ready to emerge on the first hot day. There is unfortunately no direct proof of this, but the collateral evidence already given—the apparent deposition of eggs in the autumn, the great increase in numbers, and the fact that the summer brood consists of larger and better marked specimens (from slower feeding of the larvæ, of course)—points decidedly in this direction, while the objections cannot be very serious, seeing that the food plants were growing all the winter, and that even *tender* larvæ can surely exist in a season that has allowed the fuchsias to blossom until the spring, and has not killed even the geraniums that were left in the ground. I even think that this hypothesis might

seem to account for the extraordinary fluctuations in the appearance of this butterfly in different years. It appears as though, in the efforts to produce two broods in the year, the autumnal females always lay eggs, which hatch, but that the larvæ are killed by any severe frost, thus locally exterminating the species. Some of those hatched on the coast and within the warm influence of the sea may escape, producing the few specimens seen in the early summer, and supposed to have hibernated, from which are produced the larger numbers found in favourable seasons in the autumn. This also would explain the more frequent appearance of the insect along our coasts, and especially its comparative regularity of appearance on the warm south coast of England. I can see no better explanation of the periodical appearances and disappearances in this country of a species which is constantly abundant in the warmer parts of the continent, and the casual immigration which doubtless goes on in favourably situated districts, is insufficient to account for the simultaneous appearance in numbers of perfectly fresh specimens in remote districts. The hypotheses which used to be put forward, of the prolonged torpidity of the species in the egg or the pupa state, appear hardly more feasible to me than the celebrated suggestion that the eggs are imported "in clover seed."

It is a curious circumstance, that along with that of *Edusa* there appeared an early brood of *Scapula ferrugalis* in considerable numbers. It also appeared first on June 4th, hiding in dwarf sallow bushes in marshy fields, but after a few days was to be found about the road sides, and on and under the cliffs, and at last quite commonly about the garden and fields at home—in fact, everywhere. The specimens of this early brood are always yellower than those disclosed in the autumn, and, in my experience, always very scarce; indeed, I have, with one exception, never taken them except in the immediate vicinity of the sea. The causes that have affected *Colias Edusa* have therefore evidently been at work with this species.—CHAS. G. BARRETT, Pembroke: 14th July, 1877.

Colias Edusa in Perthshire.—After reading Mr. Sang's notice of the occurrence of *C. Edusa* in such plenty near Darlington, I wrote to Sir Thomas Monereiffe to say that I fully expected to hear of the occurrence of this insect in Perthshire. In reply, I hear as follows:—"A fine male *Colias Edusa* was well seen close to him by Mr. Hird in his garden, about June 22nd. Unfortunately, he had no net, or he could have taken it easily, and, by the time he had fetched a net, the *Edusa* was gone. He knows the insect well, and I have no doubt as to his being correct in his statement.—Monereiffe House, Bridge of Earn: July 2nd, 1877."—H. T. STANTON, Mountfield, Lewisham: July 4th, 1877.

[See also "Scottish Naturalist" for July, 1877, p. 117].

The recent abundance of Colias Edusa in Britain.—In connection with this extraordinary phenomenon, it may be not without interest to remark, that having recently travelled over a considerable portion of Belgium, I took the opportunity of enquiring, both of individual entomologists, and at a Meeting of the Belgian Entomological Society, whether anything parallel to this had been observed in that kingdom this year. I could not ascertain that the species had been anywhere observed up to the first week in July, thus proving, to some extent, that the causes of its apparition in Britain were internal.—R. McLACHLAN, Lewisham: 12th July, 1877.

Capture of Sphinx pinastri near Ipswich.—The Rev. John Longe, of Tuddenham Vicarage, Ipswich, writes as follows:—"A beautiful specimen of *Sphinx pinastri* was captured in my garden on Monday, June 25th. I was playing lawn-tennis about 3 p.m., when one of my sons came and told me he had just seen a moth at rest on a wooden house in the garden, requesting his brother to capture it for him: "this was done without any difficulty under the circumstances." I have received a drawing of this insect from Mr. Longe, and it undoubtedly represents *Sphinx pinastri*. The insect is common near Brussels, and there is no reason geographically why it should not occur here. A sandy district, planted with fir trees, in the eastern counties, would be about the likeliest spot for it.—H. T. STAINTON, Mountsfield, Lewisham, S.E.: July 7th, 1877.

The yellow variety of Zygana filipendulæ.—The yellow variety of *Z. filipendulæ* is turning up again this year in Cambridge. My cousin sent me four specimens last week.—S. D. BAIRSTOW, Woodland Mount, Huddersfield: July 9th, 1877.

Heliothis scutosa.—I think that it does not require a very extraordinary amount of evidence to convince the readers of the Magazine of the authenticity of a species, but as reasonable beings, they require some evidence, and to this Mr. Hodgkinson in his lively note (*ante* p. 17) has supplied a clue. This obtained, I wrote at once to one of the fortunate possessors of Cumberland *scutosa*—the Rev. Henry Burney—and he, with his usual kindness, sent me his specimen for examination, with the remark that Mr. Hodgkinson's account of it was precisely the same as that given to him many years ago when he purchased the specimen. It is *scutosa* without doubt—a male in fair condition, and decidedly darker than my Norfolk specimen, and than a foreign type in my possession; the fore-wings being almost entirely eluded with greyish-brown in which the white nervures are conspicuous, as also are the large dark stigmata. It is pinned with an old-fashioned bead-headed pin, and has a thoroughly genuine British appearance, indeed, there need be no doubt, I fancy, after the information given in a recent interesting paper, by Mr. E. A. Fitch, of the authenticity of the Cumberland specimens.

If *Artemisia campestris* is its favourite food-plant, it is certain that Norfolk and Suffolk are the most probable counties for finding it in, since the plant is really common on the light sandy district around Thetford and Brandon, growing at the edges of fields and along pathways where the grass is not ploughed up. I have seen it in plenty at Brandon.—CHAS. G. BARRETT, Pembroke: July 14th, 1877.

Capture of Lepidoptera in the Cambridgeshire Fens.—While collecting *Lepidoptera* in the Cambridgeshire Fens during June last I captured a perfect male of *Hydrilla palustris* and two specimens of *Bankia argentula*. I also took a fine series of *Macrogaster arundinis*, of *Meliana flammea*, and of *Nascia citialis*. I have also bred *Gelechia morosa*.—A. B. FARN, Dartford: July 10th, 1877.

Hydrilla palustris at Wicken Fen.—At about 12.30 a.m., on the 12th June, when leaving Wicken Fen after night-collecting, a *Noctua* not familiar to me crawled up the glass of my lantern whilst it was resting on the ground, which proved, on examination when I reached home, to be a male *Hydrilla palustris* in fair condition.—A. H. JONES, Shrublands, Eltham: July 7th, 1877.

Cidaria reticulata bred.—At last I have had the pleasure of rearing this species

from a larva I got last autumn on *Impatiens noli-me-tangere*. I trust that Mr. Buckler will be equally successful with the two larvæ I sent him to figure. It is, at any rate, a satisfaction to know that the larvæ sent to him were identical with mine, and from the same plant.—J. B. HODGKINSON, 15, Spring Bank, Preston: July 14th, 1877.

Description of the larva of Eupithecia subciliata.—On the 21st May, 1876, Mr. J. P. Barrett, of Peckham, collected a number of larvæ of *Eupithecia subciliata* from maple flowers at Box Hill, part of which he very kindly forwarded to me.

Length about five-eighths of an inch, and rather stumpy; the head has the lobes rounded, is smooth and polished, and considerably narrower than the second segment. Body cylindrical, plump and obese in the middle, but attenuated at the extremities; the skin seems tough, and the segments being transversely wrinkled give it a puckered appearance. There are two well marked varieties, which, judging from those sent me, are about equally common. The form we will take as Var. I, has the ground colour yellowish-green, the green colour being strongest on the anterior segments; head almost green; a deep purple broad stripe, still darker at the segmental divisions forms the dorsal line; a pale shade of purple is also suffused rather broadly on each side the dorsal line; sub-dorsal lines greyish-white; there is an equally pale waved stripe above the spiracles; and a pale, but greener stripe along the spiracles. Ventral surface uniformly dingy green.

Var. II has the ground colour bright yellowish-green, the head tinged with brown; a dark green pulsating vessel forms the dorsal line; sub-dorsal lines greyish-white; there is a similarly coloured waved line above the spiracles; and a pale greenish stripe along the spiracles; segmental divisions yellowish. Ventral surface uniformly bright pale green tinged with yellowish.

At the end of the month these larvæ spun up between the leaves and amongst the flowers of maple. The pupa is scarcely a quarter of an inch long, and somewhat stumpy: it is smooth and polished, rounded on the upper side, and has the wing-, antenna-, leg- and eye-cases prominent: colour pale brown, the segmental divisions darker, the wing-cases yellowish.

The imago appeared early in August.—G. T. PORRITT, Highroyd House, Huddersfield: July 5th, 1877.

[A condensed description of the larva of this species, by the Rev. H. Harpur Crewe, appeared in the Ent. Mo. Mag., vol. ix, p. 17.—EDS.]

Notes on Manx Lepidoptera.—So far I have found the summer of 1877 very unproductive of insects, the *Lepidoptera* irregular in their times of appearance, and several species of hibernating larvæ usually numerous, viz., *Setina irrorella*, *Epunda lichenea*, and *Polia nigrocincta*, have scarcely been seen; possibly many have been destroyed by the heavy rains which have deluged the island during the winter and spring. I am unable to state the actual rainfall, but the proverbially oldest inhabitant considers last winter to have been the wettest he remembers.

Colias Edusa has been born out of due time here as well as in what Manx people call "the neighbouring island." I saw one specimen on the wing June 10th, and the occurrence of others have been named to me by visitors about the same date; the butterfly is usually seen here in August, but is never numerous.

. *Dianthacia casia* and *capsophila* have been scarce compared with last year, pro-

bably many remaining in pupæ until another summer at least. Such seems likely to be the case with several in my possession, which though lively and apparently healthy show no signs of producing the perfect insects. I have, however, secured enough specimens of both species for those correspondents whom I was unable to supply last year.

Perhaps in a popular magazine I may venture to relate what happened—or rather what did not happen—to me in pursuit of *Dianthæcia cæsia*, so as to give some idea of the risk which the capture of this insect involves. The place which I found very productive last summer (E. M. M., vol. xiii, p. 143), and naturally sought again, is under a perpendicular, perhaps slightly overhanging, cliff of about 150 feet in height: here the *Silene maritima* clothed the face of the rock, and the air was heavy with the perfume of its flowers. One evening when I went as usual I found the cliff had fallen, and, on the spot where I had stood a few hours previously without a thought of danger, thousands of tons of rock were piled up in wild confusion.

A spice of danger such as the chance of slipping on a ledge of rock which would result in a drop into 20 feet of water, perhaps adds zest to the pleasure of hunting this rock-frequenting moth; but the sudden fall of the cliff itself is a serious possibility.

I have sometimes stopped to watch a beetle crossing the pathway in momentary danger of death from the foot of each passer, and admired his coolness, sometimes helped him out of trouble, sometimes idly waited to see would he run the gauntlet safely, meanwhile pondering on his ignorance of the peril which beset him and on the possibility that we ourselves were in equal danger from unseen destroyers every moment of our lives: surely death's heavy foot trod very near me that day. The spot commands a fine view of Douglas Bay, across which the line of English coast some 60 miles away fringed with mountains is seen. As I turned away from the fallen cliff a rainbow spanned the eastern sky, a mighty painted arch apparently stretching from Suowdon to Helvellyn. What a lovely savage our great mother Nature is. One moment we are awestruck at the reckless use she makes of her gigantic strength, and the next won by the matchless beauty of her smile.

Eupithecia pulchellata is only now appearing, and the foxgloves in which it will expect to lay its eggs are mostly out of flower—the larvæ were full-grown last year on 15th July.

Sesia philanthiformis has nearly disappeared from the cliffs of Douglas Bay, on which it used a few years ago to be found in great profusion, at least it can only be had by repeating the feat of a well-known entomologist who is said to have swam off to detached rocks where it abounded with his pill-boxes in his mouth, and returned triumphant. I have obtained some on the west coast of the island where it has escaped destruction by being a little out of the track of the Easter and Whitsuntide collectors.

It is sad to think of the reckless extermination of this local insect; the pupæ have been collected and carried away by the hamperful—*cui bono?* I suppose that each of our thousand and one *Lepidopterists* may have a full row of this poor little moth, although it presents no variation of form or colour, and a pair or two answer every scientific purpose.—EDWIN BIRCHALL, Douglas, Isle of Man: July 15th, 1877.

New British Ant, Ponera ochracea!—I have taken in the earth in a conservatory here several worker ants which may perhaps turn out to be a new species of *Ponera*. When first I discovered the colony I mistook it for *P. contracta*, which was first detected some time ago by Prof. Westwood, but on forwarding specimens of my insect to Mr. F. Smith, he informed me that it was not *P. contracta*, as that insect has a punctured thorax, whereas in mine it is obliquely wrinkled, and is altogether a

more robust insect than *P. contracta*. Mr. Smith adds that the only insect that agrees with mine in these respects is a female *P. ochracea*, of which the worker is at present unknown, so that till the males and females of my colony appear it will be impossible to determine the species. When I have obtained specimens of them I will send a further account.—R. S. CHARSLEY, St. Giles's Road West, Oxford: *June 26th, 1877.*

Lopus sulcatus at Hayling Island.—I found this species commonly by sweeping *Echium*, &c., by the sea-shore last week. It was previously only known as British from specimens caught by Mr. Moncreaff,—without certain locality,—possibly from the same place.—EDWARD SAUNDERS, Wandle Road, Upper Tooting: *July 12th, 1877.*

Lepyrus corroborated as British.—I wish to record the capture of *Lepyrus binotatus* sunning itself on Whit-Monday in a sand-pit at Norbiton. I have only recently discovered that it was not *Barynotus*.—G. LEWIS, Queen's-road, Putney: *July 11th, 1877.*

A Parnus new to Britain.—Last year Dr. Power gave me some specimens of a *Parnus*, one of which I sent to Herr Kiesenwetter and received an answer at once—"The *Parnus* is certainly *P. striatellus*, Fairmaire, a rare species; we obtain our "examples from Paris."—ID.

Capture of Teretrius picipes.—Within the last fortnight, I have taken about a dozen specimens of this rare little *Hister*, on the fence on which I took last year, and again this year, *Tillus unifasciatus*. *Teretrius* is, like *Tillus*, only to be found on hot sunny mornings. I generally spend two or three hours every morning, when favourable, watching. *Tillus* is very active, and flies on and off with great rapidity; in private grounds not far off, are some fine old pollard oaks, and which I strongly suspect are the birth-places of both these insects. Of *Xylotrogus brunneus* I have, as yet, only taken one specimen.—SAMUEL STEVENS, "Loanda," Beulah Hill, Upper Norwood: *July 19th, 1877.*

Sialis fuliginosa in Worcestershire.—Six specimens in all of this insect have occurred to me: three old specimens without date; one caught flying about a blooming hawthorn, on the 20th May, 1871, near the Teme; and two caught on the 18th June last. This species is readily distinguished in the field from *S. lutaria* by its greater size and blackness.—J. E. FLETCHER, Pitmaston-road, Worcester: *July 6th, 1877.*

Occurrence of a probably new species of Setodes in England.—On the 25th September, 1876, Mr. J. B. Hodgkinson, of Preston, kindly sent me a caddis-fly he had caught at Windermere; it was a *Setodes*, of a species unknown to me. The publication of part vi of Mr. McLachlan's "Revision and Synopsis," which includes the genus *Setodes*, enabled me to identify my insect as allied to *Setodes punctata*, F. Unfortunately, it had lost both antennæ, and was otherwise injured before reaching me. ID.: *June 25th, 1877.*

[I have examined this insect (which is a ♀), and think it will prove to be an undescribed species.—R. McL.]

Setodes interrupta, F., in Worcestershire.—It may be of interest to state that this species has occurred on the Severn. I have an old specimen that I caught many years ago from osiers overhanging the river. At the same time and place I saw one or two more.—ID.

ENTOMOLOGICAL SOCIETY OF LONDON: 4th July, 1877.—Prof. WESTWOOD, M.A., F.L.S., President, in the Chair.

Mr. Douglas exhibited a living example of *Cerambyx Cerdo*, Lin., found in the heart of a log of oak from Bosnia when it was sawn into planks in London.

The President exhibited some curious heliciform larva-cases of a species of *Trichoptera*, he believed European, and drew attention to their semi-transparency, due to the nature of the siliceous material of which they were in part composed. The cases were described by Swainson in 1840 as shells of the genus *Thelidomus*, Div. *Turbineæ*. (*Helicopsyche*.—R. McL.).

Mr. J. Jenner Weir exhibited a female *Cicada montana*, Scop., taken in his presence in the New Forest in June, the captor having been led to the place by the noise the insect made; and with reference to the reputed want of means in the female to produce a sound. Mr. Weir said that he had examined this one microscopically and found that it was furnished with very small drums.

Mr. Douglas said that these small drums were only representative and not sonorous like the larger ones of the male, in which sex only of the *Cicadæ*, according to all observation hitherto recorded, the power and practice of stridulation existed, and he suggested that a male sitting contiguous to the female captured, but unobserved, had produced the sound in the present instance, and that instead of Orpheus Eurydicæ had been taken. Further, he said, that the male *C. montana* was reputed to be mute, although it is probable it could make a faint stridulation. (See Trans. Ent. Soc., 2 ser., iv, Proceed., p. 65).

The President thought the statement of the power of the female *Cicada* to produce a sound had not been established, and all notices of the music of the *Cicadæ* from antiquity till now attributed the power of stridulation to the male sex only, citing the words of the old Rhodian poet Xenarchus—

“Happy the *Cicadas*’ lives,
Since they all have voiceless wives”—

as an example of the historical testimony.

Mr. Mansell Weale said he had captured hundreds of *Cicadæ* in South Africa, and invariably it was the male sex only that was musical.

Mr. S. Stevens exhibited two living examples of *Tillus unifasciatus*, taken on oak palings at Norwood in company with a profusion of *Lyctus oblongus*, on which beetle the President said it was probable they were parasitic. Mr. Stevens said the *Tilli* were exceedingly active, flying on and off the palings during the sunshine, but there were not many of them.

The President exhibited a Hemipterous insect, one of the *Capsidæ*, received alive from Dr. A. Wallace, of Colchester, by whom it had been found on a plant of *Cattleya Aelandæ*, imported from Bahia. A leaf of the orchid was covered with blisters, cause doubtless by the punctures made by the insect. The species belonged evidently to the genus *Stiphrosoma*, the surface of the body was orange, the anterior margin of the elytra also broadly of this colour, but the rest of the disc and clavus dark steel-blue, very much resembling *S. amabilis*, Dougl. and Scott, from Palestine (E. M. M., v, 136).

Mr. Mansell Weale exhibited a fine collection of insects, chiefly *Lepidoptera*, made by him in South Africa, including a large number of *Papilio Merope* reared from the larvæ, and showing a very great amount of variation in form and colour. He also read some observations on the geographical distribution of the Fauna and Flora of South Africa, and the inter-dependence of their respective variation, as illustrated by the insects exhibited.

The President brought under the Society’s notice the accounts of the recent appearance of the Colorado beetle at Cologne and Ontario; and Mr. May handed in a copy of the Memorandum relating to this insect issued by the Canadian Minister of Agriculture.

The Secretary read a letter from the Secretary of the Crichton Royal Institution of Dumfries, stating that *Colias Edusa* had been common in that district during the month of June.

DESCRIPTIONS OF NEW *COLEOPTERA* FROM VARIOUS LOCALITIES.

BY C. O. WATERHOUSE.

(Continued from page 28).

TENEBRIONIDÆ.

CYPHALEINÆ.

CYPHALEUS ÆREUS, *sp. n.*

Oralis, convexus; capite creberrime fortiter punctato, inter oculos impresso; thorace sat transverso, antice angustato, vix crebre evidenter punctato, utrinque impresso, angulis anticis et posticis acutis, basi medio lobato; scutello punctato; elytris æneo-cupreis, convexis, vix crebre distincte punctatis, apice læviori; pedibus obscure cyaneis. Long. 8 lin., lat. 5 lin.

Thorax obscure æneous, with the sides slightly coppery; the anterior angles are prominent, slightly directed outwards, and acute, as are also the posterior angles. The elytra are very convex, narrowed at the apex, with a small impression below the shoulder, and a larger one on the side about the middle; the epipleural fold is coarsely punctured, gradually narrowed to the apex of the elytra. Prosternal process somewhat sharp at its apex; mesosternum deeply emarginate, with its anterior angles prominent and rather sharp. Metasternum bluish; abdomen brassy.

Hab.: Brisbane.MÆRODES, *gen. nov.*

Apical joint of the maxillary palpi securiform. Clypeus deeply emarginate. Prosternum not deflexed posteriorly, the produced part blunt at the apex. Mesosternum triangularly emarginate, the angles of the emargination rounded off (but not sloping down, as in *Lygestira*). Epipleural fold of the elytra broad at the base, gradually narrowing to near the apex, where it suddenly disappears.

This insect is particularly interesting as being intermediate, both in form and characters, between *Anausis* and *Lygestira*.

MÆRODES WESTWOODI, Mac Leay.

Prophanes Westwoodi, Mac Leay, Trans. E. Soc. N. S. W., ii, p. 287.

Oblonga, convexa, nitida; capite crebre punctulato; thorace transverso, antice angustato, crebre distincte punctulato, angulis anticis porrectis, acutissimis; scutello lavi; elytris olivaceis, crebre punctatis (punctis parvis et majoribus intermixtis), ad apicem oblique angustatis, apicibus breviter acute spinosis. Long. 12 lin., lat. 6 lin.

Hab.: Queensland.LYGESTIRA LATA, *sp. n.*

Oblonga, parum convexa, nigra; thorace transverso, subtiliter crebre

punctulato, antice emarginato, angulis anticis prominulis, acutiusculis, lateribus arcuatim rotundatis, basi bisinnato; scutello laevi; clytris nigro-olivaceis, thorace $\frac{1}{4}$ latioribus at $3\frac{1}{2}$ longioribus, crebre subtiliter punctulatis, lineis nonnullis impressis, ad apicem oblique angustatis.

Long. 11 lin., lat. 6 lin.

This species is at once separated from *L. simplex* by its much broader form; the thorax is a little more convex, much broader, more finely punctured, and more rounded at the sides, the anterior angles more acute. The elytra are much of the same form, but broader; the punctuation is finer and less close.

Hab. : East Australia.

ARTACTES GUTTIFER, *sp. n.*

Sub-circularis, convexus, aratus, subtus piceus; capite aeneo, subtilissime rix perspicue punctulato, inter oculos longitudinaliter impresso; thorace longitudine fere triplo latiori, subtilissime punctulato, antice emarginato, postice rotundato, angulis anticis rotundatis; scutello nigro, fere laevi; clytris thorace paulo latioribus, convexis, lateribus parum arcuatis, ad apicem rotundatis, seriatim punctatis, punctis distantibus (et saepe per paria approximatis), violaceo-cinctis; pedibus piceis, aeneo-tinctis.

Long. 4 lin., lat. $3\frac{1}{2}$ lin.

The three basal joints of the four anterior tarsi are not quite so much dilated as in the type of this genus (*A. nigratarsis*), but in other respects the present species agrees well generically with it. The distinct punctures forming the rows on the elytra being surrounded with purple gives this species a very decided character.

Hab. : Java (J. C. Bowring, Esq.).

ARTACTES LEPIDUS, *sp. n.*

Breviter oralis, convexus, supra aeneus, subtus piceus; fronte leviter convexa, fere laevi, clypeo subtilissime sat crebre punctulato; thorace longitudine fere triplo latiori, antice angustato, apice emarginato, angulis anticis obtusis, posticis rotundatis, basi rotundato; scutello parce punctulato; clytris thorace parum latioribus, regulariter striato-punctatis, punctis haud approximatis, interstitiis laevibus, lateribus leviter arcuatis, apice rotundato; antennis pedibusque piceis.

Long. 4 lin., lat. 3 lin.

The thorax is thickly but very obsoletely punctured; the margins blue. The elytra have regular rows of rather distant coppery punctures; the fine reflexed margins are blue. The anterior tarsi are only slightly dilated.

Hab. : Java (J. C. Bowring, Esq.).

CRYPISIS, *gen. nov.*

Apical joint of the maxillary palpi somewhat enlarged towards the apex, obliquely truncate. Antennae rather more than half the

length of the body, not thickened towards the apex, the third joint elongate, the fourth two-thirds the length of the third, the fifth to ninth slightly diminishing in length, the tenth a trifle longer, the eleventh elongate-ovate. Thorax regularly narrowed from the base to the front, all the angles acute. Elytra very little longer than broad, very convex, rounded at the sides and apex. Prosternum not keeled; bluntly rounded and not produced posteriorly. Mesosternum very slightly emarginate; its angles not prominent. Legs long and slender; the tarsi narrow, the basal joint of the intermediate tarsi as long as the three following together; the basal joint of the posterior tarsi very long; the penultimate joint in all the tarsi pencillated anteriorly below.

This genus must at present be placed next to *Chartopteryx*, with which it agrees in general character; but the structure of the antennæ is quite different, and peculiar in the group.

CRYPsis VIOLACEIPENNIS, *sp. n.*

Capite ante oculos angustiori, cum antennis nigris, ore picco; thorace latitudine bascos paulo breviori, perparum convexo, opaco, lævi, nigro, apice leviter bisinuato, lateribus fere rectis, piccis, tenuè marginatis, angulis anticis et posticis acutiusculis, basi medio lobato; scutello nigro, lævi; elytris thorace fere duplo latioribus, convexis, violaceis, nitidis, sub-rotundatis, subtiliter striato-punctatis; pedibus rufo-piccis. Long. 3 $\frac{1}{3}$ lin., lat. 2 $\frac{1}{3}$ lin.

Hab.: Laos (Mouhot).

RHYNCHOPHORA.

CYPHIDÆ.

STIGMATOTRACHELUS GUTTIFER, Dej.

Squamulis brunneo-cupreis dense tectus; elytris obscurioribus velutinis; scutello, macula sub-scutellari, plaga magna utrinque laterali, guttisque duabus sub-apicalibus albis; capite thoracique rugosis; elytris latitudinè paulo longioribus, posticè angustatis. Long. 5—6 lin., lat. 2 $\frac{1}{2}$ —3 $\frac{1}{3}$ lin.

Eyes very prominent. Forehead with a deep impression in the middle, and a square raised patch on each side. Thorax slightly transverse, a little narrowed in front of the middle, rugose, and with small shining black tubercles scattered over the disc, which has a distinct impressed mesial line. Scutellum elongate, white. Elytra at the base twice as broad as the thorax, velvety blackish-brown, punctate-striate, the apical half of the suture and the second interstice paler brown; there is a pure white elongate spot below the scutellum, another on the fourth interstice just below the apex, and a large white patch on the side below the shoulder.

Hab.: Madagascar

This insect has long been known under the name *Ampycus guttifer*, Dej., but I have not met with any description of it.

LONGICORNIA.

CERAMBYCIDÆ.

SYLLITUS BIPUNCTATUS, sp. n.

Elongatus, rufo-brunneus; thorace elongato, confertim ruguloso-punctulato, ante angulos posticos paulo ampliato; elytris brunneis, creberrime fortiter punctatis, singulis lineis duabus elevatis, flavis, medio distantibus ornatis, guttâ albâ notatis; pedibus 4 posticis obscurioribus. Long. 4 lin.

Closely allied to *S. grammicus*, Newm., but relatively shorter, especially in the elytra. The elytra are distinctly more coarsely punctured, the two yellow lines are more suddenly and more widely separated behind the middle, the line next the suture nearly touches it in the middle. Between the lines at the widest part there is a round white spot.

Hab. : Queensland.

British Museum : May, 1877.

NOTES ON AFRICAN HEMIPTERA-HETEROPTERA.

BY W. L. DISTANT.

CRYPTACRUS COMES, Fab. (*var.*).

This variety is unicolorous above, being shining olivaceous, thickly and finely punctured, and differs only in the absence of yellowish markings above from the typical form of *C. comes*. It appears, from the examination of a large number of specimens of both sexes, to be very constant in the localities mentioned below, but as the type was recorded from Guinea, and has been received from Calabar, the variety I describe may prove to be of a seasonal or dimorphic character.

Hab. : Mongo-ma-lobah. Camaroons (D. G. Rutherford).

CRYPTACRUS NIGRICOLLIS, Sign.

In his "Enumeratio Hemipterorum," part iii, p. 33, Dr. Stål has proposed a new genus, "*Anoplogonius*" for this species, the characters for which, in the absence of reference, I take to be enumerated in his Hem. Afr., i, p. 39-*aa*; I, however, prefer following him in the last mentioned work, and include *C. nigricollis*, in the same genus with *C. comes*, Fab.

The late Mr. Walker, in his Cat. Het., i, pp. 11 and 12, describes two species, *C. erotyloides* and *C. silphoides*, which, by an examination of the types in the Brit. Mus., I have satisfied myself are both varieties

of one form, previously described by Signoret as *Chærocoris nigricollis*. Dr. Stål, in his Enum. Hemip., has already included *C. silphoides* as a synonym of that species, from which it does not differ, but, apparently led away by Mr. Walker's remark at the end of his description of *C. erotyloides*, that "the shorter body and the marking of the thorax and scutellum distinguish it from *comes*," has placed this form as a variety of *C. comes*, Fab. The following is the synonymy of the species, and synopsis of variation, which is merely that of colour :

Thorax unicolorous. Scutellum bicolorous.

C. nigricollis, Sign. (*Chæ. nigricollis*), Sign., in Thoms. Arch. ent., ii, p. 270, 489, pl. 11, fig. 1 (1858). *Graptocoris nigricollis*, Stål, H. Afr., i, p. 40, 4 (1864). *Cryptacrus silphoides*, Walk. (Type), Cat. Het., i, p. 12, 5 (1867).
var. *a silphoides*, var. β , Walk., Cat. Het., i, p. 12 ... Brit. Mus.

var. *b* ,, var. γ , Walk., *ib.* ... Brit. Mus., Coll. Distant.

Thorax bicolorous. Scutellum bicolorous.

var. *c erotyloides*, var. β , Walk., *ib.* ... Brit. Mus.

var. *d* ,, type, Walk., *ib.* p. 11 ... Brit. Mus.

Thorax and scutellum unicolorous.

var. *e* shining bluish-black above, in all other respects agreeing with typical form. Hab. : Mongo-ma-lobah Coll. Horniman, Distant.

C. erotyloides does not differ in size from *silphoides*, as stated by Mr. Walker. I have seen specimens of each which are strictly alike. It will be seen that the range of colour-variation is alike in both *C. comes* and *C. nigricollis*, the varieties of each I have here described being either extreme or primitive forms, in which there is a total absence of yellow markings above.

West Dulwich: Aug. 1st, 1877.

BRITISH HEMIPTERA-HETEROPTERA—ADDITIONAL SPECIES.

BY O. M. REUTER.

1. ORTHOTYLUS (= LITOSOMA) VIRIDINERVIS, Kirschb., *nee* D. & S.

Capsus viridinervis, Kirschb., Rhynch. Wiesb., pp. 78, 75, and 112, 13.

Pale and somewhat transparent green, clothed with rather longish ochreous hairs; membrane pellucid, the nerves bright and constant green; vertex distinctly marginate; rostrum reaching to the apex of the second pair of coxæ; antennæ about one-fourth shorter than the body, first joint as long as the head, second joint a little more than three and a-half times as long as the first, third joint only about half as long as the second, the fourth more than half as long as the third, the last two joints together shorter than the second; the first and the second joint with a few longer pale hairs.

Length, ♂, 5, ♀, 5½ mm.

Scotland; I found three specimens in August, 1876, on *Ulmus montana*, by Diwic, near Forres (Morayshire).

Similar to *O. prasinus*, Saund. (*viridinervis*, D. & S.), but differing by the marginate vertex and the structure of the antennæ. Also allied to *O. prasinus*, Fall., *nec* Saund., but having the vertex posteriorly much more sharply marginate, the first joint of the antennæ longer and more robust, the second joint with longer pubescence and a few erect hairs, the genital segment of the male shorter, and not wider than the other ventral segments.

2. CONOSTETHUS BREVIS, *n. sp.*

♂, oblong; ♀, oval; second joint of antennæ about as long as (♂), or shorter than (♀) the width of, the head; third joint a little longer than the second, and, especially in the male, curved, fourth joint in the ♀ more than half as long as the third; antennæ shorter than the body, robust, black, the base of the first joint yellow (♂) or yellowish, toward the apex brownish (♀); hinder margin of pronotum not wider (♀), or scarcely wider (♂), than the head, the lateral margins a little sinuated; elytra as long as (♂), or almost as long as (♀), the body, wings a little shorter; legs ochreous, thighs with a few brown spots, anterior tibiae, especially in ♂, incurved. ♂ and ♀ discoloured: ♂, head flavous, with a brown spot on each side of the base, thorax grey, with the dorsal line and lateral margins flavous, the calli brownish; scutellum flavous; elytra greyish, the sides and eucus pale yellowish, membrane dusky; the body beneath yellowish; the upper-side of abdomen brownish-black. ♀ pale yellowish; elytra somewhat greenish-grey, with the lateral margins paler, membrane short, not twice as long as the eucus, nerves pale; abdomen above blackish, beneath green.

Length, ♂ almost $2\frac{1}{2}$, ♀ $2\frac{1}{3}$ mm.

Scotland; Mrs. Reuter found two specimens (♂ ♀) in saline damp places on the shore near Forres.

Very closely allied to *C. salinus*, J. Sahlb. (*griseus*, D. & S.), but much narrower and shorter. *C. salinus* has the antennæ and legs much longer, the second joint of the antennæ being distinctly longer than the width of the head, the third joint much more curved and longer, the fourth joint not half as long as the third; the elytra longer than the body, the pronotum distinctly wider than the head, with the sides more sinuated, and the posterior angles more prominent; the anterior tibiae of the male more incurved, &c.

3. HEBRUS RUFICEPS, Thoms.

Hebrus ruficeps, Thoms., Opusc. Entom., 395; J. Sahlb., Notis. Fauna et Flora Fenn., xiv, 266, 2. *Hebrus pusillus*, Flor., Rh. Livl., i, ~~171~~³⁷⁴, 1 (forte).

The first joint of the antennæ a little longer than the diameter of the eye, or than the second joint, reaching only slightly beyond the apex of the head; body

brownish-black; very finely pale pubescent; head, the first two joints of antennæ, rostrum, and legs, reddish-testaceous; pronotum reddish-brown, the disc brownish, unequal, in the middle somewhat sulcate, apical margin incrassated; elytra, in the brachypterous form, very short, scale-like, black, exterior margin reddish-brown.
Length, $1\frac{3}{4}$ mm.

Scotland; many short-winged specimens found among *Sphagnum* in August, near Perth, by Dr. Buchanan White and myself.

This species is probably mistaken for the brachypterous form of *H. pusillus*, Fall., but the latter is, as far as I know, not dimorphous; it is larger, having the first joint of antennæ much longer (nearly twice as long as the diameter of the eye), reaching far beyond the apex of the head.

Finland, Åbo et Pargas:
1st July, 1877.

ON STRIDULATION IN THE *CICADIDÆ*.

BY A. H. SWINTON.

When we observe the upper surface of the first abdominal segment of a male *Cicada*, the eye is arrested by two convex triangular membranes (tymbals), placed laterally, of the consistency of parchment, and traversed by elevated chitinous ridges, which are indurated centrally to correspond with a series of oblique callosities in the membrane. These organs, resembling minute shells, are either exposed or more or less covered by prolongations of the general integument, and in the female are only denoted and rudimentary; their function is to effect by vibration the music of these insects, communicated, as it appears to me, by scraping the indurated central part of their elevated ridges (representing a lima), over a portion of the cavity in which they are placed, projecting immediately posterior.

Two theories are extant to explain the "drumming" of the *Cicada*. The one perhaps most commonly preferred, is derived from dissections made by Réaumur (Mém., v, p. 1; ib. iv, p. 181; Amsterdam, 1741), who, not having seen the living insect, was led to recognise several parts of the structure accessory to the tymbals as engaged in the production of the sound. This view Messrs. Solier and Gonreau (who sought to confirm Réaumur's conception by observation and experiments on the Provençal *Tibicen orni*, and *Cicada hamatodes*, removing and tearing the various adventitious parts, "ventral opercule," "mirrors," and "tender membranes" in succession) found it necessary greatly to modify, so as eventually and virtually to localise the production of the sound in the tymbals, which when

successively deflected by the tendon of a large depressor muscle, attached internally and near its base, receive a vibration by elastic rebound (Goureau, *Ann. de la Soc. Ent. de France*, vi, p. 397—400; *ib.* vii, p. 401—407, Solier, *ib.* vi, 1837—38). Thus modified, the theory of Réaumur differs only in detail from the view adopted by Swammerdam, and earlier by Julius Casserius (*De vocis auditusque organis*: Ferrara, 1600).

The other theory of modern time (but also implicitly enunciated by Aristotle and Pliny) owes revival to Dr. C. G. Carus (*Analekten zur Naturwissenschaft und Heilkunde*, p. 151: Dresden, 1829), who collected ancient and mediæval bibliography, and made observations and anatomical dissections at Florence. He thus describes the drumming: "It is quite true that by pulling this muscle in a dead *Cicada* with a pair of forceps, one can produce the identical sound made by a living one. To what extent the motion necessary to produce the voice accords with the respiratory movement perceived in the abdomen of the *Locusta*,* the observation of a living and singing insect shows very strikingly. For example, when one such, perchance sitting on a spray, is examined (as I have often done on warm evenings in the olive gardens at Florence), it is noticed how the insect, at every sound that it gives out, somewhat raises the abdomen (which is the effect of the contraction of the powerful tensor of the drum-skin), and lets it immediately sink again, a movement repeated quicker and quicker, and passing into a very rapid quivering, whereby the note is merged into a mere chirp, which at length ceases and the body returns to rest."† He then proceeds to consider the effect of the muscular contraction on the internal air-bladders, and ascribes the sound to air forced through the metathoracic spiracles (these are noticed by Chabrier, *Essai sur le Vol des Insectes*: Paris, 1823), a view which Dr. Landois (*Ton- und Stimmapp. der Ins.*, pp. 49—54, *Zeitschrift für wissensch. Zoologie*, 1848) more fully elaborates, reserving to the tymbals the mere function of resonance. Burmeister on the other hand (*Handbuch der Entomologie*: Berlin, 1832) follows Carus more closely. Solier (1837) considers expiration from the metathoracic spiracles as implicated in the music, but in this he is confuted by Goureau (1838), who stopped them with tallow without inducing effect on the song's duration or intensity. Latreille held that the sound was effected by

*The theory was at this time prevalent that the *Orthoptera* sang by expiration from the abdomen. Dr. H. Landois, *Ton- und Stimmapp. der Ins.*, pp. 7—9.—A. H. S.

†*Tibicen orni* commences with a sound resembling knife-whetting that passes into a rattle like that of a tree frog. The classical *Cicada plebeia*, said to renew its youth with the sound of a waterfall, ceases its sound in a whistle.—A. H. S.

expiration from a hole at the posterior part of the tymbals. A few other theories have been advanced to account for the singing of the *Cicadae*; thus Rösel (*Insectenbelustigungen*, ii, p. 168), and after him Oken, thinks it may occur by the tendon of the motive muscle striking on the tymbal like a plectrum; others state that the abdomen is rubbed against the thorax, or attribute the sound to wing-percussion.

But the drumming of the *Cicadidæ* has claims to be classed as stridulation. First, it is produced by the tymbals, for when these are torn the sound invariably ceases. Messrs. Goureau and Solier, and Dr. G. Bennett (*Wanderings in New South Wales*), agree that the tymbals and their motive muscles are absent in the females, which are mute. Dr. Bennett speaks of the notes of the Australian *Cicadae* as follows:—"The most common sound is the incessant drumming, but it is not confined to this, the ziz, ziz, ziz, is often interrupted by ohoi, ohoi, ohoi, varied to whocky, whocky, whocky, and the noise ceases. Sometimes a prolonged note of alrite, alrite, alrite, is heard varied to ohoé, ohoé, ohoé, the last note being prolonged, followed by whocky, whocky, whocky, in very shrill tones; then ziz, ziz, ziz, continues for some time, followed by a sound of yocky, yocky, yocky, after which the din suddenly ceases. I observed them to be capable of modulating the sound and varying its intensity. As soon as the delicate tympanum of the drum was destroyed, the sound ceased, although it had just before been of deafening shrillness."

Then the elevatory movement of the abdomen is necessary to effect the sound. Goureau says, "I procured some of these insects (*C. hematodes*) in the summer of 1836, on which I made the following observations:—When this insect sings in a box no motion is noticeable in the wings nor in any other part of the body; when I held it between the fingers in such a way as left the abdomen free, its voice was as strong as usual; but if I held its body and pressed the opercula against the abdomen, it was dull, faint, and stifled; if, on the contrary, I raised the abdomen, so as to leave the cavities, which are generally covered by the opercula, open, the voice became unusually loud and strong." The motion of the abdomen regulates the pitch of the note and its intensity, as Carus also remarks, but so in like degree do the vibrations in the springing tymbal. "The tymbal vibrates and alters its form," says Goureau, "passing successively from a convex to a concave form; it is this movement which produces the sound and song. These vibrations are very apparent when the insect sings loudly, and less so when only a faint sound is produced, and when the song is

scarcely audible by us, they are imperceptible." There is also a distinct "vertical" and "lateral" movement of the abdomen during the production of the song.

These facts being considered, it will appear, on careful examination of the adjustment of the tymbals in a male *Cicada*, that the several movements mentioned *cannot* well take place without *literal contact* between the indurated portion of the ridges on the tymbals and the posterior projection, when the latter would perform the function of *a lima*, for which its construction is suitable. The music of the *Cicadae* exhibits the phenomena of love and rivalry, the males respond to each other's calls, and instigated by the notes approach and congregate on the same bough; the females attracted by the sound fly to their mates. The males sing in the hand on seizure, and eject a fluid from the anus when disturbed, stimulated, probably, by fear. Their drumming is confined to diurnal periods and sunshine, but some, as *Cystosoma Saundersi*, sing during the twilight. Another group of *Homoptera*, the *Fulgoridae*, are thought to perform at night. (Darwin, Desc. of Man, i, chap. 10; see also Ent. Mo. Mag., xi, pp. 175—177; Journ. of Asiatic Soc. of Bengal, ix, p. 441; Canadian Nat. and Geologist, iv, p. 121; Bates's Naturalist on the Amazons, pp. 229—31, 274—75, &c.). *C. Saundersi*, whose note, "a loud guttural 'r' continued incessantly," makes one think of the "churr" of the goat-suckers, is heard also in the gloom preceding a thunderstorm (Bennett, Wanderings in New South Wales).

Guildford: July, 1877.

DESCRIPTIONS OF THREE NEW SPECIES OF BUTTERFLIES FROM DELAGOA BAY.

BY W. C. HEWITSON, F.L.S.

The Monteiros have sent home their second collection, containing a large number of butterflies, chiefly *Charaxes*, and in the most perfect condition.

There is a very fine new *Philognoma*, a new *Charaxes*, and a new *Crenis* of great beauty (described below), nearly allied to *C. Benguela* of Chapman. These are, however, I am sorry to say, all that are new.

Delagoa is apparently the head quarters of *Charaxes*, since the collection contains the following species:—*C. Brutus*, *Candiope*, *Castor*, *Zoolina*, *Phæus*, sp. n., *Ephira*, *Pelias*, *Neanthes*, and *Achæmenes*.

Of *C. Achæmenes*, there are both sexes. The female, which I do not remember to have seen before, bears a great general resemblance to *C. Pelias*.

The Monteiros have been at Mozambique, but did not see a single butterfly worth bringing away.

CHARAXES PILEUS.

Upper-side. Male, grey-blue from the base to the middle nearly of the anterior wing, to beyond the middle of the posterior wing. Anterior wing with the apical half dark brown, marked by a curved band of five white spots. Posterior wing with two tails, the outer margin broadly black, traversed by a series of blue spots: the margin from the apex to the middle tail rufous, between the tails green, marked by a spot of black at the anal angle, and bordered above with lilac; the whole bordered below with black.

Under-side pale grey-brown. Both wings crossed from the base to the middle by several black lines, forming the border of a broad band on the posterior wing, both crossed by a series of rufous spots. Anterior wing with three minute black spots at the base, the margin rufous; posterior wing with the margin as on the upper-side, bordered above with dingy white.

Female black. Both wings crossed at the middle by a broad white band, tinted near its border with lilac. Anterior wing with two spots near the middle, and five spots between them and the apex, all white. Posterior wing with a sub-marginal series of indistinct white spots, the margin rufous.

Exp., ♂, $2\frac{8}{10}$; ♀, $3\frac{3}{10}$ inch.

Like *C. Bohemani* on the upper-side; like *C. Ephira* on the under-side.

PHILLOGNOMA AZOTA.

Upper-side. Female dark brown. Both wings crossed by a very broad white band tinted with lilac, commencing on the anterior wing at the third median nervule, where it is tinted with orange, and becoming broader on the posterior wing, and reaching to the abdominal fold. Both wings with the outer margin broadly rufous. Anterior wing with a bifid orange spot near the middle of the costal margin, and a broad, sub-marginal, rufous band. Posterior wing with one tail.

Under-side rufous-brown. Both wings crossed as above by a common band, but narrower, tinted with yellow, and marked near its outer border by several brown spots. Anterior wing with several dark brown spots in, and below, the cell, the bifid spot and rufous band as above; two pale spots near the apex, and a black spot at the anal angle, and a sub-marginal series of white spots.

Exp., $3\frac{1}{6}$ inch.

CRENTS ROSA.

Upper-side. Female lilac, clouded at the base with pale brown. Anterior wing with the discocellular nervure, an oblique band near it, a spot below it, a second oblique band near the apex, a spot above it, the outer margin and the nervure near it, all black. Posterior wing with the centre tinted with pale brown, a series of six round spots, a sub-marginal series of oblong spots, and the outer margin, all black.

Under-side rufous-orange, the outer margins black, the fringe white. Anterior wing with a band of three black spots beyond the end of the cell, a sub-apical band of four black spots, three of which are bordered by pale green; the outer margin

green, traversed by a series of black spots. Posterior wing crossed by four bands of pale green; the sub-basal and second bands traversed by linear black spots; the third band of oval spots each marked with black; the fourth sub-marginal, and traversed by a series of black linear spots.

Exp., $2\frac{7}{10}$ inch.

A very beautiful species, much like, but distinct from, *C. Benguela*. I have much pleasure in giving it Mrs. Monteiro's name.

Oatlands, Weybridge:
August, 1877.

NATURAL HISTORY OF *BOARMIA CINCTARIA*.

BY WILLIAM BUCKLER.

It gives me pleasure to record my thanks to Mr. J. G. Ross for kindly supplying me with eggs of this species on May 26th, 1876, which were laid together in a cluster.

In shape, the egg is elongate, elliptical, bluntly rounded at one end, and more gradually at the other, near which occurs a depression; the surface ribbed longitudinally and pitted; in colour light olive-drab, iridescent with the play of light in the numerous pits, and having a slight degree of transparency showing when held against the light, the darker embryo within; the colouring changes the day before hatching to pinkish-grey.

The larvæ hatched May 28th, and at first they were dark olive-brown, with pale olive-green head, a whitish stripe along the back, another along the side; several kinds of food were given them, but they unmistakably preferred birch, on which, after wandering over other leaves, most of them settled down, and began to eat minute patches of cuticle from the under-side, causing transparent specks to appear on the upper surface of the leaves. By 3rd of June, some had escaped, probably during my previous inspection, and one had died on an oak-leaf, the remaining twelve had moulted, and were pale greenish-yellow on the back, with a very broad darker greenish stripe on each side. After another moult, by the 9th, they were a quarter of an inch long, of olive-green colour, with several fine, equidistant, double, longitudinal, darker lines; at this time they were very lively active loopers, and had been apparently feeding a little on oak as well as birch, but preferring the latter. By the 12th, they were five-sixteenths of an inch long, and much paler green in colour, with lines only just visible, and by the 15th, had again moulted and become darker, and on the 18th, were nine-sixteenths of an inch long, having distinct dark lines with the addition of pale sub-dorsal stripes; by the 23rd, the most forward

individuals had increased their length to three-quarters of an inch, and were stouter in proportion, their lines still more distinct, the sub-dorsal white stripe relieved now by a specially dark one beneath. By the 1st of July, they had moulted for the last time, and in the course of three or four more days attained their utmost dimensions, becoming full-fed, and retiring to earth from July 6th to 10th. The first moth came forth on April 25th, 1877, simultaneously with about a dozen of *Æcophora pseudo-spretella*, both species continuing to appear at intervals, and the last specimen of *cinctaria* on May 12th, in all, seven males and three females, a wonderful result, as only two of the pupæ had been found and devoured by such a number of those insatiable pests, which appeared to have fed chiefly on the remains of the birch leaves amongst which they had spun themselves up. The *cinctaria* seemed not to have made any appreciable cocoons, as the pupa skins were found at the bottom of the pot, at a depth of four inches, apparently loose in the coarse friable soil.

The full-grown larva is one and a half inch in length, moderately slender, nearly of uniform bulk when viewed from above, but, when viewed sideways, is seen to taper very slightly from the tenth segment, both towards the head and also behind; the head is rather wider near the mouth than at its junction with the second segment; the skin is soft and smooth, its general ground colour a light and tender green, the head the lightest, and rather pinkish at the mouth, the ocelli black, on the second segment the lines to be mentioned are all very faint, the whole of the back appears much lighter than the sides and belly, from the number and closeness of pale longitudinal lines, which are relieved by fine thread-like edges only of the green ground; the dorsal line is rather bluish-green, darkest near each segmental division, and having an exceedingly fine, ragged, greenish-white, central thread, close on either side of it comes a ragged-edged, yellowish-white, or yellowish line, followed closely by another, less light or fainter, and again by a wider, ragged-edged, whitish, sub-dorsal line, these are each defined by a fine thread of green edging, and are relieved below by a wide line of rather darker bluish-green, having a very fine, ragged, paler thread running through it; below, again follows a faint greenish-white thread, edged with a darker thread of bluish-green, followed by a broad space of the light green ground, only faintly marked with the slightest possible trace of a pair of paler threads along the spiracles, which are small, roundish, oval, and flesh coloured, delicately outlined with black, the skin below them a little puckered, showing yellowish in some places; the belly is of a more bluish-green, having a ventral paler

stripe, faintly edged with darker green than the ground, and on either side are two faintly paler ragged lines also edged with darker green; the lines of the back all terminate in front of the anal flap which is light yellowish-green, with a sprinkling of most minute black freckles; freckles also occur on the hinder parts of the anal legs; a fine short bristly black hair proceeds from each of the usual tubercular situations, but can only be seen with a strong lens.

The pupa skin is nine-sixteenths of an inch in length, of ordinary shape, thickest at the ends of the wing-cases, plump in character, tapering rather suddenly to the anal tip, which has a small projection and a spike from it divided in two sharp points, the abdominal divisions are smooth, the rest of the surface finely punctate; the colour dark mahogany-brown, and rather shining; on the abdomen a few extremely fine short hairs pointing backwards.

Emsworth: *August 9th, 1877.*

DESCRIPTION OF A NEW NEUROPTEROUS INSECT FROM NEW GUINEA, BELONGING TO THE GENUS *MYIODACTYLUS*, BRAUER.

BY R. McLACHLAN, F.R.S.

MYIODACTYLUS *NEBULOSUS*, n. sp.

Form of *M. osmyloides* (Brauer), but much larger. Body yellowish (perhaps greenish in life). Head with a transverse median impression in the middle above, and with a narrow, longitudinal, median impressed line extending from the posterior margin to between the antennae, on either side of which posteriorly is an abbreviated, longitudinal, fuscous sulcus; face and palpi pale yellowish, the tips of the mandibles picuous. Antennae much shorter than the wings, stout, about 12-jointed, very pale claret colour with fuscous hairs. Pronotum with a broad, median, longitudinal, brownish-claret-coloured vitta; hairs whitish. The whole under-side of head and thorax very pale yellowish. Legs whitish (or very pale greenish-white), with long whitish hairs. Abdomen brownish (colours changed), with short whitish hairs; last dorsal and ventral segments both produced in an acute boat-shaped manner; from within the last ventral segment proceeds a stout, up-curved process (penis?).

Wings whitish, semi-opaque, as if oxidized. Anterior pair oval, the costal margin much rounded, strongly ciliated with pale hairs; costal area very broad: venuration whitish; the base of the forks in the costal area, and apical area, and the origins of the branches of the sector, black; some of the discal transverse veinlets smoky, margined with pale smoky-grey; pterostigma (in both pairs of wings) claret-coloured with a pale smoky-grey cloud beneath it extending to the point of junction of the sub-coستا and radius; a pale, smoky-greyish, oblique streak extending from the extreme apex of the wing to the anal angle, but leaving a narrow clear space between it and the margin; sector emitting eleven principal branches. Posterior-wings very narrow, dilated gradually to the sub-acute apex; forks in the apical area

marked with black at the base, but otherwise (excepting at the pterostigma) the neuration is entirely pale: on the inner margin (opposite to the pterostigma) is an oblique, pale smoky-grey cloud.

Length of body, 16 mm. Expanse of wings, 49 mm. Greatest breadth of anterior wings, 11 mm.; posterior, 8 mm.

New Guinea (*Ansus*, *A. B. Meyer*, 1873).

This fine insect belongs to the Dresden Museum, and has been communicated by my friend Baron E. de Selys-Longchamps, to whom it was forwarded by Dr. Kirsch, of Dresden, for identification. I believe it is a ♂, but the abdomen has been laterally crushed.

It differs from *M. osmyloides* in its much larger size, semi-opaque, whitish, non-iridescent wings, the presence of smoky-grey marginal streaks or clouds, the broad claret-coloured vitta of the pronotum, &c.; and in *M. osmyloides*, the transverse reticulation is almost entirely black. I believe *osmyloides* extends into the Malayan islands (although it is typically from Queensland), and I have an example labelled "China," though there may be some doubt as to the correctness of this.

The two other Australian species, *M. sejunctus*, Walker, and *armatus*, McLachlan (possibly sexes of one) differ in their very much narrower anterior wings and less complicated neuration (the costal veinlets being for the most part simple), and also in their remarkable genital armature.

Lewisham, London:
6th August, 1877.

ON SOME NEW AND LITTLE-KNOWN FORMS OF *AGRIONINA*
(*LÉGION PSEUDOSTIGMA*, DE SELYS).

BY R. McLACHLAN, F.R.S.

The group of tropical American *Odonata* forming the *Légion Pseudostigma* of the sub-family *Agrionina* is of extreme interest, as containing the largest of existing Dragon-flies, and on account of the extreme length of the slender abdomen, and the tendency exhibited to run into puzzling local forms. The *Légion* formed the first in De Selys' "Synopsis des Agrionines" (only just completed), and was worked up by him in 1860. With the exception of the description by Hagen (in 1869) of a new species, nothing has been written on the group since that time, and as so much has since been done towards the exploration of the regions where these insects occur, it is natural that additional materials should have been obtained. I propose to give here descriptions, &c., of a few remarkable forms existing in my own collection, being prompted thereto by the discovery of a species having a very anomalous neuration.

MICROSTIGMA TERMINATUM, *n. sp.*

Thorax black above, the dorsal keel narrowly yellow; a humeral line not reaching the anterior portion, and a short ante-humeral line anteriorly, scarcely extending beyond the termination of the humeral, yellow: sides, and beneath, yellow, with a complete narrow black median line on the sides, and a blackish central pectoral line. Abdomen (nearly destroyed) black, with an indication of a yellowish mark on each side of the anterior portion of the eighth segment. Wings hyaline, with black neuration; in the anterior wings there is a broad fuscous ante-apical fascia, concave internally and externally, leaving a large, opaque, ochreous (not very finely reticulated), oval, yellow apical spot. No pterostigma in either pair of wings. In the posterior wings, the apical portion is also dark fuscous (but less broadly so), convex internally, and enclosing a small, rounded, milky-white spot at the extreme apex.

Expanse of anterior wings, 11.4 mm.

I have one very much mutilated ♀ example, believed to be from East Peru (district of the Ucayali River). It wants head, legs, and basal segments of the abdomen, and the basal portion of the wings is also destroyed (by *Anthreni*). The coloration of the anterior wings is somewhat similar to that seen in *M. rotundatum*, race *exustum*, but the wings are not so broad, the reticulation less dense, and the broad ante-apical portion is darker (nearly black): the posterior wings are remarkable for the small rounded white spot in the dark apical portion. Thoroughly distinct from any described species.

ANOMISMA, *n. g.*

Allied to *Microstigma*. Differs from all known *Agrionina* in the quadrilateral area at the base of the wings being reticulated by transverse nervules, long; wings petiolated up to just within the level of the nodus; reticulation of the post-costal area not greatly ramified, forming 3—4 rows of irregular cellules in its broadest part; no pterostigma in either pair of wings.

ANOMISMA ABNORME, *n. sp.*

Black. Head black above, yellow at the back; a short yellow oblique line before and behind the basal joint of the antennae; labrum narrowly margined with yellow; under-side yellow. Prothorax yellow at the sides, the posterior margin narrowly yellow, the anterior portion with a narrow raised yellow line just within the extreme margin, which remains black. Thorax with a narrow yellow dorsal keel, a yellow humeral line (not reaching the anterior margin), and a short yellow ante-humeral line anteriorly: sides and beneath yellow; a complete black lateral line, and a black pectoral line, furcate posteriorly, connected with a transverse black line behind the legs, and there are two or three small black spots. Legs yellow, with black spines; femora externally, tibiae and tarsi internally, with a black line. Abdomen bronzy-black, yellow beneath, but with a black ventral line; 1st and 2nd segments broadly yellow on the sides, and with a narrow median dorsal yellow line, interrupted by the suture; genitalia of 2nd segment yellow. (Mutilated after the 6th segment). Wings rather narrow, the anterior pair rounded at the apex, the posterior narrower and elliptical: hyaline, with black neuration. In the anterior

wings, less than the apical fifth is occupied by a large opaque yellow space (not very finely reticulated), bordered internally by a rather narrow smoky band, expanding on the inner margin, and concave externally in an oblique manner: the posterior wings have the extreme apex narrowly margined with blackish, which colour extends a short distance along the principal sector; otherwise these wings are altogether hyaline.

Length of abdomen to end of 6th segment, 47 mm. Expanse of wings, 102 mm. Length of posterior wing, 50 mm.: greatest breadth of same, 10 mm.

I have one ♂ from the same locality as *M. terminatum*. Although evidently allied to *Microstigma*, and of the same *facies*, this genus at present rests alone in the sub-family in having a reticulated quadrilateral. This area is long; in both posterior wings there are two transverse nervules in it; in one anterior wing there are three, in the other two, so that two is probably the normal number. The genus is also peculiar, in having the wings petiolated almost up to the level of the nodus.

MECISTOGASTER JOCASTE, Hagen.

Stett. ent. Zeit., 1869, p. 260.

I have a ♂ labelled as from Columbia, rather smaller than that described by Hagen (expanse, 75 mm.). A ♀ from New Grenada (expanse, 90 mm.) differs from the ♂ in having the extreme apex of the anterior wings smoky-brown.

From East Peru (?) and Pebas, Upper Amazons, I have two ♀ (expanse, 101 and 104 mm.) of what is perhaps only a race of this, and which has long stood in my collection (and also in that of De Selys) as *M. sincerus*, McLach., MS. It differs from typical *Jocaste* in all the wings (especially the posterior) being tinged with smoky-brown, insensibly shading into the dark portion before the apical spot in the posterior wings; in the anterior wings, the dark apical portion is much broader than in ♀ *Jocaste*.

I would remark that in both forms the apical spot of the posterior wings is pure white, rather than "*niveo-flavo*" as described by Hagen.

MECISTOGASTER ASTICTUS (Burm.), De Selys.

I have two ♂ and one ♀ from Minas Geraes. The ♂ has not yet been described. This sex is somewhat smaller (expanse, 80—85 mm.). It differs from the ♀ in having the wings altogether hyaline (without white apical space). There is no true pterostigma, but in its place are several thickened black nervules, and in the posterior wings, the costal vein is also thickened at this part, and rather suddenly elevated, so as to form almost an angle.

Lowisham, London:

August 10th, 1877.

Colias Edusa in Hampshire.—The second brood of *C. Edusa* is out in great profusion. On Monday, a friend netted, at my request, about seven or eight females, the shabbiest he could see, and one or two of them deposited fifty or more eggs on *Lotus corniculatus*, and a dozen or so on *Trifolium pratense*, during a transient gleam of sunshine yesterday.—W. BUCKLER, Emsworth: 10th August, 1877.

Colias Edusa near London.—It may be of interest to record the visit of *Colias Edusa* to the north of London. One I saw last Sunday, but did not secure; two others, however, the succeeding Monday, I netted in our garden at Highgate. This is, I believe, their first visit to us since a friend of mine secured five on the railway cutting at Kentish Town, five years ago.—M. J. MICHAEL, Cholmeley Park, Highgate, N.: August 9th, 1877.

Colias Edusa near London.—I have been looking for the appearance of the second brood of this butterfly. I saw a fine, fresh specimen in my garden on Saturday, August 4th, another the day after; my wife saw two at Hampton on the 6th, and I saw one near Sunbury same day.—GEORGE LEWIS, Putney: August 7th, 1877.

Colias Edusa in London.—During the present week, I have seen several specimens of *Colias Edusa* in the gardens on the Thames Embankment, near Charing Cross.—A. H. JONES, Eltham: 17th August, 1877.

Colias Edusa at Warwick.—*C. Edusa*, although very rare in this neighbourhood in ordinary years, has been very abundant this season. My son and several of his friends have taken more than forty specimens, and have seen many more. According to their accounts, it appears to be more common than the white butterflies, and the specimens taken are very fine and in good condition.—J. S. BALY, The Butts, Warwick: 13th August, 1877.

Notes on the two broods of Colias Edusa in Sussex.—The last *C. Edusa* of the early brood was seen and captured by me here, on the 12th of July, a worn and weary male. On the 30th July, I observed many specimens of the second brood; the insect is again quite abundant.—HENRY S. GORHAM, Shipley, Horsham: July 31st, 1877.

Variety of Limenitis Silylla.—Whilst collecting in the New Forest, Hants, during the past month, my father took a beautiful variety of this species; the upper-side being entirely black, with the exception of a white dot on the middle of the inner margin of the fore-wings, whilst the under-side is richly coloured with black, red, and white, hardly a trace of the normal form being visible.—WILLIAM WATKINS, Shepherd's Bush: July 20th, 1877.

Notes on Hesperia Actæon.—The occurrence of *H. Actæon* in a new locality on the Dorsetshire coast was recorded by Mr. Parmiter in "The Entomologist" for 1870; but as no particulars of the locality were published, and as the species has been considered so excessively local in this country, a few notes on the subject may be of interest.

During last month, I found *Actæon* in some abundance on rough broken ground on the slopes of the cliffs about 15 or 16 miles east* of Lulworth Cove.

The species was sparingly distributed over an extent of ground about three-quarters of a mile in length; but in one or two spots it was abundant.

The locality in which I found *Actæon* in the greatest plenty, consisted of a level plateau about 300 feet in length and 50 in breadth, apparently formed by a landslip at no very remote period, on the side of the cliff at a height of about 130 feet above the sea. The ground at this spot is extremely rough, with masses of rock lying about in all directions, and from its proximity to the edge of the cliff and the frequency of land slips, both from above and below, the pleasure of collecting on it is certainly attended with that "spice of danger" alluded to by Mr. Birchall at p. 69 of the present volume.

The vegetation of this locality is of a very varied character, and includes, in addition to several species of coarse grass and reeds, *Equisetum fluviale*, *Rubia peregrina*, *Teucrium scorodonia*, *Galium verum* and *mollugo*, *Picris hieracioides*, *Agrimonia eupatoria*, *Artemisia vulgaris*, *Trifolium procumbens*, *Lotus corniculatus*, *Hippocrepis comosa*, *Erythraea centaurium*, *Tormentilla reptans*, *Vicia sepium*, *Ononis arvensis*, *Orchis pyramidalis*, &c.

If *Calamagrostis epigeios* be the only food plant of this species, it must of course occur in this locality, but I was not sufficiently well acquainted with the reed-maces to be able to recognise it on the spot, and I have not subsequently been able to identify it in the collection of grasses, reeds, &c., which I brought away from the locality.

I first met with *Actæon* on the 12th July, and although the majority of the specimens were in fine condition, some of them were, even at this early date, much wasted. On the 19th July, the last day on which I visited the locality, the males were to the females in the proportion of 4 to 1, which showed that the species was not then fully out.

I was particularly anxious to secure eggs of *Actæon*, but although I watched hundreds of specimens, I was unable to detect a female in the act of oviposition.

Actæon appeared particularly fond of the flowers of *Ononis arvensis* (rest-harrow), on which they constantly settled, but I rarely saw them alight on any other flowers.

Amongst other species of *Lepidoptera* which I noticed in this locality, I may mention *Colias Edusa* (much commoner than I ever before saw it in July), *Arge Galathea* (abundant), *P. Alexis*, *T. Tages*, *H. linea* and *Sylvanus*, *Z. filipendulæ* and *trifolii*, and *E. bipunctata*.—H. Goss, The Avenue, Surbiton Hill, Surrey: 1st August, 1877.

Acronycta alni.—I joined the Annual Excursion of the South-London Entomological Society to Three Bridges (for Tilgate Forest), on Monday, August 6th, and spent a few hours in the Forest. A small *Acronycta* larva, beaten off birch, fell into my net. It resembled, when at rest, the dropping of a bird, the anal segments being of a dirty white colour, and the anterior segments blackish, with whitish markings. The larva was quite unknown to us all, and though I felt disposed to think it might possibly belong to *alni*, simply from the fact that it resembled none of the commoner

* The Burning Cliff is a few miles to the west of Lulworth Cove.

Acronycta, this idea received no support. On the following day, the larva cast its skin, without any noteworthy change in its appearance, except that it had two long hairs near the head and a few short hairs on the body. Its general appearance and striking resemblance to a bird's-dropping were as before, and in this respect it was calculated to deceive a casual observer, if not its natural enemies, the birds themselves. It fed up well on birch for five days, when it spun a web on a leaf, and prepared to undergo another moulting. This I watched with some anxiety as to the result, and on the 14th inst., I had the pleasure of witnessing the most wonderful transformation in the appearance of a larva that I have ever observed. It is now veritably *albi*. All traces of white are gone, the ground colour is a beautiful black, and it has the usual brilliant yellow markings and clubbed hairs, which give it somewhat the appearance of a centipede. In 1874, I found a larva of *albi* in the New Forest, which produced a fine imago the following year, but I was unable then to fix upon the food-plant. The larva that I now possess is feeding up well upon birch.—J. PLATT BARRETT, 34, Radnor Street, Peckham: August 16th, 1877.

Notes on the habits of Chlorion lobatum and two species of wasps in India.

—When out collecting last month, in the neighbourhood of Pultah, I was much amused with watching the proceedings of a fine female of this beautiful *Sphex*. I observed it emerge and fly from its nest, a tunnel in the earth, out of which a pair of antennæ were immediately thrust in such a pleading manner, that I at once took hold and helped out of the hole a large species of field cricket, which I then left near the mouth of the tunnel in rather a weak and helpless condition; it was not many minutes before *C. lobatum* flew back to its nest, disappeared down the tunnel, missed the cricket, and flew out again in a rage, but, soon discovering the runaway, seized it with its mandibles, and shook it in the same manner as a terrier does a rat; it then plunged its sting into the body of its victim several times, then drew it off to the mouth of its tunnel, down which it went first, with the intention of pulling the cricket after it, but by this time several ants, a powerful species of *Ponera*, had taken a fancy to the cricket, which they had seized by the hind legs and just managed to draw clear of the hole; out came the *Chlorion*, and seeing what was wrong, darted at the ants, and threw them out of the way; then followed the shaking and stinging process, and again the cricket was drawn to the mouth of the tunnel, down which the *Chlorion* disappeared as before. This time I took the place of the interfering ants, and threw the cricket some two or three feet clear of the hole, out came the *Chlorion* in a terrible fluster, and evidently a little uncertain this time as to the cause of the theft, but a few *Ponera* being near, the *Chlorion* concluded they had probably something to do with it, and accordingly jerked them well out of the way, and then proceeded to search for the missing cricket: the nest was first examined five or six times, to make sure the cricket had gone, the ground immediately round the nest was then carefully examined, but not meeting with any success, the *Sphex* commenced working in a circle which gradually increased in size till the circumference took in the body of the cricket, which was then brought back as before. I repeated my experiment many times, and each time the *Chlorion* went through exactly the same routine, working in a circle, and jerking all *Ponera* out of the way; smaller ants, of which there were numbers about, of several species, were not touched. On one occasion, after the cricket had been brought back to the hole, I held it with my stick,

which the *Chlorion* boldly attacked, and seemed greatly disappointed on finding it could not be jerked aside like the ants; another time, I filled up the tunnel with mud, but *Chlorion* was never at a loss, and after a careful examination of the spot, soon cleared out the mud, working with the greatest vigour, and dragging out large pieces of rubbish at a time. At last I threw the cricket several yards from the nest, and the poor thing, which had, since its first severe mauling, shown no sign of life, began to recover, got on its legs, and made off slowly through some long grass and tangled weeds. I am unable to say whether the *Chlorion* was ultimately successful in securing its prize, for, having watched these manœuvres for over an hour, I had to leave; the last I saw of her she was hard at it, and the circles of search rapidly increasing in size. From the clear, business-like, and rapid movements of this *Sphex*, I should certainly place *Chlorion* high up in the scale of intellectual insects.

Polistes hebraeus.—I have also been interested in observing the wonderful tenacity with which this wasp sticks to its nest, under the most adverse circumstances. A nest was in process of building in the verandah of my bungalow, and increased in size till the native servants objected, making it the excuse for not pulling the punkahs properly, as they were afraid of being stung; I accordingly endeavoured to drive the wasps from the nest by dashing cans of water over it, but without the slightest success, the wasps clinging to the paper walls, and seeming all the fresher for the bath, so I had to take the nest with my hands, driving off the most daring wasps with a stick; I then fixed in the place of the nest a few cells of *Vespa cineta*, but *Polistes* would not notice them, and on the second day I replaced the nest in nearly the same position (having fed the larvæ in the meantime on sugar, which they devoured greedily), and *Polistes* immediately returned and took charge of their young, some few days afterwards the nest was knocked down by some native, but the wasps still stood to their home, and defended it successfully too, against the attacks of the large workers of *Formica compressa*, and the still more dangerous little workers of the red ants, *Solenopsis geminatus*; the nest was ultimately destroyed by natives, who appear to have a particular dislike to this wasp, although its sting is not very severe.

Vespa cineta.—I have carefully watched the building of an extremely small nest of this species in a rose bush in my compound: the nest consisted of a single layer of cells, and with its paper covering, was not larger than an ordinary lemon; the hornets working at the nest were only seven in number at any one time; they obtained the material for their paper-making from some old teak beam in my verandah, at which they were continually rasping; I distinctly watched them "build" up their cells from a ground plan, watching the walls increasing through a strong glass, generally two hornets worked at the cells and two at the outside covering, the rest flying about or looking on.—G. A. JAMES ROTRNEY, Barrackpore, Bengal: *July 2nd, 1877*.

Occurrence in Britain of Pachyta sermaculata, Linn.—Two examples of this most interesting addition to our list of British Longicorns have been captured on fir palings, immediately adjoining the Rothiemurchus Forest, Aviemore, Inverness-shire, by Mrs. King; one specimen was taken on June 30th, and another on July 2nd, 1877.

Pachyla sermaculata, Linn. (*trifasciata*, Fab.), is closely allied to *P. cerambyciformis*, Schrank (*octomaculata*, Schall.), but may be readily separated from that species by its narrower and more parallel form, more shining appearance, the much scantier and finer pubescence, finer punctuation, blacker colour, shorter basal joint of the posterior tarsi, and the different maculation of its elytra. These are black, with three pale yellow, transverse, angular bands: one at the base, one a little before the middle, and one at about two-thirds of their length. In one of these examples the three pale yellow bands are well-defined, but in the other the basal and intermediate yellow bands are confluent in the centre of each elytron. This very variable species is tolerably common in boreal Europe, occurring in Sweden, North Germany, &c. I am very much indebted to Mrs. King for one of these examples. Many subsequent visits by Mr. King and myself to the locality failed to produce any more examples, our want of success was, perhaps, owing to the very wet weather which prevailed for some time after these specimens were taken.—G. C. CHAMPION, 274, Walworth Road, London: August 8th, 1877.

Notes on the Coleoptera of Aviemore, Inverness-shire.—Another visit to this locality during the early part of the past summer, has again produced several interesting species of *Coleoptera*, some few of which I had not observed here before, therefore, a few notes on these and the rarer species met with will, perhaps, not be uninteresting. Of the numerous species captured by Mr. King, of Glasgow (who joined me after a time), and myself, during a stay of three weeks, from June 16th to July 7th, I may note *Carabus glabratus* occasionally on the paths, &c.; *Pterostichus oblongo-punctatus*, invariably under chips left by the woodmen; *Amara alpina*, one ♀, and at the same spot as before; *Harpalus 4-punctatus*, sparingly as before; *Bembidium bipunctatum* and *doris*, on the shores of the loch; *Homalota parallela*, at its usual habitat—in the nests of *Formica rufa*; *Philonthus puella*, occasionally at sap of birch; *Homalium inflatum*, rare, under bark of alder and birch; *Acidota crenata*, rare, in moss on the mountain tops; *Anthobium minutum*, common, on flowers in boggy places on the hill-sides; *Sphaerites glabratus*, two examples, at sap of birch; *Epurca silacea*, one at sap of birch, and another beneath fungus; *E. variegata*, *parvula*, and *immunda*, at sap of freshly cut birch stumps; *Dendrophagus crenatus*, rarely, beneath bark of Scotch fir; *Paramicosoma serratum*, three examples at sap of birch; *Lathridius rugosus*, not rare, in powdery fungus on alder, as before; *Cetonia florivola*, occasionally at sap; *Eros Aurora*, commonly, at old saw-pits, beneath chips left by the woodmen (this species has been very rare to me hitherto in this locality); *Pytho depressus*, occasionally found running on stumps, &c., towards evening; *Carida flexuosa*, as usual, in hard woody fungus on alder; *Abdera triguttata*, very rare this season; *Zilora ferruginea* and *Dircea lavigata*, both rare; *Anthonomus conspersus*, very rarely, on blossom of the mountain ash; *Magdalinus duplicatus* and *M. carbonarius*, both rare, former on Scotch fir, latter on birch; *Asinomus adilis*, not uncommon this year, though hitherto rare to me; *Mniophila muscorum*, occasionally, in moss.—**II.**

Abnormal antennæ in Hemiptera.—Several cases of deformed antennæ have come under my notice lately, and as Mr. Douglas has more than once described similar cases in the pages of this magazine, it may not be amiss to record them.

In a specimen of *Nezara viridula*, L., var. *torquata*, F., from Madeira, given to me by Mr. Wollaston, the left antenna is reduced to two joints: the first is nearly normal, but instead of the remaining four, it has, anchylosed to it, a subfusiform pubescent joint about as long, but twice as thick, as itself. In a species of *Nysius* from St. Helena (*N. Sanctæ-Helenæ*, not yet described), the right antenna has the first two joints about the usual length, but rather thicker; the remaining two are represented, however, by a single joint, rather shorter than the normal ultimate one; its basal half is not thicker or darker than the second joint, but the other and larger half is clavate and black, like the normal fourth joint. In another *Nysius* from St. Helena, which I cannot separate from *N. thymi*, the second joint of the left antenna is about one-third longer than usual; the normal third is absent, and the actual third resembles the normal fourth in length, but instead of being equally thick throughout, is narrow for about the basal one-fourth, and then suddenly incrassated. In this last case, it would seem as if the third joint had been divided between the second and fourth, the second taking the larger share.—F. BUCHANAN WHITE, Perth: August, 1877.

Description of Psylla visci, Curtis.—*Psylla visci*, Curt., B. E., xii, 565, 5a; Först., Verh. Ver. Rheinl., v. 71, 4?; Scott, Tr. Ent. Soc., 550, 20 (1876).—Green, yellowish or brownish-yellow. *Mesonotum*, down the central portion, with brown streaks, varying in intensity according to the colour of the insect. *Face—lobes* slightly longer than the crown down the centre, apex narrow but rounded, divergence not equal to the base of either. *Elytra* transparent, with a more or less distinct longitudinal brownish tinge between the nerves, but not extending to them; length equal to about $2\frac{1}{4}$ times the breadth; costal stigma wide at base.

Head—crown pale yellow or brownish-yellow; posterior margin concave; foveæ deep; breadth between the eyes more than twice the length down the centre. *Face—lobes* green or pale yellow or brownish-yellow, slightly longer than the crown down the centre, sparingly clothed with pale hairs; base broad, apex narrow, but rounded, outer margin perceptibly concave, inner margin almost straight, divergence not so great as the base of either. *Antennæ* pale yellow, joints 3—8 brown at the apex, 9, 10 black, 4th about three-fourths the length of the 3rd.

Thorax—pronotum generally yellowish or bone-white with two minute brown punctures adjoining the lateral margins. *Mesonotum*: anterior portion yellowish, in front reddish, or brown with a more or less defined pale space in front; central portion with broad, longitudinal, brown, sometimes reddish-brown, streaks; or entirely dark brown with four narrow, yellowish streaks placed one on each side of the centre, and another more remote; posterior portion yellowish or sometimes faintly brownish in the centre. *Elytra* transparent; length equal to about $2\frac{1}{4}$ times the breadth, with a more or less distinct, longitudinal, brownish tinge between the nerves, but not extending to them; nerves fine, brown; costal margin finely ciliate, costal stigma wide at the base, narrowing gradually to the apex; dorsal margin, next the apex of the clavus, with a short black streak, within which, on the disc, is a small dark brown or fuscous spot; radius, as far as in a line with the apex of the stigma, parallel with the costal margin, from thence to the apex slightly recurved, upper arm of the cubitus somewhat

more than twice the length of the bifurcation. *Legs* yellow. *Thighs* at the base, in dark examples, frequently with a more or less distinct longitudinal line on the upper margin. *Claws* brown.

Abdomen green or yellowish or dark brown, in the latter case the posterior margin of the segments very narrowly pale; ♂ genitalia clothed with pale hairs, genital plate brownish-yellow, tong-like processes dark brown, viewed from the side, about $2\frac{1}{4}$ times as high as broad at the base, tapering gradually to the apex, from behind they appear as two claws. In pale examples of both sexes the genitalia are not unfrequently green. Length $1\frac{1}{2}$ line.

I have received specimens of the above from Dr. Franz Löw, of Vienna, and I have also examined and compared one of the three examples (a ♀) obtained from mistletoe (*Viscum album*) by Mr. James Edwards at East Carlton, near Norwich, in May last, as stated by him at p. 44, *ante*, and with them it agrees perfectly.—JOHN SCOTT, 1, St. Mildred's Terrace, Burnt Ash Hill, Lee: 9th August, 1877.

Homoptera near Norwich.—On the 6th inst., I took a few specimens of *Psylla visci*, Curt., of the summer brood, which does not appear to have been previously noticed in this country. I have also taken off alders at Stoke Holy Cross, *Psylla alni*, Lin., somewhat commonly, and one ♀ example of *Typhlocyba jucunda*, H.-Schäff.—JAMES EDWARDS, Bracondale, Norwich: 20th August, 1877.

Obituary.

We regret to announce the death, on the 10th August, 1877, of the well-known Entomological Artist, E. W. Robinson. We hope to give a more detailed notice of his labours in our next issue.

ENTOMOLOGICAL SOCIETY OF LONDON: 1st August, 1877.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the Chair.

Mr. Stevens exhibited specimens of *Teretrius picipes*, Fab., one of the *Histerida*, which he had taken on the fence at Norwood on which he had previously taken *Tillus unifasciatus*. He also remarked on the appearance in that neighbourhood of a second brood of *Colias Edusa*, several specimens of which had been observed by him, all of which were males.

Mr. F. Smith exhibited (on behalf of Dr. Bennett, of Sydney, who was present at the meeting) a fine pair of the beautiful and rare *Eupholus Bennetti*, Gestro, from Yule Island, New Guinea. It had been described under that name in the *Annali di Mus. Civ. di Genova*, viii, 1876.

The Secretary exhibited a specimen of an insect which had been forwarded to him by Mr. Bewicke Blackburn, who stated that a large field of mangolds belonging to the Knight of Kerry, in the island of Valentia, had been totally destroyed by it. It was believed to be the larva of some Coleopterous insect, but in consequence of the imperfect condition of the specimen, it could not be determined.*

Mr. Douglas, who was unable to be present at the meeting, had forwarded to Mr. Jenner Weir a letter from Mr. R. A. Ogilvie, enclosing specimens of an insect found in great quantities in a jar of pickles (Piccalilli). They confined their attack to the pieces of cauliflower in the jar, which they appeared to relish, notwithstanding the vinegar, mustard, pepper, &c., in the pickles. The specimens had been sub-

* The larvæ of *Silpha opaca* are recorded by Curtis (*Fam. Ins.*, p. 388) as destroying this vegetable in Ireland. I also have lately received larvæ of this carrion-beetle, sent to me as injurious to mangolds in that country.—E. C. R.

mitted to Professor Westwood, who replied that, "the flies are the common *Drosophila cellaris*, with their curious two-horned pupæ, and they frequent cellars and cupboards, delighting in stale beer, wine, &c." He supposed that, "the cauliflowers were more to their taste than the other things in the jar, being more succulent and flabby." In answer to a question asked by Mr. Ogilvie, he said that the eggs were laid in the pickle jar, and not in the vegetables before they were pickled.

Mr. Douglas also forwarded a letter he had received from Mr. A. H. Swinton, of Guildford, enclosing a specimen of *Myrmica ruginodis*, which, on being placed under a wine-glass, stationed itself at the rim, head downwards, and rapidly vibrating the abdomen, continued "an intense noise," resembling the spiracular piping of the Dipteron, *Syrilla pipiens*.

Mr. Enoch remarked, with reference to a spider which had been exhibited by Sir Sidney Saunders at a previous meeting, as *Alypus Sulzeri*, that he had taken the specimen himself at Hampstead, and that he had since referred it to the Rev. O. Pickard Cambridge, who stated that the insect was certainly not *A. Sulzeri*, but that he considered it to be *A. Becki*, Cambridge, which would probably be the same as *A. piceus*, Thorell, though he was not certain, as the only female which he had of the species was too much damaged to admit of any satisfactory comparison. The type of *A. Becki* was an adult male given to him by the late Mr. Richard Beck, who was uncertain of the locality, though he considered it probable that he had obtained it from Hampstead, as he often collected there. The example sent to him by Mr. Enoch was different from the Isle of Wight species, of which he had several female specimens, but no male, though he believed them to be *A. Sulzeri*. He would be glad if collectors in the Hampstead locality would look out for the male in autumn and winter, as, if he could obtain that sex, it would enable him to put the question as to species at rest.

Mr. Enoch exhibited a bottle containing a great number of larvæ of *Cossus ligniperda*, which he had found in a portion of a small willow. He had taken fifty-six larvæ out of a piece of wood four feet long.

Mr. Dunning again directed the attention of members to the exhibition, by Mr. Jenner Weir, at the last meeting, of a female specimen of *Cicada montana*, which was reported to have been distinctly heard to stridulate, notwithstanding that the insect was a female, and also that the species was one of which even the males were not previously known to stridulate. Mr. Weir stated that since the last meeting he had again been to the New Forest, and had seen, in the possession of Mr. James Gulliver, of Rammor, near Brockenhurst, two specimens of *Cicada montana*, and he was assured by Mr. Gulliver that the stridulation of the insect was well known to him, and he was guided by the sound so made in effecting the capture. Mr. Champion said that he himself had captured the insect, and had distinctly heard a loud buzzing noise, but whether the sound was caused by the males or females he could not say. Mr. Dunning considered that further evidence was wanting to prove stridulation in the females.

The following papers were communicated:—(1.) Notes on the new or rare *Sphingidae* in the Museum of the Royal Dublin Society, and remarks on Mr. Butler's recent revision of the family: by W. F. Kirby. (2.) Descriptions of new genera and species of *Cryptocephalidae*: by J. S. Baly. (3.) Descriptions of new species of *Cleridae*: by the Rev. H. S. Gorham. *

NATURAL HISTORY OF *HYDROCAMPA STAGNALIS*.

BY WILLIAM BUCKLER.

When I was investigating the early stages of the other species of *Hydrocampide* with aquatic larvæ, I had been foiled with *stagnalis*, but, in the early summer of 1876, I was fortunate enough to find a kind and enthusiastic helper in Mr. W. R. Jeffrey, of Ashford, and by the aid he rendered me, I am now able to give a full account of this species throughout.

In Stainton's Manual, the larva is counted among the unknowns; Guenée says nothing about it; but from the synonymy of the species, *potamogetalis*, Hb., being one of its names*, it would appear that *Potamogeton* had passed for its food, and Dr. E. Hofmann says that O. Hofmann found it in cases made of the leaves of that plant. But this notion had been driven out of my head by the result of many attempts to find the larva in such a situation, and I had come to suspect that *Sparganium* would prove to be the right food, a suspicion now strengthened into certainty, as will be seen by what follows.

Mr. Jeffrey began by sending me specimens of every sort of case he could find tenanted by aquatic larvæ, and strange and interesting enough many of them were; and each fresh form was hailed as *the desideratum*, till the appearance of the imago dispelled our hopes; at last, on July 18th, he bred a specimen of *stagnalis* from one of three pupa-cases, all alike fastened to pieces of *Sparganium*, which he had found in a brook: this gave us encouragement; but, though we most carefully scrutinized again all the cases that had been found, we could detect none like these little pouches, from one of which *stagnalis* had emerged.

Then it occurred to my friend, by this time feeling nearly confident that I had been right in saying that *Sparganium* would in all likelihood prove the true food, to capture several moths of both sexes, and confine them in a vessel, at the bottom of which he had arranged pieces of *Sparganium* both floating on water and standing erect; this he did on July 21st, and seeing that by the 27th, all the moths were dead, he examined the pieces of the plant, and on the underside of one of the floating pieces found two neat little batches of eggs, and forwarded them to me. The larvæ hatched on August 5th and 6th, and immediately on quitting the egg-shells began to eat their way into some fresh pieces of *Sparganium simplex*, which I had ready prepared, and when inside the rind mined the pith of the plant in a longitudinal direc-

* In Staudinger and Wocke's Catalogue.

tion; being almost colourless, and keeping well under water when moving from plant to plant, these larvæ were very hard to watch, but I was fortunately able to see one on its travels within twenty-four hours of hatching, and noted that it was about $\frac{1}{16}$ inch long, and that the food had begun to darken its internal vessels: in twelve days' time, August 18th, I saw another larva, now $\frac{1}{8}$ inch long; on the 26th, noticing that one of the oldest pieces of *Sparganium* seemed deserted, being well riddled with mines through its length, as well as pierced by numerous little holes in the rind, through which the larvæ had entered at first, I isolated it in a saucer of water, and watched to see if any larvæ would still come out of it, for their transparency rendered it almost impossible to make sure of their presence or absence by holding the plant up to the light; after a few hours, three larvæ appeared, now grown to $\frac{1}{4}$ inch in length; and by pursuing a similar course with other pieces of *Sparganium* as they became brown, I got a sight of ten larvæ by the end of the month. On September 11th, I detected a larva now over $\frac{2}{8}$ inch long, and turned it into a saucer of water without food in order to secure a figure of it; on the 28th, I observed another now $\frac{1}{2}$ inch long, and noticed that there was no colour down the back arising from food within; this I took as a hint that it had ceased feeding and was preparing to hibernate, and on examining other pieces of *Sparganium* I discovered several larvæ already laid up, quite colourless, and quite torpid: unfortunately, these investigations could be effected only at the cost of killing the larvæ examined, for I found they soon died after their rest had been broken.

However, by the beginning of October, I had established a large cylindrical glass jar, in which several fine plants of *Sparganium simplex* were growing, no longer floating but erect and robust; upon these, were placed some of the less torpid larvæ about an inch or two beneath the water, and I had the satisfaction of seeing them mine their way into the plants until they were out of sight; the rest still occupying pieces of *Sparganium* were introduced among the growing plants to take their chance.

The winter proved open and favourable for the experiment, and in due course the plants turned brown and died down naturally, collapsing and sinking at last to the bottom of the water; but by the middle of February, 1877, a few very thin and tender narrow shoots began to appear again; after this, a thick growth of *Conferva*, which at first I did not like to meddle with, greatly impeded my view, till on the 6th April I cleared some of it away, and removed some worms I found feeding on the *débris* of the old plants, and a few other crea-

tures which I regarded as water vermin ; and then I could see clearly quite a tangled growth of young and very tender leaves of the *Sparganium* low in the water ; some of them in a few days reached the surface and lay floating there, and the first evidence I had of the larvæ beginning to feed occurred on April 20th, when I detected a small fragment of a leaf floating on the surface, and near it a kind of green dust, which, by help of a magnifier, I made out to be frass ; at length I detected the whereabouts of the larva hidden between two young leaves, which at the place seemed spun together just beneath the surface of the water ; three days later I saw other similar appearances, and for the first time after hibernation saw a larva very distinctly in the act of feeding ; its position was nearly vertical between two leaves, just at the point where after rising about an inch above the water they bent down again to float on it, here it had spun the leaves together with silken threads, but had left a little opening through which I could watch it leisurely eating the edge of the lower leaf ; more than half its body was above water, the remainder obscured by the facing to and fro of the silk threads ; this larva seemed to be $\frac{1}{2}$ inch long or perhaps more, and paler than when feeding in autumn, but otherwise similar ; next day, it had cut the leaves asunder at that part, and ensconced itself in a fresh residence lower down the plant under water, probably unable to tie the walls of its previous abode completely together, from the circumstance of another individual having firmly secured itself between the floating extremities of the same two leaves. Onwards from day to day I could distinguish the positions of others just beneath the surface, and some quite low down in the water, with minute air bubbles clinging to some of their abodes.

They now began to greatly ravage the plants, pieces cut from the the tips of the leaves and other portions being often found floating on the surface. Occasionally, I partly opened some of their residences to obtain a peep at the inmates, and found them steadily growing ; one of these tenements I cut off on the 27th April, and placed it in a saucer of water to take a figure of it ; it had been constructed by drawing the two edges of a leaf partly towards each other for the length of nearly an inch, and by joining to them with a spinning of silk some parts of two other adjacent leaves, on both of which the larva had fed occasionally, advancing its head for this purpose as far as it chose ; while my attention was engaged on its appearance, I saw five little pellets of frass suddenly ejected from it, which convinced me the occupant was in a proper state for examination, so I proceeded to pull the construction to pieces, and to expose the larva which now measured

$\frac{3}{4}$ inch in length: after being turned out of its tenement into the water, it seemed not the least incommoded, but without once approaching the surface, or causing any air-bubble, it walked about on the saucer at the bottom of the water, raising its head and extending it as though searching for the *Sparganium*; and when two or three small fragments were given to it, soon connected them together with silk threads; presently, however, not finding them sufficient, it grew discontented and wandered about until it was restored to the growing plants, when it at once crept between two floating leaves, and made itself snug again in a new habitation. After this, at intervals I disturbed one or two more, and was unlucky enough to find them waiting for a moult. On May 21st, while again removing Conferva, I found two larvæ less advanced than the others, of rather an olive tint, and both laid up for moulting.

The first moth appeared on the evening of June 29th, and the second on the 6th August,—during the interval, my stock had been diminishing from the attacks of a merciless dragon-fly larva, of which once or twice I had a momentary glance, but which I failed to secure until almost too late, for then only two pupæ remained, the last of which I sacrificed to the necessity of figuring and describing, and the other produced the second moth.

This sketch of the progress of *stagnalis* reared from eggs on *Sparganium simplex* will have shown that on this plant the larva is a veritable miner from the moment it leaves the egg-shell until after hibernation in the spring, when it finds itself unable to mine into the young leaves of its food-plant, which are then too narrow and thin for the purpose, but, accommodating itself to the changed condition of the plant, it now spins parts of the flaccid leaves together and lives between them, securely hidden from view.

Its habits on *Sparganium ramosum*, a plant of larger size, are somewhat different: this plant in spring at first bends under any flowing water, but soon gathering substance and strength stands erect, and the larva, after hibernation, is still a miner, no longer indeed eating its way longitudinally through the tissues of a single leaf, but excavating large irregular perforations through some of the inner leaves, generally sparing the keel as well as the fibre at the outer margins, so that, when thus ravaged, the leaves can still retain their position.

The larva keeps itself a little below the surface of the water, and as the plant grows, the ravages in the leaves turn blackish, and become exposed to view at a distance above it, and thus afford a sure indication of the larva below, generally about where the green colouring

of the plant begins to fade a little : on approaching its full growth, the larva keeps nearer the surface of the water, and sometimes cuts through a leaf all but just the fibre on one side, which causes the upper portion to fall and be suspended in the water ; observing how this was done by a larva in captivity which I had received from Mr. Jeffrey, I was enabled to find one by seeing a *Sparganium* similarly treated in a brook, where, in former years, I had often sought for the larva in vain ; on those occasions, however, I had only sought in on the surface of the water, or above it, seldom or never beneath, expecting, as I did, to find it in a case of some kind, after the manner of its congener *nymphæalis*.

The eggs, which my friend sent me, in two groups, appeared to number thirty-seven in one group, and forty-nine in the other, laid very close and evenly together in rows, and somewhat imbricated ; in shape, the egg is roundish-ovate, and its surface striated ; the colour, olive-yellow and semi-pellucid, showing the embryo rather paler ; in about a week, they become roundish above, and greyish, and begin to show a black blotch at their summits, and next day the larvæ appear. The newly-hatched larva has a blackish head and plate on the second segment, a clear and colourless body, and in twenty-four hours shows a broad, greenish-grey dorsal vessel through the clear skin, the lobes of the head blackish, mouth and ocelli black, being about $\frac{1}{16}$ inch in length ; when twelve days old, it is in length a trifle more than $\frac{1}{2}$ inch, the head and plate on second segment changed to very pale brown, the body translucent, of a watery yellowish-green tint, the internal vessel light greenish ; in twenty days, it grows to be a quarter of an inch long, of slender proportion, the third and fourth segments the stoutest, slightly tapering from them each way, the head and second segment light brown, body pale greyish-brown, the internal vessel rather deeper greyish-brown, broad at beginning of the third segment, and not visible beyond the ninth, the second segment clear and transparent as the others.

In another month's time, it is nearly half an inch long, of a light brownish-olive colour, the segmental folds of skin, and its outline showing the most colour, and also the fine tracheal thread ; the lobes of the head outlined with darker brown and the mouth darker, ocelli black. When about to hibernate, the body becomes transparent and colourless.

The full-grown larva measures $\frac{7}{8}$ inch in length, of rather slender proportion, tapering from the third segment to the head, and again gradually from about the tenth to the anal extremity, the head small, flattened, and tapering towards the mouth, the segmental divisions

and sub-divisions are moderately well-defined, the skin puckered a little and dimpled along the sides, the ventral and anal legs fairly well developed, each foot being furnished with a complete circlet of fine hooks; in colour, the head is pale translucent brown, the lobes margined with a reticulation of darker brown, and a similar streak in the middle of each; the mouth is blackish-brown, sometimes there is a spot of this dark colour on the triangular space above it, the ocelli large and black; the second segment, yellow or olive-yellow, has sometimes a few brown freckles, and a thin transverse streak of brown at the hind margin, and a few fainter freckles on each side the dorsal region; all the rest of the body is of a bright, deep yellow, or else of olive-yellow, but so translucent as to show very distinctly through the skin, not only the broad and blackish-olive internal vessel sliding to and fro, but also the paler trachea, with its larger branches, and the multitude of excessively fine ramifications; in the more olive tinged examples there occur two parallel brown streaks low on the sides of the second, third, fourth, and fifth segments, sometimes most marked on the fourth and fifth; the spiracles are of the ground colour, ringed with brown; some extremely minute hairs, one in each usual tubercular situation, can only be seen with the aid of a powerful lens.

When the larva has fed up on the soft, narrow, ribbon-like, floating leaves of *S. simplex*, it cuts off a couple of pieces of the plant, varying in length from about three-quarters to nearly an inch, without regard to their being equal in size, these it spins securely together and moors with silk near the edge to a floating leaf; the puparium thus made lies horizontally, partly or entirely submerged.

But when *S. ramosum* is the food-plant, the larva chooses a situation close to the outside edge of a leaf in an almost perpendicular position, and there, low in the water, attaches a piece of the plant, broader at the lower than at the upper end, and draws it round itself close to the leaf, on which it looks like a natural excrescence, being about an inch and a quarter in length, rather bluntly rounded off below, and for half an inch tapering to a point above.

The cocoon is of white silk, apparently quite dry within and closely enveloping the pupa with the old larval skin sticking behind; the pupa itself is a trifle over three-eighths of an inch in length, of moderate slenderness, the head well produced, the back of the thorax gently rising from it, and from thence the width is uniform to the ends of the wing-covers; these, though well defined, are pressed close to the body; the abdomen begins to taper from the tenth segment, to which the ends of the leg-pieces reach, projecting free; the tip of the

abdomen terminates in a hook, curved downwards; the colour is a deep bright yellow, a little inclining to orange-yellow; a narrow brown streak obliquely crosses each eye-piece; three spiracles on either side are conspicuously prominent on circular swellings, paler than other parts, and are like nipples of brownish-red with rather darker orifices; the other spiracles behind these are very small, flat, and brown, yet can just be detected with a lens.

I have now only *Acentropus* left of the known British species of *Hydrocampidæ* to be figured, and shall be extremely obliged to any entomologist who can obtain eggs or take the larva, if he will bear my want in mind at the proper season.

Emsworth: September 11th, 1877.

DESCRIPTIONS OF A NEW GENUS AND THREE NEW SPECIES OF
EUROPEAN HEMIPTERA.

BY EDWARD SAUNDERS, F.L.S.

NEOSTRACHIA, *g. n.*

A genere Bagrada, cui affinis mihi videtur, forma elongata, oculis haud stylatis, thoracisque margine anteriori elevata, lævi, bene distincta.

N. HELLENICA, *sp. n.*

Nigra, fortiter punctata, thoracis margine anteriori emarginata, elevata, lævi, lateribus subsinuatis, marginibus angustissime reflexis, pallidis, basi producta rotundata, in medio sinuata, disco linea dorsali vix discreta, transversim sub-impresso, macula transversa alba notato. Scutello elongato, lateribus sinuatis, linea dorsali sub-elevata, maculis callosis duabus basilibus, apiceque albis. Corio macula basali, fuscique transversa prope apicem scutelli, albis. Connexico maculis magnis albis notato. Membrana infusca. Subtus, medio utrinque maculis sub-quadratis albis ornato. Antennis pedibusque nigris, femorum basi tibiisque posticis pallidis, harum apices nigræ. Long. 6 mm.

Habitat, Greece.

GEOCORIS JAKOWLEFFI, *sp. n.*

Nitidus, capite nigro, apice macula utrinque pallida, antice sub-rugoso, postea utrinque oblique impresso, inter oculos lævi. Thorace fortissime punctato, margine anteriori macula media, angulisque posticis pallidis, disco ante medium utrinque linea transversa lævi elevata. Scu-

tello valde punctato, postice linea dorsali elevata lævi. Elytris ochraceis, rufo-tinctis, macula triangulari magna fusca utrinque ornatis. Clavo punctorum serie unica, corio basi scriebus duabus, lateribus utrinque serie unica, impressis; apice punctulato, disco lævi nitido; membrana infuscata. Subtus niger, maculis sex, prope coxas positis, albis. Femoribus nigro-fuscis, apicibus, tibiis tarsisque dilutioribus. Antennis nigro-fuscis, articulo secundo apice, tertio quartoque piccis. Long. 3 mm.

Habitat, Tangiers.

Differs much in colour from any of the species that I know, and from *pygmæus*, to which it seems to me to be most nearly allied, in the absence of the raised dorsal line of the thorax.

PLINTHISUS HORVATHI.

Niger, nitidus, alatus, elytris albido-ochraceis, margine apicali medio, utrinque macula triangulari, fusca, ornata; membrana lactea. Capite punctato. Thorace antice glabro, puncturis quibusdam prope marginem impresso, postice punctato; lateribus antice rotundatis, prope medium sinuatis, basi sinuata. Scutello punctato. Elytris: clavo lineis quatuor punctorum impresso, margine basali infuscata; corio irregulariter sed sat fortiter punctato; membrana alba. Pedibus piccis, genuibus, tibiis apicibus, tarsisque dilutioribus. Antennis rostroque piccis, articulorum apicibus dilutioribus,

Long. $3\frac{1}{2}$ mm.

Habitat, Besika Bay (J. J. Walker).

ALYDUS TANGIRICUS, sp. n.

Fuscus, rugoso-punctatus, grisco-pubescentis. Capite nonnihil dilutius, maculis quibusdam nigris ornato. Antennis testaceis, articulorum apicibus sub-sanguineis; articulis 2^{do} et 3^{io} longitudine sub-æqualibus, 1^o paullo brevioribus. Thorace nigro-variegato, lateribus subrectis. Scutello apice summa pallida. Elytris fortissime punctatis, costis nigro-variegatis. Connexivo nigro, maculis pallidis ornato. Subtus fuscus, pube grisea adpressa vestitus. Abdomine pallido, medio carinato, maculis minutis rufo-fuscis adpersis et vittis tribus fuscis ornato. Pedibus pilis griseis longis vestitis; femoribus fuscis, plus minusve nigro-irroratis, posticis incrassatis, spinis tribus longioribus septemque brevioribus armatis; tibiis pallidis, basi apicisque fuscis, anterioribus fusco-irroratis; tarsis articulo primo flavo, reliquis fuscis.

Long. 10 mm.

Habitat, Tangiers.

Holmesdale, Upper Tooting:

8th Sept., 1877.

BRITISH HEMIPTERA-HETEROPTERA—AN ADDITIONAL SPECIES.

BY EDWARD SAUNDERS, F.L.S.

ORTHOXYLUS FUSCESCENS.

Capsus fuscescens, Kirschb., Rhynch. Wiesb., 77, 92 (1855).*Orthotylus fuscescens*, Reuter, Pet. Nouv. Ent., No. 138, Dec., 1875.

Olive-brown, covered with fine pale and black hairs intermixed. Thorax with a slight transverse impression behind the callosities. Elytra, in the ♂ with nearly straight parallel sides, in the ♀ slightly curved; membrane dark and iridescent, slightly paler at the extreme apex of the cuneus. Antennæ brown, 1st joint shorter than the 4th, 3rd about two-thirds of 2nd, 3rd and 4th together about equal to 2nd. Legs rather paler than the rest of the body. Length, 2¼ lines.

This very distinct species was found by Mr. Geo. Norman of Forres, on the 21st July last, and was afterwards taken by him in profusion on pines in the Chuny Hill grounds, but very locally, as he says he took it on some dozen isolated trees, but nowhere else in the whole neighbourhood. He has asked me to forward a description of it to this Magazine.

Holmesdale, Upper Tooting:
September 8th, 1877.

DESCRIPTION OF A NEW SPECIES OF *SETODES* OCCURRING IN THE BRITISH ISLES.

BY R. McLACHLAN, F.R.S.

At p. 70 *ante*, Mr. J. E. Fletcher recorded a single ♀ example of a *Setodes*, taken by Mr. J. B. Hodgkinson at Windermere, in September, 1876, which I concurred in thinking was probably undescribed. It did not then appear to me desirable to describe it from this somewhat mutilated individual. Last month, the Rev. A. E. Eaton made a short tour in Ireland, and though he had few opportunities for entomologizing, he nevertheless brought back a small collection. In it I find six examples of this same *Setodes*, captured on the 18th August at Muckross, Killarney, not far from the Abbey: he says that at dusk it was coming up in great quantities from the lake. I hear that Mr. Hodgkinson has again found it at Windermere. As there is no doubt whatever that it is undescribed, I proceed to give a description.

SETODES ARGENTIPUNCTELLA, *n. sp.*

Greyish-yellow, probably greenish in life; the abdomen greenish (bright green in the ♀, but becoming greyish in the dry ♂). Head and palpi clothed (the head

thinly) with greyish hairs. Eyes deep black. Antennæ whitish; to beyond the middle, more than the apical half of each joint is distinctly annulated with black or blackish; basal joint yellowish, clothed with grey hairs. Legs silvery-whitish. Anterior wings narrow, and very acute if the fringes be removed: rather densely clothed with greyish-brown pubescence, and with about five longitudinal rows of minute, but very distinct, rather distantly placed, silvery points (one row in each area), one or two of which, on the apical margin, are rather larger than the others (in examples in very good condition, there appear to be about three fuscous points on the apical margin): fringes long, concolorous with the pubescence: 4th apical cellule with a long footstalk; anastomosis irregular, the nervule closing the discoidal cell placed much nearer the apex of the wing than those below it. Posterior wings very acute, smoky-greyish, very iridescent; with fuscous neuration and very long greyish-fuscous fringes.

In the ♂, the superior appendages are long, hairy, somewhat dilated towards the apex when viewed from above; from between them proceeds the enormously long penis, flattened and canaliculate above, broad laterally, curved in a nearly semi-circular manner, so that the sub-acute apex nearly touches (or even slightly overlaps) the margin of the last ventral segment; no evident cover nor sheaths in dry examples. Ninth ventral segment narrow ventrally, somewhat dilated laterally; on each side of it is a short, obtuse, hairy process or appendage, dilated at its base; inferior appendages short, nearly straight, sub-acute, slightly dilated internally towards the base when viewed ventrally.

In the ♀, the 9th dorsal segment is narrow, produced into a triangular hairy process on either side: from it proceeds a very broad, horizontal, semi-transparent plate, its outer edge forming a small angle at the point of termination of a median dorsal keel; this edge slightly turned upward (in dry examples). Of the lateral valves I see nothing in dry examples, and there is no prolongation of the 9th ventral segment.

Length of body, $3\frac{1}{2}$ mm. Expanse, 12 mm.

England (Windermere, *Hodgkinson*). Ireland (Killarney, *Eaton*).

A beautiful little insect, of the same group as *S. punctata* (= *hiera*, Kol.) and *S. viridis* (= *punctata*, Rbr.); readily distinguished from the latter by its universally darker colours and the very distinct rows of silvery points on the anterior wings; from the former, by its narrower anterior wings, their darker ground, more distinct and rather distant silvery points, darker fringes, &c. From both, the dark hind wings readily separate it (these are silky-white in *punctata* and *viridis*). The anal parts are more allied to those of *punctata* in both sexes, though considerably different. I have made drawings, but not so satisfactory as I could wish, in consequence of the condition of the examples not being good for examination of these parts.

Lewisham, London:

September, 1877.

DESCRIPTIONS OF NEW SPECIES OF *RHOPALOCERA*.

BY W. C. HEWITSON, F.L.S.

The following species, of which the first three are from Lake Nyassa, and the last from China, are in my own collection.

MYCALESIS ENA.

Upper-side rufous-brown. Both wings crossed by two sub-marginal brown lines. Anterior wing marked by two black ocelli, with rufous border and white pupil, the apical ocellus considerably smaller than the other.

Under-side grey-brown, darkest from the base to the middle, and undulated with darker brown. Both wings crossed at the middle by a continuous undulated rufous-brown band. Anterior wing with the ocelli as above, except that the lower one is surrounded by a circle of brown. Posterior wing with a series of seven ocelli: the second and third from the costal margin minute, the fourth and fifth largest, all black, with rufous borders and pupils of white.

Expanse, $1\frac{7}{10}$ inch.

Very like *M. Mirian* on the under-side, but marked on the upper-side by ocelli, which that species is without.

MYCALESIS BIRSHA.

Upper-side rufous-brown. Both wings crossed by two sub-marginal bands of brown. Anterior wing crossed at the middle by an indistinct band of brown: marked by two ocelli bordered with orange, the pupils white. Posterior wing with two similar ocelli between the median nervules.

Under-side rufous, irrorate with paler colour. Both wings crossed below the base by a pale brown band, bordered inwardly by paler colour, and by two sub-marginal bands of white: both crossed at the middle by a common band of white, followed on the anterior wing by the ocelli as above, but surrounded by a circle of white: followed on the posterior wing by a series of seven ocelli, bordered above and below by a common linear band of white, the iris orange-yellow, the pupils white: the first (near the costal margin), fourth, and fifth largest.

Expanse, $1\frac{7}{10}$ inch.

This species scarcely differs on the under-side from *M. Mineus*.

YPHTHIMA BERA.

Upper-side rufous-brown. Anterior wing with one ocellus near the apex, with rufous border, and marked by two minute white spots, and enclosed in a large circle of pale brown, triangular at its lower extremity, and zig-zag on its inner side. A sub-marginal line of brown. Posterior wing with two ocelli between the median nervules, with rufous border and white pupil: two sub-marginal bands of brown.

Under-side: anterior wing as above, except that there is an indistinct band of brown crossing the cell. Posterior wing with a band of brown before the middle, a sub-marginal series of fine black ocelli, with rufous border and pupil of white, the whole enclosed by a common linear brown band, the ocellus second from the costal margin smaller than the others.

Expanse, $1\frac{6}{10}$ inch.

A very distinct species.

AMBLYPODIA AVIDIENA.

Upper-side : anterior wing with the basal half (except the costal margin, which is rufous-brown) lilac-blue, the outer-half dark brown, marked by a bifid spot of orange, the fringe rufous. Posterior wing rufous-brown, with a trifid sub-basal blue spot ; the anal lobe large and prominent.

Under-side : anterior wing pale ochreous-brown, the outer margin broadly rufous, bordered inwardly by a line of white. Posterior wing rufous, crossed from the costal margin (where it is broad, and marked by a triangular rufous spot) to the anal angle (where it is narrow) by a band of grey bordered on both sides with white.

Expanse, $1\frac{1}{2}$ inch.

A remarkable species, belonging to the *Narada* group.

In my notice of butterflies sent by Mr. and Mrs. Monteiro from Delagoa Bay, I omitted to mention the best thing in the collection, *Godartia Wakefeldi*, of which there are several specimens, ♀ and ♂, in fine condition.

Oatlands, Weybridge :

September, 1877.

DESCRIPTIONS OF THREE LEPIDOPTEROUS INSECTS
FROM QUEENSLAND.

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

TIGRIDOPTERA, H.-Sch.

TIGRIDOPTERA ROTUNDATA, *n. sp.*

Allied to *T. matutinata* (*Panæthia matutinata* of Walker), but easily distinguished by its more rounded wings, thicker black bands, and the absence of black spots on the discocellulars.

Wings above bluish-grey, crossed in the centre by three parallel, irregular (almost zigzag), transverse blackish lines ; basal area whitish-brown, centre of disc white ; outer border pale brown, two longitudinal streaks of sandy-brown interrupting the two outer of the three central lines on each wing ; primaries crossed by two converging sub-basal interrupted black stripes ; five fusiform sub-apical black spots parallel to the outer margin, and two more rounded spots near the external angle ; a blackish sub-marginal spot opposite to the third of the sub-apical series, and a second opposite to the first of the two spots near external angle ; secondaries with three sub-apical fusiform black spots, and two rather smaller near the anal angle : thorax bluish-grey, crossed by three black bars, abdomen ochreous : wings below pale greenish-grey, irregularly and very broadly bordered with black at apex and outer margins ; a large black discocellular spot, and a broad transverse postmedian band subangulated on each wing ; primaries with a black streak through the discocellular spot to inner margin ; a diffused white spot on either side of the discal band

at its elbow ; secondaries with an elbowed black line crossing the wing behind the discocellular spot ; a white diffused spot beyond the discal band ; pectus and legs mouse coloured, venter ochreous. Expanse of wings, 2 inches, 6 lines.

Queensland (Miskin).

POTAMOPHORA, Guenée.

POTAMOPHORA NEOCHERINA, *n. sp.*

Primaries above not very unlike those of *P. Manlia* ; purplish-brown towards the base, crossed by two darker parallel oblique streaks, and bounded by a straight, pale-edged, blackish bar, parallel to the outer margin ; discal area, from the bar just mentioned, dull wood-brown, transversely striolated, and irregularly clouded with dull olivaceous ; apical and external areas broadly dark greyish-olivaceous ; an oblique line from the apex bounding a sub-pyriform, speckled, reddish-brown patch ; also two or three small spots of the same colour, connected with black dots, on the disc ; secondaries blue-black, becoming greyish and showing indications of transverse dark striations towards the anal angle, abdominal area clothed with brown hairs ; the entire central area occupied by a large snow-white patch ; fringe brown : body smoky-brown : primaries below brown, glossy towards the inner margin ; the apical area brilliantly shot with purple, limited internally by an abbreviated, irregular, snow-white band, from the sub-costal nervure to the first median branch, its inner edge, from the lower radial to the first median, trisinuated ; an indication of a white discocellular spot ; secondaries snow-white, the costa irrorated with purplish-brown ; a black spot uniting the costa to the centre of the costal nervure ; a very broad dentate, sinuated, dark brown outer border, brilliantly shot with purple ; abdominal area brown : body below brown, legs irrorated with grey. Expanse of wings, 3 inches, 9 lines.

Queensland (Miskin).

A most magnificent species, resembling the genus *Nvochera* in the coloration of the under-surface.

CALLIODES, Guenée.

CALLIODES LANIPES, *n. sp.*

Wings above brown, crossed in the middle by a snow-white band, which tapers to near the apex of primaries ; a broad dull green outer border, bounded internally by a black line, and traversed by two parallel, festooned, black lines, broader and more compressed in the secondaries ; primaries with a large black ocellus, bordered with greenish externally and with white internally, having a slender yellow internal iris, and a slender, metallic, steel-blue, C-shaped pupil, the interval between which and the inner part of the iris is filled in with castaneous ; the costal area, a spot at the base, an irregular sub-basal transverse streak, and two or three arched stripes beyond the ocellus, dull shining green ; disco-apical area pale ochreous, crossed by eight pearly-white spots parallel to the central band ; a group of lilacine scales near external angle ; secondaries with an interrupted transverse streak of lilacine scales on the disc ; fringe long, and snow-white ; head, thorax, and basal segments of abdomen mouse-grey, shading into brown at the back of the collar, tegulae, and abdominal

segments; a transverse whitish band behind the collar; hinder segments of abdomen ochreous: wings below purplish-brown; each wing crossed by a broad, elbowed, white band, which does not reach the costa; primaries paler brown towards the base; a large black spot, enclosing a white crescent, at the end of the cell; apex cream-coloured; secondaries with a white fringe; pectus, palpi, and legs sandy-yellow; the tibiae of the anterior legs densely clothed with a mass of long woolly hair; venter cream-coloured. Expanse of wings, 2 inches, 11 lines.

Queensland (Miskin).

By far the most splendid species of the genus, and not nearly allied to any form that I have hitherto seen; I am much indebted to Mr. Chapman for the pleasure of examining it and the two other very interesting species here recorded.

British Museum: *August, 1877.*

The recent appearance of Colias Edusa.—My experiences with regard to this insect tend to confirm the truth of Mr. McLachlan's statement, that the causes of its appearance in this country are probably internal (*Ent. Mo. Mag.*, xiv, 66). I left London on July 21st, for a fortnight's collecting in the Rhine Valley, during which period I certainly did not see more than four specimens of the insect. Previous to my departure, accounts of its occurrence had reached me from nearly all parts of England. (A friend, well acquainted with the species, had seen a specimen in a London square, and Mr. E. Boserer informs me that he has taken about a dozen specimens, and seen as many more in the neighbourhood of Twickenham, where it had not been seen to his recollection for about 18 years). From August 4th to the 11th, I was collecting in the neighbourhood of Hamburg, and did not see a single specimen. Returning to London, *via* Venlo and Flushing, the first thing that struck me on landing at Queenboro' was the great numbers of *C. Edusa* flying about the railway embankments. On the 18th of August, I had occasion to cross to Paris, where I spent three days; during my journey through France and in the country round Paris, I saw only about six specimens. August 26th and 27th I spent at Deal, and there saw the insect again in profusion.—R. MELDOLA, 21, John Street, Bedford Row, London, W.C.: *August 29th, 1877.*

Colias Edusa in the County Limerick.—On the 7th September, in a field with a southern aspect, in this neighbourhood, I took my first specimen of *Colias Edusa*. It proved to be a ♂, just emerged, and in the most perfect condition. On the following day, I feel certain I saw one of the same species, which, however, I was unable to capture.—WILLIAM W. FLEMING, Tower Hill, Pallas Green, Co. Limerick: *11th September, 1877.*

Colias Edusa near London.—I do not know whether attention has been called to the frequent appearance of *Colias Edusa* (the clouded yellow) near London this season. Chiswick is only four miles from Hyde Park Corner, but hardly a single fine day this month has passed without my seeing at least one specimen of *Edusa*, an old favourite and acquaintance of mine, in my walks here. I noticed three yesterday, and succeeded in catching one—a male, in first-rate^o condition; and one fine morning

last week, I saw three among the scanty patches of lucerne that grows on the District Railway cutting between Hammersmith and Earls Court Stations. A friend of mine took three *Edusa* on Barnes Common one day this week, and saw several more. I might mention that last year I saw a male and female *Edusa* flying together at Chiswick, and succeeded in capturing the former; but though I have been here many years, and in my early collecting days caught all I could lay hands on, in the hope it would prove "something good," I have never seen *Edusa* in this neighbourhood before.—HERBERT D. DALE, Vicarage, Chiswick: August 25th, 1877.

Colias Edusa near London.—In July last, I saw several specimens of *Colias Edusa* flying in this neighbourhood, and the experience of former years led me to expect that the species would be plentiful during the following August. In this I was not disappointed, for on the afternoon of the 4th of that month, on reaching home from the city, I captured a specimen in the garden, which, from its freshness, could only just have emerged. On the following day, being Sunday, on my way to and from church, I counted eighteen specimens, and within a few yards of my house, I caught one with my hand, its wings scarcely dry, a most lovely specimen of the var. *Helice*. Monday being Bank Holiday, I started out, and, in a field at the top of the road from which, at an earlier period of the year, clover had been cut, and which at the time was covered with long grass and scattered tufts of clover, in the space of an hour I caught over two dozen beautiful specimens, and could, had I stayed, no doubt have secured as many more. I have since seen many specimens in the neighbourhood. The frosty nights of the past week do not seem to have affected them, as yesterday I saw four apparently fresh specimens flying in the sunshine, but the inclement weather that has set in to-day will probably bring their flight to a close. *Vanessa Atalanta* has been abundant here, and *V. cardui* common.—J. C. MILLER, Lynmouth House, Langley Road, Elmer's End, S.E.: Sept. 3rd, 1877.

A Butalis new to Britain.—On June 29th, 1875, I took upon the heath, known as Greenham Common, near Newbury, a specimen of a *Butalis*, which remains yet undetermined. It was flying low, about sunset. The specimen in question is a little larger than *B. senescens*: fore-wings greyish-fuscous, with a whitish streak from base nearly to apex up the middle, and a dark spot towards anal angle. Mr. Stainton returned it as perhaps *dissimilella*, H.-S., which is not at all improbable to be British, and of which the larva feeds on *Helianthemum*; but Prof. Zeller declined to give any definite opinion, and seemed to think it might be undescribed. I was unfortunately prevented from searching for more this season; and as my near departure for Australia renders it extremely problematical when I may again have an opportunity of doing so, I think it best to make known these facts in the hope that some one may accept the task.—E. MEYRICK, Ramsbury, Hungerford: Sept. 3rd, 1877.

Larva of Nepticula quinquella.—The larva of this species, which, so far as I am informed, has hitherto escaped notice, mines the leaves of oak, preferring low bushes to trees. The mine is very narrow and excessively contorted, as though rolled into a ball, thus occupying a very confined space. The greenish larva may be distinguished from the other oak-feeding larvæ with great ease by the character of the dorsal vessel; this is very distinct, forming a row of conspicuous dark spots

down the back, which are easily perceptible through the leaf, when held up to the light. I found these larvæ last year at Cambridge, for the first time, on Nov. 6th, they were then mostly young, whilst of the other three oak-feeding species almost every mine was already empty. A week later, they were in extraordinary profusion, such as I have never seen the like of in any other species; the locality is rather restricted, but the oak-bushes stand pretty thickly, and on nearly all of them literally every leaf held from twenty to thirty larvæ; many had from fifty to one hundred, and in one large leaf I counted one hundred and twenty-three. The effect upon the appearance of the bushes was very conspicuous, hardly a vestige of green remaining; but at that season a casual observer would doubtless have set it down as the result of natural decay. My specimens (kept here, where bred insects always appear considerably later than elsewhere) did not begin to emerge until the first week in July; but Mr. Sang bred some in the middle of June, and about that time the imago may usually be taken in abundance at Cambridge.—ID.

Rare Lepidoptera in Kent.—It may interest some of your readers to learn that I have had the good fortune to capture the following good and rare species during the past month of August, whilst on a collecting excursion to the South-East coast of Kent, and being in every case my own absolute capture, I can vouch for the accuracy of the fact:—Two specimens of *Mecyna polygonalis*, two *Margarodes unionalis*, one *Sterrha sacrararia*, one *Leucania albipuncta*, one *Laphygma exigua*, two *Heliothis peltigera*, one *Heliothis armigera*, &c.—W. H. TUGWELL, 3, Lewisham Road, Greenwich: *September 6th, 1877.*

On the egg and food-plant of Thecla quercus.—Last year, after ineffectual attempts to get ♀s of this species to deposit eggs in confinement, I squeezed an egg out of the ovipositor of one of them, and examined and described it; thus I was able to identify an egg lately sent me by Mr. G. C. Bignell: on 30th last August, he noticed a ♀ *quercus* sitting on a willow leaf, and on plucking the leaf saw she had deposited an egg just in the centre of it; he tells me he had previously beaten larvæ from willow bushes, but had been accustomed to account for their presence there by supposing they had fallen or wandered from neighbouring oaks; now, however, this additional evidence points to willow being sometimes, at least, the food-plant; one question remains—the willow leaf would before long have fallen from the bush, and decayed; and if the larva is not hatched till the spring (E. M. M., vi, 223), what meanwhile becomes of the egg?

The egg of *Thecla quercus* is much of the *Lycana* form, but larger, its diameter, compared with that of the egg of *Argiolus*, being as 4 to 3: it is round in outline, flattened, and, with the exception of a central depression on the upper surface, covered with irregular oblong reticulation, the lines of which—much more prominent on the top than in *Lycana*—become so exaggerated on the sides that at the angles they stand out like spines, and the egg looks quite like a rough *Echinus* in miniature; the under surface, which rests on the leaf, is only granulated; the shell under the reticulation apparently has a very pale pinkish-brown tinge; the reticulation is whitish.—J. HELLINS, Exeter: *September 11th, 1877.*

Thecla rubi feeding on Ulex.—At pp. 37, 38, E. M. M., vi, is an account of the discovery of the larvæ of the first brood of this species, feeding on *Genista tinctoria*

and *Cytisus scoparius*; whilst staying at Chagford during the second and third weeks of last month (August), I found several larvæ of the second brood on flowers of *Ulex nanus*: these differed slightly from the others, the head being of a darker brown, the dorsal stripe darker, and the markings on the sides of a paler (almost whitish) yellow.—ID.

Pseudopteryna cytisaria feeding on *Ulex*.—Last June I beat some larvæ of this species from young shoots of *Ulex europæus*; this may serve to explain what has sometimes been a puzzle—the presence of the moth in localities where *Cytisus scoparius* could not be found.—ID.

Catocala promissa in Devonshire.—This is not such a common species that a new locality for it need not be recorded; we took a fine specimen of the imago at rest on the trunk of an oak tree, August 12th, at Chagford.—ID.

Anisopteryx æscularia and *A. pometaria*.—That I can bring forward something worth knowing about this species is due, I must at once acknowledge, to an enquiry sent across the Atlantic by Mr. C. V. Riley, Chief of the U. S. Entomological Commission at St. Louis.

It appears that orchards in the United States suffer from the depredations of the larvæ of two species of Geometers, one of which Mr. Riley gives as *Anisopteryx pometaria*, and the other—though closely allied—he finds it necessary to place in another genus, and names *Paleacrita vernata*: with regard to *A. pometaria* he was anxious to settle definitely whether it was the same species as our *æscularia*, but with the materials at hand he could not satisfy himself on one or two points, specially as to the number of legs in the larva; in *A. pometaria*, he found an undeveloped pair of ventral legs on the 9th segment (the 8th as he reckons it), but in no description that he could find in English books and magazines was there any mention of this feature in *A. æscularia*, while Guenée says (Tome X, p. 255), “Il ne faut pas chercher des caractères pour les *Anisopteryx* dans les premiers états, car les chenilles ne diffèrent ni pour la forme, ni pour les couleurs, ni pour les mœurs, de celles des *Hybernia* du premier groupe.”

Through Mr. McLachlan, the question came to Mr. Buckler and myself; and as *æscularia* was one of the species *done* years ago, before we quite knew the importance of every small detail, we could not answer it; now, however, we can; the larva of *æscularia* has the small pair of legs on segment 9, but the species is sufficiently distinct from *pometaria*, differing from it in the ovum, larva, and imago: and I will close this introductory part of my note by saying that I have examined the larvæ of *Hybernia rupicaprararia*, *leucophacaria*, *progemmaria*, and *defoliaria*, and of *Cheimatobia brumata*, but could find no trace of the pair of feet on the 9th segment, nor does it exist in the species mentioned above, *Paleacrita vernata*.

Mr. J. G. Ross, of Bathampton, kindly sent me a batch of eggs of *æscularia* on April 3rd, 1877, a portion of which was at once despatched to Mr. Riley; with me, the larvæ did not hatch till the 25th, while Mr. Riley in a letter dated the 23rd said the parcel had reached him with the larvæ hatched, and dead; I suppose the temperature in the steamship was higher than in my room, and expedited the hatching: my larvæ ate oak, and were full fed during the first week in June, but a week later again I beat a few from an oak tree, some of which were not full fed for several days after.

The female moth seems to deposit her eggs in patches (there were more than fifty together in one patch sent me by Mr. Ross) ; and they are arranged very closely and evenly, touching one another, firmly cemented together, and covered over with the long fibre-like scales from the maternal anal tuft : the egg is oblong, standing upright on end, almost cylindrical, but somewhat squared by being squeezed closely against the other eggs with which it stands, the upper end convex, the lower more flattened ; the shell smooth and glossy ; the colour olive-brown, browner on the top, without much change ; the larva escapes by eating a round hole through the top of the egg, and is at first yellow in colour, the internal vessels showing faintly blackish down the back, and there is a fine blackish sub-dorsal line ; the usual dots very small, black, and bearing pale yellowish short bristles ; at first there is no appearance of feet on the 9th segment. As the larva feeds, the middle portion of the body becomes greener, while the head and tail are more yellowish, but after a little growth the green spreads throughout ; when the larva is almost half-grown it plainly shows some rudiments of legs on the 9th segment. When full grown, it is rather over an inch in length, very even in bulk ; the head flattish, but with rounded outline to the lobes ; under the anal flap are two short blunt points ; on segment 9 a pair of feet, perfectly formed, but useless for walking, being about one-sixteenth of the size of the pair on segment 10 : the general appearance of the colouring is yellowish-green, owing to the number of green and yellow lines which run intermixed down the body ; the dorsal line is a pale yellowish thread, running between two dark green lines, darkest at the segmental divisions, and themselves again edged with pale yellowish ; then on a pale yellowish-green ground are some pale yellow freckles ; then comes the sub-dorsal line, yellowish, edged with decided green ; then more yellow freckles ; then a waved, rather broken, supra-spiracular line of yellow, edged above thickly but irregularly with green, reaching highest at the beginning and end of each segment, and lowest just in the middle above each spiracle ; the spiracular region broadly and decidedly green, each black-ringed spiracle with a small yellow halo (and in some individuals behind each spiracle is a conspicuous spot of darker green) ; the sub-spiracular is a stouter undulating line of deeper yellow, edged in parts with dark green ; the belly rather bluish-green ; the head greenish with a tinge of very pale brown.

The cocoon is neatly formed, of long oval shape, and of tough texture, being lined with close woven yellowish silk, and covered with fine earth ; in fact, it looks like a little knob of earth : it is about $\frac{3}{8}$ inch long, and $\frac{1}{4}$ inch broad : the pupa is rather over $\frac{5}{16}$ inch long, very plump and full, being for the greater part of its length nearly $\frac{1}{8}$ inch across : the eye-cases prominent, the abdomen tapering off quickly, but with a blunt end, on which is a flat blackish knob, furnished with two short widely diverging sharp spines ; the colour golden-brown, tinged with greenish on the back, the eye-cases, &c., more brown ; the skin finely punctured but glossy.—ID.

Description of the larva of Scopula lutealis.—For years I have tried to find out the larva of this species, but although the perfect insect is so abundant with us as to become almost a nuisance when it is out, it was not until the present season that my endeavours were crowned with success. I had done my best to find the larva at large ; and had watched the ♀ moths where they abounded, in the hope of seeing them deposit their eggs, from early evening till late at night ; I have had

numbers imprisoned with sprigs of every likely plant I could think of, but to no purpose: not a larva or an egg could I get. Last year, however, I received information from Dr. F. Buchanan White that he had reared the moths from larvæ found on one of the thistles, and having obtained this clue, I hoped there might not be much more difficulty, as I was not sure that I had ever particularly searched any thistles. In the spring of this year, therefore, I carefully preserved every thistle plant that appeared above ground in a field I have adjoining the garden (where *lutealis* was common last year), much to the amusement, and possibly disgust, of some of my friends. The thistles grew vigorously, but although I examined them minutely from time to time, no trace of *lutealis* could I detect. I had almost given up in despair, when, on the 30th June, I had occasion to fetch in some dock leaves on which to feed larvæ. On one of the leaves I had plucked, from a plant near where one of the preserved thistles was growing, I accidentally saw on the under-side beneath a web the larva of a *Pyralis* with which I was unacquainted. The thought at once crossed my mind, "here is the long-looked-for *lutealis*." The appearance of the imago has since proved the suspicion correct. I searched long to discover another larva, but without success: perhaps they had all spun up, as this was evidently almost full fed.

Length, about three-quarters of an inch, and of average bulk in proportion; head slightly polished, it has the lobes rounded, and is the same width as, or perhaps a trifle narrower than, the second segment; body cylindrical, and attenuated towards both extremities: it is also divided into conspicuous sections by the segmental divisions, which are deeply cut all round, or, to be more strictly correct, have the appearance of being so, from each segment being plump and rounded, especially at the sides; the skin has a semi-translucent glossy appearance, and each tubercle emits a single but noticeable hair.

Ground colour, pale green; head pale yellowish-brown with a few scattered dark brown dots; a conspicuous broad dark green stripe extends through the dorsal area, widest on segments 2, 3, 4, 5, and 6; on each side of this stripe and edging it is an equally broad greyish-white stripe, these together forming the caterpillar's most noticeable markings; there is also a fine greyish line along the region of the spiracles; tubercular dots dark green, the hairs grey. Ventral surface uniformly pale greyish-green.

In some respects, the larva reminds me very forcibly of that of *Ebulea sambucalis*.

In a week, the larva changed to pale straw-colour, and in another day had spun a loose cocoon in a part of its dock leaf which had become folded against the sides of its cage. Two or three days later it had changed to a pupa, and I found the imago dead in the cage on my return home from a collecting expedition to the New Forest, on the 9th August.—GEO. T. PORRITT, Highroyd House, Huddersfield: August 14th, 1877.

Ebulea stachydalis bred.—As Mr. Buckler's interesting account of the larva of *E. stachydalis*, at p. 134 in Vol. xiii of this Magazine, was given us before he had bred the moths, and hearing he has not been fortunate in getting them out, it seems well to record the rearing of a few examples by myself last month. Mr. Buckler kindly revealed to me the way to find them before it was too late last September, when I soon detected them freely in this part. The young larvæ I have already found feeding, and those who want good examples should search for the larvæ now, as doubtless it will be found in most districts.—W. R. JEFFREY, Ashford: August 22nd, 1877.

Hydrocampa stagnalis bred.—In July, 1876, I bred one moth of this species from a larva on *Sparganium simplex*. Following up this clue I was able to obtain a number of young larvæ in September, which were kept through the mild winter in a glass tank out of doors, supplied with earth and roots of the *Sparganium*. From them I have bred 15 moths, the first appearing in the evening of July 23rd, the last on the 15th of this month (August). Eggs have been freely laid by these bred moths on the growing plants, and the young larvæ are now feeding again. It has been a pleasure to me to furnish Mr. Buekler with larvæ for figuring, and he has since found the larva in his own neighbourhood. Fully expecting he will make known the result of his observations on the economy of this wonderful larva, I will not attempt any further account of it.—ID.

The Hissing Larva.—*Langia zeuzeroides.*—On the 9th July, 1867, two large *Sphinx* caterpillars, four and a quarter inches in length, green, with maroon-coloured backs, dropped down from the apricot tree in front of my house at Simla. I placed them in a box with a few apricot leaves, they did not feed; when touched, or disturbed in any way, they gave a *strong* and *sharp hiss*; they did not attempt to bury themselves, but after three or four days began to change colour, became lethargic, and when touched gave a *squeak*, which daily became more feeble, and ceased on the 20th, when they had shrunk to half their length, and had nearly formed into pupæ; in another ten days they were dead. Some time prior to this, I had obtained, at Koteghur, in the valley of the Sutledge (56 miles N.E. of Simla), a large pupa which was new to me, but which I now recognised as being identical with this of the hissing larva. The *Sphinx* from the Koteghur pupa I gave to Dr. T. C. Jerdon, the naturalist, which he assured me was a new species (he took it to England), and quite unknown to entomologists. (This specimen is now in Major A. Lang's collection).

1868.—I was not in the Hills this year, but asked my friend, Captain A. M. Lang, R. E., to try and obtain a hissing caterpillar at Mussourie, he obtained one only, and reports as above. It died when but half formed into the pupa state; it did not bury.

1869.—About the middle of July, I obtained a "*Hisser*" at Simla from the same tree as I got those in 1867, he would not feed, but in four or five days formed into a chrysalis, *without burying in the earth*, only scraping a hollow the size of a saucer. I took this pupa down to Umballa, in October, and on the 7th of December, a female *Sphinx* issued therefrom, it uttered a faint stridulous cry, like that of *Acherontia Atropos*, and *Satanas*, but not so loud. (The larvæ of *Acherontia* are mute). Expanse, 6¼ inches.

1870.—Late in June, I obtained four hissing larvæ, and found that even when full-grown, their backs were of a light colour, a pale green, and only turned of a dark maroon colour some twenty-four or thirty hours before they were ready to turn into chrysalides; a *Sphinx* from one of these pupæ I gave Captain Lang. I have now two in my own collection, both females.

1876.—Last year I procured but one hissing caterpillar, it formed into a chrysalis, but died.

I have during this month (July) obtained seven larvæ from the apricot tree in front of the house, two were quite green when taken, yet would not feed, it was

three or four days before their backs assumed the dark maroon colour. One larva is dead, the others have all formed into chrysalides, but *without burying in the earth*. I covered them with earth two or three times, when they were more than half formed into pupæ, but in a few hours they were on the surface again! I am told this *Sphinx* has been named "*Langia zeuzeroides*," but I first discovered it, and sent the first specimen to England by Dr. Jerdon, and the only specimens in Major Lang's collection (a male and female) were given him by me.—WM. CHAS. GOTT, Colonel, Bengal Army: Simla, 1876.

[The above is a reprint of a two-page tract, printed in India, and forwarded to us by Mr. J. S. Baly.—EDS.]

Re-occurrence of Setodes interrupta in Worcestershire.—Visiting the banks of the river Teme on August 6th, in the forenoon, in search of *Trichoptera*, I was so fortunate as to meet with a little colony of *Setodes interrupta*. The creatures were at rest, exposed on the leaves of herbage, especially nettle, in the shadow of willows, and presented a striking and attractive appearance. When disturbed, they darted off with a shuffling, zigzag gait towards the earth. From the condition of the specimens, which are mostly rather worn, the right time to look for the insect should be from the middle to the end of July. I secured twenty-seven. If any Neuropterist desires the species, I shall be happy to send him a type or two.—J. E. FLETCHER, Pitmaston Road, Worcester: *September 1st, 1877*.

Phryganea obsoleta in Ireland.—The Rev. A. E. Eaton captured a fine ♂ of *P. obsoleta* (not hitherto recorded from Ireland), at Limerick, on the 16th ult. The species is very variable; this individual has the anterior wings prettily varied with brownish. Ireland has never yet been systematically worked for *Trichoptera*, and there is no knowing what good things may occur there. The few results of Mr. Eaton's not specially entomological tour have raised my expectations considerably.—R. McLACHLAN, Lewisham: *3rd September, 1877*.

Note on Hebrus ruficeps, Thoms.—This little creature will probably prove to be rather widely distributed in Britain, at least in the North. I took it in 1870 in Dr. Sharp's original locality for *Lamproptax* in Dumfriesshire, as well as in the place where Dr. Reuter and I found it here. At the time, I took it to be a brachypterous or undeveloped form of *H. pusillus*, and indeed did not examine it very closely. It is to be found by shaking *very wet Sphagnum*, at the edges of ponds and marshes.—F. BUCHANAN WHITE, Perth: *September 8th, 1877*.

Note on the Natural History of some Aphidæ.—In the grass-root lice (*Pemphigus*, *Schizoneura*, *Amycla*), I find wonderful alternate generation, for while the ærian *Pemphigi* (*bursarius*, *affinis*, &c.) in the winged state lay agamous lice furnished with a rostrum, the subterranean *Pemphigi* (*Boyeri*, *corulescens*) lay sexual young without any rostrum!! Are the grass-root lice the winter form of the poplargall lice, similar to the *Phylloxera* on the vine? It is very difficult to follow the migration of such small creatures, yet after Adler's discoveries about *Cynipidæ* all is possible, and some day we must find out what becomes of the winged *Pemphigi*, which disappear in the autumn and arrive in the spring;—a mystery hitherto inexplicable, although De Geer, v. Gieichen, Bossuet, Kaltenbach, Réaumur, and others followed it up for many years without success.—J. LICHTENSTEIN, Montpellier: *31st July, 1877*.

Note on the transformation of Cantharis.—I have succeeded pretty well this year in breeding *Cantharis*, having now eight larvæ in their second form, which has hitherto been unknown. After having passed the first stage of their life feeding in the interior of honey-bees, they feed on honey, which, of course, is an artificial nutrition, in liberty they must eat the bee's egg before eating the honey. The honey I give them is of two different kinds—one from *Osmia tridentata*, the other from *Ceratina chalcitis*, the former yellow, the latter white, and the larvæ take the colour of their food.—ID.

Review.

THE LOCUST PLAGUE IN THE UNITED STATES: by CHARLES V. RILEY, M.A., Ph.D.; 8vo, pp. 236. Chicago: Rand, McNally, and Co. 1877.

This instructive volume is confessedly chiefly made up from the 7th to 9th Reports on the Insects of Missouri, by the same author, already noticed in our pages. But good service has thereby been done, and the result is a capital book illustrated by good figures, and by excellent maps shewing the various parts of the United States in which the insect permanently exists, and also those over which it, in a somewhat erratic manner, spreads in migratory swarms from year to year. The author, in his introduction, says, that "man has power to utterly rout, by practical and feasible means, the young, or unfledged, insects. Indeed, when our people become familiar with the locust plague in all its phases, it will cease to be such a bugbear." The same remark will apply to the so-much-dreaded Colorado beetle. We wish we could say as much respecting our potato fungus:—a correspondent, with much justice, says he would gladly compound for the beetle, if the fungus could be destroyed. The only paragraphs we should like to have seen omitted by Dr. Riley, in this practical reprint, are some theological allusions at pp. 213–216, which contain good common sense advice without doubt, but are out of place.

Obituary.

E. W. Robinson.—Born January 20th, 1835, the son of a well-known engraver, it was but natural that E. W. Robinson should learn the art of steel-engraving, whilst assisting his father.

How his attention was first drawn to insects, or when we, know not. Richard Shield, the author of "Practical Hints respecting Moths and Butterflies," wrote of him in May, 1856, as "a young friend of mine, and one of my entomological pupils."

Mr. Shield exhibited, as a specimen of his friend's skill in engraving, as applied to entomological subjects, a sample plate representing *Lithocolletis tenella*, highly magnified. Mr. Shield was well aware that the "Natural History of the Tineina" (of which only one volume had then appeared) was delayed by the want of an artist to execute the plates; and, since the death of William Wing, on the 9th January, 1855, the want of both entomologist and artist combined in one had been much felt.

Richard Shield thought that in E. W. Robinson he had found this *desideratum*, and the materials for the plates of vol. 2 of the Natural History of the Tineina were soon placed in the hands of the new-found artist, and the entomological world is well aware with what results.

The plate illustrating the Entomologists' Annual for 1857 was, we believe, the first published plate executed by Mr. Robinson.

In 1857, he also executed a plate for the Transactions of the Entomological Society, illustrating a paper by Mr. Baly on new *Chrysomelide*. In the next volume of the Entomological Society's Transactions (vol v, new series), 13 out of the 19 plates are by Robinson, embracing subjects as varied as: Baly on *Sagride*, Moore on *Adolias*, Saunders on *Eratina*, Scott on *Coleophora*, and Wollaston on *Cossonides*.

In subsequent volumes of these Transactions, he illustrated papers by several other authors, viz.: F. Bates, H. W. Bates, Clark, Hutton, Lubbock, McLachlan, Pascoe, E. Saunders, Wallace, and Westwood.

The Entomologists' Annual continued to be illustrated by him till it ceased to appear, in 1874; and the volumes of the Natural History of the Tineina that he illustrated are 12 in number.

The Journal of the Linnean Society contains numerous plates executed by him, principally in illustration of a valuable series of Coleopterological papers by Mr. Pascoe, as also do the Annals and Magazine of Natural History, and the Journal of Entomology.

Amongst other publications illustrated by him, may be mentioned the volume on Hemiptera by Douglas and Scott, issued by the Ray Society, Westwood's Thesaurus Entomologicus Oxoniensis, the entomological works by Stainton, Rye, and others, in Lovell Reeve's Natural History series, &c.

Mr. Robinson was, however, not content with being only an entomological artist, he aimed at being a water-colour painter; and many quiet nooks and corners of our island were visited by him, from Yorkshire to South Wales and Devonshire, in search of subjects for his pencil. Then the Channel was crossed, and French scenes enriched his portfolio; and at length he found himself South of the Alps, making sketches on the shores of Italian lakes, and in Switzerland, amongst the grander scenery of the glaciers. This part of his career, though not entomological, deserves notice here, as showing why, in the later years of his life, his occupations led him more and more away from entomological subjects.

But there were already symptoms indicating some mischief in the system; and more than ten years ago, Mr. Robinson was subject to sudden fainting attacks, and would drop down whilst at his work; and once, when returning from Italy, he had a sharp attack of illness, which quite prostrated him for the time, at Faido, between Bellinzona and the St. Gothard.

Fortunately, his buoyant, cheerful disposition helped him over this as over many subsequent illnesses; but of late years his health had generally failed in the summer, and when it again failed last January to an extent it had never before failed in winter, his friends could not but feel anxious as to the result.

In July, it became only too evident that recovery was hopeless, and on the 10th August (as we announced, last month) he breathed his last.

William Arnold Lewis.—I regret to have to record the death of Mr. W. Arnold Lewis, who, with his companion Mr. Noel Paterson and three guides, lost their lives in the fatal accident on the Lyskamm, on the 6th of September. Mr. Lewis was educated at Harrow, and, after practising for a short time as a special pleader, was called to the bar in 1869. Such time as he could spare from his professional engagements he devoted to entomology, in the study and pursuit of which he displayed a zeal and energy which sometimes led him into conflict with those whose tenets clashed with his. The *Lepidoptera* were his favourite group, and he chiefly distinguished himself by his opposition to the constant alterations in the nomenclature of the Order. His papers on that subject, read before the Entomological Society and the British Association, shewed a fund of knowledge and a power of reasoning and vigorous expression, which, if they failed to convince, commanded the admiration of his opponents. Mr. Lewis was elected a member of the Entomological Society in 1869, and a Fellow of the Linnean Society in 1872. His remains lie buried at Zermatt. All who knew him well, and especially those who ever joined him in his entomological excursions, will deplore the sad catastrophe which terminated his life at the early age of thirty.—[T. H. B.]

ENTOMOLOGICAL SOCIETY OF LONDON: 5th September, 1877.—PROFESSOR J. O. WESTWOOD, M.A., F.L.S., President, in the Chair.

Mr. F. Smith exhibited a fine collection of *Hymenoptera*, collected near Calcutta last season by Mr. Rothney. There were new species of *Cerceris* and *Apidae*, and fine *Sphegidae*, &c. He called attention to *Chlorion lobatum*, the habits of which have been graphically noticed by Mr. Rothney, *ante* p. 91.

Mr. McLachlan exhibited enlarged drawings (made during a recent visit to Brussels) of the extraordinary insect from Java, described by Wesmael in 1836, as *Himantopterus fuscinervis*, and placed by him in the *Lepidoptera*: the insect remains unique in the Brussels Museum. In 1866, Hagen (*Hemcrob. Synopsis Synonymica*) transferred *Himantopterus* to the *Neuroptera* as a sub-genus of *Nemoptera*. The mouth parts and legs were wanting when Wesmael first described the insect; but from the form of the body, venuration, clothing of the wings as seen under the microscope, &c., Mr. McLachlan had no doubt whatever that the insect is *Lepidopterous*, and should come near to *Thymara Zoida*, E. Doub., from North India, near which he found Mr. Butler had located it (from the figure and description) in the British Museum. Professor Westwood stated that in 1876 he had also made drawings of the insect, and agreed with its position near *Thymara*.*

Mr. McLachlan also exhibited leaves of various large species of *Acer* growing in the grounds of M. van Volxem, at Laeken, near Brussels. Although many of the trees were over 50 ft. high, nearly every leaf was marked with large whitish blotches, being the mines of a small saw-fly (*Phyllotoma aceris*, Kaltentbach). The insect only appeared for the first time last year, and was now in such extraordinary abundance as to threaten serious damage to the trees.

Professor Westwood exhibited minute species of the curious Hymenopterous genus *Mymar* from Ceylon. Also the sexes of a curious species of *Celoniidae* from the Neilgherries, sent to him by Mr. Wood-Mason; it was first described in 1842, in the "*Areana Entomologica*," and had remained almost unique.

Mr. Wood-Mason exhibited the sexes of a rare species of Indian *Mantida* (*Phyllothelys Westwoodi*), the ♀ of which is remarkable for the possession of a long frontal horn, absent in the ♂. He also exhibited drawings of a stridulating spider (*Mygalé stridulans*) from India; and a stridulating scorpion of large size; both sexes of this stridulated, and the sound could be artificially produced in dead specimens preserved in alcohol. Finally, he exhibited a Homopterous insect, collected by Colonel Godwin-Austen (who was present), in Bangalore, to the abdomen of which a larva was attached at the last segment by a transparent cord. He thought the larva was *Lepidopterous*, but there was some difference of opinion as to this: he handed the specimen to Professor Westwood for examination.

Mr. Wormald exhibited (for Mr. W. B. Pryer) a small but interesting collection of Butterflies from North China.

Mr. Champion exhibited *Pachyta sexmaculata*, a new British Longicorn (*vide ante*, p. 92), and other rare *Coleoptera* from Aviemore, Inverness-shire.

A letter was read addressed to the President by Mr. Grevelink, of the Hague, respecting damage occasioned to cocoa-nut trees in the West Indies by various insects.

Mr. Jenner Weir stated that he had recently bred a single female of *Lasiocampa quercus*, which was kept so that no male could possibly have gained access to her, and was killed within twenty-four hours of emerging, and yet a number of eggs laid by her proved fertile, and he had the larvae now feeding.

The Secretary exhibited an exotic Longicorn, which had been found alive at Birkenhead.

Mr. J. W. Slater read "*Vivarium notes on some common Coleoptera.*"

* A fuller account of the peculiarities of the insect will appear in notes I have forwarded for the *Compte Rendu* of the Belgian Entomological Society.—R. McL.

ON AN ORGAN OF HEARING IN INSECTS, WITH SPECIAL REFERENCE TO THE *LEPIDOPTERA*.

BY A. H. SWINTON.

That an organ of hearing exists in *Insecta* may be inferred, when it is noticed that those capable of producing instrumental music, perform in turn, or *en reconnaissance*. A little observation enables us to detect this feature in the music of the *Cicadidæ*, *Acridiidæ*, and *Locustina*: and it exists, doubtless, in that of the *Gryllidæ* or *Blattina* (?). We may likewise observe it in the stridor of some *Longicornia* (*Dorcadion*) in the open; and some *Lamellicornia* (*Geotrupes*) when boxed together. That the required organ should present structural variety, I think we may conclude from the diverse pitch, quality, and rhythm, of the notes; or from their range of expression, in *Orthoptera* and *Cicadidæ*. We also find reason to look for an auditory organ in certain *Diptera* (*Syrphidæ*) and *Hymenoptera* (*Aculeata*), the whining spiracular music of which presents kindred phenomena: or in certain *Lepidoptera* and *Hymenoptera* (*Mutilla*) with a capacity for music. Deductions may be also drawn from a species of wing-beating employed by some *Bombycina* in pairing.

Many seeking inference from the *Vertebrata* are predisposed to locate the organs of sense as of constant position in the cephalic ring, and thus to the antennæ has generally been attributed the faculty of hearing. On the other hand, in many cases, the function of the antennæ and palpi of creeping insects is pre-eminently that of touch, especially when they are in locomotion; and in those which are likewise aerial, it has been inferred that the antennæ direct the course of the insect. I conceive it is a fact that it is so, in those which fly rapidly among obstructions, in which we notice these parts are lengthened, pectinated, or lamellated. Be this as it may, it is certain that any supposed organ of hearing situated in the head or its appendages, has hitherto proved to be somewhat minute. On the other hand, it has become an axiom in entomological bibliography, that the organs of sense in *Insecta* have neither stable external position nor internal connection; save that some communicate with the anterior ganglions of the nervous chords, the nerve ganglia individually assuming the spontaneity of action that in *Vertebrata* flows from the brain alone. Thus a hover-fly (*Helophilus pendulus*), which I decapitated over night, and placed on the window-sill the ensuing morning, occupied itself in cleaning its legs and wings, although incapable of locomotion. It would therefore not be surprising

if in *Acridiidae*, *Lepidoptera*, and *Cicadidae* (?), we should find at the base of the abdomen structures suited to hearing, and which in the *Locustina* and *Gryllidae* have a counterpart on the fore tibiae.

The *Cicadidae* challenge and reply to each other when they are at a distance apart; and, considering the low pitch of their notes, this action would accord with an auditory adit of considerable dimension. The females also alight near the musical males. Now the corresponding cavities at the base of the abdomen, placed ventrally, and closed inwardly by a membrane, posteriorly tense and iridescent, and anteriorly soft, answer structurally the requirements of an external ear, by intermittent exposure in the males to atmospheric impressions by the action accompanying their music. These cavities, although having a considerably greater development in the male, are similar in the female sex, and seem to correspond to the other auditory structures I shall notice.

Regarding the counterpart of this organ in the *Acridiidae* (*Orthoptera*), more is known, thanks to the researches of Gonreau, Müller, and Siebold. In this there is evidently a cavity, with an ovate, lunate, or linear opening; situated at the hinder lateral portion of the first dorsal arc of the abdomen, partially covered by the wings. This cavity is closed interiorly by an iridescent, thin, and oval membrane (*membrana tympanica*), which parts it from the first abdominal air-bladder. On its disc, certain brown punctate discolorations are seen, which mark the position of two raised chitinous pieces on its internal surface; the larger angular, the other small and triangular. To the more projecting angular piece is attached a snow-white vesicle, distended with a clear fluid (*membranous labyrinth*), that also sends off a thin arm, inserted in the smaller piece situated towards the centre of the disc. The tender vesicle again is surrounded with the ramifications of a nerve (representing the acoustic), proceeding from the third thoracic ganglion. And lastly, in the horny setting that surrounds the iridescent membrane, where it dilates anteriorly and inferiorly, is a minute round or oval opening, forming a communication between the air-bladder and external air; adapted to the part of an Eustachian tube, by introducing air immediately behind the membrane (Von Siebold, *Erichson's Archiv für Naturgesch.*, 1844, pp. 52—81). A readier proof of the function of this organ may be gathered by observation than comparison. If any one will watch the grasshoppers in the meadows it will be noticed how the male, on the conclusion of his music, lowers one or both femora horizontally, retaining the elytra somewhat raised, and thus exposing their membrane until he receives a response: or how, when he seeks to allure the female, he places

himself so that the stridor shall impinge on her cavities, which she in turn keeps exposed, by retaining one or the other femur lowered. In the species of *Stenobothrus* I have examined, the auditory structure in the female proved largest and best suited for examination by the lens or microscope. Cavities similar to those of the *Aceridiidæ* may be observed in male *Blattina* at the hind margin of the metathorax laterally; and as regards qualification as auditory organs, they in some respects excel similar cavities near the base of the antennæ.

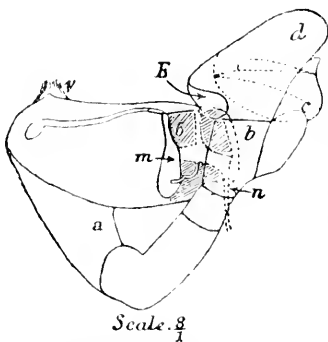
To supply the requirements of instrumental music, even in conjunction with the phenomena of wing-beating, the prevalence of an organ of hearing in *Lepidoptera* would scarcely be demonstrable: for the auditory might be supposed to be supplanted by the other senses, as the selective demonstration of love and rivalry may be seen manifesting itself in other directions: such as the alluring wing dances, or aggregation of the males, or the sedentary display of the female; which would postulate an adaptation of the visual rather than the auditory faculty. Or, again, the sexual provision of odorous fans would have relation to the sense of smell. But, on the other hand, in seeking for an auditory organ, protective and generally intimate, we have perhaps greater prestige.

However this may be, the counterpart of the auditory organ of the *Aceridiidæ* exists in the *Noctuina*. If after having killed an individual of a large *Noctua*, and denuded the abdomen of scales and hair, we examine its junction with the thorax, we observe a constriction of the segments that has occurred in the metamorphosis, whereby the first and second abdominal segments of the caterpillar are represented by dorsal ares indicating a pedicel. In the *Noctuina*, the organ to which I attribute the function of hearing, is found between these contracted segments and the metathorax, and, projecting posteriorly, may be said to occupy the transverse section of the first, second, and third dorsal ares. It is bounded in front by the metathoracic muscles, and encased posteriorly in a saddle-shaped tube, varying in consistency from delicate white membrane (*Acronycta psi*, *Xylophasia polyodon*, *Mania typica*, &c.) to a hard, yellow, opaque substance, which a needle point chips with difficulty (*Catocala nupta*). The external ear (*a*) is recognised in a largish cavity (*meatus*), that here penetrates the abdomen at either side, oval in section, with a posterior excavation or conch; that occasionally extends as far back as the termination of the third segment, conferring on its mouth (in *X. polyodon* ♀) an extreme length of 2''' and depth of 1'''.

Certain accessories to the cavity are invariably present. One is a minute protuberance posteriorly in the conchoidal excavation; semi-

circular in profile in *X. polyodon*; lanceolate and clothed above with smooth hair in *C. nupta*; or very elongate and spatulate in *Plusia gamma*. Placed behind at the origin, concealed by this protuberance, is the opening of a spiracle. Another adjunct is a little triangular membranous valve (*v*), fringed with hair; attached anteriorly at the entrance of the cavity, and connected by a muscular ligament to the base of the hind-wing, in such a way as to participate in its movement. I have thought this might contribute in some way to the power of hearing, by sudden and rapid condensation of the air in the cavity, during the flight of the insect.

The external cavity (*a*) is similarly terminated by a membrane (at *m*), which, proceeding from the front of the auditory adit, closes the external ear vertically and obliquely. Its surface is convex, and outline elliptical. It is divided vertically into distinct portions, indicated by one (*C. nupta*) or more (*X. polyodon*) chitinous pieces (*m*) placed on the disc. Of the two parts, that outward from the projecting piece or pieces is distinguished by a milky opacity: the most inward (shaded in the figure) on the contrary, is extremely tense, beautifully iridescent, and of great tenuity, the slightest touch causing it to rend and collapse like a withered flower petal. This is, I conceive, the sentient portion (*membrana tympanica*). In a careful dissection of a large moth it is just possible, when the posterior parts have been removed with the scissors and needle-point, to detach successfully a portion of this membrane from the thoracic muscles, so as to reveal the structural mechanism of the internal ear. The figure shows this operation successfully performed in *Cutocala nupta*. We then see



EXPLANATION OF FIGURE.

- a* Meatus
b Auditory cell with thin tympanal membrane removed, showing vesicle containing fluid and its attachments.
(b, c, d, e) An Eustachian tube formed of cells.
m Chitinous piece.
n Acoustic nerve.

disclosed a cellular air-bladder (*b*), which the membrane shuts off from the auditory canal. To the inner-side of the elongate, club-shaped, horny piece (*m*), is attached a slender white chord, traceable to a little membranous vesicle, cylindrical in shape and distended with fluid, to which it unites. (This evidently corresponds to the "membranous labyrinth" of Siebold, and "thin-skinned bladder filled with water" of Müller). From the upper extremity of this vesicle another short process is sent to the upper horny margin of the chamber, where it appears to ramify; and from the

lower proceeds, in the direction of the third thoracic ganglion, a silvery nerve (*n*) (auditory of Müller and Siebold), running obliquely across and round the elevator muscle of the hind-wing.

Lastly, by dissevering the abdomen of a *Noctua* at the junction of the third and fourth segments, and laying bare the posterior, saddle-shaped, transverse encasement of the organs of hearing, a judicious use of the needle-point will reveal some accessories to the parts described. It will then become clear, that above the cellular bladder (*b*) containing the membranous vesicle and nerve, parted by a membrane, sometimes white with a shining spot, sometimes wholly iridescent and mirror-like, is a second cavity (*c*), contained in a more or less ovate process, which on either side forms as it were a pommel of a saddle. This second cell, sometimes parted from the corresponding one by another mirror, will be found on the one hand to be in connection with the bladder (*b*) containing the membranous vesicle and nerve by means of a little orifice: and on the other to communicate with the external air by a lateral chitinous tube (*d*) that opens at the side of the abdomen at the junction of the third and fourth dorsal ares (at *E*), immediately above the conch of the external ear. This is unmistakably the counterpart of the Eustachian tube, suitable to balance the atmospheric pressure on the delicate membrane of the tympanum. Behind and beneath the entire structure lie the large basal abdominal bladders, developed in *Lepidoptera* and *Diptera*.

Such are the essentials of an organ adapted to hearing in the *Noctuina*, resembling the Acridian structure so closely that the diagram given, would exemplify the usual parts in either. The chief point of departure is the convoluted adjunct of empty cells (*b, c, d*), with mirror-like partitions, variously developed in *Lepidoptera*. I have noticed this formation in the *Bombycina* and large *Geometrina*; more rudimentary in *Crocallis clingularia*, it projects on either side into the abdominal air-bladders, in the form of two isolated pear-shaped bodies, partially divided by a septum, and terminated by an iridescent mirror. It may be traced in certain *Diptera* (*Tipula*). Gourcau, in searching for the musical organ of *Acherontia Atropos*, has perchance stumbled on the auditory. He mentions a white muscle, inserted in the borders of a slight cavity covered with smooth transparent membrane, on either side of the first abdominal segment (just beneath the insertion of the fan). The *Coleoptera* should also commonly present an organ of hearing; the antennæ have been indicated as such; there are also membranes in a horny setting, on the metathorax posteriorly at the root of the hind-wings, likely to reward examination.

In the *Gryllidæ* and *Locustina* (Von Siebold, Erichson's Archiv before quoted) we can find a similar auditory organ, often presenting four equally efficient "tympana." The fore tibiæ in both sexes are usually thickened above, and present on either side a cavity more or less developed, with an ovate or linear opening, closed inwardly by a milky-white (*Gryllidæ*), or silvery and glassy membranes, semi-chitinous, or a chitinous piece on the disc (*Locustina*). Between the pro- and meso-thorax is found a funnel-shaped opening, which proceeds towards the median line, and making a bend, traverses the fore leg, dilating vesicularly within the membranes of the tibiæ, and thus supplying the function of an Eustachian tube. The nerve which represents the acoustic, according to Siebold, proceeds from the first thoracic ganglion, and immediately above the vesicle swells into a flat ganglion, the inferior extremity of which in the form of a band is inserted into the sides of the vesicle. This auditory organ was first described by Von Siebold; its function was surmised by Goureau and Müller. The male *Locusta* (*Phasgonura*) *viridissima*, when it performs, extends its fore legs (as it struck me), in order to adjust these cavities and receive the music of its rivals. The organ of hearing in *Gryllus hieroglyphicus* (Müller, Zur vergleich. Physiol. des Gesichtsinnes, p. 439), and in *Gryllotalpa* (?) resembles that of the *Acridiidæ*, and is similarly situate.

Guildford: 16th June, 1877.

A SINGULAR HABIT OF *HILARA*.

BY BARON C. R. OSTEN-SACKEN.

During a short stay at Gurnigel, the well-known watering-place near Berne (August 20-27 of this year), I had occasion to observe a fact which, as far as I know, is so unique in entomology, that I do not hesitate to give it immediate publicity.

Walking about in the woods, at the back of the hotel, between 9 and 10 a.m., I noticed in the sunbeams, penetrating through the dense shadow of the fir trees, small swarms of flies, performing that rapid flight in zig-zag, backwards and forwards, which is commonly observed among *Muscidæ*, especially males, in similar situations. What attracted my attention to them, was the uncommonly brilliant white or silvery reflection which they gave in crossing the sunbeam. I caught one of them with my forceps, and was astonished to find a much smaller fly than I had expected, and without anything silvery about

it: that is, instead of a Muscid, with a silvery head or abdomen, I had before me a small, dull greyish male *Hilara*. At the same time, however, I perceived on the gauze of my forceps, not far from the fly, a flake of opaque, white, film-like substance, oval, about 2 mm. long, and so light, that the faintest breath of air could lift it. The appearance of this film was not unlike that of the opaque, white tissue spun by some spiders; but for its much lesser weight, it might also be compared to the petal of a small white flower. I caught several specimens in succession, with the same result. It became evident to me that the silvery reflection, as well as the apparent larger size of the fly, when on the wing, were due to these bits of white tissue, which they waved like flags behind them.

What is the purpose of this performance? How do the flies hold these flags: with the legs, pressed against the abdomen, or with the forceps of the hypopygium? Where do they obtain these flakes? Is it, perhaps, a portion of their cocoon? Is it a habit peculiar to this species, or, has it been simply overlooked before, and is of more common occurrence? Such are the questions which naturally suggest themselves in presence of this phenomenon.

I repeated the observation on several other days, but had no opportunity for further investigations.

Prof. Loew, whom I recently visited in Guben, had the kindness to name the species for me. It is the *Hilara alpina*, Loew, of his collection, a name which seems to prove that the species is peculiar to the alpine region, and not one of the common European *Hilaræ*. He told me at the same time that, several years ago, Prof. Zeller had communicated to him a somewhat similar observation.

Prof. Zeller, to whom I wrote on the subject, kindly informed me that he observed the same phenomenon on the 14th of August, 1873, between the villages Latsch and Stuls, above Bergün, Canton Grisons, at an altitude of about 1600 metres; and his observation seems to agree with mine in every respect, except that he first perceived the flies gyrating *in a shady place*.

Frankfort-on-Main,
October, 1877.

REMARKS ON SOME BRITISH HEMIPTERA-HETEROPTERA.

BY O. M. REUTER.

(Continued from page 62).

LITOSOMA VIRESCENS (Cat., 31, 6) is cited by Mr. Saunders (Synops., 293, 11) as being the male of *concolor*. Mr. Douglas has

kindly sent me a typical specimen of *virescens*, and I have also received from Mr. Saunders specimens belonging to the species described by him as *Orthotylus concolor*. Both these species are identical. But in examining the specimens, I have found also that *L. virescens*, Doug. and Scott, and *Orth. concolor*, Saund., are synonymous with the true *Capsus chloropterus*, Kirschb. To this species are also to be referred many specimens, sent by Mr. Douglas, under the name of *Litos. concolor*. It is clear that all these specimens belong to *O. chloropterus*, Kirschb. (*nec* Doug. & Scott), and not to *concolor*, Kirschb., for Prof. Kirschbaum says in the description of the former (Rh. Wiesb., pp. 156 & 157): "viridis, hemelytris saturatus, parum nitidus," "capite (♂) supra obsolete longitudinaliter sulcato," "rostello perbrevis," "pronoti lateribus pæne marginatis," "membrana infuscata, nervo griseo, circa cellulam minorem dilute luteo," "tibiaram spinis nigris," and further: "Schnabelschcide sehr kurz, nicht bis zu den Mittelhüften reichend" (the rostrum does not reach to the apex of mesosternum), "gesättigt grünen, wie übertünchten Halbdecken." All these characters accord with *Litos. virescens*, Doug. & Scott, and *Orth. concolor*, Saund. (*nec* Kirschb.), and there is no doubt that *Orthotylus chloropterus*, Kirschb., is the right name for these species. I have also received the same species from Dr. Puton, under the name of *chloropterus*.

LITOSOMA CONCOLOR (Cat., 31, 7). According to specimens, sent from Messrs. Douglas and Scott to M. Sahlberg and myself, Messrs. Douglas and Scott have described under this name two very allied, but yet distinct, species: *Orthotylus chloropterus* (♂) and the true *O. concolor*, Kirschb. The latter differs from the former by the following characters, taken from the diagnosis and description by Prof. Kirschbaum (Rh. Wiesb., pp. 155 and 156): "dilute viridis," "antennis, pectore, tibiaram spinis, tarsisque sordide dilute lutescentibus," "membrana dilute fusco-hyalina, nervo sordide lutescente, inter cellulas viridi." "Fühler, Glied 1 ungefähr halb so lang als der Kopf," "die Halbdecken * * etwas durchscheinend." It has, further, the rostrum longer, reaching to the base of the second pair of coxa.

LITOSOMA PRASINA (Cat., 32, 13). Mr. Saunders writes to me: "*Hyps. prasinus*, Doug. and Scott, = *Orthotylus flavosparsus*, C. Sahlb. The specimens are old and broken, but the green cell of the membrane is still clearly visible."

LITOSOMA CHLOROPTERA (Cat., 32, 14) and *Orthotylus chloro-*

pterus, Saund. (Syn., 291, 12), is a very distinct species and is easily to be known by the head, which is very wide across the vertex, and in the ♀ scarcely more than one-fifth to one-sixth narrower than the hinder margin of the pronotum. As a synonym, is cited (*l. c.*) *Litosoma bicolor*, Doug. and Scott, and this must be regarded as the right name of the species. It differs further from the true *chloropterus*, Kirschb., by the grey-brown colour of head, thorax, scutellum, clavus, and inner apical angle of corium of the ♂; the rostrum reaching a little beyond the apex of mesosternum, and the spinose hairs of the tibiæ are brown or testaceous, as in *concolor*, not black. It is probably identical with the *Pachylops chloropterus*, Fieber (Eur. Hem., p. 285), of which I have not seen a typical specimen, and it is possible that Prof. Kirschbaum sent the species to Fieber, under the name of *Capsus chloropterus*, in company with which species it also lives; but it is certainly not the same as Prof. Kirschbaum has described in Rhynch. Wiesb.; and the description may have a greater authority than a mistake afterwards made, whether by Kirschbaum himself or by Fieber. Prof. Kirschbaum says of both *chloropterus* and *concolor*: "Kopf $\frac{2}{3}$ so breit als den Vorderrücken am Grunde," a character not agreeing with the species described by Messrs. Douglas and Scott, under the name of *chloropterus*, but very well with the *virescens* and *concolor* of the British authors.

LITOSOMA DOUGLASSI (Cat., 32, 15) is synonymous with *Capsus adenocarpi*, Perris (Nouvelles excursions dans les grandes Landes, p. 85), which is an older name. Dr. Puton has kindly sent me the typical specimens of this latter species last summer (1876). I have found many specimens of all the above-mentioned species (except *bicolor*) in Scotland.

ORTHOLYTUS SAUNDERSI, Reut. (Synopsis., 293, 9). As a synonym of this species is cited *Tinicephalus obsoletus*, Doug. & Scott. In my "Revisio critica Capsinarum," I have written under *O. luridus* (II, p. 137): "Ab hoc (viz., *Tiniceph. obsoletus*), qui ad *Ortholytum* nec ad *Tinicephalum* referendus, corpore latiore etc. distinguendus. * * Nomen *Tinicephali obsoleti*, Fieb., in *Ortholytum Saundersi*, Reut., mutandum." This determination of *T. obsoletus* is based on a male, sent by Mr. Douglas, and which wants the hamus of the wing. Mr. Saunders has also published in the Ent. Mo. Mag., xi, p. 234: "*Tinicephalus obsoletus*, Doug. and Scott. This species, following Fieber's views, must be removed from this genus, the only (British) exponent

of which is *hortulanus*, Mey., for the wing-cell has no hook, the character of the division in which *Tinicephalus* occurs. * * I should have called it a *Litosoma*, but if it is to enter that genus, its name will have to be changed, as an *obsoletus* already exists therein." Last summer I took a great many specimens of *T. obsoletus*, in Scotland, but, on examining them, I found that they all have a hook in the wing-cell, and that, therefore, they could not be referred to *Orthotylus*. In communicating this to Mr. Saunders, I obtained an answer: "I was just going to write to you about this when I got your letter. I have specimens with and without the hamus, clearly identical otherwise, so that I conclude that the hamus is not a distinctive character. Those I have without the hamus are all ♂, but I have ♂ with it; does not the var. with the hamus = your *Macrocoleus Reiberi*, which I have from Dr. Puton?" Mr. Saunders had also the goodness to send me a specimen of "the ♂ without the hamus," and having carefully examined "the ♂ with the hamus," and "the ♂ without the same," I have found that the former is the species described by Fieber as *Tinicephalus obsoletus* (which, however, could not be referred to the genus *Tinicephalus*!); it is the same that I have re-named *Macrocoleus Reiberi* (Pet. Nouv. Entom., i, No. 135, p. 540), having before made a mistake in determining it as a *Tinicephalus*. "The ♂ without hamus" differs, however, in some other respects from the typical *Tinicephalus obsoletus*, which it at all events is extremely like. I give the following characters:—

"♂ with hamus."

(*Tinicephalus obsoletus*):

Second joint of antennæ distinctly longer than the width of the posterior margin of pronotum; third joint distinctly longer than the width of the head; fourth joint not half as long as the third.

"♂ without hamus."

(*Orthotylus Saundersi*):

Second joint of antennæ not longer or scarcely longer than the width of the posterior margin of pronotum; third joint not longer than the width of the head; fourth joint half as long as the third.

I think, therefore, that the two are distinct, and I still believe that the hamus among the *Capsi* is a very distinctive character of generic value. The xyphus in *Tinicephalus obsoletus* is convex, in *Orthotylus Saundersi* even, as also it is in *O. adenocarpis*, although not finely marginated, as in this latter. *O. Saundersi* differs much from all the other allied species of this genus in the colour and the marking of the membrane, being similar to *Tinicephalus obsoletus*. Perhaps, however, it is necessary to compare a greater number of specimens to

be able to decide the question concerning *Tiniccephalus obsoletus* and *Ortholytus Saundersi*. Is it possible that the latter ("the ♂ without hamus") is a hybrid form of the true *Tiniccephalus obsoletus* and some species of *Ortholytus* (as *adenocarpi* or *concolor*)? Last summer I found these species living together in great quantities on *Sarothamnus* and *Ulex* in Scotland (Perth, Edinburgh, Forres).

Synopsis of the last mentioned species:—

- 1 (2.) Species greenish-grey, membrane, with the cells and a 7-shaped mark below the apex of the cuneus darker O. SAUNDERSI, Rent.
- 2 (1.) Species green.
- 3 (4.) Head very wide, nearly as wide as the base of the thorax...
O. BICOLOR, D. and S. (*chloropterus*, D. and S., and Saund.).
- 4 (3.) Head not nearly as wide as the base of the thorax.
- 5 (8.) Third and fourth joints of antennæ together longer than the second; third joint almost as long as the second.
- 6 (7.) Rostrum thick, not reaching to the apex of mesosternum. Colour bright, darker green. Cell-nerve grey. Spinose hairs of tibiæ black...
O. CHLOROPTERUS, Kirschb. (♂ *virescens*, D. and S., *concolor*, D. and S., pars, Saund.).
- 7 (6.) Rostrum not thick, reaching to the intermediate coxæ. Colour paler green. Cell-nerve yellow...
O. CONCOLOR, Kirschb. (*concolor*, D. and S., pars).
- 8 (5.) Third and fourth joints of antennæ together not so long as the second. Third joint of antennæ about half as long as the second. Cell-nerve yellow O. ADENOCARPI, Perr. (*Douglasi*, Saund.).

TYTTHUS INSIGNIS (Cat., 33, 1). Under this species is cited as synonymous: *Tytthus flavcolus*, Rent.; but in the Ent. Mo. Mag., xiii, p. 113, Mr. Saunders says: "*Chlamydatus pygmaeus* = *Tytthus insignis*, Dong. and Scott," and in his letter to me: "I have a specimen of *flavcolus*, very distinct." I have also, in Finland, found specimens of *Chlamydatus pygmaeus*, Zett., having the pronotum nearly entirely flavous (var. *b.* in "Rev. crit. Caps.," p. 128), and these specimens, which could not be mistaken for *flavcolus*, accord very well with the description of *Tytthus insignis*, Dong. and Scott. In my "Rev. crit. Capsin.," p. 126, I have, on the authority of Messrs. Douglas and Scott, described *Chlamydatus flavcolus*, under the name of *insignis*, which must be changed to the former.

(To be continued.)

DESCRIPTION OF *TYPHLOCYBA TILLE*, GEOFFR.

BY JAMES EDWARDS.

Having made the acquaintance of this insect, and ascertained the equity of its claim to rank as a distinct species, which has been much questioned, it has occurred to me that a detailed description and some comparative remarks might be acceptable.

Head bright yellow. Pronotum in front bright yellow, behind whitish, anterior margin with three large, nearly round, whitish spots. Scutellum deeply transversely impressed on apical third, with a reddish triangular spot at each basal angle. Elytra milk-white; clavus, anterior margin of corium broadly, and 1st, 2nd, and 4th cells of membrane, fuscous. Corium more or less sprinkled with reddish atoms placed more closely along the course of the 1st nerve, and forming a more or less distinct patch between the apex of the 1st and 2nd nerves; membrane, 3rd cell, milk-white, nerves yellow. Legs pale yellowish; ♂, 1st and 2nd pairs, tarsal claws fuscous; 3rd pair, tarsi entirely, and extreme apex of tibiæ, black; ♀, as in *T. blandula*. Abdomen yellow, base sometimes blackish.

Length, $1\frac{1}{2}$ lin.; expanse, $3\frac{1}{2}$ lin.

Exceedingly like pale examples of *T. blandula*, but differs in being slightly larger, and in the markings on the pronotum, which characters

will always serve to separate the females of the two species. The difference in the form of the outer genital processes of the ♂ of the two species, will be seen from the figures:

(1) *tille*, (2) *blandula*.

Beaten from firs at Ringland, not uncommonly in March, but very local.

Bracondale, Norwich:

18th September, 1877.

NOTES ON AFRICAN HEMIPTERA-HETEROPTERA.

BY W. L. DISTANT.

In a small collection of *Hemiptera* made by Mr. Simons at Livingstonia, Lake Nyassa, the same general absence of new species was observed as is recorded by Mr. Hewitson (p. 51 *ante*) of the *Rhopalocera* in the same collection. There seems no doubt that the East African fauna undergoes little change till the longitude of the Great

Lakes is passed, and Commander Cameron, though his attention was chiefly directed to geographical exploration, bears testimony to the same fact. "To the west of Tanganyika a new geographical, ethnological, zoological, entomological, and botanical region is entered." ("Across Africa," vol. ii, p. 311). Unfortunately, the *Hemiptera* had been preserved in sawdust impregnated with carbolic acid, which had discoloured a large portion of the specimens, and rendered them somewhat difficult to determine.

SCUTATA.

The species belong to the East African fauna, with a slight amount of variation in some cases from the typical forms. *Hotea subfasciata* and *Brachyplatys pallipes*, found also in the Calabar district, were in the collection, as was also the wide-ranging *Æthus indicus*.

HOTEA SUBFASCIATA, Westw. & Hope, var.

This variety has its most constant character in the slightly produced and almost spineless condition of the lateral angles of the thorax, and diverges only from the typical form in some specimens by a visible serration on the anterior part of the lateral edges of the thorax, and sometimes by a considerable increase in size. I do not, however, consider any of these characters as sufficiently differentiated at present to give them a specific character, as the type of *subfasciata* in the Hope collection at Oxford has the lateral angles of the thorax very slightly produced, and in a long series of that species from W. Africa, I can detect instances where the thoracic serration is also visible. Size too is of little value, as in eight specimens I possess from Livingstonia, scarcely more than two agree altogether in that respect.

The real distinction between *H. subfasciata* and *H. gambiæ*, the other dominant African species, is the formation of the ventral segments, as pointed out by Dr. Stål in his "Hemiptera Africana," and drawings of which have most obligingly been forwarded to me by Prof. Westwood.

The East Asian species, *H. curculionoides*, H.-Schäff., follows the same variation and wide range of habitat. It is recorded from Sumatra, Malacca, Java, Timor, Celebes, Amboina, and China; and of its variability in colour, Vollenhoven remarks, "L'individu le plus clair en couleur est de Java, le plus foncé est d'Amboine."

CYCLOGASTER DELEGORGUEI, Spin. ? (*Natalicola Delegorguei*) Gen. d'Ins. arthroid., Mem. Soc. Ital., xxv (1852), p. 110. *Gonielytrum circuliventre*, Stål, Öfv. Vet. Ak. Förh., x (1853), p. 223.

By all the authors I have seen, the above have been placed as synonyms of *C. pallidus*, Westw. There is in this species, however, a very constant character in a small, oblong, post-discoïdal cell of the corium, as shown in Westwood's fig., Trans. Ent. Soc., ii, pl. 2, fig. 6 (1837), and as I have also seen, by an examination of the type with Prof. Westwood at Oxford. This does not exist in any of my specimens (♂ or ♀) from Livingstonia, and the last joint of the antennæ is much longer than the third, thus also differing from Westwood's fig. This last character, and the larger size of the body, agree with Stål's description of *Goniclytrum circuliventre*, but I have used Spinola's name as being the oldest and probably the correct one, thus following Dr. Stål himself.

REDUVIIDÆ.

This family is well represented in this small collection, and also belongs to the East African fauna. *Lestomerus æneicollis*, figured by Schaum in Peters, Reis. Mossamb., is included, with its immature forms.

CATAMIARUS NYASSÆ, n. sp.

Black, pilose, somewhat shining below. Hind lobe of prothorax obscure chocolate-brown. Antennæ pilose, first and second joints black, third and fourth brownish, basal joints somewhat pubescent, second and third joints sub-equal in length. Ante-ocular part of the head, basal joint of the rostrum, anterior part of frontal lobe of prothorax, a triangular patch on each side of corium (of which the bases are on the outer edges, and the points almost meet below apex of scutellum), six sub-quadrate spots on each abdominal border (of which the apical one is small and somewhat indistinct), apex of abdomen above, edges of abdominal segments below (excepting on disc), a narrow spiracular longitudinal line on each abdominal border, and legs (including coxæ), densely silvery pubescent, somewhat yellowish on upper side of body. Front lobe of prothorax longitudinally and rugosely striated, with a distinct central longitudinal furrow, hind lobe confluent rugose. Membrane somewhat opaque. Claws reddish-brown. Length, 10 lines.

This is a very interesting species, belonging to a genus of which only one other representative is as yet known, *C. brevipennis*, Serv., from Hindostan.

There are some other new forms to be described; but, in the present discoloured condition of some of them, I prefer waiting for fresh material before giving any further descriptions.

1, Selston Villas, Derwent Grove,

East Dulwich: September 1st, 1877.

Entomological Notes of a Tour in Egypt and Syria.—During the early spring of 1876, I spent some time in Egypt, and a short time in Jerusalem and its neighbourhood. The following brief notes of a few insects which I brought back may be of some interest. My captures were chiefly among *Coleoptera*, from the comparative ease in taking and preserving them, but I will first say something about the other Orders, especially as I shall not attempt to arrange these notes after any scientific method.

In the brilliant narrow river margin, which constitutes the greatest extent of Egypt, there are but few *Lepidoptera* to be seen in the early months of the year. The wider plains of the Delta may be richer in this respect. By far the most common species is *Danais Chrysippus*: it swarmed in gorgeous luxuriance in the rich gardens of the Gezeerah Palace, and other similar places about Cairo. Some species of *Pieris*, *Anthocharis*, and *Lycæna*, calling for no special notice, were seen along the banks of the Nile, but were few and far between. In Syria, indeed, *Lepidoptera* were far better represented; but, as I have not yet acquired the art of butterfly-hunting on horseback, I captured very few; those I took being principally some *Zygæna* at rest, taken during our mid-way halts.

I took a few *Hymenoptera*; they included *Xylocopa æstivans*, L., which flew in a strong way across the Nile, and my specimens of which I captured buzzing about our dahabeah.

Tetralonia ruficollis, Brullé, occurred on the banks.

Chalicodoma sicula, Rossi, was to be captured by thousands; its favourite resort is the old walls of Egyptian temples, which it plasters over to an amazing extent, entirely covering up all inscriptions, or sculpture, that may be thereon.

Scolia similis, Fab., burrows abundantly in the sand; and the black wasp *Eumenes tinctor*, Christ., was not rare.

As far as I observed, in Egypt (though I must confess that my examination was a very superficial one) the variety of *Coleoptera* is somewhat limited. The time of year may partly account for this, but there is too small a food area, in Upper Egypt at all events, to sustain a great number. The species one perhaps meets with most frequently are *Pimelia asperata* and *P. grandis*, Klug, with *Oenera hispida*, Forsk., and *Adesmia Pariseti*, Solier. These ugly black beetles are very common in the long lightless passages so numerous in the huge temples: they live, I believe, in such localities principally on the droppings of the countless bats which dwell in these gloomy vaults, and whose chief function in life seems to be to flap in the inquisitive traveller's face, and chill him to the marrow with confused fears of restless angry spirits of prince or priest of the age of the Pharaohs.

Scarabæus sacer, L., kept itself in proud seclusion, and I was rarely favoured with a sight of the living mystic symbol, but its sculptured effigy, with wide-spread wings of protection, stretches over temple gate or hall; or, graven as a signet, is offered by the persistent "fellah," at many times its weight in gold. Its giant relative *Heliocopris Isidis*, Savigny, was rather less exclusive. In the neighbourhood of the Apis Mausoleum, at Sakkarah, I took one specimen, and saw a few more, of the pretty black and white *Graphipterus variegatus*, Fab., which jumps in an aggravated *Cicindela*-like style, quite as nimble as the most lively tiger-beetle.

Among other *Coleoptera* taken in Egypt, were *Zophosis abbreviata*, Kl., *Tentyria discicollis*, Reiche, *Himatismus villosus*, Dej., *Oenera Genei*, Solier, *Pedinus punctulatus*, Muls., and *Leucosomus (Gonoconus) senectus*, Schönh.

The conditions of search were entirely altered in Palestine; instead of the dark passage, or sandy ridge, or rank cultivation of the Nile valley, one has the close herbage, gay with innumerable flowers, which alternates with bare rock, over all the shadeless hills and dry valleys, now so characteristic features of that land. But to careful examination the entomological yield would be very varied, if one could range from the alpine and sub-alpine heights of Lebanon to the tropical depths of the Jordan valley, as it ends in the Dead Sea. I only collected for a few hours, near Jerusalem, and again near the Well of Elisha at Jericho. My captures, therefore, were, for the most part, of the species frequenting the blossoms which give a brief glory to the bare hill-sides of Judæa. Those most frequently met with were two species of *Mylabris*, *M. damascena*, Reiche, and *M. decempunctata*, Fab.: in the Jordan valley, these simply swarmed on every flower, and were common in places of greater altitude; accompanying them were *M. sanguinolenta*, Ol., and one or two others of the same genus. Their bright scarlet-banded elytra fade much after death. A very common beetle was the little black, white-spotted, *Oxythyrea cinctella*, Stev., while *O. hirtella*, L., and *O. squalida*, L., were not rare. *Amphicoma papaveris*, Sturm, gleamed in its bright purple sheen, with the more sober *A. psilotrichius*. *Phyllopertha lineolata*, Fischer, I found abundant. In the Jordan valley, I took two beautiful little green and gold species of *Trichodes*, one of them being *T. quadripustulatus*. I met also with the British *Chrysomela menthastri*, Suffr. Among the graceful willows, which thickly fringe the sides of the Jordan, a large gay-looking beetle was to be seen, sitting apparently in sleepy idleness, on the leaves; but it was for all that asleep "with one eye open," and the least attempt to circumvent it sent it like an arrow, glancing in the hot sunshine with metallic radiance; to resume a watchful position nearer the top of the tree. Time and appliances being wanting, I only got one; it proved to be the Buprestid *Sterapsis squamosa*, Klug. I also took specimens of *Nebria Hemprichi*, Klug, *Aphodius unicolor*, Lucas, *Cetonia libani*, G. and P., *Omophlus syriacus*, *Lydus algiricus*, L., *Lixus Buqueti*, Dej., *Phytocia Wachanruui*, Muls. (= *syriaca*, Chev.), and some others.

I must add in conclusion, that I am much indebted to Mr. Waterhouse, Dr. Sharp, and Mr. F. Smith, for their kind help in naming my little collection.—W. D. ROBINSON-DOUGLAS, Orchardton, Castle Douglas: *September, 1877.*

Colias Edusa, var. *Helice*, near *Darlington*.—I captured a very fine example of this variety at Richmond, Yorkshire, on September 27th, apparently not long emerged. It was flying leisurely on a rough bank, about 9 a.m., settling often on the ground, so that I caught it without difficulty. What makes it rather more remarkable is the fact, that I have only seen *Edusa* alive once before in my life (this season also, in June); so that, with me, *Helice* bears the very unusual proportion of one in two.—J. SANG, Darlington: *October 8th, 1877.*

Further captures of Sphinx pinastri near Ipswich.—Since the Rev. Mr. Long, of Tuddenham, showed me the specimen of *Sphinx pinastri* which was the subject of a short communication in your August number, I have had two other specimens brought to me. Both of them were captured at Waldingfield, near Ipswich; one in

August, 1876 (a very worn specimen), and the other early in August of the present year. Both are in the possession of the Rev. Mr. Waller, Vicar of Waldingfield, by whose son they were captured.—J. E. TAYLOR, Museum, Ipswich: 3rd Oct., 1877.

Thais rumina captured in the Brighton market.—When I was in Brighton last Saturday, Mr. Dowsett, of North Street, showed me a fine specimen of *Thais rumina* which had recently been caught in the Brighton market. There can be no doubt that the insect had been imported from the Mediterranean with fruit or vegetables.—H. Goss, The Avenue, Surbiton Hill, Surrey: 11th October, 1877.

[Our correspondent's explanation of the cause of the appearance of this beautiful butterfly is no doubt perfectly correct.—EDS.]

On the stridulation of the pupa of Thecla rubi.

[The writer of the following had collected, in July, near Dresden, a number of larvæ of *Lycæna Battus* on *Sedum telephium*, and of *Thecla rubi* on *Genista tinctoria*; on the 20th of August, the last larva of *Lycæna Battus* having assumed the pupa state, it occurred to Herr Schild to economise space, by putting all the pupæ of *Thecla rubi* and *Lycæna Battus* together in one receptacle, and as he, with this view, turned the former pupæ on to a sheet of paper, he distinctly noticed a peculiar noise, which emanated from the pupæ.—EDS.]

On watching them closely and separately, I was clearly satisfied that the pupa of *Thecla rubi*, without any perceptible motion, produces a slight, short chirp, but in order to hear this sound distinctly and continuously, it is best to place a number of the pupæ together. In the evening I could distinctly hear the chirping of my twenty-five pupæ through the gauze, which covered the vessel in which they were.

On examining the pupæ individually, I found that in the thicker ones, which were probably females, I could hear the sound distinctly, but in the more slender pupæ, which were probably males, I could hear nothing. I also noticed that after a copious watering of the earth on which they rested, all the pupæ were mute, but as soon as they were dry, they began to chirp again.

My first idea was that this sound was an expression of uneasiness, because a slight disturbance of their repose, by touching or blowing on the pupæ seemed to make the chirping demonstration more general, but the silence of the pupæ on their wet bed suggested to me another cause, which is, perhaps, more nearly connected with their vital processes, but the certainty of which is only to be ascertained by anatomical investigation.

My hypothesis is that the sound arises from air being pressed and drawn in through the tracheæ on the abdomen and above behind the eyes. Perhaps, if the dense clothing of fine bristles is for the purpose of conducting moisture inwards, it is possible that with the same object, a more lively respiration through the tracheæ takes place, where the pupa is dry, but, on the other hand ceases, when this is no longer the case.—F. G. SCHILD, in the "Stettiner entomologische Zeitung," xxxviii, 86 (1877).

[How true it is that "there is nothing new under the sun!" Herr Kleemann, of Nuremberg, writing to the "Naturforscher," in 1774 (more than 100 years ago!) says (Vol. iv, p. 123): "Talking of oniseiform larvæ, I must not omit to notice a

“green one, which feeds on the so-called *Kienschroten*.* This changes to a pupa, from which, when one places it near the ear, one can distinctly hear a creaking† noise. Whence this proceeds, and by what means these pupæ produce it, I cannot yet determine, but will endeavour to find out. Probably several pupæ may have this peculiarity, only it has not hitherto been observed. These pupæ produce a small butterfly, with six legs, and blackish-brown wings, the entire under-side of which is of a pleasant green.”—EDS.]

On the habits of the larva of Pempelia formosa, Haworth.—In 1847, I recorded, in the *Zoologist*, p. 1915, the capture of “upwards of thirty specimens of *Phycita formosa*, at Lewisham, by means of light, July 10th to 31st.” In subsequent years, several others came to light, always about the same time. In 1851, I obtained two specimens by beating hedges, which were principally *elm*, on the 5th July. However, till this year I was unacquainted with the larva of this pretty species.

Kaltenbach, in his “*Pflanzenfeinde*,” mentions amongst the elm-feeders (p. 538) that, “Herr v. Heyden found the larva on elms, the middle of June,” and adds, “the imago flies at the beginning of October,” apparently reversing the times of appearance of the larva and imago.

E. Hofmann, in his “*Kleinschmetterlingsraupen*,” p. 16, repeats the statement that “v. Heyden found the larva on elms, the middle of June,” but gives the time of appearance of the imago correctly, as “July.”

To Mr. Buckler we are indebted for a detailed notice of the larva, which will be found in the 7th volume of this magazine, at p. 14. Mr. Buckler received his larvæ July 21st and August 19th, and they were full-fed between August 20th and September 15th; the moths appearing from July 12th to 17th the following year.

About the 20th September, I noticed on some elm leaves, a considerable amount of white web just over the mid-rib, but I failed to detect any larvæ, though quite expecting to find some *Pyralis* larva at work. On the 22nd September, I again noticed these webs, and was more fortunate in finding the makers of them. I found some plain green larvæ, feeding quite exposed on the upper surface of the elm leaves. I was quite at a loss to know to what to refer them: they were clearly no *Pyralis* larva, nor could I find any suitable elm-feeding larvæ amongst the *Noctua*, so I forwarded some to Mr. Buckler, who at once cleared up the mystery by declaring they were the larvæ of *Pempelia formosa*.

I now sought the larvæ more diligently, and from first to last I probably collected more than fifty. I am well acquainted with the larva of *Pempelia betula*, which feeds between united birch-leaves, in May, and had fully anticipated that the larva of *Pempelia formosa* would have had a similar habit: but nothing of the sort. Every larva that I found was on the upper-side of the leaf, perfectly exposed: the leaf retaining its natural form, the webs placed longitudinally along the mid-rib,

* *Kienschroten* may be some local name for a plant. Esper suggests that the plant meant is probably (*Spartium scoparium* common broom.—EDS.

† In the “*Naturforscher*,” the word is printed “knarrendes.” Esper, who quotes a portion of this sentence from Kleemann (Vol. i. p. 281), prints it “knorrendes,” and this misprint is quoted by Schilld. in the *Stettin. ent. Zeit.* see note, p. 87, who adds (after referring to Esper’s quotation from Kleemann): “In individual pupæ the noise sounds clearly, in short, quick (*tempo*), almost as though a little stone were slaken in an empty pupa skin. This impression is produced all the more readily, because if one moves the pupa quickly backwards and forwards “close to the ear, the sound is the more distinctly audible.”—EDS.

having no tendency to distort the leaf. The larvæ were not in or under the webs, but *perfectly exposed*, the webs being probably only used as a shelter at night. In no single instance did I find any leaves united by these larvæ, nor any with the edges turned down.

In my tin, in which I had a number of larvæ together, a considerable amount of spinning was made, far in excess of what I had met with out of doors, and here, consequently, there were appearances as of leaves spun together, but this I take to be an accident, arising from confinement, and not the normal habit of the insect.

These larvæ only occurred on some elm underwood growing amongst a hawthorn hedge, and were restricted to a space of about half-a-mile. It was elm, with a peculiar form of leaf, more resembling horn-beam; on the ordinary elm on the opposite side of the lane, I saw none of these larvæ, nor did I observe any of their webs. Hitherto, I have sought in various directions in the neighbourhood, but without finding a fresh locality for these larvæ. The latest date at which I have noticed the larva was October 2nd.—H. T. STANTON, Mountsfield, Lewisham: *October 8th, 1877.*

On the habits of Opostega spatulella, Guenée.—On the 11th June, I again met with this insect flying, between 6.30 and 8 p.m., over the tops of long grass, resting at short intervals on the blades, as though ovipositing; I could not, however, detect it in the act. I did not then observe it flying more than eighteen inches from the ground.

That evening, the weather was extremely favourable, but they were not plentiful. I searched diligently for several subsequent evenings, but without success; perhaps I was rather too late, as in 1876, I took them May 30th.

On the 6th September, on my way to some woods near here, I observed a little thing on the wing, raising its flight to go over a high hedge on my right, and which, on knocking it down with my stick, proved to be *O. spatulella*. I had, fortunately, my net in my pocket, which I soon arranged and prepared myself for action; but, unfortunately, not expecting to meet with this little moth, and being out more for a walk than for the purpose of collecting, I had taken very few boxes with me, however, all I had were very speedily filled. The insect was flying in tolerable plenty in the lane, but the range of its flight was limited to a space of about twenty yards. The moths ceased to fly shortly before six. That afternoon the weather was very fine—clear sunshine and southerly wind. Then followed two days of northerly wind, and though I went each day to the spot, not a specimen could I see.

On Monday, September 10th, the weather was more favourable, but I was unable to go after my little friends, so I sent my little boy (10 years old). He reached the spot about 2.30 p.m., but saw nothing of them till 4 p.m., when they began to fly, and he obtained a fair number of them. He informed me that he saw but few after 5 o'clock. I sent him again several times, but the weather was generally unfavourable, the wind having settled down in the north-east, and he saw no more of them.

Whilst collecting *Nepticula* larvæ on Saturday last in the same district, I disturbed a small moth from the elm, which, on capturing it, proved to be *O. spatulella*. It was not in so good a condition as those taken on the 6th September, but in much better condition than those taken in June. I beat the elm for some distance, but did not dislodge another.

In September, its flight is rather more lively than in June (though at all times it has a heaviness about it), and it flies higher, often about five feet from the ground, without any apparent wish to rest on the grass, or even on a hedge, but on approach the latter, it would raise its flight and go over.

These facts, combined with the fresh appearance of the September specimens, and the worn appearance of those on the wing in June, have led me to the conclusion that the insect hibernates, and does not deposit its eggs until the spring.—W. D. CANSDALE, 4, Guithavon Terrace, Witham: *October 8th*, 1877.

Opostega spatulella, Guenée.—A careful study of some specimens of this insect just received from the captor, Mr. Cansdale, leads me entirely to his conclusion, that the June specimens had hibernated.

As the description I gave in the *Entomologist's Annual*, 1860, p. 125, from specimens taken by Mr. H. Tompkins, at Southend, in Essex, in the middle of August, admits of improvement, I have noted as follows:—

The hibernated specimens are shining pale ochreous, with a small *dark grey* spot on the inner margin before the middle, and an oblique grey (paler) streak from the middle of the costa—distinctly posterior to the dorsal spot. The grey scales, with which the entire disc of the wing is suffused in the fresh specimens, are almost entirely absent.

In the fresh specimens, these two dark markings can be seen, when we know where to look for them, but they are not conspicuous; the spaces immediately beyond them on both margins appear as *pale* spots, being freer than the rest of the wing from the suffused grey scales: sometimes there is also a scarcity of the grey scales on the basal side of the dark spots—hence the description in the *Ent. Ann.*, 1860, p. 135, speaks of “two pairs of pale marginal spots.”

Hence, I find that Herrich-Schäffer was more correct than I had thought, when he described the markings on this insect as *dark* spots.

The general glossiness of the insect, even when not greasy, renders it, however, difficult to describe.—H. T. STANTON, Mountsfield, Lewisham, S.E.: *Oct. 1st*, 1877.

Micropteryx larvæ in autumn.—Among several mines in birch leaves collected at High Force, about the middle of August, were some very odd looking ones, which I sent to Mr. Stanton. My surprise was great when, on receiving them back, I found among probable sawflies and others unknown, that one was a mine of *Micropteryx*. Subsequent visits to the same place, and to Wolsingham, produced a few more; also recent empty mines. It has been suggested to me, that they might be individuals retarded by the lateness of the season: to this, however, I cannot subscribe, bearing in mind this fact, that the birches at Wolsingham were covered with the usual *Micropteryx* mines, in the first week in June, just as usual; and I did not find that, up to the end of June, there was any special retardation of species even there. It was after the beginning of July, when the rains came, that many species seemed to be thrown so much out of course, so that I cannot help coming to the conclusion that it may either be a new species, or one of those with unknown larvæ. I hope next season will decide the question.—J. SANG, Darlington: *Oct. 8th*, 1877.

*Capture of Xylotrechus liciatu*s, Linn., in Warwickshire.—Of this grey powdery Hylotrupoid *Clytus*, of which the metropolis appears to be in the South of France,

South Russia, and the Caucasus, I found a live specimen on the stable wall of this Rectory, in the third week of last August. No circumstance likely to account for its introduction occurs to me.—EUSTACE F. CLARK, Ufton Rectory, near Southam, Warwickshire: 15th September, 1877.

Entomology underground.—A few days ago, whilst going through a colliery in South Yorkshire, I saw *Pyralis farinalis* flying in the workings more than a quarter of a mile underground, and the cobwebs contained quantities of remains of the same insect. One of the colliers informed me that they often killed “mosquitoes,” which seemed to possess strange qualities. Upon investigation, it appeared to me that the “mosquitoes” were a species of *Sirex*, which had probably escaped from the mine props.—HOWARD VAUGHAN, Bromley, Kent: 28th September, 1877.

Obituary.

Captain Alwin S. Bell.—Believing that this Magazine will be increased in value by being made the record of departed naturalists who have contributed directly or indirectly to its pages, I send you the following brief account of one, who though little known to the public, was, nevertheless, an ardent lover of natural history. I have had, before now, to announce the discoveries of Captain Alwin S. Bell, of the 2nd West India Regiment, on Sherborough Island, from whence he sent home new species of *Iolais* of great beauty; and have also described some new species of butterflies, which he took on the memorable march to Coomassie, where, in his country's service, he was so prostrated by fever, that he never recovered his health, and, to the deep regret of those who knew him, died at Harrogate on the 24th of September last. My collection contains several memorials of his generous kindness.—[W. C. H.]

ENTOMOLOGICAL SOCIETY OF LONDON: 3rd October, 1877.—PROFESSOR J. O. WESTWOOD, M.A., F.L.S., President, in the Chair.

Mr. Distant exhibited pieces of dry hides from China, riddled by the ravages of *Dermestes vulpinus*, which had swarmed in that particular importation to such an extent, that deterioration in value from 15 to 20 per cent. was the result.

Mr. McLachlan also referred to the subject, and showed a portion of a wooden case in which hides had been imported from Shanghai, reduced almost to powder by the borings of the insects.

Professor Westwood exhibited the pupa of a Trichopterous insect, and made some remarks on its structure. Also a small Lepidopterous insect from Lake Nyassa (apparently a *Psyche*), which was said to have emerged from the pupa-case of a *Tachina*, but there was evidently some uncertainty or error of observation. He next referred to the subject of the Lepidopterous larva (exhibited at the last Meeting) attached by a thread-like substance to the dorsum of the abdomen of one of the *Fulgoridæ* (*Eurybrachys spinosa*), and was inclined to think it was a true case of parasitism, the larva probably feeding on the waxy secretion of the Homopteron. Mr. Wood-Mason, in referring to this and other instances, looked upon them as examples of commensalism rather than of parasitism. A discussion on this subject took place, in which many members joined. Prof. Westwood mentioned that Mr. Bates had found, in Brazil, numbers of a small moth on the living body of a sloth.

A communication from Mr. Albert Müller was read, to the effect that he had established an "Entomological Station" at Basle.

Mr. H. Goss exhibited a series of specimens of *Lycæna Arion* from the Cotswolds taken in June of this year. At least one-third of the examples taken were remarkable for their very small size. He had found no parallel difference in size in specimens from other localities.

Mr. Meldola exhibited a collection of *Lepidoptera* taken by him in Ceylon and the Nicobar Islands in 1875.

It was announced that the Longicorn beetle taken at Birkenhead, and exhibited at the last Meeting, proved to be *Monohammus titillatus*, F., a species inhabiting the United States.

Mr. McLachlan read a paper "On *Notiothauma Reedi*, a remarkable new genus and species of *Neuroptera* from Chili, pertaining to the Family *Panorpidæ*."

Mr. Butler communicated a paper "On the *Lepidoptera* of the Family *Lithosiidæ* in the collection of the British Museum."

CHARACTERS OF A NEW GENUS, AND DESCRIPTIONS OF NEW SPECIES, OF *GEODEPHAGA* FROM THE SANDWICH ISLANDS.

BY THE REV. T. BLACKBURN, B.A.

LEBIIDÆ.

SARONYCHIUM, gen. nov.

(*Cymindi* affine).

Mentum dente medio obtuso.

Palpi maxillares articulo ultimo cylindrico truncato, labiales securiformi.

Mandibulæ fortiter arcuatae.

Labrum transversum, fortius emarginatum.

Caput breve, latum, basi fortius constrictum.

Oculi magni, convexi.

Antennæ capite thoraceque conjunctis haud longiores, articulo primo tertio rix majore, secundo minore.

Prothorax fortiter transversus, basi media haud productus.

Elytra lata, depressa, apice truncata.

Pedes breves, crassiusculi.

Tarsorum articulus quartus bipartitus.

Unguiculi intus fortiter pectinati.

S. INCONSPICUUM, sp. nov.

Subnitidum, parce pubescens, setis marginalibus longis vestitum, brunneum, capite prothoraceque obsolete punctatis, hoc fortiter transverso, subcordato, canaliculato, antice haud emarginato, lateribus transversim rugatis, margine laterali repando, angulis posticis fere rectis; elytris fere parallelis, crebre punctatis, leviter striatis, angulis humeralibus fere rectis.

Long. 9 $\frac{3}{4}$ mm.

On the plains near Honolulu. Apparently very rare.

ANCHOMENIDÆ.

More than three-fourths of the *Geodephaga* that have occurred to me on these islands belong to this family. Among the species that I am about to describe, I think it not impossible that there may be found eventually material for some new genera; but it does not appear to me that those of which the characters have been already published are in so settled a state, as to render the formation of new genera (unless very strongly marked) likely to be of permanent value, until the species already existing in collections have been more comprehensively studied, and the result published.

My species possess in common the following characters (besides those shared by the whole group *Anchomenidæ*): "*mentum* with a central tooth, *labrum* not emarginate, *antennæ* with 3rd joint not more than moderately longer than 4th, *prothorax* cordiform or suborbicular, *elytra* moderately sinuate at extremity, *claws* simple."

There are some eight or ten genera already characterised possessing these characters, many of them closely allied, all of them grouped around, or actually taken out of, the two extensive genera *Anchomenus* and *Dyscolus*. As I cannot identify my species with any of the smaller genera, and can discover no strongly marked character separating them from the larger ones, I think it better to assign them all to the two leading genera. But here a difficulty presents itself. *Anchomenus* and *Dyscolus* run into each other very remarkably. The principal accepted distinctive characters are, I believe, as follows: In *Dyscolus*, the 4th joint of the tarsi should be bilobed (in *Anchomenus* not more than moderately emarginate). *Dyscolus*, also, should have the parallel depressed form of a *Dromius* (near which genus Dejean placed it), but without any truncature of the elytra, and should occur on the leaves of plants.

These characters, however, do not seem to be invariably found in company (I see the fact is alluded to by Lacordaire in his *Gen. des Col.*).

In some of the species I am about to describe, there is this unsatisfactory want of exactness in possessing the distinctive characters of either *Dyscolus* or *Anchomenus*; some leaf-frequenting species, with bilobed tarsi, being of at least moderately convex form, and some having the 4th joint of the tarsi less deeply and widely bilobed than others; while among the ground-frequenting convex species, some have the tarsi almost bilobed. All those, however, which I describe as *Dyscolus*, occur on leaves of plants, and have the 4th joint of the tarsi (in

one tarsus as compared with another) more *equally* bilobed; while the rest all frequent moss, damp ground, &c., and in those of which the tarsi approach the *Dyscolus* form, the tendency is much less evident in the hind than in the other tarsi. I have, however, mentioned the characters of the tarsi in each description. Still, it does not appear to me that all the species (notably the last *Anchomenus* and first *Dyscolus*) fall quite naturally into any genus that I know of.

I have characterised the form of the tarsi according to their appearance when examined from beneath. The appearance of the 4th joint, viewed from above, is frequently deceptive, as the apical joint is often inserted near the base of the 4th joint, and received in a kind of furrow running down the latter, but not really dividing it.

In nearly all the *Anchomenidæ* I have met with in the Sandwich Islands, the 4th joint of the tarsi is very distinctly wider and more emarginate than in the British species of *Anchomenus*, and I can discover scarcely any trace of the sexual distinction usual in the anterior tarsi.

It should perhaps be stated, that in the following descriptions, when the antennæ, as compared (in respect of length) with half the body, are called "*multo longiores*," their length equals about two-thirds of the body.

All the following species, moreover, have the two or three slight impressions usual on the third interstee of the elytra, but (except in one instance) not in a remarkable degree.

ANCHOMENUS.

A. MUSCICOLA, *sp. nov.*

Piceus; palpis, pedibus, prothoracis elytrorumque marginibus, testaceis; antennis piceo-testaceis, basi dilutioribus; capite elongato; oculis magnis, convexiusculis; antennis corporis dimidio multo longioribus; prothorace subcordato, leviter transverso, postice quam antice haud angustiori, canaliculato, antice fortiter emarginato, margine basin versus fortiter repando, angulis posticis fere rectis, lateribus fortius rotundatis; elytris ovalibus, convexiusculis, fortiter striatis, interstitiis convexiusculis, humeris fortius productis; tarsorum (nec postremorum) articulo quarto fortius emarginato.

Long. 9—10 mm.

Common (at one spot only) on the Oahu Mountains.

N.B.—Dr. Sharp informs me that this insect is near *A. Nichollii*, Woll. It is certainly, I think, allied to *A. albipes*, F.; compared, however, with that insect, the antennæ are distinctly longer; the head longer; eyes a little less convex; thorax much wider behind, with margins broadly spread out behind, base unpunctured, hinder angles

much less pronounced, front rather strongly emarginate; elytra (with sides much more rounded) uniformly and more strongly striated; the interstices are somewhat convex, and the 4th joint of the four front tarsi are rather strongly (of the hind tarsi only slightly) emarginate.

To render my descriptions as clear as possible, I insert the foregoing comparison of *A. muscicola* with a common European species, and exercise the greatest care in the following descriptions to express each character in terms that will prove correct when compared with those used in describing *muscicola*.

A. EPICURUS, sp. nov.

Piceo-niger; prothoracis elytrorumque margine reflexo (raro superiore etiam) ferrugineo; antennis testaceis, parum infuscatis; palpis pedibusque testaceis; capite vix elongato; prothorace vix subcordato, antice minus fortiter emarginato, postice utrinque foreolato (in A. muscicola, prothoracis fovea basalis margine repando mersa est), margine laterali minus repando, angulis posticis obtusiusculis; elytris antice latioribus, minus fortiter striatis, striis externis minus profundis, humeris minus productis; cætera ut in A. muscicola.

Long. 9—9½ mm.

Oahu Mountains. Very local, and not common.

A. PROTERVUS, sp. nov.

Piceus; elytrorum apice (plus minusve) marginibusque, palpis et pedibus testaceis; antennis testaceis plus minusve infuscatis; prothorace rufo-piceo, margine reflexo testaceo; capite parum elongato; oculis minus convexis; antennis corporis dimidio parum longioribus; prothorace ut in A. epicuro (at paulo brevior, angulis posticis minus obtusis); elytris fere oralibus, ante apicem fortius sinuatis, convexis, fortiter striatis, interstitiis convexis, humeris fortius productis; tarsorum articulo quarto parum emarginato.

Long. 6½—7¾ mm.

Widely distributed, but not common.

A. SCRUPULOSUS, sp. nov.

Subnitidus, brunneo-piceus; prothoracis rufescentis marginibus, elytrorum marginibus, sutura, apiceque, rufis vel testaceis; antennis, palpis, pedibusque flavo-testaceis; capite parum elongato; oculis magnis convexis; antennis corporis dimidio multo longioribus; prothorace fortius transverso (nec subcordato), antice emarginato, postice utrinque foreolato, canaliculato, lateribus sat rotundatis, angulis posticis fere rotundatis; elytris oralibus, parum convexis, subtiliter striatis, interstitiis latis, egregie planis, humeris sat productis; tarsis ut in A. muscicola.

Long. 8—8½ mm.

Oahu Mountains. Taken by me only once.

A. FRATERNUS, sp. nov.

A. scrupuloso affinis, plerumque paulo obscurior; prothorace obsolete (sat evidenter autem) subcordato; elytris convexiusculis, antice latioribus, paulo fortius striatis, interstitiis (postice præsertim) minus planis.

Long. 7¾—8 mm.

Oahu Mountains. Neither local nor common.

A. METICULOSUS, *sp. nov.*

Subnitidus, piceus; prothoracis elytrorumque margine reflexo et horum suturâ, rufescentibus; antennis, palpis, pedibusque flavo-testaceis; capite brevi, thorace parum angustiori; oculis magnis, convexis; antennis corporis dimidio paulo longioribus; prothorace transverso (nec subcordato), postice leviter angustato, canaliculato, antice parum emarginato, postice utrinque distincte foreolato, lateribus parum rotundatis, angulis posticis rotundatis; elytris ovalibus, parum convexis, subtilius striatis, interstitiis sat planis, humeris leviter productis; tarsi ut in A. muscicola.

Long. $6\frac{1}{2}$ — $7\frac{1}{4}$ mm.

Oahu Mountains. Rare.

A. CUNEIPENNIS, *sp. nov.*

Convexus, piceus; ore, antennis, palpis, pedibusque ferrugineo-testaceis; capite elongato, oculis parum convexis; antennis corporis dimidio brevioribus; prothoracis leviter transverso, evidenter subcordato, postice quam antice vix angustiori, canaliculato, antice leviter emarginato, postice utrinque foreolato, lateribus sat rotundatis, angulis posticis fere (nec abrupte) rectis; elytris basi prope latioribus, illinc postice gradatim angustatis, profunde striatis, interstitiis fortius convexis, lateribus fere rectis, humeris parum productis; tarsorum articulo quarto vix emarginato.

Long. $8\frac{1}{4}$ — $9\frac{1}{2}$ mm.

Oahu Mountains. Neither local nor rare.

A. FOSSIPENNIS, *sp. nov.*

Subnitidus, rufo-piceus, marginibus pallidioribus; antennarum basi, pedibusque testaceis; palpis testaceis, plerumque plus minusve infuscalis; capite mediocri; oculis parum convexis; antennis corporis dimidio paulo longioribus; prothoracis transverso (nec subcordato), postice quam antice haud angustiori, canaliculato, antice leviter emarginato, postice utrinque profunde foreolato, marginibus latis, fortiter rotundatis, angulis posticis fortiter obtusis; elytris ovalibus, fortiter striatis, interstitiis convexiusculis, tertio fortiter triforeolato, humeris sat productis; tarsorum articulo quarto parum emarginato.

Long. 7 — $7\frac{1}{2}$ mm.

Oahu Mountains. Local, but not scarce.

A. OCEANICUS, *sp. nov.*

Rufus; capite nigricante, fortiter elongato; oculis parvis, fere planis; antennis corporis dimidio multo longioribus; prothoracis elongato, postice quam antice paulo latiori, canaliculato, antice emarginato, postice utrinque foreolato, lateribus minime rotundatis, angulis posticis leviter obtusis; elytris elongato-ovalibus, postice acuminatis, fortiter marginatis, prothorace plus duplo latioribus, fortiter striatis, interstitiis planis, humeris fortiter productis; tarsorum articulo quarto parum emarginato.

Long. 9 mm.

Oahu Mountains. Apparently very rare.

A. BARDUS, *sp. nov.*

Rufo-piceus, antennis, palpis, pedibusque testaceis; capite sat elongato; oculis parum convexis; antennis corporis dimidio vix longioribus; prothoracis fortiter transverso, postice quam antice evidenter latiori, antice emarginato, canaliculato, postice utrinque foreolato, lateribus sat rotundatis, angulis posticis subrotundatis; elytris

sat convexis, antice latioribus, fortiter striatis, interstitiis parum convexis, humeris sat fortiter productis; tarsorum (nec postremorum) articulo quarto sat fortiter emarginato.

Long. $10\frac{1}{2}$ mm.

Oahu Mountains. Appears to be rare.

A. FUGITIVUS, *sp. nov.*

Piceus, antennarum basi, palpis, pedibus, thoracis elytrorumque marginibus, et horum apice, testaceis; capite oculisque mediocribus; antennis corporis dimidio vix longioribus; prothorace fortiter transverso (nec subcordato), postice quam antice haud angustiori, canaliculato, antice leviter emarginato, lateribus fortiter rotundatis, postice utrinque foveolato, angulis posticis subrotundatis; elytris convexis, ovalibus, fortiter striatis, interstitiis parum convexis, humeris parum productis; tarsorum articulo quarto parum emarginato.

Long. $8-8\frac{1}{2}$ mm.

Oahu Mountains. Rare.

A. MYSTICUS, *sp. nov.*

Piceus, antennis, palpis, pedibusque testaceis; prothoracis marginibus rufescentibus; elytris plus minusve (præsertim apicem versus) confuse flavo-maculatis vel transversim lineatis; capite mediocri; oculis magnis, convexis; antennis corporis dimidio multo longioribus; prothorace fortiter transverso (nec subcordato), postice quam antice vix angustiori, canaliculato, postice utrinque foveolato, antice emarginato, lateribus leviter rotundatis, angulis posticis obtusis; elytris elongatis, subparallelis, parum convexis, striatis, interstitiis planis, humeris fere (nec abrupte) quadratis; tarsorum omnium articulo quarto fortiter emarginato.

Long. $8\frac{1}{2}-9$ mm.

Waianae Mountains. Very local.

DYSCOLUS.

D. TANTALUS, *sp. nov.*

Convexiusculus, piceo-niger; antennis, palpis, pedibusque ferrugineis, vel sordide testaceis, plus minusve infuscatis; capite prothorace evidenter angustiori; oculis magnis, sat convexis; antennis corporis dimidio multo longioribus; prothorace transverso, postice quam antice haud angustiori, leviter canaliculato, antice leviter emarginato, postice utrinque foveolato, lateribus leviter rotundatis, angulis posticis subrotundatis; elytris elongatis, prothorace duplo latioribus, plus triplo longioribus, striatis, interstitiis planiusculis, humeris productis; tarsorum (postremorum minus evidenter) articulo quarto sub-bipartito.

Long. $9\frac{2}{3}$ mm.

Var.? *Minor, colore obscurior, gracilior, antennis pedibusque (cæteris membris comparatis) longioribus.*

Oahu Mountains; on various trees. Not scarce.

D. PALME, *sp. nov.*

Parum convexus, piceo-niger; antennis, palpis, genibus, tarsisque ferrugineis, plus minusve infuscatis; capite lato, prothorace vix angustiori; oculis magnis, sat convexis; antennis corporis dimidio multo longioribus; prothorace leviter subcordato, vix transverso, postice quam antice parum angustiori, leviter canaliculato, antice vix emarginato, postice utrinque foveolato, lateribus sat rotundatis, angulis posticis sub-

rectis; elytris ovalibus, prothorace duplo latioribus, viz triplo longioribus, subtilius striatis, interstitiis planis, humeris rotundatis; tarsorum articulo quarto late bipartito.

Long. $7\frac{1}{2}$ —8 mm.

Oahu Mountains; generally on palms. Not common.

D. MUTABILIS, *sp. nov.*

Latus, colore variabilis; capite prothorace paulo angustiori, rufescente vel piceo; oculis magnis, sat convexis; antennis testaceis, corporis dimidio multo longioribus; prothorace testaceo (disco plus minusve infuscato), transverso, obsolete subcordato, postice quam antice paulo angustiori, leviter canaliculato, antice emarginato, postice utrinque foreolato, lateribus sat rotundatis, angulis posticis obtusis; elytris testaceis, disco (nonnullis exemplis, elytris totis) infuscatis, ovatis, parum convexis, prothorace duplo latioribus, triplo longioribus, fortius striatis, interstitiis planiusculis, humeris rotunde productis; tarsi ut in D. palmæ.

Long. $6\frac{3}{4}$ — $7\frac{3}{4}$ mm.

Oahu Mountains; on low plants. Local, but not uncommon.

D. CALIGINOSUS, *sp. nov.*

Angustus, convexiusculus, piceo-rufus, plus minusve infuscatus; antennis, palpis, pedibusque testaceis; capite lato, prothorace viz angustiori; hujus longitudine latitudini æquali, lateribus parum rotundatis, cætera ut in D. mutabili; elytris ovalibus, prothorace minus duplo latioribus, plus triplo longioribus, fortiter striatis, interstitiis planiusculis, humeris sat productis; tarsorum articulo quarto anguste bipartito.

Long. $6\frac{1}{2}$ — $7\frac{1}{2}$ mm.

Oahu Mountains; on low plants. Local, and scarce.

Honolulu: 1877.

NOTES ON THE LEPIDOPTERA OF THE SCILLY ISLES.

BY REV. H. HARPUR CREWE, M.A.

At the end of August and beginning of September, I was the guest of Mr. Dorien Smith at Tresco Abbey, in the Scilly Isles, and, whenever an opportunity offered, I investigated the entomology of the islands, or rather, I should say, of the particular island Tresco, upon which I happened to be located. I only paid occasional visits to the other islands, and always in the day-time, when there was very little stirring, though some of the downs on St. Mary's covered with *Ulex nanus* and *Calluna vulgaris* in full bloom, looked most inviting, and possibly, if visited at night, might have produced some rarities. I saw nothing, however, worthy of much notice, except a single specimen of *Heliothis peltiger*, which I took flying over the heather bloom.

The commonest insect on all the Islands was *Scopula ferrugalis*; it swarmed in every direction. *Colias Edusa* was not nearly so plentiful as in Buckinghamshire, where it has been more or less abundant ever since May. I did not see a single specimen of *C. Hyale*. *Vanessa*

Io was entirely absent, but *V. Atalanta* and *cardui* swarmed; I fully expected to see *V. Antiopa*, but was disappointed. *Sphinx convolvuli* was common at dusk, hovering over various flowers in the garden, but all the specimens were more or less battered. A single specimen of *Acherontia Atropos*, just out of the pupa, was caught by the gamekeeper in his cottage, and brought to me. The gardeners told me that the tomato plants had been much stripped by some large larva; I have no doubt that it was *A. Atropos*. *Macroglossa stellatarum* occurred in myriads. There is a good deal of *Euphorbia paralias* growing on the islands, and I searched it well for the larva of *Deilephila euphorbiae*, but without success; the gamekeeper, however, to whom I described it, and who is a very observant man, told me he was almost sure he had seen it. On both the islands of Treseo and St. Mary's there are some large fresh water pools of great antiquity, fringed with reed-beds, and with a thick scrub of heather or sallow close at hand. I saw nothing, however, either by day or night, except *Leucania pallens* and *impura*. I sugared dense masses of ragwort-bloom on the margins of the Treseo pools, but without any result. For about a fortnight I sugared the blossoms of the shrubby New Zealand Veronicas in the Abbey gardens almost every evening; I captured the following insects:—*Agrotis lunigera* (a single specimen), *saucia*, *suffusa*, *segetum*, *puta*, and *tritici*; *Triphæna orbona*; *Noctua plecta*, *c-nigrum*, *xanthographa*, and *rubi*; *Phlogophora meticulosa*; *Miana furuncula*; *Cerigo cytherea*; *Melanthia rubiginata*; and a single somewhat damaged specimen of the rare *Margarodes unionalis* and *Eupithecia pumilata*. The larvæ of *Dianthæcia capsicola* were common on *Lychnis diæca*, and those of *Eupithecia absinthiata* and *centaureata* on ragwort bloom. I saw no trace of any other *Eupithecia* except *E. nanata*, a few larvæ of which I swept from flowers of *Calluna vulgaris*. *Acidulia promutata* occurred on banks near the sea, at St. Mary's, and *Plusia gamma*, *Camptogramma bilinearia*, and *Stenopteryx hybridalis* swarmed everywhere.

An entomological friend, who was a guest at the Abbey for some weeks previous to my visit, took *Leucania littoralis*, *Triphæna interjecta*, *Dianthæcia conspersa*, *Agrotis lunigera* and *obelisca*, *Lithosia quadra*, *Bryophila glandifera*, *Hadena pisi*, *Eupithecia subnotata* and *pulchellata*, *Cleora lichenaria*, *Ourapteryx sambucaria*, *Cledeobia angustalis*, *Stenia punctalis*, *Endotricha flammealis*, and *Herbula cespitalis*.

I took the larvæ of *Chelonia caja*, *Spilosoma lubricipeda* and *menthastri*, *Acronycta rumicis*, *Mamestra brassicæ*, *Hadena oleracea* and *chenopodii*, and I saw traces of *Cucullia verbasci*.

I did not collect *Tortrices*, *Crambites*, or *Micros*.

Hipparchia Janira, *Vanessa urticæ*, *Pieris brassicæ*, *napi*, and *rapæ*, *Lycæna Alexis*, and *Polyommatus Phlæus*, were the only butterflies I saw in addition to those already mentioned.

This list is very meagre, considering the excessively mild climate of the islands, in which the plants of the Cape, New Zealand, Australia, &c., flourish with almost native luxuriance; but the flora, though select, is not numerous. The past summer, too, has been cold and ungenial, and the weather during my visit was very showery and uncertain. From what I saw of the islands, I am inclined to think that any one diligently working them in a good season from May to October, would find himself amply rewarded.

The Rectory, Drayton-Beauchamp, Tring :
October 31st, 1877.

THE RECENT ABUNDANCE OF *COLIAS EDUSA*.

BY C. G. BARRETT.

Notwithstanding the multitude of notices of the occurrence of *Colias Edusa* that have already appeared, I feel constrained to add a few remarks to those which I made earlier in the season (*ante* p. 64). I then recorded the appearances of the first brood up to July 4th, and suggested the probability that the habit of the species was not, as usually supposed, to hibernate in the imago state.

By the end of the first week in August, I began to hear from friends in the South of England that *Edusa* was again out, and in vastly increased numbers, but we were then enjoying our ordinary Pembroke weather—wind and rain—and it was not till August 10th, that the sun shone out sufficiently to bring out the first two or three small males. Next day, both sexes were out, and we took a score, my eldest little lad securing—and spoiling—the first *Helice*. From that time, the species was evidently emerging daily, since fresh and perfect specimens kept occurring in the clover fields, while the more worn ones scattered themselves over the country. In size, *none* were equal to the large June specimens, and the proportion of *dark-bordered* females was (as in the previous autumn) larger.

On September 1st, I crossed into Somersetshire, and there found the species very much more plentiful and variable than at home, indeed, the clover fields were quite lively with them. Besides *Helice* and the females already mentioned, in which the yellow spots in the black border were few and small, I met with one female having an *uninterrupted* row of large yellow crescents in the black border, another

with these spots orange-coloured, another quite small enough to be the variety formerly called *Chrysothene*, two or three males equally small with black dashes produced from the interior of the marginal band near the costa, another male in which the black spot on the fore-wings had a yellow centre, specimens of both sexes with the fore-wings lemon-yellow, and others with the hind-wings and base of fore-wings dark. Out of two hundred or three hundred specimens examined, this seems to be a large proportion of varieties.

When I returned home in the middle of September, I found that *Edusa* was still to be seen on every fine day, haunting sunny banks and sheltered valleys, although the clover fields were all mown and desolate, but they got gradually scarcer and more worn and feeble, so that the conclusion forced itself upon one's mind that hibernation in their case was impossible, as they would have insufficient *vitality*.

Wishing to ascertain with certainty how long they continued to fly, I sent the boys out every sunny day, as soon as they came from school at mid-day, to examine the railway embankment, and was thus able to ascertain that they continued on the wing until October 16th, after which the *weather* decided the point. But the most convincing proof that I met with was this: a female found sitting on a warm bank, and confined under gauze, with flowers and clover leaves, in the garden, took advantage of a warm sunny day (October 11th) to lay all her remaining eggs (about 20 in number) and then die.

These eggs, which I regard with peculiar interest, were placed at once in the hands of Mr. Buckler, and I hope that, in due time, he will have more to tell of the life history of *Edusa* in this country. But I think that, if any evidence exists of the *hibernation* of this species in the imago state, it would be desirable now to have it produced.

While working the clover fields, I discovered the (to me) novel fact that *Heliothis armiger* flies most actively in the sunshine, feeding at the clover blossoms exactly like the swarms of *Plusia gamma* around it, and that it soon becomes in this way most miserably worn. One specimen at home and two in Somerset served as unsatisfactory illustrations to both facts.

Gonopteryx rhamni, which was common enough among the clover in Somerset, appears to be totally absent here.

It is a singular circumstance that on the very day of the emergence of *Colias Edusa*, a fresh brood of *Scopula ferrugalis* appeared, and became common, through August, all over the country. The specimens, although darker than those found in June, were not as strongly marked as those which appeared at the usual time in September and October, and which, in fact, are still out.

LIFE HISTORY OF *PAPILIO ARCHIDAMAS*.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S.

This fine butterfly was tolerably plentiful in certain localities in the neighbourhood of Valparaiso in October, November, and December, 1872. In January, 1873, it became less frequent, and, by the end of that month, had altogether disappeared. In its habits this species is a swift flyer, seldom remaining for more than a few seconds upon any flower it might happen to alight on; is excessively shy; and this, added to the rough nature of the ground where it usually occurred, made it most difficult to capture, and those obtained were generally so rubbed and torn, as to be quite unfit for preserving.

On the 24th November, I observed a female fluttering over a small *Tropæolum* plant, evidently, from her movements, depositing eggs; in a few moments she flew away, and, upon examining the plant, I discovered a small cluster of eggs upon the upper surface of one of the leaves. These were perfectly circular, rather flattened, and covered with a slight yellowish bloom. The same day, in other parts of the *Tropæolum*, I found larvæ of all sizes, from just hatched to full grown.

The eggs laid on the 24th November hatched on the 30th. The juvenile larvæ are at first quite black, but grow very rapidly, and soon assume a dark purple hue. The full fed larva is velvety, and of a deep madder purple, which, in certain lights, seems almost black; claspers of the same colour; head and prolegs black; from each segment springs a short, blunt, fleshy, yellow spine, forming a sub-dorsal row; on the second segment on each side of the face is a long, yellow, moveable tentacle, black at the tip, and from this, when the larva is irritated, long yellow thread-like filaments are emitted; these tentacles are connected by a yellow collar, which is also faintly discernible on the under surface; on the third, fourth, fifth, and sixth segments there is a short yellow spine, but below those forming the sub-dorsal stripe; a pale yellow streak runs just above the prolegs; a short, blunt, yellow spine springs from the base of each clasper, and there are spines similarly situated on the eleventh and twelfth segments; spiracles black, edged with orange. The whole appearance of the larva is short, much thickened in the middle, and tapering towards each extremity, and the segmental divisions are well defined. It is soft and flabby to the touch, has a disagreeable smell, and adheres with considerable tenacity to its food plant. When about to change, it spins a pad of silk on a twig, girds itself with a silken thread, and turns into a dusky brown and much angulated chrysalis.

My larvæ had all changed by the 8th December, 1872. The first butterfly appeared 18th May, 1873, while we were at sea in lat. 4° S. ; the second on 7th July at sea, in lat. 35° N. ; and the remainder emerged at irregular intervals up to the 17th December, when the two last reached the perfect state while we were at San Blas, on the coast of Mexico, having been more than a year in the chrysalis state, and subjected to a variety of temperatures.

H.M.S. "Britannia," Dartmouth :
Nov. 9th, 1877.

NOTES ON A COLLECTION OF BUTTERFLIES FROM ZANZIBAR,
WITH DESCRIPTIONS OF TWO NEW SPECIES OF *ACRÆA*.

BY W. C. HEWITSON, F.L.S.

Mr. Buxton has very kindly given me a small collection of butterflies from Zanzibar, rich in beautiful things. Amongst them the fine *Harma Achlys* of Hopffer, the very pretty *Peryplysia Leda* of Gers-taecker, and two very distinct new species of *Acraea*, together with a most exquisite variety of *A. Dammi* (Ward's *Masonala*) suffused with earmine. Mr. Buxton tells his own tale (a very sad one) in the accompanying notes with which he has kindly favoured me:—

"The district where I collected all my insects and birds was about 80 miles from Zanzibar, to the S. W., on the Mainland. There was a most magnificent harbour (Darrasalam) coming up to the house or palace I lived in, a square old Moorish residence with fine airy rooms. Next the village, there was a large plantation, a quarter of a mile of manioe, then cocoa nut plantation, but of very low growth. In the morning particularly, the cocoa nut bushes were covered in hundreds by that beautiful reddish-brown butterfly, *Euriphene Coccalia*, of which I sent so many—the female, with a white mark on the wings. They were very tame; as soon as ever they were caught, and found to be imperfect, and let go, they settled upon the next piece of cocoa nut.

"In the brushwood, there were hundreds of butterflies, but chiefly *Danaïs* and common species. Further on there was a long shady glade, and along this the beautiful green *Rhomalæosoma* was sunning itself in hundreds; they were perfectly fearless, but very difficult to catch, and, like the others, as soon as they were caught, and let loose, they settled at once. On a sunny day there were generally forty or fifty in this glade; and I had to walk up and down to look for a new specimen, and come away sometimes without any.

"To the right of this was my great hunting ground. I found it

out accidentally from losing myself in the wood. There were high trees partly burnt and cut, small bushes about 15 feet high, a little maize, and a little cultivation. *Acraea* certainly did swarm here. I caught them, looked at them, and looked at them again in uncertainty. I could make nothing out of them; I am afraid I may have let some good species escape, but one cannot do everything. I feel sure I saw *A. Hova*, but it is difficult to say; it had the flight of a very large *Acraea*, high up in the bushes. There was a beautiful brown *Acraea*, of which I only got two.

“As to the *Charaxes*, there is a grand time for somebody, I am sure. I could see them flying about, and settling on the trees beyond my reach; I never got one, except one that a native picked off a twig, a common one. I believe, in the hot and rainy season, wonders might be done there, and I have no doubt I should have done it, had I had health; as it was, I was only there in the dry season, when it rained occasionally. There was no beetle life, and, in the hot weather, it is said to be in thousands. I believe any one might have collected 500 butterflies in a day.

“Early in the morning, when the natives dig up their crops, the butterflies come in thousands for the first half-hour; they are more like a swarm of bees than anything else, but they are almost all common; and often as I stayed to watch them and wonder, with the secret hope of getting a rare one, I never succeeded. Still I believe, from the proximity of Madagascar, that it will be found almost a new district for animals, birds and insects. The heads of antelopes that I saw at Dr. Kirk’s were such as I had never seen before, and I know them pretty well; the account of the few birds I got, I hear is favourable.

“There is another side to all this. I went out myself with as fine a constitution as any man ever had, I lived perfectly temperately, and the result is, for the last eight weeks I have been laid on my back on the borders of eternity. Let any one count the cost.”

The following are the new species of *Acraea* above referred to:—

ACRÆA ZONATA.

Upper-side semi-transparent, rufous-orange. Anterior wing with a black spot at the middle of the cell, and a black band at the end of the cell which crosses the wing to the anal angle; the costal margin brown, the outer margin broadly brown, traversed by a series of eight rufous-orange spots. Posterior wing with a minute black spot at the end of the cell, a transverse band beyond the middle, the nervures below it and the outer margin dark brown.

Exp. 2 $\frac{1}{10}$ inches.

ACREA BUXTONI.

Upper-side scarlet, with the base black. Anterior wing with the outer half transparent; a black spot at the end of the cell. Posterior wing with a large black spot from the base divided by the nervures, and marked by a small scarlet spot; the outer margin black.

Under-side as above, except that there are sometimes two or three white spots near the base of the posterior wing.

Exp. 2 inches.

Oatlands, Weybridge :

9th November, 1877.

DESCRIPTIONS OF THREE NEW BRITISH SAW-FLIES.

BY P. CAMERON.

DOLERUS CHAPPELLI, *sp. n.*

♀. Dull black, with a faint bluish tinge, densely covered with a pale pubescence, deeply and coarsely punctured. Abdomen, from the 2nd segment, reddish-yellow; the sheath of the saws black. Wings sub-hyaline; the costa, stigma, and nervures black.

Length, $4\frac{1}{2}$ lines; alar exp., 11 lines.

This distinct species comes near *D. anticus*, Kl., but it has the clypeus more deeply incised; the pubescence thicker and closer; the abdomen more sharply pointed; the pleuræ less shining; and the whole of the 1st abdominal segment, the tegulæ, pronotum, and mesonotum, black.

It was taken in one of the English midland counties by Mr. Joseph Chappell, of Manchester, to whom I am indebted for the opportunity of examining it.

DINEURA SIMULANS, *sp. n.*

♀. Black; the antennæ filiform, nearly as long as the body, the 3rd and 4th joints equal, the remaining joints becoming gradually shorter and thinner. The head (especially on the vertex) very finely punctured; the mouth is white. The thorax is half shining, bare, and finely punctured; the scutellum is raised, oval, and shining, the cenchri small, pale. The abdomen is of the length of the head and thorax, but is narrower, the apex mucronate; the sheath of the saws is very large, black, and largely projecting. The legs are white, the femora are lined with black above, pale fuscous at the sides; the apex of the posterior tibiæ and tarsi (except the last joint) fuscous. Wings hyaline; the costa and stigma pale; the latter with the apex fuscous. The neuration is irregular in the only specimen I have seen, but on the whole it agrees with that of *D. testaceipes*, &c.

Length, scarcely $1\frac{1}{2}$ lines; alar exp., 3 lines.

This little insect has a very considerable resemblance to the gall-making *Nematus gallicola* (*Vallisnerii*), but it is a true *Dineura*; certainly it cannot be regarded as a *Blennocampa*, in which genus Thomson has placed *D. parvula*. The present species comes near *D. parvula* (judging by the description) and *D. despecta*. From the latter it is readily known by its much longer antennæ (Hartig gives their length as "lang wie Kopf und Thorax"), while *parvula* has the 9th segment pale yellow above, and the stigma unicolorous.

Taken in England by the Rev. T. A. Marshall.

I have never seen a specimen of *despecta*, but I have reason to believe that it is British, as the late Mr. Charles Healy told me that he had found in the London district, a saw-fly larva mining the leaves of the buttercup: this being the habit of *despecta*, according to Kaltenbach (*Pflanzenfeinde*, p. 9).

HOPLOCAMPA GALLICOLA, *sp. n.*

♂. Antennæ a little longer than the abdomen, fuscous, paler on the under-side, the base of the 1st joint entirely testaceous; the 3rd joint a very little longer than the 4th, the rest of equal length and thickness; the 9th conical at the apex. Head globular in front, the face below the antennæ pale white; the apices of the mandibles piceous; the vertex faintly punctured. Thorax black, the mesonotum smooth, shining; the edge of pronotum, pleuræ, and sternum pale testaceous. Abdomen with its dorsum black, pale at the junction of the segments; the anal lobes and belly testaceous. Legs pale testaceous, the apex of posterior tibiæ and the tarsi fuscous. Wings hyaline, the nervures and costa pale fuscous; the tegulæ and stigma pale testaceous; the marginal nervure received in the apical quarter of the 3rd submarginal cellule; the 1st submarginal cellule nearly square; about half the length of the lower part of the 2nd, which itself is a little shorter than the 3rd, on its lower side, and considerably shorter on the upper. The 1st recurrent nervure is received not far from the 1st submarginal nervure; the 2nd a little in front of the 3rd.

Length, 2 lines; alar exp., 4 lines.

Not to mention other differences, *H. gallicola* may at once be known by the testaceous pleuræ from the black species hitherto described. Our three species of this group may be distinguished as follows:

a. Pleuræ black.

Belly black; antennæ and edge of collar testaceous... *rutilicornis*, Kl.

Belly testaceous; antennæ and collar black *chrysorrhœa*, Kl.

b. Pleuræ testaceous.

Belly, antennæ, and edge of pronotum testaceous..... *gallicola*, Cam.

This interesting species was bred by Mr. Ed. Parfitt, of Exeter,

from pea-shaped, woolly-haired galls, which do not differ materially from those of *Nematus pedunculi*; they are attached also to a species of *Salix*, and were found in Devonshire.

This is the second species of *Hoplocampa* that has been found to raise galls. The other species (*Hoplocampa xylostei*) was discovered by that most excellent and painstaking observer, Dr. Giraud, to form galls on the young branches of *Lonicera xylosteum* (Verh. z.-b. Ges. Wien, xiii, p. 1297, pl. 22).

I am not quite sure whether the lanceolate cellule is contracted or petiolate, but this is a difficult matter to ascertain in other species of *Hoplocampa*, through the paleness of the nervures. In other respects, it agrees perfectly with *Hoplocampa*; although I first thought that it might be a *Dineura* (with which the neuration of both wings agrees, unless the lanceolate cellule is contracted), but the antennæ show that it cannot be placed in that genus.

Glasgow: November, 1877.

Rare Lepidoptera near Dartmouth.—The following rare and local species have been taken in this neighbourhood within the last three years, viz.: *Colias Edusa*, var. *Helice* (common), *C. Hyale*, *Thecla betulæ* (common), *Lithosia quadra*, *L. caniola*, *Deiopeia pulchella* (5), *Demas coryli*, *Trichiura cratægi*, *Pericallia syringaria*, *Ennomos erosaria*, *Geometra papilionaria*, *Asthena sylvata*, *Acidalia manciunata*, *Notodonta dictæa*, *N. trepida*, *N. chaonia*, *N. dodonæa*, *Leucania pubescens*, *Helio-phobus hispidus*, *Agrotis lucerneæ*, *Noctua glareosa*, *Tæniocampa miniosa*, *Dasyampa rubiginea*, *Hoporina croceago*, *Tethea subtusa*, *T. retusa*, *Dianthæcia conspersa*, *Epunda lutulenta*, *E. nigra*, *E. lichenea*, *Nyctina semibrunnea*, *N. petrificata*, *Cucullia absinthii* (abundant), *C. chamomillæ*, *Heliothis peltiger*, *H. arniger*, *Stilbia anomala*, *Botys lancealis*, *Spilodes sticticalis*, *Margarodes unionalis* (1), *Scopula ferrugalis* (abundant), and a *Noctua*, which is either a new species or an extraordinary variety of *D. conspersa*.—GERVASE F. MATHEW, H.M.S. "Britannia," Dartmouth: 9th November, 1877.

Notes on Lepidoptera.—*Colias Edusa.*—The first specimen I met with was on June 3rd, at Eton, and for the rest of the month they were out in profusion in every field near Slough and Eton. I noticed that they were mostly worn specimens, and a great majority of them females. They continued in plenty till the middle of July, when the numbers slackened again, but the first week in August I found them swarming on Epsom Downs, at Headley, Leatherhead and Mickleham Downs, and, in fact, wherever I went: the railway banks as far as Clapham Junction abounded with them all through the month. During a few very dull days about the 6th and 7th August, they were the only butterfly to be seen in the fields near Medmenham Abbey and Great Marlow. The last specimen I saw was about the second week in September. Those caught about the middle of August were mostly males, and all in splendid condition. Two or three specimens of the var. *Helice* have been taken on Mickleham and Leatherhead Downs.

Pieris Daplidice in Devonshire.—I have just had a very good ♀ specimen of *P. Daplidice* given me by E. C. A. Byrom, Esq., of Trinity College, Cambridge, taken by himself last May, flying over long grass about the middle of the day in the grounds at Culver, near Exeter. (Newman, *British Butterflies*, p. 159, says, “May and August. The August specimens only are taken in this country.”)

Curious food for larvæ.—At the beginning of October, I found several young larvæ feeding on low-growing plants under a white-thorn hedge: they were placed in a cage with a supply of food, and on renewing their food afterwards I was surprised to find a bunch of haws nibbled completely down to the seed in the centre. I searched carefully for slugs, sow-bugs, &c., but none had been included, and I then introduced a large bunch of fresh haws with the new supply of food: the next morning the berries were all eaten as before, and the larvæ had apparently attacked them in preference to their usual food. The larvæ were so young that I could not make out the species, and I have not seen them since. Might not this suggest berries, &c., as a convenient food for hibernating and semi-hibernating larvæ?

Acherontia Atropos at Epsom, &c.—During August I had several specimens of the larva of this insect brought me, viz., one on each of the following days: August 18th, 21st, 22nd, 27th, September 15th. Those on the 18th and 22nd August were sent me by Mr. Chandler, of Epsom, both having been found in a very small patch of potatoes in his garden. A bee-hive adjoining may possibly account for two having been found in such a small space. The larva on the 21st was found in our own potatoes, or, rather, on the bare ground, the haulm having been all dead for some time; and the last two were both taken in fields at Epsom, where all the haulm was dead or had been cut for some time previous. Beside the above captures, one was taken by a man at Ashted and subsequently let out unharmed, and one by a gardener at Epsom, who put it under a bell-jar whence it managed to escape. I hear that several larvæ were found this year also in the vicinity of Headley, feeding on dog-wood, in a hedge. My informant had seen the remains of the plant, eaten nearly to the ground, but the larvæ had been already taken. A fine pupa, dug at Epsom, was also brought me at the beginning of this month. The only previous capture I have heard of in the vicinity of late years was that of a fine female taken in Banstead Churchyard, last year, by a baker. When at Christchurch, Hants, in September, I heard that the larvæ had been common, but did not come across a pupa. A specimen of the perfect insect is reported as having been taken in the Forest of Glentamar, in the *Aberdeen Journal*, October 27th.—A. VERNON JONES, Trinity College, Cambridge: *October 31st, 1877.*

Acherontia Atropos in the County Cork.—When staying lately at Schull, I saw a specimen of this moth, which was taken there about the end of July, this year. A lady captured it late in the evening, while it was at rest in the hall of her father's house. The habit that this species has of entering bee-hives is well known, and it is called by the country people the “bee-robber,” and it may, therefore, be worthy of note, that bees have for several years settled in one of the chimneys of the house in which this specimen was captured.—WILLIAM W. FLEMYNG, 18, Upper Fitzwilliam Street, Dublin: *8th November, 1877.*

Lewania albipuncta at Freshwater, I. W.—It may be worth while to record

the recurrence here of this species in 1877. Eight specimens have, to my knowledge, occurred: a pair on each of the 28th, 29th, and 30th August, and the last two early in September. Four of these fell to my share, and all were taken at sugar in the small woods between Freshwater and Yarmouth (the same locality as that in which they were taken by Mr. Blackburn and myself last year). Having sugared in the same wood every night for three weeks before *albipuncta* turned up, I should say that it is a species which makes its first appearance in a worn and chipped condition. With the exception, perhaps, of one *Phycis Davisellus* and two *Depressaria subpropinquella*, var. *rhodochreella* (beaten out of thatch), nothing worth recording rewarded my exertions at this locality during August, which, indeed, seems a blank month here. A few larvæ of *Diphthera Orion* resulted from assiduous beating in the woods above alluded to, but otherwise larva-hunting was lost labour.—CHARLES J. BUCKMASTER, Sussex Lodge, Wandsworth, S.W.

On the habits of Ebulea stachydalis.—On June 25th, I noticed some well-grown *Stachys sylvatica* in a warm sunny spot under a hill, and on investigation, turned out one lovely *Ebulea stachydalis*, evidently fresh from the pupa; but wet weather came on and I did not see another until July 2nd, after which the storms of wind and rain became most violent, and it was not till July 24th and 25th that I could find the insect in any numbers, and then the majority were spoiled; in fact, they had no chance, they could hardly peep out of a hedge without the risk of being swept away by the wind, and, unfortunately, they do not seem to have sense enough to choose a sheltered hedge. They seem to prefer the lanes, but are only to be found in isolated spots, and not by any means wherein the *Stachys* grows. I think the species was at least a fortnight late this year; indeed, I saw one, badly worn, in the garden, as late as August 6th.

The larva was to be found feeding all through October, and I even met with two on the 5th November, when searching for pupæ of *Amblyptilia acanthodactylus*, which are to be found attached by the tail to the flower spike of the *Stachys*, between two of the whorls of seed vessels, where they look like dried up flowers.—CHARLES G. BARRETT, Pembroke: November 5th, 1877.

On the habits of Diasemia literalis.—At the time when *Diasemia literalis* ought to have appeared, the weather was stormy and wet, and when, on June 4th, it began to mend, I found one specimen, and that one worn. However, I knew that on the bare places which it frequents, one day's rain would be sure to produce that effect, so did not despair, and on the 9th was gratified at finding a few fine specimens, although they were still very scarce, and it was not until four days later that they were to be found in any number.

As was the case last year, they were entirely confined to pasture fields on the hill-sides, where the herbage was most bare and scanty. Here they sheltered themselves behind any little tuft of grass, or in any inequality of ground which would serve as a protection from the wind, but were easily disturbed whenever the sun shone or the air was warm. I found them most active, however, from 5 to 6 p.m., and most difficult to disturb after 6.30 p.m., but suspect that they fly again at night.

The second brood appeared about August 16th (last year it was worn on August 17th), and was not scarce, but the specimens, females especially, were smaller than those of the first brood.

Its time of appearance here seems, therefore, to be the first half of June and the first half of August, and I doubt very much its being out in September.

I can get no clue to the habits or food of the larva. The females do not lay any eggs in confinement, and I have searched the fields in July, lying down on the grass and examining every green thing for indications of larvæ—external, internal, or at the roots—but without the slightest success, yet this *must* have been the time when they were at work.—ID.

Opostega spatulella in Somersetshire.—When in Somersetshire, in September, I found that the thatches about the farms sheltered plenty of *Depressaria ultimella*, *pimpinellæ* and *pastinacella*, and a few *Gelechia vitella*, and with them a minute species, evidently an *Opostega*, new to me. One afternoon, about 6 p.m., when walking with friends, we suddenly found ourselves surrounded by specimens of this *Opostega*, apparently flying down from the tall elms. It was exciting work, since while I tried to box those already netted, my father and sisters were all calling upon me to secure others flying near them. They only flew for a few minutes, long enough to enable me to secure thirty specimens in the few pill-boxes I had, and no clue whatever was obtained to the probable food-plant of the species. When submitted to Mr. Stainton, it proved to be *Opostega spatulella*.—ID.

Leptogramma Boscana and *scabrana* only broods of one species.—A very interesting fact, long suspected, but I think not previously proved, has been worked out this season by my friend, Mr. W. West, of Greenwich. For three years he has been trying to rear larvæ from eggs laid in summer by the female of *Leptogramma Boscana*, and has also tried to obtain eggs of *L. scabrana* in the spring, but without success. Last July he confined all the ♀ *Boscana* that he took in a wide-mouthed bottle, and obtained eggs in small greenish patches on the glass, looking from the outside like mere spots of dirt: this was on July 17th. On the 24th, he found the patches dotted with tiny black specks, and on the next day they hatched. The young larvæ were supplied with elm (*Ulmus campestris*), upon which they fed freely, at first turning down the edge of a leaf and gnawing the surface, but when older, uniting two leaves together and eating from the edge to the mid-rib. On August 20th, they were half-an-inch long, pale green, with a few scattered bristles, head, feet, and plate on 2nd segment, black. On August 28th, they drew two leaves together for the last time, and assumed the pupa state between them. On September 29th, the first imago appeared, a *true scabrana*, and sixteen more followed. *Leptogramma Boscana* and *scabrana* are therefore *proved* to be only the two broods of one species.

The correct name of the species is easily settled: *Boscana*, Fab., dating from 1793; *scabrana*, Steph., subsequent to 1827; and *parisiana*, Gn., 1845. *Boscana*, having the priority, must therefore be retained for this species.—ID.

Description of the larva of Stenopteryx hybridalis.—A specimen of this insect, which I captured at the end of July or beginning of August last, in the New Forest, deposited eggs: these were attached to the sides of the chip box in batches of six or eight, and were slightly oblong, globular, and highly polished, the colour dark olive-green. On 14th August, the infant larvæ emerged, and were dingy-green, with

highly polished intensely black head. Not knowing the proper food, I tried various low plants, but they very soon showed a decided preference for *Polygonum aviculare*. On this plant they fed greedily, and in a few days I put six or eight of them in a warm room, with a view of accelerating their growth, and by this method this lot were full-grown by the end of September.

Length when crawling quite an inch, but when at rest only about three-quarters of an inch: in this position too it is tolerably plump, but when crawling has an attenuated appearance. Head a little wider than the second, but scarcely so wide as the third segment; it is highly polished, has the lobes rounded, and the jaws prominent. Body attenuated a little towards the extremities; it is cylindrical, but the segmental divisions being deeply cut, and each segment plump and rounded, and divided into two sections, give it a very uneven appearance. There is a polished plate on the second segment; skin semi-translucent and glossy, with a tough appearance; tubercles raised, and from each of them springs a short stiff hair.

The ground colour is a warm olive-drab; the head varies in different specimens from reddish-brown to dark sienna-brown, and is more or less marbled with black, the mandibles being black in all cases. The plate on the second segment takes the same colouring as the segments which follow, in some instances, however, being a little browner. Dorsal line dark olive-drab, and being bordered with pale drab is very distinct; outside it is a prettily arranged series, four on each segment (one on each side every section of the segment), of large, round, black polished plate-like marks, and each mark is enclosed in a circle of pale drab. These form the most characteristic markings of the larva. There are no noticeable sub-dorsal or spiracular lines, but there is a pale whitish waved stripe below the spiracles, which are black, encircled with grey. Ventral surface uniformly semi-translucent dark olive-green.

When young, and indeed, until just before its full growth is attained, the larva is much more slender, and the head is then even larger than the third segment.

These larvæ were about the liveliest creatures I ever reared; they wriggled backwards and forwards in all attitudes, excelled in this respect by no *Tortrix*: they reminded me more of young eels than anything else, in both their colour and actions mimicking those creatures most wonderfully. They were, too, very pugnacious, as two coming in contact immediately showed fight, and bit each other with their mandibles most unmercifully.

They formed rather tough, white, glossy, silken cocoons in the corners or on the bottom of the cage, amongst leaves of the food-plant, and all changed to pupæ a day or two after finishing their cocoons. The pupa is large for the size of the moth; is five-eighths of an inch long, glossy, and of the usual shape, except that the case containing the head, eyes, and palpi is considerably narrower and smaller than the thorax; and there is a very peculiar and conspicuous tubercle on each side of the front of the thorax. Colour, pale yellowish-brown, the eye-cases, dorsal stripe, and abdominal divisions dark brown; the hooked anal point, and the eye-like frontal tubercles, alluded to above, nearly black.

The imagoes from these forced larvæ appeared at the end of September; and at the same time the larvæ of the remainder of the brood, which had been kept at a natural temperature, were fast spinning up. At the beginning of October they had all become pupæ, in which state they will now no doubt remain over until spring.—
GEO. T. PORRITT, Highroyd House, Huddersfield: November 3rd, 1877.

Captures of Micro-Lepidoptera in Essex.—During the past season I have had the good fortune to capture, in addition to *Opostega spatulella*, elsewhere referred to, the following Tineina: two *Scythropia cratægella* on June 27th: I also bred several of this insect from larvæ taken on white-thorn; one *Bucculatrix cristatella* on June 4th; two *Cleodora cytisella* on July 12th; one *Bedellia somnulentella* and one *Gelechia lutulentella* on August 23rd; and three *Depressaria ultimella* on September 10th. I may also add that I succeeded last spring in breeding a few specimens of *Nepticula intimella* from mines (Sallow) taken in October, 1876.—W. D. CANSDALE, 4, Gwithavon Terrace, Witham, Essex: November, 1877.

Erotis baltica, McLach.; a *Trichopterous insect new to Britain.*—In part vi (May, 1877) of my Revision and Synopsis of European *Trichoptera*, I described (pp. 325, 326, pl. xxxv) a new genus and species of *Leptoceridæ* under the above name, from specimens taken in the Island of Oesel in the Baltic, and in Finland; all males. My friend Mr. Barrett has just sent me four males, taken by Mr. F. D. Wheeler, in Wiiken Fen, I know not under what circumstances, but probably they were attracted by the ingenious “light” apparatus, noticed in this Magazine, vol. xiii, p. 246. It occurred to me at the time that Mr. Wheeler’s apparatus might prove of great aid in the capture of fen *Trichoptera*.

E. baltica somewhat resembles *Trianodes bicolor*, but the colours are less bright. In structure, *Erotis* agrees with *Trianodes* in the absence of the apical fork No. 5 in the neuration of the posterior wings; but it differs in having a complete “cellula thyridii” in the anterior wings (wanting in *Trianodes*). The complicated arrangement of the anal parts in the ♂ is fully detailed and figured in my work; the ♀ is still unknown.—R. MCLACHLAN, Lewisham: 13th November, 1877.

A new species of Ant found in Britain.

POXERA TARDA, *sp. n.*

Female, length, 2 lines. Shining, rufo-piceous, sparingly covered with a fine yellowish pile. Head punctured, wider than thorax; antennæ and mandibles yellow, approximating at their base; eyes ovate, placed anteriorly at the sides of the head; ocelli in a triangle on the vertex, a longitudinal impressed line runs from the anterior ocellus to the insertion of the antennæ. Thorax oblong-ovate, slightly punctured; clypeus and femora rufo-testaceous, tibiae and tarsi yellow. Abdomen slightly punctured, the scale of the petiole as high as the first segment; a constriction between the first and second segments; the apex dull yellow. On the fore part of the head, and on the posterior part of the abdomen a few strong hairs are emitted.

Worker major, length, $2\frac{1}{5}$ lines. Shining, ferruginous. Head very large in proportion to thorax, without ocelli; on the anterior part of the head in the position of the eyes in the female, is a minute spot surrounded by a dark ring, and looking very like an ocellus. The antennæ and legs the same colour as the body, the former rather darker at the apex. The head more lightly punctured than in the female, or in the small worker.

Worker minor, length, $1\frac{1}{2}$ lines. Resembles female generally, but differs in being of a lighter rufo-fuscous colour. Without eyes or ocelli. A longitudinal impressed line running from the base of the head to the insertion of the antennæ.

Male unknown.

In mentioning the workers of this species in the August number of this Magazine, I made a mistake in saying that they were wrinkled. The specimens I possessed at that time had all been killed in water, and the minute hairs covering the body had, in the process of drying, become stuck to it, looking so exactly like wrinkles that both Mr. Smith and myself mistook them for such, and afterwards, however, found they were punctured and not wrinkled. The females appeared in June, but I could find no males. The labial palpi are two-jointed, and the maxillary two-jointed. The whole insect appears to be more robust than *Ponera contracta*, the antennæ and legs being thicker. The colony has evidently been long established in the conservatory, as I have found wings and other parts of the insects among the dust on ledges which have not been disturbed for years. The insects seem very sleepy, never running quickly when disturbed, I therefore thought "*tarda*" an appropriate name. During June, I found two females drowned in a water-butt some distance from the conservatory. A species of *Myrmica* inhabits the same bed with the *Ponera*, and associates with them in perfect harmony.—R. S. CHARLESLEY, St. Giles Road, Oxford: November, 1877.

Notes on Hymenoptera captured in 1877.—I have made the following captures this summer, which I think may be worth recording.

At Hayling Island, on 30th June, I met with a ♂ & ♀ of the rare *Prosopis dilatata*, and also several males of *P. varipes*, all flying round the flowers of brambles; unfortunately, I did not discover what species I had taken till I got home, or I might probably have secured more specimens. I also took a small ♂ *Halictus*, which does not seem to agree with any of the species described as British, and which I hope may prove to be new.

At Southwold, Suffolk, in August, I took *Andrena nigriceps*, several ♂ and two ♀, flying about and settling on various flowers in a waste piece of ground near the sea. These males I felt convinced were *nigriceps*, but I could not make them agree with the description in Mr. Smith's British Aculeate Hymenoptera; I therefore showed them to him on my return, and he quite agrees with me, that they are probably the true males of *nigriceps*, and he thinks that the one he has described will prove to be that of some other species. I took another ♂ specimen of this same insect at Tunbridge Wells, in May. It resembles *3-dentata*, ♂, of which at first I thought it was a variety, but may be distinguished from it by the stouter and larger build of the insect, the bright brown pubescence, and the want of the testaceous apex to the abdomen. I also took the following: *Andrena 3-dentata*, ♂, several, *A. decorata*, commonly, *A. denticulata*, ♂, *A. coitana*, several; *Halictus aratus*, *H. leucopus*, ♂; *Prosopis punctulatissimus* ♂, *P. perforator*, ♀; *Cilissa 3-cincta*; *Stelis aterrima* on *Senecio*, six specimens; and *Megachile versicolor* †.

On the 20th October! in my father's garden at Worthing, under a wall, in the bright sunlight, I took the following: *Cemonus unicolor*, 3, one of which I detected entering a hole at the top of a stick put in the ground to mark certain plants; I found the pith of the stick cleared out for some two or three inches, and two or three larvæ carefully stored away in it. *Odynerus parietinus*, *Vespa sylvestris*, *Halictus cylindricus*, ♂, common, *H. albipes*, ♀, *H. leucozonius*, ♀, *H. morio*, ♂ & ♀, common, *H. minutissimus*, ♂ & ♀, common, *Andrena bicolor*, ♀, *Osmia areca*, ♂, three species of *Bombus*, and *Apis mellifica*. It certainly was an exceptional day, but I should not have thought it possible that so many species would have appeared at such a late time of year.

I have been giving a good deal of attention lately to the small black species of *Halictus*, belonging to the group that includes *minutus*, and I find in my collection two species which I think are certainly new to this country. I have two or three of each of them. They both differ from *minutus* in having the punctuation of the thorax much stronger; in one, the face is considerably longer than in *minutus*, in the other, decidedly shorter. The short-faced one Mr. F. Smith has identified for me with *pauillus*, Schenk, a specimen of which he brought for my examination; the long-faced one has yet to be made out. The specimens that I possess of each are females, and I am very anxious to get as many males as possible of this section to examine, hoping to be able to find mates for my two new females. Should any of the readers of this Magazine have any which they would entrust to my care, they would greatly oblige by letting me see them.—E. SAUNDERS, Holmesdale, Upper Tooting: 1st November, 1877.

Notes on Hemiptera taken at Southwold.—During my stay at Southwold, I took two rare species of *Hemiptera*, one of which, so far as I know, has not occurred before in this country, viz., *Orthotylus prasinus*, Fall., Reut. In the August No. of this Magazine, p. 62, Dr. Reuter points out the differences between *Orth. prasinus*, *viridinervis*, and *Scotti*. *Scotti* is the one we have all known for so long under the name of *viridinervis*, D. & S., = *prasinus* of my synopsis; *viridinervis* was added to our list by Dr. Reuter, who took it last year in Scotland, and Mr. Norman has taken it there commonly since; the true *prasinus* is now brought forward as British for the first time. I only found a single specimen on an ash tree, but its characters are so well defined, that I have no hesitation in referring it to Fallén's species, according to Dr. Reuter's diagnosis, which so exactly points out the distinguishing characters between this and *viridinervis*, Kirsh., that I need not repeat all the differences. The shorter basal joint, and the absence of longer hairs on the second joint of the antennæ, are among the most prominent of them.

The other species worthy of note is *Brachysteles pilicornis*, of which I took two females under an elm hedge by sweeping; I also saw one or two larvæ. Had I known at the time that the species was to be found under elm bark, I have no doubt I should have found many more; but I had no books with me to refer to, and did not find out about it till too late. So far as I know, only one specimen has been taken in England before by Dr. Power, without note of locality.—ID.

On the occurrence of Orthotylus prasinus, Fall., in England.—In the August No. of this Magazine (p. 62 ante), Dr. Reuter has clearly demonstrated that *Orthotylus prasinus* of Mr. Saunders' "Synopsis" is not identical with the insect described by Fallén under that name. I have two specimens in my collection, taken off a plum tree, in all probability in Yorkshire, that agree in every particular with *prasinus*, Fall., only excepting the third joint of their antennæ, which has a length of $13\frac{3}{4}$ to 7 in the fourth joint, consequently, the fourth joint is slightly in excess of half the length of the third. Dr. Reuter, however, states, that in his typical specimen of *prasinus*, Fall., the third joint is about twice the length of the fourth, and, from what he subsequently mentions, I understand him to imply that the fourth joint is rather under than over half the length of the third; notwithstanding this, there is no doubt that my insect is the true *prasinus*, Fall., and quite distinct from *Orthotylus Scotti*, Reuter.—A. BUCHAN-HEPBURN, Junior Carlton Club: November 3rd, 1877.

Note on Orthotylus Saundersi, Reut., or Tinicephalus obsoletus, Fieb.—I wish to say a few words on this subject, chiefly as an apology to Messrs. Douglas & Scott for having so unhesitatingly removed the species that they had placed in the genus *Tinicephalus* to that of *Orthotylus*, on account of the absence of the hamus in the wing-cells of the specimens under my examination; whereas, it now appears, that there are really two distinct forms, one with and the other without this character. I had been examining two males without the hamus; Messrs. Douglas & Scott, and Dr. Fieber, who originally described *Tinicephalus obsoletus*, had before them specimens with it; and therefore, although the observations I made on my specimens were so far correct, yet I was, of course, not justified in so rapidly jumping to a conclusion that I was right and that they must be wrong, and I am glad to be able to say so here.

Now, the question remains, are there, as Dr. Reuter suggests (p. 120 *ante*), two species almost exactly alike in separate genera, or only one, and, if one, is it an *Orthotylus*, a *Tinicephalus*, or a *Macrocoleus*? Should the hamus prove to be not an essential character, there would be, so far as I know, great difficulty in distinguishing between these three genera as now constituted. For myself, I cannot but feel convinced that we are regarding two forms of the same species; but the absence of the hamus occasionally in a single species, may not be sufficient to upset a distinction which separates two apparently natural groups. If we still regard the hamus as generically distinctive, *obsoletus* will have to be a *Tinicephalus* or a *Macrocoleus*, and its name will at any rate be suggestive of the occasionally obsolete hamus. I cannot think that it can be a hybrid with any of the other green species, as, if so, I think one would find the specimens more inclining to green in colour, or at any rate, partaking of some other of the characters of *Orthotylus* than the negative one of the absence of the hamus.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: 7th November, 1877.

Captures of Hemiptera-Heteroptera in Morayshire.—During the past summer I have been collecting *Hemiptera* in the neighbourhood of Forres, in Morayshire, and send for publication a list of my captures. From the northern position of Forres the list will be interesting to those who pay attention to the geographical range of species. With few exceptions my captures have been seen by Mr. E. Saunders, who kindly undertook to name them for me. The species not otherwise denoted are common.

Piezodorus lituratus.

Acanthosoma griseum and *A. dentatum.*

Tropicoris rufipes.

Gastrodes ferrugineus.

Nysius thymi (on thyme and by sweeping near the sea-shore).

Eremocoris plebeius (local, under stones among heather under pine-trees).

Scolopostethus affinis, and *S. ericetorum* (rare).

Macrodema micropterum (occasional, among heather).

Drymus sylvaticus (not common), *D. brunneus.*

Peritrechus luniger.

Stygnocoris sabulosus and *S. arenarius.*

Ischnorrhynchus didymus (occasionally).

Monanthia cardui (all the year round).

Acalypta brunnea (occasional, in moss), and *A. parvula* (in moss on trees).

Miris calcaratus, *M. holsatus* (nearly all the year round), and *M. lævigatus* (Culbin Sands).

Megalocera ruficornis.

Teratocoris Saundersi.

Leptopterna ferrugata.

Phytocoris populi (on willows), *P. tiliæ* (on elm, &c.), and *P. pini*.

Calocoris striatellus (on hazel), *C. striatus* (Dunphail, taken by Dr. Reuter), *C. roseo-maculatus* (on *Ononis*, &c.), and *C. bipunctatus*.

Rhopalotomus ater (not common).

Dichroscytus rufipennis.

Peciloscytus Gyllenhali (rare).

Hydrodema pinastri.

Plesiocoris rugicollis (rare, Loch Romach, on dwarf sallow; Dulsie Bridge, on hazel. Both stations are elevated).

Lygus pabulinus, *L. contaminatus*, *L. viridis* (not common), *L. pratensis* (everywhere nearly all the year round; the var. *punctatus*, Reuter, on pines among heather), *L. pastinacæ*, *L. Kalmi* and the var. *pellucidus* (not rare), and *L. cervinus* (on ash and lime trees).

Monalocoris filicis (on *Pteris*).

Bryocoris pteridis (Relugas, on *Lastrea oreopteris*, &c.: one developed specimen).

Pithanus Mærkeli (not unfrequent).

Cyllocoris histrionicus.

Ætorrhinus angulatus.

Chlamydatus ambulans, and *C. caricis*.

Dicyphus globulifer (rare, on *Lychnis vespertina*), *D. pallicornis* (on foxglove, nearly all the year round), and *D. errans* (on *Stachys*).

Macrolophus nubilus (rare, on *Stachys*).

Malacocoris chlorizans.

Heterocordylus tibialis.

Orthocephalus coriaceus (rare, on *Ononis*).

Ortholygus bilineatus (on aspens and rowan, Relugas and Dulsie Bridge), *O. viridinervis*, Kirschb. (everywhere, on *Ulmus montana*, July to September), *O. fuscescens*, Kirschb. (abundant on pines, Cluny Hill, but very local: new to our lists), *O. nassatus*, *O. tenellus* (rare), *O. Saundersi* (on whin), *O. adenocarpi*, Ferris, = *Douglasi*, Saund. (rare, on oak and broom), *O. chloropterus*, and *O. ericetorum*.

Harpocera thoracica (on oak).

Phylus melanocephalus, *Ph. coryli*, and *Ph. arellanæ* (on hazel).

Plesiodesma pinetellum (on pine).

Psallus betuleti, *Ps. ambiguus*, *Ps. variabilis*, *Ps. obscurellus* (rare and local), *Ps. sanguineus*, *Ps. lepidus*, *Ps. roseus*, *Ps. alnicola* (not common), *Ps. varians*, *Ps. Kirschbaumi* (rare), *Ps. diminutus*. I have a *Psallus* from sycamore and sloe, with spotted clavus, which I thought might be new; Dr. Reuter, however, refers it to *diminutus* as a var.

Plagiognathus arbustorum, and *P. viridulus*.

Tetraphteps vittatus.

Acompocoris pygmaeus (common), *A. alpinus* (not rare).

Tennostethus nigricornis (rare, Sanquhar and Loch Romach, on pines).

Anthocoris nemorum, and *A. nemoralis*.

Lycocoris campestris (rare).

Ceratocombus coleoptratus (rare, under stones).

Cryptostemma alienum (Findhorn Banks).

Ploiaria vagabunda (rare, on yew).

Nabis limbatus, *N. ferus*, *N. rugosus* (not common), *N. ericetorum*.

Saldia scotica, *S. littoralis* (near the rifle butts), *S. orthochila* (on dry banks),

S. opacula (rare), *S. e-album*, *S. pallipes*, *S. saltatoria*, and *S. cincta*.

Hydrometra stagnorum (rare).

Gerris thoracica.

Velia currens.

Nepa cinerea (rare).

Notonecta glauca.

Corixa Geoffroyi (local), *C. præusta*, *C. hieroglyphica* (local), *C. lugubris* (rare, pond at Moy), *C. Stali* (rare), *C. Linnaei*, *C. Sahlbergi*, *C. striata*, *C. verrucosa*, *C. moesta*, *C. Fabricii*, *C. semistriata*, *C. venusta*, *C. fossarum* (rare, Loch of the Blairs), *C. Scotti*, *C. variegata*.

Cymatia Bonsdorffi (local).—Gt. NORMAN, Cluny Hill, Forres : October, 1877.

Linnean Society (*Insects of the Arctic Expedition*) : 15th November, 1877. Dr. J. Gwyn Jeffreys, F.R.S., &c., in the Chair.

A "Report on the *Insecta* (including *Arachnida*) collected by Capt. Feilden and Mr. Hart, between the parallels of 78° and 83° N. latitude, during the recent Arctic Expedition," was read by its author, Mr. McLachlan: the following is a brief abstract :

Commencing with some eulogistic remarks concerning the naturalists of the Expedition, especially referring to Capt. Feilden, R.A., who was attached to the "Alert" (Mr. Hart, who occupied a similar position on board the "Discovery," being a botanist), the author said he regarded the insects as the most important of all the zoological collections made during the voyage. The *Arachnida* had been included in the materials placed in his hands by Capt. Feilden (with the consent of the Council of the Royal Society). Of these, the true spiders had been worked out by the Rev. O. Pickard-Cambridge, and the *Acarida* were being studied by Mr. Andrew Murray. The *Diptera* had been examined by Baron Osten-Sacken; the other insects (with occasional help) by the author. The materials solely referred to the Fauna of Grinnell Land, on the west side of Smith Sound, that of Greenland having been already tolerably well examined. From this high northern region, about forty-five species of true insects (excluding *Arachnida*, which numbered six species of *Aranidea*, and about the same of *Acaridea*) were brought, including five species of *Hymenoptera* (two of them *Bombi*), only one beetle (*Quedius fulgidus*), thirteen of *Lepidoptera*, about fifteen of *Diptera*, one of *Hemiptera* (the walrus parasite, *Hematompinus trichechii*), seven of *Mallophaga* (bird-lice), and three of *Collembola* (*Poduridæ*). The *Bombi* frequented the flowers of a *Pedicularis*, and were probably instrumental in effecting the fertilization of that plant. Of the *Lepidoptera*, five species (included in thirty-five specimens) were showy butterflies, viz.: *Colias Hecla*, var., *Argynnis polaris*, *A. Chrysolea*, (protean vars.), *Chrysophanus phæas*, var., and *Lycana Aquilo*; the other *Lepidoptera* were represented by *Dasychira groenlandica* (the large hairy larvæ of which were found abundantly almost up to the highest point reached), two *Noctuidæ* (a new species of *Mamestra*?, and *Plusia parilis*), one Geometer (*Psychophora Sabini*), a new species of *Scoparia* (nearly black), and three *Tortricidæ*. The *Diptera* included the common arctic *Tipula arctica*, *Culices*, a *Trichocera*, *Chironomi*, *Muscidæ*, and *Tochiniidæ*.

The reader commented upon this remarkable and quite unexpected result, and alluded, in connection therewith, to the fact that Prof. Oliver had determined over sixty species of flowering plants from the same region. Capt. Feilden had furnished useful notes on habits, &c. About one month in each year was the longest period in which it was possible for insects, and especially butterflies, to appear in the perfect state, and six weeks was the limit for plant-feeding larvæ, hence it was considered probable that more than one year was necessary for the undergoing of all their transformations, though the continuous day in the short summer would favour butterfly larvæ, as it did the perfect insects, which were on the wing all the twenty-four hours, and were often more common at "midnight" than at mid-day, supposing the sun's face not to be obscured by clouds or snow-showers. Many Lepidopterous larvæ were found in the stomachs of gulls and terns, and many must fall victims to the attacks of parasitic *Hymenoptera* and *Diptera*. Of the species of the latter order, the most interesting points were the occurrence of "blow-flies," if offal were thrown away, or the carcass of a musk-ox lay on the ground, and the time of appearance of the genus *Trichocera*, which, though known with us as the "winter-gnat," was there necessarily found only after midsummer.

After alluding to the evidences of a Mioocene Flora once existing near the North Pole, that must strongly have resembled that now possessed by the Southern States of America, it was contended that this was followed by an "Arctic," or circum-polar, Flora (and Fauna), which culminated before the glacial epoch; when the Polar ice-cap began to move southward it destroyed this Fauna, or drove what remained of it before it; on the recurrence of an increasing temperature, the survivors began to move northward; some settled on the tops of high mountains and established the existing Alpine Fauna, whereas stragglers reached the home of their ancestors in the Arctic regions and became the progenitors of the species now occurring there. What is practically this theory was first advanced in 1846 by Edward Forbes, and has since, in a more or less modified form, been accepted by Darwin, Lyell, Hooker, and others in England, and by Paekard, Grote, &c., in America. The introductory remarks were concluded with a brief notice on the causes of the great variability exhibited in both Alpine and Arctic insects, which it was considered might be due partly to an enforced lengthened period in the undergoing of their transformations, and especially to the elements of isolation or segregation that necessarily exist.

A selection of the insects collected was exhibited, and Mr. Jenner Weir exhibited some species captured by him at between 7,000' and 8,000' on the Alps, showing the great resemblance in the Arctic and Alpine forms.

Captain Feilden, in making some observations, called especial attention to the extent to which insect life is destroyed by birds, and exhibited microscopic slides of the contents of the stomachs of several birds, which consisted almost entirely of insect remains.

Dr. Rae alluded to the abundance of butterflies in the northern parts of the Hudson Bay Territory.

Sir G. Nares, in saying a few words on the conditions under which insects maintain an existence in these high latitudes, alluded especially to the uniform temperature maintained beneath the snow, and considered that this no doubt acted beneficially. He also alluded to the amount of daylight in the brief summer; taking a given period, there was as much actual daylight as in England.

Dr. Trimen made some remarks on the botanical features of the district. Dr. Murie and others also took part in the discussion.

ON THE LIFE-HISTORY OF SOME BLISTER BEETLES.

BY PROF. C. V. RILEY.

(Extracted from the Transactions of the Academy of Science of St. Louis, vol. iii).

It is generally stated by writers on the Hive-bee that the Oil-beetle (*Meloë*) is one of its parasites. The possibility that our more common blister-beetles were similarly parasitic on bees, taken in connection with the frequent complaints from apiarians of the wholesale death of bees from causes little understood, led me, some years since, to pay attention to the biological characteristics of the blister-beetles, in the hope of ascertaining whether or not they really bear any connection with bee mortality. From these investigations I am satisfied that *Meloë* is only parasitic on the perfect Hive-bee as it is on so many other winged insects that frequent flowers; and that it cannot well, in the nature of the case, breed in the cells of any social bee whose young are fed by nurses in open cells.

I have had no difficulty in getting the eggs or the first larvæ of several of our Vesicants, and described some of them at the Hartford (1874) Meeting of the Am. Ass. Adv. Sc.; but these young larvæ refused to climb on to plants furnished to them, or to fasten to bees or other hairy insects. Nor would they nourish upon honey, bee-bread, or bee larvæ on which they were placed. They showed a proclivity for burrowing in the ground, and acted quite differently from those of *Meloë* or *Sitaris*, which not only readily attach to bees in confinement, but which, in the case of *Meloë*, I have known to so crowd upon mature Hive-bees as to worry them to death and cause extended loss in the apiary. Explorations into the nests of solitary bees gave no clue, and, in fact, the immense numbers in which the more common blister-beetles occur rendered a parasitic life upon such bees highly improbable. In sweeping plants and flowers with the net, I had never met with any of the first larvæ with which I had become familiar, as already indicated; while I had on several occasions, in digging ground where there was no trace of bee nests, met with the curious pseudo-pupa so characteristic of the Family. While analogy and the law of unity of habit in species of the same family pointed, therefore, to a parasitic life, I began to conclude, from the facts just stated, that the parasitism was of another kind, having satisfied myself by various experiments that the triangulins did not feed on roots. Few discoveries are stumbled upon. We find, as a rule, that only which we anticipate or look for. Late last fall, in digging up the eggs of the Rocky Mountain Locust (*Caloptenus spretus*) at Manhattan, Kansas,

the pseudo-pupæ were not unfrequently met with. The thought at once occurred to me that locust eggs might be the proper food for these blister-beetle larvæ, and it was encouraged by the fact that the Meloids abound most in those dry western regions where the *Aceridiide* most prevail, and by a pretty distinct recollection, which my notes support, that the years when the Vesicants were most injurious to potatoes had been preceded by dry falls, during which there had been much locust injury and, necessarily, unusual locust increase. The suspicion thus raised, that these blister-beetles preyed in the preparatory states upon locust eggs, was confirmed last spring by finding the larvæ of different ages within the egg-pods and devouring the eggs of *Caloptenus spretus*.

From such larvæ preying on the eggs of *spretus*, I have reared the unicolorous form of *Epicauta cinerea* (Forster), or the Margined Blister-beetle; the *Epicauta pennsylvanica* (De Geer), or the Black Blister-beetle; the *Macrobasis unicolor* (Kirby), or the Ash-gray Blister-beetle; and the form of it described as *murina* by Le Conte, or the Black-rat Blister-beetle.

Since then I have found it very easy to trace the larval habits and development of the two more common potato-feeding species around St. Louis, viz., the Striped Blister-beetle (*Epicauta vittata*, Fabr.) and the Margined Blister-beetle (*marginata*, Fabr.) just alluded to.

Careful examination of locust-eggs in the vicinity of potato fields frequented by these beetles, shows a varying proportion of the egg-pods affected, and in some locations nearly every pod of the Differential Locust (*Caloptenus differentialis*) will contain the *Epicauta* larva. The eggs of this locust are laid in large masses of 70 to about 100. The pod is but slightly bent, rather compact outside, while the eggs are irregularly arranged, and capped with but a shallow covering of mucous matter. It is the egg-pod of this species which the larvæ of the two Blister-beetles in question prefer; for, while they will feed upon those of other species in confinement, I have so far found none in the deeper-necked, narrower, more compact egg-pods either of *Caloptenus femur-rubrum*, *C. Atlantis*, or *Ædipoda sulphurea*, in which the eggs are regularly and quadrilinearly arranged as in those of *C. spretus*. Not only have I found a large proportion of the egg-pods of *C. differentialis* naturally infested with these *Epicauta* larvæ, but I have succeeded in hatching and rearing numbers in-doors, and have them even at this writing (Oct. 30th) by hundreds, in all stages from the first larva to the pseudo-pupa.

From July till the middle of October, the eggs are being laid in

the ground in loose, irregular masses of about 130 on an average—the female excavating a hole for the purpose, and afterwards covering up the mass by scratching with her feet. In confinement, she sometimes omits both these instinctive acts, and oviposits on the surface of the ground. She lays at several different intervals, producing in the aggregate probably from four to five hundred ova, judging from examinations made on the ovaries of some that were gravid. She prefers for purposes of oviposition the very same warm sunny locations chosen by the locusts, and doubtless instinctively places her eggs near those of these last, as I have on several occasions found them in close proximity. In the course of about 10 days—more or less, according to the temperature of the ground—the first larva or *triungulin* hatches. The hatching takes place without the aid of any *raptor ovi*, for the egg-shell is so delicate that it easily splits, from mere expansion, along the back near the head, and breaks and shrivels up with the escape of the larva. These little *triungulin*s, at first feeble and perfectly white, soon assume their natural light brown colour and commence to move about. At night or during cold or wet weather, all those of a batch huddle together with little motion, but when warmed by the sun they become very active, running with their long legs over the ground, and prying with their large heads and strong jaws into every crease and crevice in the soil, into which, in due time, they burrow and hide. Under the microscope, they are seen to fairly bristle with spinous hairs, which aid in burrowing. As becomes a carnivorous creature whose prey must be industriously sought, they display great power of endurance, and will survive for a fortnight without food in a moderate temperature. Yet in the search for locust eggs many are, without doubt, doomed to perish, and only the more fortunate succeed in finding appropriate diet. Upon the slightest disturbance they curl up in a ball with the head bent pretty closely on the breast.

Reaching a locust egg-pod, our *triungulin*, by chance, or instinct, or both combined, commences to burrow through the mucous neck, or covering, and makes its first repast thereon. If it has been long in the search, and its jaws are well hardened, it makes quick work through this porous and cellular matter, and at once gnaws away at an egg, first devouring a portion of the shell, and then, in the course of two or three days, sucking up the contents. Should two or more *triungulin*s enter the same egg-pod, a deadly conflict sooner or later ensues until one alone remains the victorious possessor. By the time the contents of an egg are consumed, the body of the parasite has perceptibly

increased so that the white sutures between the segmental plates show conspicuously, especially as there is a tendency on the part of the animal to curve its body, and bring the sutures more into relief. A second egg is attacked and more or less completely exhausted of its contents, when a period of rest ensues, the triungulin skin splits along the back and there issues the *Second Larva*—white, soft, with reduced legs and quite different in general appearance from the first. This moult is experienced about the eighth day from the first taking of nourishment. The animal now naturally lies in a curved position, but, if extracted from the egg-pod, will stretch itself and move with great activity, reminding one very strongly of many Carabid larvæ, for which reason I would designate this as the *Carabidoid* stage of the second larva. After feeding for about another week, a second moult takes place, the skin, as before, splitting along the back and the new larva, hunching, out of it until the extremities are brought together and released almost simultaneously. This kind of moulting, which is characteristic of our blister-beetles up to the pseudo-pupal state, is exceptional among insects, the skin being ordinarily worked backward from the head. The modification at this moult is slight. The mouth-parts and legs become rudimentary and the body takes on more fully the clumsy aspect of the typical Lamellicorn larva, for which reason I designate this as the *Scarabæidoid* stage of the second larva.

Another six or seven days elapse, and the scarabæidoid skin is rent and shed with but slight modification in the form and characters of the animal. In this, the *Ultimate* stage of the second larva, the creature grows apace, its head being constantly bathed in the rich juices of the locust eggs, which it now rapidly sucks or more or less completely devours. The colour is more yellowish than it was before, and the power to stretch and travel on the venter on an even surface is still retained. In another week it forsakes the remnants of the pabular mass, and, by burrowing a short distance in the clear soil, avoids the deleterious decaying influences of these egg remnants. In the soil it forms a smooth cavity, within which it lies stretched on one side, motionless and gradually contracting. The skin separates and becomes loose at the end of the third or fourth day, when it splits on the top of the head and thoracic joints and is worked toward the extremity, but never fully shed. The mouth-parts and legs are now quite rudimentary and tuberculous, the soft skin rapidly becomes rigid and of a deeper yellow colour, and we have what has been called the semi-pupa. The term pseudo-pupa given it by Fabre is more appropriate, and I should prefer myself to call it the *Coarctate Larva*, for

it is nothing but a rigid and dormant larval stage, having its counterpart in the well known "flaxseed" stage of the Hessian-fly larva and in the so-called coaretate pupa of the *Diptera* generally. A similar dormant but less rigid larval stage occurs with many *Tenthredinide* in *Hymenoptera*, and, in fact, the summer dormancy of certain Lepidopterous larvæ and the winter dormancy of others is analogous. We find something similar, therefore, in all the Orders undergoing complete transformations, but in no insects is the change so marked and exceptional or the freeing of the subsequent larva from the coaretate larva so striking as in these *Meloidæ*. The insect has the power of remaining in this coaretate larval condition for a long period, and generally thus hibernates.

In spring the coaretate larval skin is, in its turn, rent on the top of the head and thorax, and there crawls out of it the *Third Larva*, which differs in no respect from the ultimate stage of the second larva already mentioned, except in the somewhat reduced size and greater whiteness. The coaretate skin, when deserted, retains its original form almost intact. The third larva is rather active, and burrows about in the ground; but while there seems to be no reason why it should not feed, nourishment is not at all essential, and all my specimens have, in the course of a few days, transformed to the true pupa without feeding. In the transformation to pupa the third larval skin is worked into a wrinkled mass behind, as is also the skin of the true pupa when shed. The pupa state lasts but five or six days, and before the wings of the imago are fully expanded, or the abdomen contracted, the general aspect of *Epicauta* forcibly recalls the mature *Henous*.

The period of growth, from the first feeding to the coaretate larva, averages, as will be gathered from the foregoing, about a month; yet in the month of September, out-doors, under screens where I have had the Differential Locust oviposit for the experiment, I have known the full larval growth of *vittata* to occupy but 24 days. As this species occurs in the beetle state as early as June in the latitude of St. Louis and as late as October, there are possibly two annual generations here and farther south.

LARVAL HABITS OF MACROBASIS AND HENOUS.

The characteristics of the triangulins of the blister-beetles, represented by *Epicauta* and *Henous*, are remarkably similar, and point to unity of habit. The slight differences of some are given in the appended descriptions. The same holds true of the characters of the second, coaretate and third larva and of the pupa of *Epicauta* and *Macrobasis*. They are precisely alike; so that, while appreciable

differences may be found in the triangulins, it is doubtful whether the subsequent developmental stages will indicate specific or even generic differences in species of similar size in these three genera.

That the eggs of *Epicauta* may exceptionally hibernate is possible, but, from their delicate nature, improbable. That the triangulins frequently do so there can be no doubt, especially in species like the Black blister-beetle, which is found on the flowers of *Solidago*, *Eupatorium*, etc., till the end of October, and continues laying till frost. I have at the present time many of these last that are quietly huddled together, and, with the winter temperature, will doubtless remain so; while others have worked in between the locust eggs, there evidently to remain without feeding till spring opens. I have also found as many as five triangulins of this species curled up in the deep red mucous matter that surrounds the eggs of *Ædipoda phanacoptera*—all numb and torpid, and evidently hibernating.

CONCLUSION.

From the foregoing history of our commoner blister-beetles, it is clear that while they pass through the curious hypermetamorphoses so characteristic of the family, and have many other features in common, yet *Epicauta* and *Macrobasis* differ in many important respects from *Meloë* and *Sitaris*, the only genera hitherto fully known biologically. To resume what is known of the larval habits of the family, we have :

- 1st.—The small, smooth, unarmed, tapering triangulin of the prolific *Sitaris*, with the thoracic joints sub-equal, with strong articulating, tarsal claws on the stout-thighed but spineless legs, and, in addition, a caudal spinning apparatus. The mandibles scarcely extend beyond the labrum; the creature seeks the light, and is admirably adapted for adhering to bees but not for burrowing in the ground. The second larva is mellivorous, and the transformations from the coarctate larval stage all take place within the unrent larval skin.
- 2nd.—The more spinous and larger triangulin of the still more prolific *Meloë*, with long caudal setæ, but otherwise closely resembling that of *Sitaris* in the femoral, tarsal and trophal characters, in the sub-equal thoracic joints, in the unarmed tibiæ, and in the instinctive love of light, and fondness for fastening to bees. The second larva is also mellivorous, but the later transformations take place in the rent and partly shed skins of the second and coarctate larvæ.
- 3rd.—The large and much more spinous triangulins of the less prolific *Epicauta*, *Macrobasis*, and *Henous*; with unequal thoracic joints, powerful mandibles and maxillæ, shortened labrum, slender femora, well-armed tibiæ, slender, spine-like less perfect tarsal claws—combined with an instinctive love of darkness and tendency to burrow and hide in the ground. The second larva takes the same food as the first, its skin is almost entirely cast from the coarctate larva, while the subsequent changes are independent and entirely free of the shell of this last.

LARVAL HABITS OF CANTHARIS.

The question naturally arises here, whether *Cantharis*, in its larval habits, will most agree with *Meloë* and *Sitaris* or with *Epicauta*. The triangulin, except in becoming almost black, has much in common with *Meloë*, in the sub-equal thoracic joints, the toothless mandibles, and the long antennæ; also in its habit, observed by

Lichtenstein, of fastening to bees. The fact that it can nourish on honey, though it does not appear to do so freely, would also indicate that it breeds in the nests of solitary bees. Nevertheless, in the slender thighs and the caudal and abdominal characters it agrees more nearly with *Epicauta*, and in the stage following the first moult the legs are still quite long and the general aspect much like the carabidoid stage of that genus. I should not be surprised, therefore, if *Cantharis* also nourished on locust eggs, and I hope that my friends in the South of France will not fail to make the test.

WHAT IS KNOWN OF THE LARVAL HABITS OF OTHER MELOID GENERA.

Mylabris, Fabr. (*nec* Geoff.), according to V. Mayet, is much less prolific than any Meloids so far observed. The egg is 2.5 mm. long and half as wide,⁶ with a tolerably thick shell, and the embryo more fully bent within it. The triungulin has many of the characters of *Epicauta*, judging from the published description (*Ann. Soc. Ent. de Fr.*, 1876, Bull. p. exevi), which is, however, not sufficiently detailed as to the trophi. I doubt not that the genus will be found to infest locust eggs.

Horia, Fabr., from what little is known of it, would seem to have a similar partial parasitism to *Meloë*, but on Carpenter-bees.

Tetraonyx, Latr., was found by Guérin-Ménéville in places frequented by Humble-bees.

The eggs of *Apalus*, Fabr., as well as its triungulin, are said to resemble those of *Meloë*.

Zonitis, Fabr., is known to develop in the cells of *Osmia* and *Anthidium*, and to have a coarctate larva much like that of *Sitaris*.

ENQUIRY ABOUT PLANT LICE.

BY JULES LICHTENSTEIN.

Having been already for eight or nine years very much engaged in observations on the biology of the grape root-lice (*Phylloxera vastatrix*), and other Aphidians of the same or allied genera, I expected to be soon in a position to express some new ideas on their metamorphoses; but, having lately described, as *not yet known*, the sexuated forms of *Schizoneura corni*, F., and *Vacuna dryophila*, Heyden, a French entomological paper advises me that the English naturalist Huxley, has, about twenty years ago, already spoken of the female *Vacuna* in the Transactions of the Linnean Society.*

As it is quite impossible, in present times, for any man to know all that has been published, in all countries, on any subject, I have come to the conclusion to send you a short notice on the actual state of my observations, and to ask your readers if they are already aware of any similar observations on the same insects.

I notice the following stages of life in *Phylloxera quercus*, a species in which I could best follow the complete cycle of existence. A large mother louse appears at the beginning of May, and lays small eggs under the leaves of a kind of oak very common in our parts (Mont-

* "On the agamic reproduction and morphology of Aphis," *Trans. Linn. Soc.*, xxii pt. 3, 1858), pp. 193-236, pls. 36-40.

pellier), *Quercus coccifera*; the lice which come out of these eggs grow very quickly, and, after four moults of five days each, become all winged, and fly away from *Q. coccifera*; they wander to another kind of oak, *Quercus pubescens*, and there lay little eggs under the leaves; the lice which come out of these second eggs grow very slowly, and produce, after their four moults, many generations of apterous lice, all agamous. When the month of September arrives, some of these lice (*not all*) take wing and fly back to *Quercus coccifera*. Here they do not lay eggs, but little ovoid bodies of two sizes, from which issue, in a very few days, apterous lice wanting a rostrum, but having the sexual parts well formed. These are the males and females, and, after copulation, these last lay each *a single* large egg, which is the only true fecundated egg worthy of that name; it passes the winter in the crevices of the oak bark, and gives birth in the spring to the mother louse, which appears in May.

Thus the *Phylloxera*, in the course of the year, takes twice a winged form (I speak here only of the *oak Phylloxera*, the grape one has a rather simpler history): in the first, its progeniture is agamous, and it has a rostrum; in the second, it is sexuated, and without a rostrum. The first phenomenon is already known as *parthenogenesis*; I call the second one *anthogenesis*, finding some analogy between the louse containing a female and some male pupæ, and the flower bud containing the female pistil and the male organs with their pollen. Besides this, there is the exceedingly curious fact of migration from one species of oak to another.

Now, after having given so far the history of an anthogenetic Homopteron, I think a good many other plant-lice, and more particularly, the short-horned ones, *Pemphigus*, *Schizoneura*, *Tetraneura*, &c., will prove, some day or other, to be also wanderers from one plant to another, and anthogenetic.

Also I discover that *Pemphigus Boyeri*, *cærulescens* (grass root-lice), and *Amyela fuscicornis* (also a grass root-louse), give sexuated forms in the spring.

Schizoneura corni gives in summer an agamous, but, in the autumn a sexuated, generation.

Vaccina dryophila is in the same case.

Pemphigus spirotheca, the common gall-louse of the poplar, gives now (in December) sexuated individuals.

I should not be astonished at all, if some ardent follower of entomological observations, find out some day that the gall-lice of the poplars, elms, &c., are only the summer form of the grass root-lice. Who knows?

DIAGNOSES OF A NEW GENUS AND SOME UNDESCRIBED SPECIES
OF AFRICAN PHYTOPHAGA.

BY JOSEPH S. BALY, F.L.S.

CRIOCERIS CORONATA.

Elongata, subcylindrica, flava, nitida capite nigro flavoque variegato, vertice utrinque carina transversa curvata, medio sulco longitudinali separata, instructo; antennis brevibus, robustis, articulis cylindricis, fusco-fulvis; thorace longitudine latiori, subcordato, lateribus postice constrictis, rufo-testaceo, hic illic rude punctato; scutello nigro, elytris infra basin leviter depressis, regulariter punctato-striatis, margine laterali ante medium, fascia basali, postice erosa, altera pone medium, antice et postice erosa, suturaque ab hac fascia ad apicem, nigris.

Var. A. *Elytrorum linea apicali nigra obsoleta, scutello flavo.*

„ B. *Elytrorum fascia posteriori late interrupta.*

Long. 2—2½ lin.

Hab.: Lake Nyassa.

PÆCILOMORPHA AMABILIS.

Elongata, angustata, parallela, fulva, nitida, pube suberecta concolori parce vestita; tibiis, tarsis, antennisque, nigris; thorace transverso, lateribus pone medium abrupte angulatis, disco irregulariter excavato, ad latera sul crebre, medio minus crebre, punctato; elytris subfortiter, suberebre punctatis.

Long. 4¼ lin.

Hab.: Lake Nyassa.

SCELODONTA NATALENSIS.

Anguste oblonga, valde convexa, metallico-cærulea, nitida, pube sericea albida vestita, antennis nigris; thorace crebre, minus rude, transversim elevato-strigoso; elytris oblongis, sat fortiter punctato-striatis; interspatiis transversim rugulosis, ad apicem costatis, pube brevissima vestitis; capite fortiter punctato, inter oculos triangulariter impresso, clypei apice bidentato; femoribus muticis.

Long. 2½ lin.

Hab.: Port Natal.

Readily distinguished from the other African species by its form being more oblong, less attenuated towards the apex, and also by its smoother and less coarsely punctured face.

SCELODONTA JACOBYI.

Oblonga, valde convexa, cuprea, subtilis sat dense, supra parcius, pube albida vestita; antennis extrorsum nigris, elytris purpureo-maculatis, setulis suberectis albidis, seriatim dispositis, vestitis; thorace rude et crebre transversim elevato-strigoso, interstitiis punctatis; elytris thoracis basi multo latioribus, postice attenuatis, fortiter punctato-striatis, interspatiis inerassatis, transversim elevato-strigosis, una infra callum humerale alterisque tribus ante apicem costatis.

Long. 1¾—2¼ lin.

Hab. : Lake Nyassa.

The pubescence on the under surface of the body is arranged in dense patches on the sides of the thorax and on the pleuræ; over the abdomen and breast it is more scattered.

COLASPOSOMA TIBIALE.

Subelongatum, parallelum, modice convexum, viridi-æneum, nitidum, pube adpressa grisea vestitum; antennis extrorsum nigris, his basi, femoribus basi, tibiis tarsisque picco-fulvis; thorace clytris æquilato, fortiter punctato; elytris glabris, oblongis, infra callum humerale longitudinaliter elevatis, pone basin transversim depressis, rude transversim elevato-strigosis, strigis inter se irregulariter reticulatis, interstitiis fortiter punctatis. Long. 2 lin.

Hab. : Lake Nyassa.

COLASPOSOMA VARIANS.

Anguste oblongum, modice convexum, cæruleo-plumbeum, nitidum, supra glabrum, pedibus viridi-tinctis, antennis nigris, articulis basalibus obscure fulvis, viridi-tinctis; thorace elytris fere æquilato, tenuissime granuloso, sat crebre fortiter punctato; elytris rude transversim elevato-strigosis, strigis inter se irregulariter reticulatis.

Var. A. *Corpus viridi-aureum aut æneum.* Long. $2\frac{2}{3}$ —3 lin.

Hab. : Lake Nyassa.

Nearly allied to *Colasposoma tibiale*; separated by its larger size, broader form, different coloration, and still more easily by the absence of the longitudinal elevation on the sides of the elytra, and also of the transverse depression below the basilar space.

MENIUS COSTATUS.

Breviter ovatus, valde convexus, subgibbosus, nitidus, subtus obscure piccus, cupreo vix micans, pedibus antennisque fulvis, femoribus basi summa antennarumque articulo ultimo piccis; supra obscure cupreus, clypeo labroque pallide piccis; thorace transverso, lateribus a basi ad apicem citius angustatis, leviter rotundatis, disco modice convexo, fortiter minus crebre punctato; elytris convexis, singulatim infra basin transversim impressam piccis, ænco-tinctis, sat profunde punctato-striatis; interspatiis convexis, infra basin hic illic abrupte elevatis, pone callum humerale et prope latera interruptis; sulco orbitali postice modice dilatato; prosterno latitudine longiori, lævi, pone medium abrupte ampliato, lateribus anticis elevatis, postice prolongatis et supra discum posticum erectas duas elevatas formantibus; marginibus lateribus posticis reflexis.

Mas, *tarsis anticis articulo basali valde dilatato.* Long. $1\frac{1}{2}$ lin.

Hab. : Guinea, Camaroons.

MENIUS MURRAYI.

Oblongo-oratus, valde convexus, nitidus, metallico-ceruleus, viridi-micans, tibiis (basi excepta), tarsis, antennisque fulvis, his extrorsum, labro, mandibulisque nigris; capite thoraceque tenuiter subremote punctatis; hoc transverso, lateribus basi fere parallelis, hinc ad apicem rotundato-angustatis; scutello semiovato, acuto; elytris sat fortiter punctato-striatis, interspatiis parce tenuissime punctatis, flavis, disco exteriori obsolete convexiusculis; sulco orbitali postice distincte dilatato; prosterno latitudine fere duplo longiori, pone medium abrupte ampliato, lateribus anticis leviter elevatis, disco postico utrinque intra latus leviter sulcato.

Var. A. *Tibiis tarsisque piccis.*

Long. $2\frac{1}{2}$ lin.

Hab.: Guinea, Old Calabar.

MENIUS CONCINNICOLLIS.

Sat elongatus, convexus, nitidus, supra obscure cupreus, subtus obscure piceus, pedibus antennisque pallidioribus; capite thoraceque sat crebre fortiter punctatis, hoc transverso, lateribus rotundatis; elytris sat fortiter punctato-striatis, interspatiis planis; sulco orbitali postice vix ampliato; prosterno latitudine paullo longiori, plano, rugoso.

Long. 2 lin.

Hab.: Lake Nyassa.

(To be concluded in our next.)

DESCRIPTION OF A NEW SPECIES PROBABLY INDICATING A NEW GENUS OF ANCHOMENIDE, FROM THE SANDWICH ISLANDS.

BY D. SHARP, M.B.

BLACKBURNIA INSIGNIS, n. sp.

Picea, nitida, antennis pedibusque rufis; capite parvo thorace angustiore; hoc elytris duplo angustiore, longitudine latitudine æquali, lateribus sinuatis, angulis posterioribus subrectis, grosse punctato, medio sulcato, margine laterali clerato; elytris amplis, convexis, profunde sulcatis, sulcis fossulatis apicem versus angustioribus et fere sine fossulis; corpore subtus grosse punctato, segmentis ventralibus tribus ultimis fere lævibus. Long. corp. 11 mm. Lat. elytr. $4\frac{1}{2}$ mm., prothor. $2\frac{1}{2}$ mm.

Of this curious insect, two specimens have been found by the Rev. T. Blackburn in Oahu, at an elevation of about 3000 feet. The specimen described is one of this pair, and is, I have no doubt, a female; the other individual Mr. Blackburn informs me is a male, though it has no other apparent sexual distinction than a very slight dilatation of the basal joints of the front tarsi.

Though the insect is very closely allied to the genus *Anchomenus*, it has a very peculiar appearance, and departs so much in several

points of structure from the species of that genus, as to induce me to give it a distinct generic name, and I have created one in compliment to its discoverer, who is working most energetically with a view to give us a knowledge of the insect fauna of the isolated insular group in which he is just now resident.

The mandibles of this insect are simple, and rather short and stout. The labrum is rather large, and its front margin is slightly emarginate. The labial and maxillary palpi are rather long and slender, and are formed as in *Anchomenus*. The eyes are small, not at all prominent, and indistinctly faceted. The thoracic segments are formed very much as in *Anchomenus*. The last three sutures of the ventral segments are excessively deep; the apical segment is rather long, and not in the least truncate. The elytra are not sinuate near the apex, and their apical portion is more elongate than in *Anchomenus*. The legs are rather short, but are formed as in *Anchomenus*. Fourth joint of the tarsi simple, its hind margin a little emarginate. The unguiculi are simple. The scutellum but little visible.

The points in which this insect departs from *Anchomenus* are, the greater development of the after body in proportion to the head and thorax, the feeble eyes, the very deep ventral sutures, and the elongation of the elytra at their extremity, and their accurate co-adaptation with the elongate apical ventral segment. I think the genus should be placed very near *Anchomenus*, but the genus *Cardiomeria* approaches it in respect of the deep ventral sutures. It is possible that a knowledge of the trophi will reveal other differences from *Anchomenus*.

Thornhill, Dumfries :

8th November, 1877.

DESCRIPTION OF A NEW *LEPTALIS* FROM ECUADOR.

BY W. C. HEWITSON, F.L.S.

LEPTALIS MIRANDOLA.

Upper-side: male, dark brown, paler on the posterior-wing. Anterior wing with two longitudinal bands from the base and the costal margin to the middle, pale brown; two yellow spots (one of which is a continuation of the lower longitudinal band) divided by the first branch of the median nervure; a central oblique band of three yellow spots (the third spot at a distance from the others), and two sub-apical spots of the same colour. Posterior wing with a large orange-yellow

spot on the costal margin, a large pale yellow spot at the anal angle, and a smaller spot of the same colour at the middle of the outer margin.

Under-side : anterior wing with the costal margin brown, marked at its middle by a yellow spot ; the apex yellow, bordered inwardly by brown. Posterior wing yellow, clouded with pale brown, the basal half red-brown, marked by several pearly-white spots.

Exp. $2\frac{2}{10}$ inch.

This species, which is in form and general appearance most like *L. Zaela*, and in colour more like *L. Medora*, was taken by Dr. Wolf in Ecuador, and is now in my collection.

For this and three other new species, I am indebted to Mr. Alfred Simson.

Oatlands, Weybridge :

October, 1877.

DESCRIPTION OF THE MALE OF *CHARAXES (PHILOGNOMA) AZOTA*.

BY W. C. HEWITSON, F.L.S.

CHARAXES AZOTA.

Upper-side : male, black. Both wings with the outer margin broadly bright brick-red (colour of *C. Protoclea*). Anterior wing with the costal margin rufous, the band of the outer margin marked by black spots, and divided as it reaches the apex into two bands of separate spots, one of which is on the margin. Posterior wing dentated, the red margin covering half the wing, and marked near the anal angle by two minute black spots centered with white.

Under-side red-brown. Both wings with a sub-marginal series of minute white spots. Anterior wing with four bands in the cell, and a spot beyond it ; crossed at the middle by a band of glossy colour bordered with brown, the apex marked by two white spots. Posterior wing crossed near the base by a band of red-brown, and at the middle and beyond it by broad glossy bands.

Exp. $3\frac{1}{10}$ inch.

This fine species was taken by Mr. Thelwall, at Nyassa. It is closely allied to *C. Protoclea*, and is the ♂ of a butterfly from the collection of the Monteiros, which (having lost the posterior portion of the hind wings) I described as *Philognoma Azota*.

Oatlands, Weybridge :

November, 1877.

Natural History of Mamestra furva.—For the long-desired opportunity of studying the larva of this species, I am greatly obliged to Mr. John Dunsmore, of Paisley, whose unwearied kindness throughout the winter of 1876–77, in repeatedly hunting up specimens for me, in spite of adverse weather, has my warmest thanks; and I must not omit my obligations to Mr. Andrew Wilson, of Edinburgh, who, in 1869, sent me eggs, though at that time, through want of experience, I failed in retaining the larvæ. The eggs were sent to me towards the end of summer, and the larvæ hatched in September; they were very active at once, and seemed anxious to hide under the earth, and presently established themselves at the base of a tuft of grass, and spun together a little earth, frass, and some of the grass-roots, for protection; Mr. Dunsmore found the larvæ (commencing in the first week of November, when they were but three-sixteenths of an inch long) amongst the roots of *Poa trivialis* and *P. nemoralis*, growing from under large stones, which capped a turf wall in a hilly district; after I received them, finding it necessary to supply them from time to time with growing food, for they woke up occasionally from hibernation and ate away the heart of the grass shoots close to the root, I tried them with *Poa annua*, and, to my great convenience, they took to it quite contentedly; during the winter their growth was trifling, but as Mr. Dunsmore continued to send me fresh examples at intervals of time, which were always smaller than those I had been keeping previously, I drew the conclusion that in the colder climate of their northern habitat their hibernation was more complete, and that *there* during winter they probably did not quit the smooth, silk-lined, oval nests or chambers, which they constructed—each for itself—by spinning together the grass roots; after the middle of May I saw these nests were made less carefully, being no more than dome-covered hollows, out of which they came every night, and fed, generally as before, close to the grass roots, but sometimes on the panicles of seeds; becoming full-fed during the first half of June, they then turned to pupæ, without making any cocoon whatever, but loose in the peaty soil under the grass, and between July 1st and 14th, I bred six imagos, all males.

The egg of *furva* is small, dome-shaped, ribbed and reticulated, of a dirty whitish colour at first, changing afterwards to light drab, and again to dark grey, a day or two before hatching; the newly-hatched larva is dirty whitish with dark brown head, plates and minute dots; the hairs in the dots visible only with a lens; in six weeks or two months time, it is about three-sixteenths of an inch long, of a light pinkish-brown colour, the head, plates, and warts of the same colour, but more shining than the rest of the skin; and by the end of December, examples vary in length according to their growth, from four-sixteenths to five-sixteenths of an inch, and again at the end of March, from three-eighths to four-eighths; in April it advances still slowly, and moulting, becomes rather paler, and grows by the middle of May to five-eighths of an inch in length, and, after further moulting, towards the end of the month, its colouring is still paler; it is now dirty whitish, or pale drab, or flesh colour, the head, plates, and spots continuing brownish-red or pinkish-brown as before; henceforward its growth is more rapid, and after another moult it attains its full growth, from the beginning to the middle of June.

The healthy full-grown larva measures one and a quarter of an inch in length, and is moderately stout in proportion, nearly uniform in size, except that the first and last segments a little smaller, the head full and rounded, the lobes on the crown well-

defined, and the jaws large, the segments plump and distinct at the divisions, the only very noticeable wrinkles being on the third and fourth; the general colouring of the body is a light and rather shining pallid flesh colour, almost a light drab on the thoracic segments, melting gradually from thence into a more warm fleshy tint, excepting on the belly which is pallid; down the middle of the back can just be seen, deep beneath the surface of the skin, a faint appearance of a pinkish-brown dorsal vessel, gently pulsating; *the head is of a dark brick-red colour*, very glossy, and with a few fine hairs, *the upper lip flesh colour*, the mouth dark brown; *the broad glossy plate across the second segment is rather brighter than the head, and is reddish-brown, its front margin slightly waved and boldly defined with very dark brown, the semi-circular hind margin narrowly outlined with the same dark brown*; this plate is well relieved from the lobes of the head by an interval of the pale skin between them (generally conspicuous); *the glossy plate on the anal flap is also light reddish-brown, strongly outlined with very dark brown in front, and more narrowly behind*; *the tubercular warty spots are rather small, smallest on the middle segments of the body, not very shining, and of reddish-brown colour*, each bearing a hair, their number and arrangement precisely similar to those of *polyodon* and *lithoxylea*;* the spiracles are small, oval, and black; the anterior legs reddish-brown, the ventral ones fringed with dark brown hooks.

The pupa is from six-eighths to seven-eighths of an inch in length, moderately stout, and of the usual *Noctua* figure; close below the ends of the wing-covers the abdomen begins gradually to taper, and there the next two rings are more deeply cut than those towards the tip, which has a blunt prolongation furnished with a central pair of straight pointed spines, and farther apart outside them another pair, thinner, shorter, and curved a little outwards; the colour of the tip and spines is black, all the rest a deep and rich red-brown, the whole surface, with the exception of a narrow band of punctures across the front of the more prominent abdominal rings, very glossy.

From the preceding account it will be seen at once that *furva*, in the appearance and habits of its larva, is much more of a *Xylophasia* than a *Mamestra*, a resemblance noticed before by Guenée (Tome v, p. 198), in words of which there is a translation in Newman's British Moths; but I am inclined to think that *his* description, as well as that of Freyer, quoted in Stainton's Manual, does not sufficiently give the points of distinction, which, in the midst of much general resemblance, satisfactorily separate this larva from *polyodon* (of *lateritia*, the other *Xylophasia* mentioned by Guenée, I know nothing); and I can suggest an explanation of this confusion, from two circumstances which happened to myself whilst rearing the larvæ, and either of which might have set me quite wrong, had I not taken the precaution to rear each example separately. I had been prepared by Mr. Dunsmore for expecting ichneumonid larvæ, presenting an abnormal appearance, and amongst my stock I found two, in which the head plates and spots were precisely similar in form and appearance to the same features in the healthy larvæ, so that no doubt could exist of the species, notwithstanding the size they ultimately attained; one of them, after moulting on the 14th of April, became, by the 20th, nearly one and a half inches long, and very stout; its skin minutely wrinkled transversely, and of a dull pink colour; on May

* Vide vol. xi, page 208.

2nd, I took a second figure of it, for it had changed considerably, both in colour and texture of skin, and had grown to be one inch and three-quarters in length; the skin now tense, smooth, and very glossy, of a dirty, somewhat flesh, colour; on the 10th, it had invested the bottom of its domed nest under the grass with grains of earth, and lay hidden in a complete cocoon, though very soft and fragile; I opened the cocoon about the middle of July, and found within a large, circular, rather flattened mass of light fawn-coloured silk, and in the centre the dark red head-piece of the larva; this I had scarcely placed on a table and covered with a glass, than there issued from it in quick succession a swarm of *Microgaster alvearius*, which, perhaps, to the number of more than one hundred, I hastened to destroy with chloroform: the other variety was about one inch and a half in length, of a dark smoky-grey colour above, and lurid reddish beneath, it was more than once by night observed to be at the tops of the grass nibbling at the seeds; it was figured on the 15th of June, and died three days later, from the wounds caused by about thirty middle-sized ichneumon larvæ eating their way out of its body.

The other circumstance was this. In the first instalment of little larvæ from Mr. Dunsmore was an individual, which, in point of colouring, for some time presented no particular variation from its companions, but eventually became noticeable by its outstripping them in growth, when I began to pay it much attention, and gradually became aware of well-defined differences developing themselves each time it moulted, until at length, as I had begun to expect, the special characteristics of *polyodon* appeared to convince me it was that species; it continued to grow, and by the month of April it had reached the length of two inches (longer in fact than those I described in 1875), with a body of proportionate stoutness, and looked quite a formidable creature; and to leave no doubt at all in the matter, I bred the moth on 8th of June.

Now, had I kept all these larvæ together, I might—selecting the biggest examples for the purpose—have taken my description from an ichneumoned specimen, or from the *polyodon* larva, and should thus have missed the true characteristics of *furva*; these are printed in italics in the foregoing account, and it is specially to be noted that the head, plates, and warts, are not black, but reddish-brown.—WILLIAM BUCKLER, Emsworth: October 26th, 1877.

Captures of Lepidoptera in the New Forest.—From July 30th to August 9th, I spent in the New Forest; the former part of the time in company with the Rev. T. W. Daltry, M.A., of Madeley; and the last day with Mr. J. G. Ross, of Bath. *Lepidoptera* were very scarce, and we worked hard for very little. The best species taken was *Cleora glabraria*, but we only got a few of it, by beating the lichen-covered branches. Perhaps we were rather too early for it, as the local collectors were breeding it daily the last few days we were there. *Catocala sponsa* and *promissa* were both very abundant at sugar, and we secured a fine long series of each; very singularly, however, hardly anything else came to the sugared trees. *Selidosema plumaria* was also very plentiful, but worn; we secured a fair number of females, and I have now larvæ feeding. Butterflies were in great variety, and included *Leucophasia sinapis*, the second brood of which was just appearing; *Colias Edusa*, of course; *Argynnis Paphia*, in swarms, with a few of its var. *Valezina*; *Vanessa cardui*, *Limnitis Sibylla*, common; *Lycæna Egon*, in thousands, &c., &c. We saw

one *Apatura Iris*, alive in a collector's box, taken in the Denny Enclosure, but did not capture the species. The other species, taken in greater or less numbers, included *Limacodes testudo*, *Nola cucullatella*, *Calligenia miniata*, *Lithosia quadra* (a few), *Liparis monacha*, *Ennomos angularia* and *erosaria*, *Cleora lichenaria*, *Gnophos obscurata*, *Pseudoterpna cytisaria* (abundant about whin-bushes), *Hemitea thymiaris*, *Ephyra pendularia* and *trilinearia*, *Acidalia promulata*, *Minoa euphorbiata*, *Ligdia adustata*, *Pachyrenia hippocastanaria*, *Melanthia procellata*, *Platypteryx unguicula*, *Thytlira derasa* and *batis*, *Erastris fuscata*, *Ebulea crocealis*, *Scopula ferrugalis*, *Crambus pinetellus*, *Warringtonellus*, and *selasellus*, *Pempelia palumbella*, *Melia sociella*, and many others. Larvæ were very scarce, so we did not beat many. Amongst those we did get were *Lithosia aureola*, common on lichen-covered branches, *Ennomos angularia* and *erosaria* (besides imagos of both), *Ephyra punctaria*, *Noto-donta dromedarius* and *dodonæa*, *Diphthera Orion*, &c.—GEO. T. PORRITT, Highroyd House, Huddersfield: December 5th, 1877.

Chærocampa Celerio in Ireland.—A larva, apparently belonging to this species, which was found feeding on vine in a greenhouse, was brought to me the other day. I have not heard of the species having been met with in Ireland before, but there is no reason why it should not occur as an occasional visitor here, as well as in other parts of Central Europe.—W. F. KIRBY, Royal Dublin Society: November 30th, 1877.

Acherontia Atropos at sea.—A specimen of the death's-head hawk-moth flew on board the steamer "Cameroon," on her last voyage home from Africa, and while off Cape de Verde.—J. F. FOTHERGILL, Cloughton, Birkenhead: 10th Dec., 1877.

[When Messrs. Wallace and Bates, on their voyage to the Amazons, anchored off Salinas, at least six miles from the nearest land, at the pilot-station for vessels bound to Pará, they were met by two large hawk-moths.—EDS.]

On Lepidoptera from the Hawaiian Islands.—Mr. N. C. Tuely has brought us a few more *Lepidoptera*, forwarded to him by the Rev. T. Blackburn, subsequent to the publication of my paper, pp. 47—50 of the present volume. They are as follows:—

Danais Archippus, Fabricius.—The example given to us by Mr. Tuely is smaller than most American examples; it is a female.

Leucania dislocata, Walker (No. 6).—Mr. Blackburn has now sent the male of this species, hitherto we have only known the female.

Plusia verticillata, Guenée (No. 3).—This example agrees with that previously received.

Mr. Blackburn has also sent a specimen, without abdomen, of an apparently new species of *Agrotis*, somewhat resembling *A. suffusa*; but, as I hope we may receive a better specimen one of these days, I will not at present describe it.

Of the Pyralites, he sends the following:—

Botys Blackburni, Butler (No. 32).—A male example.

Botys accepta, Butler (No. 18).—An example without abdomen.—A. G. BUTLER, British Museum: November, 1877.

Captures of Hemiptera-Heteroptera in Scotland.—During my stay in Scotland, in the summer of 1876, I collected *Hemiptera* in Morayshire, mostly in the neighbourhood of Forres, from 24th July to 12th August, and having found the following species, which are not noted by Mr. Norman in his Morayshire list, p. 165 *ante*, I think that it will be interesting to mention them. *Trapezonotus agrestis*, *Dictyonota strichnocera* (Forres), *Acalypta nigrina* (Sanquhar Wood, in moss), *Teratocoris viridis* (Dava, very frequently, 2nd August), *Phytocoris longipennis* (on oak, maple, etc.), *P. dimidiatus* (on *Fagus*, Burgie), *Globiceps fulvipes* (on *Salix repens* near Culbin Sands), *G. dispar* (Culbin Sands, Dunphail), *Orthocephalus saltator* (Burgie), *Orthotylus concolor*, Kirschb., Reut., *Conostethus brevis*, Reut. (Kinloss), *Temnostethus pusillus* (Burgie), *Acanthia* (= *Salda*) *lateralis* (Kinloss), *Gerris lacustris* and *odontogaster* (Sanquhar Wood).*

Perhaps the Hemipterists in Britain will be interested to know the scarcer species, found by me in other localities in Scotland, namely, the neighbourhood of Perth, Aberdeen, and Edinburgh. In the first of these places I have taken the following: *Phytocoris longipennis* and *pini*, *Calocoris sex-guttatus*, *Dicyphus pallidus* (on *Symphytum*), *Orthotylus tenellus* (on oak), *O. chloropterus*, *O. concolor*, and *O. adenocarpi*, *Plesiodema pinetellum*, *Psallus variabilis* and var. *Whitei* (on maple), *P. varians*, *P. diminutus*, and *P. lepidus*, *Agalliastes saltitans* and *A. Wilkinsoni* (both with developed elytra and wings!), *Microphysa pselaphiformis*, *Tetraphleps vittatus*, *Temnostethus nigricornis*, *Anthocoris sarothamni*, *Cryptostemma alienum*, *Coranus* (= *Nabis*) *limbatus*, *Acanthia scotica*, *A. c-album*, *Hebrus ruficeps*, *Corisa socia*, *vernica*, and *semistriata*.

Near Aberdeen: *Berytus pygmaeus* (Muchalls), *Pisma quadrata* (Muchalls), *Teratocoris Saundersi* (Scotston), *Lygus cervinus* and *pastinacæ*, *Coriscus flavomarginatus* (Muchalls), *Gerris Costæ* (Muchalls).

At Edinburgh: *Phytocoris distinctus*, *P. longipennis*, and *P. dimidiatus* (all in the Botanical Garden), *P. ulmi*, L., Fall., *Malacocoris chlorizans* (on a Siberian *Corylus*), *Tinicephalus obsoletus*, *Microphysa elegantula*, and *Temnostethus pusillus* (the last two in the Botanic Gardens on *Fagus*).

From the 6th to 14th July, I was in the Shetland Isles, where *Hemiptera* were very scarce, and I could only observe the following species:—*Leptopterna ferrugata*, *Pithanus Markeli* (not uncommon), *Chlamydatus ambulans* (rather common), *Acanthia littoralis* (common), *A. fucicola*, *A. orthochila* (on almost dry stony places), *Velia currens*:—only seven species of the *Gymnocerata*. The *Cryptocerata* were more numerous: *Corisa socia*, *C. cognata* (dark), *C. Wollastoni*, *C. vernica*, *C. Fabricii*, and var. *nigro-lineata*, *C. Scotti* (Bressay), *C. variegata*:—in all, eight species.

In the Orkney Islands I collected, from the 15th to 23rd July, and found: *Miris holsatus* (not uncommon), *Megalocera ruficornis* (not uncommon), *Teratocoris viridis* (Orphir and Stennis), *Leptopterna ferrugata* (also a long-winged ♀), *Calocoris 2-punctatus* (very common), *Pithanus Markeli* (common, also long-winged), *Chlamydatus ambulans* (very common), *Acanthia littoralis*, *A. fucicola*, *Gerris Costæ*

* I have also taken a long-winged *Ceratocombus muscorum* ♀. *Lygus cervinus* was not uncommon on *Tilia*, *Fruus pedos*, *Corylus*, and *Abies pectinata*.

(Orphir)—in all, ten *Gymnocerata*. Among the *Cryptocerata*: *Notonecta glauca* (Orphir), *Corisa Panzeri*, *C. socia*, *C. Fabricii*, with the vars. *dubia* and *nigro-lineata*, *C. venusta*.

Thus, in these northern islands, the following families are quite wanting: *Pentatomidæ*, *Coreidæ*, *Lygæidæ*, *Aradidæ*, *Tingitidæ*, *Cimicidæ* (= *Anthocoridæ*), and *Reduviidæ*.

Another time I will mention the *Hemiptera-Homoptera* I found in Scotland.—O. M. REUTER, Berggatan, 8, Helsingfors, Finland: 10th December, 1877.

Note on the stridulation of Myrmica ruginodis and other Hymenoptera.—At Guildford, towards the middle of July last, I was in the habit of entertaining myself by examining with a pocket-lens some individuals of *Myrmica ruginodis*, which had established a domicile beneath a wall, but were invariably collected on the blighted spikes of certain wayside clumps of *Cnicus arvensis* and *lanceolatus*. When the sun shone, these thistle heads became really objects of interest. You could see *Aphides* thereon in various stages of metamorphosis, each with its rostrum plunged deep in the sappy cuticle, and gathered round were the desiring ants, which, ever on the alert, moved from one *Aphis* to another, watching and contending for each slowly-welling drop of honey-dew as it appeared at the anal tubes; two together often sucking the precious secretion.

Wishing to re-produce this curious scene, I cut off a thistle top or two, and secured them, with the drowsy *Aphides* thereon, to the mouth of small phials of water; at the same time carefully separating the ants, and covering them with an inverted wine glass. The weather was hot and sultry, and these *Myrmicæ* were probably irascible; for they had not been long left to themselves, when a puny individual was observed, placed head downwards, at the side, and near the inverted edge of the glass, rapidly vibrating its abdomen vertically from the pedicle, and simultaneously giving out a continuous singing sound, resembling in tone and intensity the sharp whining of the little dipteran, *Syrilla pipiens*.

Concluding that the rythmical motion accompanying the sound indicated this ant was a stridulator, I carefully studied its external anatomy beneath the microscope, and found the abdomen, contracted anteriorly and having corresponding callosities, as though the skin were drawn in, was here produced and movably inserted into the second knot or articulation of the pedicle, which was moulded in the form of a dark ring, and traversed by more than twelve minute, yet regular, annular striæ; this formation was reproduced at the place where the second knot articulated to its triangular antecedent, but with the striation less marked; elsewhere, the exterior surface was merely punctured or wrinkled. The spiracles of this *Myrmica* are minute. I would therefore ascribe the singing of the puny (male?) individual to the friction of the first mentioned striated ring. To Mr. F. Smith I am indebted for the specific name *ruginodis*.

That instrumental musicians should exist in the *Formicidæ* presents no anomaly, for apart from the hissing of questionable origin given out at times by companies of ants, the solitary species of the parasitical genus *Mutilla* have the power of producing true frictional cries, shrill and sibilant in tone, which characterize the winged males, no less than the wingless females (?). This sound, Goureau considers, perceptibly

arises from rubbing a shining surface on the third abdominal segment beneath the inner border of the second (Annal. de la Soc. Ent. de France, 1837, p. 66), and in this statement he is corroborated by N. Westring, who observed this shining surface, and says, it resembles a little, dark, flat shield, which, beneath a lens, is seen to be transversely and finely rugose (Kröyer's Naturhist. Tids., i, 57, 1844-45). Darwin, on the other hand, surmises the sound may arise from the friction of the head, which, where it articulates on the projecting thoracic collar, is marked like the surface of the third and preceding abdominal segments, with very fine concentric ridges (Descent of Man, i, chap. x, p. 366).

Sounds produced by other *Hymenoptera* which exhibit no corresponding exterior rhythmical motion, are markedly accompanied by internal vibration of the thoracic muscles, spreading, but not invariably, to the organs of flight. This class of notes, from the physiological experiments hitherto instituted, of clogging with honey, clipping, or removing the wings, stopping the spiracles, or plunging the subject beneath water, manifestly originates in the vibration of air at the cup-shaped lips of the enlarged metathoracic openings; and on this point the experiments of John Hunter, with the hive-bee (*Apis mellifica*), seem very conclusive (Philosoph. Trans. v. 82, p. 182, 1792): see also Landois (Ton- und Stimmap. der Insecten, p. 59). Thus is constituted a vocal music, similar to that existing in the *Diptera*, although the little rows of membranous plates on the internal edges of the before-mentioned spiracles, so obvious in the *Syrphidæ* and *Muscidæ*, do not appear present to implicate the tones.

The production of such sounds, distinguished from the ordinary buzz, may be regarded as expressing the low type of emotion peculiar to *Insecta*. It is well known that many species of *Aculeata*, and more especially of the genus *Bombus*, when held in the hand, have the faculty of producing a whining note, betraying perception of fear; and some of this genus behave thus when free and engaged in maternal labours, at which time the sound seems to spring from, and indicate, the nervous pleasure experienced in industry. Here also might be instanced the hum emitted by gravid females of the species of sand-wasp (*Sphex*) when burrowing; and in Argyleshire I have repeatedly observed two distinct kinds of humble-bee, producing a similar sharp, impatient note, when, assaying the flowers of roses, brambles, or fox-glove, they settled on an unpillifered or more palatable nectary. The first bee I observed producing this intermitting sound, was a small individual with red-tipped abdomen and yellow head and prothorax (*Bombus lapponicus*); the other was *Bombus lucorum* (worker);* both species kindly determined by Mr. F. Smith.—A. H. SWINTON, Calais: November 2nd, 1877.

ENTOMOLOGICAL SOCIETY OF LONDON: 7th November, 1877.—PROFESSOR J. O. WESTWOOD, M.A., F.L.S., President, in the Chair.

* Mr. Smith writes: "On the continent many would call this bee *Bombus terrestris*, but they have no name for that insect, as they do not unite the true male, *B. lucorum*, to it. Both of the types of Linneus' species are in the Linnean cabinet, and I have taken the sexes *in coitu*, and also out of their nests repeatedly."—Eus.

Mr. McLachlan exhibited a selection of the Insects captured between the parallels of 78° and 83° N. latitude by the naturalists of the recent Arctic Expedition, in anticipation of his Report to be read at the Linnean Society (*vide ante* p. 167).

The Rev. A. E. Eaton narrated some of his experiences regarding Arctic insects in Spitzbergen. He was disposed to consider that their transformations might sometimes be protracted over two or more years. He had noticed, that although there was no actual night in the middle of summer, the insects did not appear insensible to the time that should be night, in which the amount of light was about equal to that of ordinary sunlight in London as compared with that of the open country.

Mr. Meldola exhibited a *Gonopteryx rhamni* with five wings, captured near Brandon, Norfolk, in August, 1873, by Mr. Woodgate. Also a gynandromorphous *Pieris brassicae*, taken near Thame, Oxfordshire, by Mr. J. B. Watson, the right side ♀, the left ♂.

Mr. Goss exhibited a gynandromorphous *Gonopteryx rhamni*, from Abbott's Wood, Sussex, the right side ♀, the left ♂.

Mr. Douglas exhibited a *Polyphylla fullo*, which flew on board a steamer at Antwerp, in August, and was brought to London; a specimen of *Tettigometra impresso-punctata*, recently captured at Sanderstead Downs; also *Typhlocyba debilis* (Douglas), from the same locality.

Mr. W. C. Boyd exhibited a larva of *Pieris rapæ* attacked by *Microgaster*, apparently the first instance that had been recorded, as it usually infested *P. brassicae*. This exhibition was made in connection with a request from Entomologists in the United States for cocoons of this insect, in order to counteract the destructiveness of *P. rapæ*, recently imported into America.

Professor Westwood read notes on new exotic lamellicorn *Coleoptera*, and exhibited the insects. He called attention to an article on sound-producing *Crustacea*, published by Mr. Savile Kent in "Nature" (November 1st, 1877). Professor Wood-Mason followed with a lengthened discourse on stridulating organs in *Crustacea*, Scorpions, *Mygale*, *Orthoptera*, &c.

Professor Westwood called attention to a paper by Dr. Anderson (Proc. Asiatic Soc. Bengal, 1877) on *Gongylus gongyloides*, L., a remarkable Mantis that is stated to mimic a flower, the deception being supposed to attract insects upon which the Mantis feeds. Professor Wood-Mason referred to the same subject, and adduced other instances of similar mimicry in eastern *Mantida*.

Sir Sidney Saunders read notes on the specific identity of the species of trap-door spider taken at Hampstead, which the Rev. O. Pickard-Cambridge had at first pronounced to be *Atypus Becki*, but which was probably *A. Sulzeri*, Latreille. Mr. Enoch exhibited a ♂ and ♀ of this spider, taken at Hampstead on October 21th last.

Mr. C. O. Waterhouse read a paper on the Coleopterous genus *Callirrhapis*, and exhibited specimens.

The Rev. H. S. Gorham read a continuation of his paper on the *Cleridæ*.

Mr. A. G. Butler communicated a paper on a new genus and some new species of *Sphingidæ*.

Mr. Baly communicated descriptions of new genera and species of *Halictinæ*.

December 5th, 1877.—J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the Chair.

Mr. Distant exhibited two rare species of West African *Hemiptera-Heteroptera*, viz., *Tetroxia Beauvoisi*, Fairmaire, and *Oncocephalus subspinosus*, A. and S., both only known hitherto from the mutilated typical examples.

Mr. F. Smith exhibited a series of both sexes of *Macropis labiata*, captured by Mr. Bridgman, near Norwich; the ♂ had hitherto been extremely scarce. Also a specimen of *Rophites 4-spinosus*, a genus and species of Aculeate *Hymenoptera* new to Britain, captured at Guestling, near Hastings, by the Rev. E. N. Bloomfield; it is an insect of wide distribution on the continent.

Mr. Meldola exhibited photographic enlargements of photographs, taken by Mr. E. Viles, of Wolverhampton. Two of these represented the mouth parts of a bee and fly respectively, enlarged ten diameters from the original negatives. He further exhibited an acoustic apparatus, illustrating the action of the stridulating apparatus of *Pterinoxyglus*, as described by Mr. Wood-Mason at the November meeting: the apparatus consisted of a bell, thrown into vibration by a violin-bow, and the sound enhanced by the application of an air-chamber. He also exhibited a specimen of *Gongylus gongyloides*, alluded to at the previous meeting as a mimicking insect.

Mr. Wood-Mason detailed the results of further investigation of the stridulating apparatus of scorpions: he had detected at the base of each pair of legs carrying the apparatus, a well-defined pore opening into the interior of the leg.

Mr. F. Smith mentioned that he had noticed stridulation to exist in a small weevil (*Acalles roboris*) found at Deal, but the sound was scarcely audible, unless several were confined in the same box; the sound is produced by the friction of the segments of the abdomen against the under-surface of the elytra. His attention had been called to this subject in consequence of the discovery by Mr. Wollaston of a musical *Acalles* in Madeira.

Mr. Dunning called attention to a paper recently published in the Proceedings of the Cambridge Philosophical Society, by Mr. Neville Goodman, M.A., on a striking instance of mimicry between a dipterous insect (*Laphria*), and a hornet (*Vespa orientalis*), both found in the same districts.

The Secretary directed attention to a letter in "Nature" (Nov. 15th, 1877), detailing some experiments upon *Abraxas grossulariata*, tending to shew that the insect was sensitive to sound.

Mr. F. Smith read Descriptions of new species of *Hymenoptera* collected by Prof. Hutton at Otago, in New Zealand, and exhibited the insects.

Mr. Butler read a paper on the *Sphingæ* and *Bombycæ* collected by Prof. Trail on the Amazons in the years 1873—1875.

Dr. Sharp communicated Descriptions of eight new species of *Cossonides* from New Zealand, and of a new genus and some new species of *Rhyncophora* from the Sandwich Islands.

ADDITIONS TO THE GEODEPHAGOUS FAUNA OF NEW ZEALAND.

BY H. W. BATES, F.L.S.

Several of the species described in the following pages, as will be observed, are remarkable forms of the family *Carabidæ*, and form an interesting addition to our rapidly-growing knowledge of New Zealand *Coloptera*.

PTEROSTICHUS (TRICHOSTERNUS) DIFFORMIPES, *n. sp.*

Elongato-oblongus, niger, suprâ rubro-cupreo tinctus, modice convexus; capite ovato, oculis modice prominentibus, collo haud crasso; thorace quadrato, postice modice sinuatum angustato, angulis posticis prominulis, subacutis; elytris elongato-ovatis, apicem versus paulo sinuatis, suprâ punctulato-striatis, interstitiis æqualibus, vix convexis, tertio et quinto prope apicem bi-, septimo septem-punctatis, punctis longe setiferis. Mas: femoribus intermediis subtus late dentatis, tibiis intus emarginatis et apice paulo dilatatis. Long. $10\frac{1}{2}$ lin., ♂ ♀.

Wellington, not uncommon in the same localities as *P. (Trich.) planiuseculus* (Mr. C. M. Wakefield).

Rather more slender and less robust in form than the typical species of *Trichosternus*; the head especially is narrower and not thickened behind; there is a moderate orbit behind the eyes. The elytra are scarcely more convex than in *T. Guérini* (Chand.), but the striae are simply and very finely punctulated, and the interstices smooth and but slightly convex. The somewhat obscure red-coppery tinge is diffused over the elytra, and on the thorax is most brilliant near the hind angles.

PTEROSTICHUS LOBIPES, *n. sp.*

Elongato-oblongus, sub-depressus, niger, sericeo-nitidus; capite quadrato, orbita postice magis quam oculo prominenti, collo paululum constricto; thorace quadrato, pone medium modice sinuato-angustato, marginibus erenulatis, angulis posticis acutissimis; elytris valde elongatis, juxta basin transversim depressis, prope apicem fortiter sinuatis, suprâ punctulato-striatis, interstitiis planis, 3^{io}, 5^{to}, et 7^{to}, quinque-punctatis. Mas: tibiis intermediis apice extus lobato-productis. Long. $2\frac{1}{2}$ lin., ♂.

Otira River, West Coast of Southern Island (Mr. C. M. Wakefield).

SYLLECTUS, *nov. gen.* Fam. HARPALIDÆ.

Facies Anthoni. *Antennarum pubescentia ad articulum tertium incipiens: forcis frontibus versus oculos curvatis; tarsorum articulis quatuor pedum 2 anteriorum tantum dilatatis, plantis dense æqualiter pubescentibus. Mandibulæ valde elongatæ, graciles, subrectæ. Palpi subnudi, articulis terminalibus gradatim longe acuminatis. Mentum medio dentatum. Ligula apice libera, bisetosa, paraglossis angustis. Pedes graciles, subtiliter setosæ, tarsi supra nudi.*

The present genus is another of those remarkable antarctic forms of *Carabidæ*, like *Oopterus*, *Merizodus*, *Euthenarus*, *Lecanomercus*, and others, of which we have no near allies in the Northern Hemisphere. It is more anomalous, however, than any of the others just mentioned, uniting in itself the characters of various other groups in a most remarkable manner. The *four* dilated joints of the tarsi, and the pubescence of the 3rd antennal joint, bring it within the definition of the *Harpalidæ*, although its small head and long slender mandibles are utterly unlike any other known Harpalideous form. The clothing of the soles of the dilated joints resembles that of the *Anisodactylinæ*, but differs in the hairs being less brush-like. The four dilated joints are equal in breadth, and are broadly cordate in shape.

The frontal foveæ resemble in their depth and direction those of the *Acupalpus* group, but are scarcely so sharply incised. The metasternal episterna are elongate, and their epimera normal in shape. The palpi are fully as acute as in the *Trechi*, but their terminal joints are rather broader near the base, *i. e.*, more fusiform in figure. The tooth in the centre of the emargination of the mentum is as long as the side lobes, and has a pair of strong bristles at its base. Upon the whole, I am inclined to think the nearest affinities of this interesting form are in the direction of such genera as *Lecanomercus* and *Trachysarus*.

SYLLECTUS ANOMALUS, n. sp.

Modice convexus, politus, nigro-piceus: partibus oris, antennis, pedibusque fulvo-testaceis: capite parvo, oculis prominulis: thorace capite vix latiori, quadrato, ante medium paulo rotundatim dilatato, angulis posticis rectis; elytris thorace plus quam duplo latioribus, ante apicem leviter sinuatis, passim æqualiter sub-punctulato-striatis, interstitio 3^o pone medium unipunctato. Long. 2½ lin., ♂ ♀.

Similar in form to *Anchomenus*, but of small size, glossy piceous-black, with the antennæ, legs and parts of the mouth tawny testaceous; in some examples the femora and palpi are paler and yellowish. The thorax is but little broader than the small head, and is quadrate in shape, with the sides a little rounded outwards anteriorly, and incurved posteriorly, with distinct hind angles; the surface is smooth, with a long, and rather deep, but wholly smooth fovea on each side. The elytra are broad in comparison with the head and thorax, very glossy, and striated with equal distinctness throughout, the striæ being indistinctly punctulated.

Auckland, New Zealand. In my own collection and that of Dr. D. Sharp.

CILLENUM ALBESCENS, n. sp.

Oblongo-ellipticum, convexum, politum, pallido-testaceum, capite, thoracis medio, elytrorum macula discoidali, ventrisque basi fusco-æneis, antennis pedibusque robustis, thorace cordato-ovato, basi angustato, angulis posticis obtusis; elytris margine laterali usque prope apicem late explanato, apice late subtruncato, rotundatis, supra striatis, interstitio tertio tripunctato. Mas: tarsi anticis articulis duobus, præcipue extus, dilatatis.
Long. 2-2½ lin., ♂ ♀.

Tairua, near Auckland (Capt. Brown).

A very remarkable and handsome species of the sub-family *Bembidiinæ*, which I place in the genus *Cillenum*, on account of its long, sharp, and curved mandibles, robust, short, submoniliform antennæ, and explanated lateral veins of the elytra. The last mentioned peculiarity, it is true, is not so strongly marked in the European *Cillenum*, but it is, nevertheless, distinctly perceptible, the dilated portion terminating rather abruptly before the apex of the elytra, giving a subtruncated appearance to those members. The New Zealand species differs from our *Cillenum*, in being decidedly convex and elliptical in form, and especially in the long, robust legs. The antennæ do not differ in relative proportions from *Cillenum*. The head is also very similar in shape; the eyes are not prominent, the frontal furrows broad, smooth, and shallow, and the setiform puncture on the margin of the eye is exceedingly large. The thorax is convex, glossy, impunctate, cordate-ovate, narrowed gradually behind to the obtuse hind angles; a transverse depression extends across the base, but there are no very distinct foveæ. The elytra are elliptical, perfectly rounded at the shoulders; the lateral margin is dilated most strongly after the middle, the widened recurved rim ends before the apex quite abruptly; the striæ are scarcely perceptibly crenated, strongly impressed except near the apex. The general colour of the insect is pale testaceous-yellow; the crown of the head (as far as the base of the clypeus), the central part of the thorax and middle of its base and apex, and a large triangular spot on each elytron, are dark brassy; the elytral spot extends from the 2nd to the 7th stria, posteriorly it approximates to the suture, which also is dark. The basal ventral segments are dark brown.

BEMBIDIUM TAIRUENSE, n. sp.

Quoad formam, B. tibiali (Dufts.) simile; gracilius, elongatum, depressum, piceo-nigrum, paulo ænescens, palpis, antennis pedibusque piceo-rufis; thorace anguste cordato, foreolis basalibus simplicibus juxta angulum sitis; elytris punctato-striatis, interstitiis 3^{to} et 5^{to} punctis setiferis munitis. Mas: tarorum anticorum articulo basali tantum dilatato, oblongo.
Long. 2-2½ lin.

Many examples from Capt. Broun.

Belongs to the same group as *B. charile* and *maorinum*, a group of *Peryphus* apparently peculiar to New Zealand, having a cordiform thorax not at all dilated at the posterior angles, with a narrow, simple fovea close to the angle, and with setiform punctures on the 5th, as well as on the 3rd, elytral interstices. The head and thorax in *B. Tairuense* are small in comparison with the elytra, and quite destitute of punctuation; the frontal foveæ, as in the allied New Zealand species, are broad and deep; the eyes only moderately prominent. The elytra are elongate-oblong-ovate, rather depressed, and with rather strongly impressed and closely punctured striae, the interstices being plane; the first and second striae converge at the base into a depression, the outer striae do not reach the base, and leave a smooth space near the shoulder; striae 2—7 become very faint near the apex.

The species is closely allied to *B. maorinum*, from Christchurch, and it would be difficult in a description to make their difference clear, though their general aspect is very distinct; *B. maorinum* being broader, more brightly æneous; the elytra much broader, the striae less impressed, &c.

BEMBIDIUM PARVICEPS, n. sp.

Gracile, modice convexum, nigrum, vix ænescens, politum, palpis, pedibus antennisque fusco-piceis, his articulo basali rufo; capite parvo, foreis frontibus latis, profundis; thorace cordato, angulis posticis haud prominentibus; elytris grosse striato-punctatis, striae (1^{mo} excepta) longe ante apicem subito evanescentibus.

Long. 2 lin.

Tairua, near Auckland (Capt. Broun).

Belongs to none of the European sections of *Bembidium*, but nearest allied perhaps to *Peryphus*. The frontal furrows (broad and deep, without marginal ridges) and the form of the thorax (with contracted hind angles and simple fovea) are the same as in the *Peryphus maorinum* group; but the 5th elytral interstice has no setiferous punctures. The head is small, and the eyes are not so prominent as usual in *Bembidium*. The thorax is also small, and impunctate; it is cordate, gradually narrowed behind until near the base, and then its sides are straight, without the slightest projection of the posterior angles, which are indeed scarcely rectangular; the basal fovea is narrow, and lies close to the marginal rim. The elytra are elongate-oval, coarsely punctured in slightly impressed rows; the punctures and striae abruptly ceasing at about two-thirds the length, except the sutural and marginal striae; the sutural stria is, as usual, a little recurved at the apex, and the hook thus formed is distinctly separated by a smooth ridge from the recurved marginal stria.

BEMBIDIUM ANCHONODERUM, n. sp.

Elongato-ovalum, ænescenti-nigrum, politum, palpis, antennis pedibusque piceis; thorace rotundato, angulis posticis haud explanatis, anguste foveatis, supra lateribus subtiliter alutaceis; elytris punctato-striatis, striis prope apicem paulo debilioribus, interstitio tertio bipunctato. Mas: tarsorum anticorum articulis duobus basalibus dilatatis, apice intus productis.

Long. 1 $\frac{3}{4}$ –2 lin., ♂ ♀.

Variat colore suprâ æneo.

Tairua, near Auckland; 2 examples (Capt. Broun).

Belongs apparently to the same group as *B. parviceps*; but the thorax is quite different in shape, being more broadly and regularly rounded at the sides, and rather abruptly narrowed at the base; the lateral margins very narrow, without projection at the hind angles, which are, nevertheless, rectangular. The frontal furrows are broad, deep, and simple. The head is rather small, and the eyes only moderately prominent. The back of the head and the sides of the thorax are very finely shagreened, and there are some wrinkles on the disc of the latter. The elytra are elongate-ovate, rather convex: the striæ are tolerably deep, and only a little less impressed on nearing the apex, the 1st and 2nd are indeed deeper near the apex, the 2nd flexuous, and joining the recurved apex of the 1st; the 7th is distinct; the punctures are moderately large, but become much fainter towards the apex.

BEMBIDIUM EUSTICTUM, n. sp.

Elongato-ovalum, suprâ æneum, politum; palpis, antennis, pedibusque rufo-piceis; thorace late rotundato, angulis posticis distinctis, marginibus postice nullo modo explanatis, foveolis basalibus angustis; elytris ovalis, grosse punctato-striatis, striis 2–7 ante apicem evanescentibus; interstitio tertio punctis duobus, anteriori maximo, notato.

Long. 1 $\frac{1}{4}$ –1 $\frac{2}{3}$ lin.

Tairua, near Auckland; 4 examples (Capt. Broun).

Very closely allied to *B. anchonoderum*; differing only in its rather smaller size, its broader thorax and relatively shorter elytra, the conspicuously larger anterior puncture on the 3rd elytral interstice, and the obliteration of all the middle striæ before the apex.

BEMBIDIUM CALLIPEPLUM, n. sp.

Elongato-ovalum, nitidum, æneum, antennis basi, pedibus, elytrisque flavo-testaceis, his poae medianæ plaga communi angulata fusco-ænea; thorace rotundato-cordato, basi angustato, lævi, angulis posticis nullo modo explanatis, subobtusis, vix foveatis; elytris punctato-striatis, striis versus basin vix impressis, tertio tri-punctato. Mas: tarsorum anticorum articulis duobus basalibus dilatatis, apice extus productis.

Long. 1 $\frac{3}{4}$ lin.

Wellington; from Mr. Wakefield.

Belongs to the same group as *B. anchonoderum* and *rotundicolle*; but distinguished by its pale testaceous elytra, with a large angular fuscous spot a little behind the middle. This spot forms a triangle on each elytron, with the external angle extending to the sides of the elytra; behind, it is a little prolonged on the suture. The head has deep, broad, and simple frontal foreæ. The antennæ are pale at the base, becoming gradually dusky towards the tip. The thorax (impunctate, like the head) is cordate, but with very rounded sides, narrowed behind, first gradually, and at the base, more suddenly; the hind angles are closely applied to the trunk, and rather obtuse. The elytra are much rounded at the shoulders; the punctate striæ are deeper near the apex than near the base; the exterior striæ are, however, somewhat faintly impressed towards the apex. The legs are pale yellowish, with the joints of the tarsi tipped with dusky.

PTEROSTICHUS LOBIPES. The length of this species is erroneously given on p. 191, as only $2\frac{1}{2}$ lin.; it should be $12\frac{1}{2}$ lin.

Bartholomew Road, Kentish Town, N.W.:

1st December, 1877.

ON THE ECONOMY, &c., OF *BOMBYLIUS*.

BY T. ALGERNON CHAPMAN, M.D.

The few items in the history of these flies that I have accidentally observed may be of use to others who propose, with more determination, to thoroughly work it out. I watched the oviposition of a small brown species, a number of years ago, when observing the habits of *Odynerus spinipes*. A portion of the same hot, sunny bank where *spinipes* had a colony was frequented by this species, which would approach tolerably close to me when I refrained from moving; the process of oviposition was conducted against the bank of earth in a manner closely similar to that adopted by dragon-flies on the surface of water; the fly (not, of course, a pair, as with dragon-flies) would approach the bank within an inch or so, and carefully examine it, and, if satisfied, would make a little sudden swoop, bringing the extremity of the body close to the bank, by passing from a horizontal to a sloping attitude, yet not touching it, the small white egg being seen to be thrown with a short jerk against the bank. On several occasions I noticed very closely the spot, but always failed to find the egg, which was not, however, surprising in the rough and cracked earth. I over and over again, however, satisfied myself that it was not thrown into the burrow of any bee, though *Halictus* and others were numerous in the same bank.

This winter I have had the good luck to meet with the larva and pupa of *Bombylius major* in the cells of *Andrena labialis*. Having come across a colony of this bee in some earth undergoing removal, I met with a few pupæ, which I proved to be *Bombylius major*, by forcing one, and find it figured in Westwood's Introduction. I also found a few larvæ which were new to me, of a very hymenopterous aspect, and which I secured on general principles, thinking at the time that perhaps they were some *Nomada*, a genus with the larvæ of which I am not acquainted. Along with the pupa of *Bombylius*, I found the cast larva-skin, and the remains of the larval head attached to it enabled me to recognise these larvæ as those of the *Bombylius*. Though of hymenopterous aspect, they are at once seen to be dipterous, when the head is examined. The abdominal segments very closely resemble those of *Rhipiphorus* larva, both in longitudinal and transverse section, lateral prominences, and in having a very transparent skin and contents, much filled by lobulated fat masses, between which the black intestinal canal may be seen. It differs from *Hymenoptera* and *Rhipiphorus* in the anterior (thoracic) segments being straight, not curved forwards, and in being rounded instead of flattened, and in the diminution in size to the head taking place chiefly in the dome-shaped 2nd (1st thoracic) segment. (The head is set into this segment and is retractile: it is very small; its centre is occupied by a prominent wedge-shaped portion, the point of the wedge being downwards, and immediately in front of the mouth. Immediately beneath this are two black, very sharp, setiform jaws (?), on each side is a papillary eminence (antenna?) of three joints set in a circle of softer tegument, and immediately below project downward on each side two large palpi (labrum?), looking like jaws, but having a vertical, not a lateral, mobility, on the anterior face of each of these there is a palpus of some length, apparently unjointed, set in a circle.) Several very stout bristles are set round the head. The six true feet are represented by stout bristles; there are two spiracles on the 2nd, and two on the 12th segment, these have on one side a corneous are marked by radiating lines, making it look like a curved comb; the larva is without other appendages. It exists in the cell of *Andrena*, in which it has obviously been reared, I am inclined to think, living on the larva of *Andrena*, and not on its store, this I judge from the oral structure and the cleanness of the cell it occupies; not knowing what it was when I picked it up, I omitted to notice what other cell contents there might be.

The pupa is larger than the larva, the latter is of a size fitting its supposed food, viz., one larva of *Andrena*, the pupa seems at first view

too big for this. The explanation may perhaps be found in the circumstance that the pupa of *Bombylius* is, if I may so express it, very hygroscopic—one kept for a few days in a pill-box soon shrunk into dimensions much smaller than the *Andrena*, but when plentifully supplied with water soon regained its original bulk. Though the fly afterwards perfected its development within the pupa case, it failed to escape from it, so that this experiment or the other unnatural conditions had weakened its vitality.

It is to be noted that the insect follows the habit of the aculeate and parasitic *Hymenoptera* and other parasites in retaining the visceral contents until it assumes the perfect state—a habit at which I have always marvelled. The larva is a good deal more tough and strong than it looks, and though when at rest, it is straight, it can and does arch itself in a circle, bringing the extremities of the body into contact, contrasting much with the absolutely passive larvæ which I have said it in some points resembles.

The pupa of *Bombylius major* at first glance suggests a *Hepialus*, say *lupulinus*. But a superficial examination shows the very notable distinction of five curious prongs or spines on the ventral aspect of the head, that the leg- and wing-cases are free from the abdomen, and that the anal armature is not of a Lepidopterous type. Length, 15 to 18 mm. Colour, semi-transparent pale ochreous-brown, or in some specimens greenish, with dark, almost black, markings, the markings corresponding to some extent to harder portions of tegument.

The head is black, its dorsum smooth and corresponding tolerably evidently to the two eyes, anteriorly it is continued into two spines which curve downwards, and are wrinkled at their bases but smooth and polished towards their sharp-pointed extremities—about the middle (antero-posteriorly) and where the lateral joins the ventral aspect are (one on each side) two other horns or spines—these project almost directly forwards, but are curved with the convexity forwards. Close to the base of each is a bifid process, one branch of which is a subsidiary hard sharp black spine, the other is paler, softer looking, and more rounded, with a fringe of very short hairs, looking like a palpus. These two anterior and two lateral spines are about 1 mm. in length, very sharp when viewed laterally, but are somewhat blunter when viewed from the front. There is a fifth horn or spine situated ventrally at the junction of the head and thorax, this is somewhat shorter than the others, slopes somewhat backwards, and is thin and sharp viewed laterally, but viewed in front is bifid, each lobe being flat and rounded. The space between the bases of these five horns is occupied by a

wrinkled prominence surrounded by a narrow groove. The thorax dorsally is smooth and rounded, laterally and dorsally blackish, the rest of the ochreous or rufous tint noted above. There is a very distinct narrowing behind the thorax. The legs and wings project downwards in front in Lepidopterous manner, except that though touching the abdominal segments they are free from them, the wings extend to the 3rd, and the legs and proboscis to the 5th, abdominal segment; though this depends much on the fulness of the abdominal segments.

The meta-thoracic segment only shows a very narrow band. The 1st abdominal segment is more slender than the following ones. On the anterior margin of its dorsal aspect is a row of sixteen tubercles, eight to either side, with a narrow vacancy at the dorsal line, each of these carries a long rufous bristle, each nearly 3 mm. long, lying adpressed and extending backwards to the posterior margin of the next segment. The next six segments are different from the first, but of a uniform type. The dorsal aspect of the second segment (the first of these six) presents a transverse row of ten hooks, with indications of two or three smaller ones at either end: each hook is nearly a third of a mm. in length, is very sharp, its concavity being backwards, the base of each hook extends backwards for about a third of the width of the segment as a corneous ridge, and then throws up a smaller reversed hook. In the centre of each space between these ridges is a small tubercle supporting a short bristle, where the hooks laterally become obsolete these bristles are stronger, to the number of six on either side. All this dorsal armature is on a dark coloured base. The lateral prominences each support four bristles of about 2 mm. in length; the ventral aspect is tolerably flat, and on a dark base, carries two long bristles on either side.

The 3rd and 4th segments hardly differ from the 2nd, except that the spines and hooks are a little less strong; on the 5th they are decidedly smaller; on the 6th their complicated structure can hardly be made out; and on the 7th they are reduced to fine tubercles ranging with those carrying the bristles—which in these segments are stronger. The 7th segment carries sixteen strong bristles. Each of these segments presents an indication of a spiracle immediately behind the anterior portion of the lateral prominence, there is also an indication of a spiracle immediately in front of the origin of the wing. The 8th abdominal segment is much smaller than the preceding ones, but carries dorsally a transverse line of bristles and tubercles, the lateral bristles are reduced to two, the ventral are not represented. The next segment

or anal tubercle is narrower but fully longer than the preceding segment, it terminates in a bifid short spine, very similar though smaller to that on the neck. Antero-laterally, are two (one on each side) long ($\frac{2}{3}$ -mm.) trowel-shaped spines, raised on a stout base and directed slightly dorsally—but that as the last few segments are bent forwards, these anal spines are after all directed backwards in the line of the insect's body. This anal segment is rufous, the spines being of the brown colour so common in Lepidopterous pupæ.

There are no parts of the perfect fly formed in the cephalic spines, which remind me forcibly of the tusks of a walrus. Their use is evidently to tear down the clay-stopping in front of the pupa, when the time for its emergence approaches, for which the perfect fly has no apparatus: they are, indeed, actual digging organs. Most *Lepidoptera* that have to force a way out of earth or wood, *Hepialus*, *Trochilium*, &c., have a blunt wedge-like spine, but these all have the way prepared for them by the larva. Our present subject has to force a passage through the clay-filling placed by the bee in its burrows, and to climb through six to ten inches of these burrows. The larva, as we have seen, can make no preparations; and, though many pupæ have to force their way through obstructions, this is the only one I know of actually provided with mattock and shovel with which to do its own navigating.

Hereford: *January*, 1878.

NATURAL HISTORY OF *SCOPULA FERRUGALIS*.

BY WILLIAM BUCKLER.

I have again to thank my good friend Mr. Wm. R. Jeffrey, of Ashford, and this time for a twofold kindness; he has enabled me to identify a larva, which I figured but could not rear in 1867, and also to give the economy of a species, which, common enough sometimes in the imago, has, hitherto, remained undescribed in its preparatory stages.

The larva I had in 1867, was found on some sea-shore plant gathered for another larva, and not detected at the time of gathering, so I could not, at that time, follow up the search; but on September 27th, 1876, Mr. Jeffrey found exactly such another larva at Folkestone, feeding on *Eupatorium cannabinum*; this became full fed and spun up on October 7th; not, as I expected, among its food plant, but at the top of its cage, which was protected with a double covering of grenadine

first, and over that, of fine cambric ; the larva made a hole through the grenadine, and crawling between the two coverings, cut through the cambric in a horse-shoe curve with about five-eighths inch radius, and drawing this partially detached portion together with silk, fixed it to the grenadine in such a manner as to form a cocoon—lined throughout with silk, which, from above, had much the form of a pasty ; the imago, a *S. ferrugalis* ♀, appeared at the end of August, 1877.

Very nearly at the same date, Mr. Jeffrey disturbed a female moth from some plants of *E. cannabinum*, which he captured, and shut up in a pill box ; and, on the white paper lining, she deposited about thirty eggs, in little groups of twos, threes, and fours ; and when these had been sent to me, September 12th, she continued to lay a few more on the side of a jam pot, into which she had been put, together with leaves of the food plant. We doubted the fertility of the eggs at first, but they all hatched in due time, those in my possession, on September 14th and 15th, and all the larvæ matured and spun up, some in the leaves of their food and some in pieces of muslin supplied for the purpose.

Meanwhile, both Mr. Jeffrey and myself did not forget to look occasionally on other plants, and on September 19th, he found several of the larvæ far advanced, others very young on the *Eupatorium*, and on October 10th, a few nearly full fed on *Stachys palustris*, and, curiously enough, one or two more under strawberry leaves in his own garden ! A fact which accounted very well for his little boys having earlier in the season disturbed several of the moths from some faggots of wood there, which, at the time, was a puzzling circumstance. On my part, besides finding one on *E. cannabinum*, I took a full-fed larva on *Stachys sylvatica* on the 4th of October, and on the 11th found a solitary plant of *Arctium minus* much ravaged, and after a careful search, detected one full-grown larva still remaining, the others, which I reckoned might have been twenty in number, having fed up and gone. To my surprise, the larva I had taken on *S. sylvatica*, which had pupated in a day or two, produced the moth on the twenty-fifth day, *i. e.*, October 29th, and Mr. Jeffrey bred one in a cage out of doors on the 9th of September, and the Rev. J. Hellins, to whom I had sent two of the larvæ reared from eggs, bred one moth on the 17th of the month, and the second moth in the first week of this present January, 1878.

Whether there are two broods or more of *ferrugalis*, I am, at present, unable to say, but that some few are bred late in the year, and probably hibernate till spring, has now become evident.

The white egg is very small, roundish, flat, and scale-like at first, and most difficult to detect when laid on a white surface, but by the seventh or eighth day the margin becomes rounded or raised, and, like the rest of the upper surface, a little convex; the shell then is seen to be minutely pitted, and through it the whitish, wax-like, opaque, faint form of the larva coiled round can be just discerned: on the ninth day it shows more distinctly, and on the tenth the head can be plainly seen as a black spot on the margin; the shell pearly and glistening; and after this the larva hatches in a few hours.

When hatched, the larva, at first, is semi-pellucid, whitish, and glistening, with a black head, it soon begins to feed, and when but a day old shows a dark greenish-grey dorsal line; it eats out little pits and channelled depressions on the under surface of a leaf, and by the third day even pierces quite through it. In about a week the first moult well over it is rather broadly and very faintly tinged with greenish on the back, and with a green dorsal line, head black; at the end of a fortnight it is a quarter of an inch long, and still having a black head, yet the body begins to show faintly some of the characters which will afterwards mark the adult, such as black specks on either side the second segment, the growing opacity and whiteness generally under the skin of the back, and the translucent green colour of the dorsal line: at the next moult, within five more days, the black head piece is finally cast off, and the general appearance very similar to that of the mature larva, excepting only that the back is often of a more silvery whiteness. After another moult the growth increases considerably, and after the last operation of this nature, the full growth is soon developed, for its appetite also increases in proportion, and large pieces are eaten from the leaves as well as large holes through them, so that, at this period, the indications of its presence on a plant are sufficiently obvious.

Its habits from the first is to hide itself by drawing together, with white silk, a part of a leaf, or to fold under a part of one edge; afterwards to partially join two leaves together so as to conceal itself; and latterly to lie in a very slight and open web of a few fine threads, which, spun on the under surface of a leaf, create and retain the hollow the larva designs to dwell in; and where it finds a secure footing, stretched out on the threads.

The full-grown larva varies from $\frac{3}{4}$ to nearly $\frac{7}{8}$ inch in length, moderately stout along the middle of the body and attenuated at each end, the head flattened, widest near the mouth, which is rather promi-

nently in advance ; the segments beyond the fourth are well defined, especially beneath, and the deepest wrinkle across the back of each is farther behind than in many *Pyrales*, but this is not very deep, another rather less deep is near the beginning, and a much fainter one near the end ; the ventral legs slender, the anal pair extended behind the body. The colour of the head is pale drab, the front margins of the lobes freckled with brown, and a group of similar freckles on each cheek, the mouth and a transverse streak above it light brown, the ocelli black ; the dorsal stripe is dark translucent green, showing at times a still darker pulsating vessel within ; this stripe is less distinct on the thoracic segments as they are broadly tinged on the back with similar green, but beyond them, on either side of the dorsal stripe, the back is of an opaque creamy-whitish, or cream colour, or sometimes a very pale tint of yellowish-drab, commencing narrow and faint on the third or fourth segment, widening and strengthening from thence along the middle segments, and then narrowing gradually to the end ; this is bounded by a *very fine line of the dark translucent green*, closely followed by a much stouter line of opaque whitish, which originates on the second segment and ends on the thirteenth, well relieved below by a broad stripe of translucent darkish green or greyish-green, the pale tracheal thread showing along its lower edge through the clear glassy skin ; the spiracles of the same pale tint of creamy-white ; the belly and legs semi-translucent watery-greenish, sometimes having the faintest possible tinge of flesh colour ; *on either side of the second segment are two black velvety spots, viz. :—one in front, elongate oval, and one behind it, small and round*, reminding one of a printer's stumpy-proportioned note of exclamation ; on the light parts of the back, near the beginning of each segment, a transverse row of fine green freckles can be seen, and on the anal flap a few black ones ; the tubercular warts are slightly raised, each having its small summit green, bearing an extremely fine hair ; hairs proceed also from the head.

When about to spin up amongst its food, it cuts partly out a portion of a leaf and draws it over around itself, much in the fashion before mentioned, and then spins its cocoon as a silken lining, and pupates therein.

The pupa is about five-sixteenths of an inch in length, of moderate substance in proportion, the head and all its parts well produced, eyes prominent, the thorax well developed ; the wing-, leg-, and antenna-cases long ; the tip of abdomen with a small pointed projection furnished

with two curled-topped spines crossing each other; four rows of minute warts, with single hairs pointing a little forwards, are visible down the back of the thorax and abdomen; the surface of the head, thorax and wing covers, and last ring of abdomen are brilliantly glossy, the other segments dull; the colour black, save in the segmental divisions, which are shining brown.

Emsworth: *January 8th, 1878.*

DIAGNOSES OF A NEW GENUS AND SOME UNDESCRIBED SPECIES
OF AFRICAN *PHYTOPHAGA*.

BY J. F. BALY, F.L.S.

(concluded, from p. 179).

HORATOPYGA CARINATA.

Aptera, ovata, convexa, pallide picea, subtus nitida, supra subopaca, pedibus antennisque piceo-fulvis; thorace transverso, disco utrinque longitudinaliter impresso, foreolato-punctato; foreis rotundatis sat profunde impressis disci medio minus crebre, ad basin et ad latera crebre dispositis; clytris breviter oratis, singulis carinis longitudinalibus 12, alternis ante apicem abbreviatis, instructis; interspatiis singulis serie unica punctorum rotundorum impressis; interspatio externo elevato, plano; pygidio vix exserto.

Long. 1 $\frac{3}{4}$ lin.

Hab.: Cape of Good Hope.

POLYSTICTA SIMONSI.

Oblonga-ovata, convexa, rufo-testacea, nitida, antennis, basi excepta, epipleuris posticis, pedibus, scutello, thoracisque punctis sex, 1, 4, 1 dispositis, nigris; clytris minus nitidis, minute granulosis; tenuiter punctato-striatis, interspatiis tenuissime punctatis; metallico-cyaneis, limbo exteriori rufo-testaceo, punctorum metallico-cyaneorum serie unica, plerumque discoidali, ornato; antennis brevibus, articulis ultimis sex compressis, claram elongatam formantibus.

Long. 1 $\frac{1}{3}$ lin.

Hab.: Lake Nyassa.

PHYSOMA VIOLACEIPENNIS.

Elongata, parallela, modice convexa, pallide fulva, nitida, vertice rude varioloso-punctato, nigro, antennis extrorsum nigro-fuscis; thorace fortiter punctato; clytris metallico-violaceis, anco-micantibus, crebre punctatis, punctis magnis, rotundatis.

Long. 2 $\frac{1}{2}$ —3 lin.

Hab.: Lake Nyassa.

EUTHECA.

Corpus ovatum, convexum. Caput modice exsertum; facie brevi, perpendiculari; oculis elongatis; antennis filiformibus. Thorax trans-

versus. Elytra punctato-striata. Pedes robusti; femoribus posticis valde incrassatis; tibiis spina apicali acuta armatis; posticis quatuor cæcis ante apicem emarginatis; unguiculis simplicibus. Prosternum postice depressum, dilatatum, truncatum; acetabulis anticis integris.

Very closely allied in all its characters to *Blepharida*, but separated from that genus by its simple claws.

EUTHECA HAROLDI.

Ovata, convexa, picea, nitida; capite utrinque inter oculos sulco sinuato sat profunde impresso; thorace flavo, disco piceo-tincto, ante medium fovea oblonga, necnon basi utrinque villa brevi, quasi linea curvata, fortiter punctata, pone apicem posita, impresso; elytris sat profunde punctato-striatis, interspatiis ante apicem et ad latera convexiusculis, maculis elongatis nullis ornatis.

Long. 2 $\frac{3}{4}$ lin.

Hab.: Lake Nyassa.

MYRCINA CHAPUISI.

Subelongata, modice convexa, nigra, nitida, abdomine obscure fulvo; thorace transverso, lateribus rotundatis; disco tenuiter punctato, utrinque intra marginem lateralem longitudinaliter impresso; elytris infra basin transversim impressis, tenuiter punctatis.

Var. A. *Corpore obscure piceo.*

Long. 1 $\frac{3}{4}$ —3 $\frac{3}{4}$ lin.

Hab.: Lake Nyassa.

Very nearly allied to *Myrcina nigra*, Chapuis, but much more variable in size than that species; its thorax broader, with more distinctly rounded sides, its upper surface more distinctly punctured, and impressed at some distance within the lateral margin with a longitudinal groove on either side.

AULACOPHORA SCUTELLATA.

Ovata, postice paullo ampliata, obscure fulva, nitida, antennis (basi excepta) pedibusque nigris, abdomine piceo; thorace transverso, lateribus obtuse angulatis, margine basali medio in tuberculum obtusum elevata; disco distincte punctato, transversim sulcato, sulco medio interrupto; elytris nigris, medio infra basin leviter conjunctim depressis, suberebre punctatis; singulis basi obsolete gibbosis, conjunctis circa scutellum late excavatis, foveam magnam transversam basalem formantibus, fovea laxi, antice fulva, postice tuberculis duabus contiguis ad suturam positus, instructis; scutello libero, lineariformi, recurvato—Mas.

Long. 3—3 $\frac{1}{2}$ lin.

Fam.: Elytris basi haud gibbosis, circa scutellum haud excavatis, totis nigris; scutello trigonato, haud libero.

Hab.: Lake Nyassa.

AULACOPHORA JENEIPENNIS.

Ovala, postice paullo ampliata, rufo-fulva, nitida, tarsi antennisque robustis, nigris, harum articulis quinque basalibus obscure fulvis, articulo ultimo picco; thorace transverso, lateribus obtuse angulatis, laevi, hic illic parce punctato, transversim sulcato, sulco integro; elytris minute granulosis nitidis, suberebre punctatis, viridi-aeneis. Long. $2\frac{1}{2}$ lin.

Hab. : Lake Nyassa.

Warwick : September, 1877.

DESCRIPTIONS OF SEVERAL NEW SPECIES OF HETEROCERUS
LEPIDOPTERA FROM JAPAN.

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

MACROGLOSSA SAGA.

♂. Primaries and body of a dark slate-grey colour, with dark brown bands and spots as in *M. Corythus*; secondaries with a broad central bright cadmium-yellow belt; base and external area black-brown (more broadly bordered than in *M. Corythus*); abdomen with three lateral basal transverse cadmium-yellow spots on each side, separated by black abbreviated bars, the spot nearest to the base very small; under surface similarly marked to *M. Corythus*, but considerably redder in colour. Expanse, 2 inches, 5 lines.

Yokohama (Jonas).

Type in B.M.

Though agreeing in pattern with *M. Corythus*, this species looks almost black by the side of it, being even darker than *M. Alcedo*.

SENDYRA NOCTUINA.

Primaries above black-brown, with pale veins; an oblique angulated abbreviated whitish-brown bar from the costal margin to the lower radial; reniform and orbicular spots black, with pale margins; a longitudinal pale-edged interno-median black patch; a concave oblique discal black stripe limiting the external border; outer border rosy, with marginal and submarginal parallel ferruginous lines; fringe white, intersected by a black line; secondaries ochreous, with undulated outer margin; a large spot on the end of the cell and a rather broad submarginal belt, terminating near anal angle in an internally directed tooth-like process, black; outer border from apex to second median branch, with ferruginous lines as in the primaries, thence to anal angle, with a single black marginal line; fringe as in primaries; head, thorax, and legs, hairy, black streaked with white, legs below with ochreous tibiae; abdomen ochreous, with a dorsal row of spots, and the anus black, below greyish; wings below ochreous, with the outer borders rusty; a large black spot terminating each discoidal cell; a black dash on the interno-median areas; primaries with a black spot in the cell. Expanse, 1 inch, 10 lines.

Hakodadi (Whitely).

Type, B.M.

Although belonging to the *Agaristidae*, this species somewhat calls to mind some of the *Noctuities* in the arrangement of its colours.

DATANOIDES, n. gen.

Allied to *Anzabe*, but with more nearly the aspect of *Datana*;

wings narrower, the inner margin of the primaries slightly waved, not strongly convex; the subcostal branches lying nearer to the costal margin; median vein four-branched, but the first branch emitted further from the end of the cell than in *Anzabe*; secondaries narrower, with the outer margin less arched; lower discocellular forming an acute point with the median vein; radial emitted as a fourth median branch, instead of from the upper discocellular; body much more slender than in *Anzabe*; palpi more prominent; scape of antennæ with a long external spur; shank with the articles submoniliform (in the female) and set, along the front edge, with short setæ or spinules.

Type, *D. fasciata*.

DATANOIDES FASCIATA.

♀. Primaries above pale sericeous rosy-brown; with a broad central belt, widest upon costal margin, limited by white lines followed towards the base and on the disc by bronze-brown belts; outer margin waved with a white marginal line; fringe brown, intersected by a black line; two black dots enclosed by an 8-shaped white margin at the end of the cell; secondaries greyish, with pale rosy-brown outer border; fringe whitish, black-spotted towards apex; body pale rosy-brown; anus ferruginous; head and collar greyish; under surface pale ferruginous, crossed by a dusky discal line; secondaries with the interno-median area greyish. Expanse, 1 inch, 5 lines.

Yokohama (Jonas).

Type, B.M.

APHA TYCHOONA.

♂. General character of *A. subdives*, but smaller, greyer, less strongly marked, the wavy lines less strongly sinuated, and less distinct; primaries pale greyish-brown; three blackish subquadrate basi-costal spots; an 8-shaped blackish line across the basal area; two distinct, and a third indistinct, sinuated oblique angulated ferruginous central lines, terminating upon the costa in blackish spots; an apical costal oval olive-clouded yellow patch; a blackish-edged oblique yellow discal line from inner margin to apex, bounded externally by an olivaceous stripe; outer border greenish olivaceous; a transverse battlemented submarginal line of blackish; secondaries sandy-yellowish, crossed in the middle by a ferruginous-bordered yellow line, which is bounded internally by a greyish stripe; outer border clouded with olivaceous; an ill-defined blackish battlemented line parallel to the outer margin; head brown; collar olivaceous; tegulae whitish-brown, clouded with olivaceous; remainder of body above sandy-yellowish; wings below altogether brighter than above; the basal two-thirds of primaries, and the basal half of secondaries, reddish-orange, crossed by dark slaty-grey lines, and bordered externally by a belt of the same colour; apex and a pyramidal discal belt bounded externally by the battlemented line of primaries, and the whole disc of secondaries bright saffron-yellow; the battlemented line blackish; external border clouded with picuous; palpi, pectus, and legs saffron-yellow speckled with vermilion; venter vermilion. Expanse, 2 inches, 3 lines.

Yokohama (Jonas).

Type, B.M.

The genus *Apha* belongs to the *Lasiocampide*.

NOTES ON SOME AFRICAN *HEMIPTERA-HETEROPTERA*.

BY W. L. DISTANT.

REDUVIIDÆ.

CENTRASPIS IMPERIALIS, Westw.*Var. BICOLOR*, Dist.

Black, shining, fore lobe of pronotum dull red; fifth joint of antennæ slightly longer than the fourth, and considerably longer than the sixth, last four joints fulvous; rostrum black, apical joints reddish. Pronotum with a central longitudinal furrow extending through the fore lobe to near the posterior margin of the hind lobe, a rounded and deeply excavated impression on each side at the junction of fore and hind lobes, and a smaller one near each lateral angle, situated on the hind margin. Scutellum reddish, with a rounded central impression. Elytra black, opaque. Abdominal border with a row of sub-quadrate reddish-yellow spots. Abdomen below shining black, with four reddish-yellow fasciæ, situated on the centre of the second, third, fourth, and fifth segments, not extending to the abdominal border. Legs black, tarsi reddish.

♂. Antennæ setose, second joint about twice the length of the first. Ante-ocular part of the head compressed, channelled. Hind lobe of pronotum nearly twice as long as the fore lobe, disc of hind lobe elevated and rounded. Elytra almost reaching the apex of the abdomen.

Long. 35 mill. Greatest lat., 12 mill.

♀. Antennæ slightly setose, second joint not twice the length of the first, head broad, raised, very slightly channelled. Hind lobe of pronotum a little longer than fore lobe, with the disc slightly raised. Elytra not nearly reaching apex of abdomen.

Long. 37 mill. Greatest lat., 14 mill.

Hab.: Camaroons (Rutherford), Mongo-ma-lobah.

It is probable that this may be a distinct species, the bi-coloration of the pronotum, and the totally different coloration of the under-side at once differentiate it from "*C. imperialis*." I have, however, as the result of a careful examination of one specimen of *C. imperialis* in the British Museum, been unable to discover any sufficient structural character to separate it from that species. That specimen has the last three joints of the antennæ as described above, which character does not sufficiently appear in Westwood's figure: Trans. Ent. Soc. iv, pl. 7, fig. 2 (1847).

TETROXIA BEAUVOISI, Fairm., in Thoms. Archiv., ii, p. 311, 595.

Of this species Dr. Stål (Hem. Af., iii, p. 126) states, "Exemplum typicum *Beauvoisi*, antennis, rostro, abdomine pedibusque destitutum, in collectione Signoreti asservatum, descripsi." I have received one specimen from Isubu, W. Africa, which is clearly referable to this species, agreeing on the whole with Fairmaire's description, save in a few particulars of coloration.

The colour of the pronotum is purplish-black—"d'un roussâtre brillant," Fairm. Femora from near the base to one-half their length, and the apical half of the tibiæ, pale yellowish—"base des cuisses et milieu des jambes d'un jaunâtre pâle," Fairm. All the other characters agree, though it should have been stated that the base of the second joint of the antennæ is also blackish.

ONCOCEPHALUS SUBSPINOSUS, A. & S., Hist. des Hém., p. 388, 1.

According to Stål (Hem. Af., iii, p. 159), "Specimen typicum pessime conservatum, haud describendum, misit Signoret, *O. annulipedi* maxime affinis, sed major, spinulis anticis capitis magis erectis, articulo primo antennarum paullo longiore, &c., &c. Long., 28; lat., 4 mill."

I have examined four specimens, two in my own collection and two in the collection of Mr. Horniman, which agree with the above description. There are also the following colour differences. The "vittula clavi et vitta oblongo maculaque minuta interioribus ante medium corii" of *O. annulipes*, Stål, are absent in *O. subspinus*. In the last named species, the spot on the membrane is less elongate and more quadrate.

Derwent Grove, East Dulwich:
December 29th, 1877.

ON THE IMPLIED POWER OF STRIDULATION IN THE HAIR-STREAK BUTTERFLIES (*THECLA*).

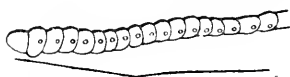
BY A. H. SWINTON.

Mr. A. R. Wallace, in his paper on the Butterflies of the Amazon Valley (Trans. Ent. Soc., n.s. ii, p. 263), says, regarding the *Theclæ*—*Endymion*, *Marsyas*, *Ætolus*, *Pholeus*, &c.—"they have a very peculiar habit of moving the two lower wings over each other in opposite directions, giving an appearance of revolving discs," a phenomenon also observed of certain Hair-streaks in the isthmus of Panama by Mr. T. Belt; who relates (Naturalist in Nicaragua, p. 299), that at the small town of Tierrabona he saw, "on wet muddy places near the stream, groups of butterflies collected to suck the moisture. Among them were some fine Swallow-tails (*Papilio*), quivering their wings as

they drank, and lovely blue Hair-streaks (*Theclæ*). The latter, "when they alight, rub their wings together, moving their curious tail-like appendages up and down."

Being desirous of witnessing, if possible, this biological trait in the *Theclæ*, I one May gave my attention to the habits of the indigenous *T. rubi*, in order to ascertain if anything similar was observable in its economy. Nor was I disappointed in this, for on two occasions when an individual was sitting sedately on a bramble-leaf with shut wings, I was rewarded by seeing it lift the hinder wings alternately, and, in a leisurely fashion, rub them backwards and forwards over the fore ones, thus betraying, I conceive, the real movement performed by its exotic congeners; for, on examination of one of them, *T. Ætolus*, the overlapping fore-wing has its anal vein decidedly denuded beneath, where it is also blackened and indurated, indicating friction.

Regarding the presence or not of a stridulating organ in connection with this rhythmical action, I may mention that beneath, on the overlap of the fore-wing in various species of the genus, the scales are supplanted by a patch of hair, and just above, the anal vein is bare and raised. This bare raised portion, in *T. rubi*, I have submitted to



Basal portion of the under-surface of the anal vein of the fore-wing of *Thecla rubi*, highly magnified.

a microscopical scrutiny, and find it crossed at uniform distances by pronounced striæ, which indicate internal diaphragms, and constrict the tube into a series of bead-like formations, whose surface, in common with that of the other fore-wing veins, is pitted, or bears a row of obsolete tubercles resembling those constituting a musical organ in certain *Acridiideæ*. Otherwise, the wing veins of this butterfly are not blackened nor indurated to form a *lima* such as we see occurs in larger species; and thus, any frictional sound caused by these bead-like constrictions or their tubercles moving over the costal vein of the hind-wing would be slight. If we likewise consider the celerity with which *Lepidoptera* receive intimation of cause of alarm, and their powers of locomotion, the difficulty of approaching the ear near enough to catch the possible stridor of the smaller kinds when at liberty will be evident; and it will therefore not appear surprising when I state that I failed to detect a sound accompanying the movement in *T. rubi*.* It would be a matter of much interest if it could be determined whether or not the wing movement is a secondary sexual character. *T. rubi*, like most of the *Rhopalocera*, pairs at noon.

Calais: January 3rd, 1878.

* If a sound be produced, it may be of a pitch too high to be audible by human ears.—Eds.

Argynnis Selene in Ireland.—The long anticipated observation of this insect in Ireland has at length been made; I have received an example from Mr. J. R. Holt, of Trinity College, Dublin, which was taken near Edenderry, in the King's County, last summer by Mr. E. P. Henn. A specimen was also taken near Templeogue, County Dublin; only solitary specimens were seen, and Mr. Henn, not being aware that the insect was a novelty in the island, made no special search. Of the genus *Argynnis* found in England, two species, *Adippe* and *Euphrosyne*, are still absentees from Ireland, and if, as is probable, Ireland received a large portion of her Lepidopterous fauna via Scotland, we shall very likely look in vain for them, as *Argynnis Adippe* does not occur, and *Argynnis Euphrosyne* is rare, in Scotland.—EDWIN BIRCHALL, Douglas, Isle of Man: *January 11th, 1878.*

An exhibition of insects.—On Thursday and yesterday an interesting exhibition drew together a large number of people at the Church Room, George Street, Grosvenor Square. This was the fifth annual exhibition of the West London Entomological Society. There were many very excellent collections on the tables, of which some cases of rare moths and butterflies are specially worthy of mention. In one of these there was a hermaphrodite specimen of *Anthocharis cardamines*. It was noticeable that the efforts of the exhibitors seemed all directed to but few orders of the vast insect world. The *Lepidoptera* (butterflies and moths), of course, predominated over everything else put together, but we could not see any good purpose served by many of the collections containing numerous specimens—sometimes even scores—of the same species of insect. A very large proportion of the insects was unnamed, a defect which efforts should be made to rectify in a future exhibition. Next to the *Lepidoptera* came some good collections of *Coleoptera* (beetles), and almost the only other order represented was that of the *Hymenoptera* (bees, wasps, &c.), to which a few cases were devoted. There were some cases of well-preserved caterpillars, including that of the Lobster Moth (*Stauropus fagi*). In many of the collections of *Lepidoptera* the absurd fashion was adopted of arranging the insects in patterns regardless of their connection by species or family. Thus a beehive, an anchor, stars and crosses were figured—certainly very artistically—but they were of no value from a scientific point of view. In but very few instances was the life history of any particular insect worked out by the exhibition of specimens in all the stages of its growth.—The "Echo," *December 8th, 1877.*

[We cordially endorse the foregoing remarks. It is surely time that such trivial employment as making designs in the form of a "bee-hive, an anchor, stars and crosses," with insects should cease, or, at any rate, should not be deemed entomological work, nor be patronized by an Entomological Society. Such things only excite the pity of scientific men and the ridicule of others, extending not only to the makers, but also to entomology itself. We earnestly hope the officials of our useful local Entomological Societies will discourage to the utmost exhibitions of this nature. An ample field for the investigation of the natural history of insects, as well as the examination of their structure, still remains to be occupied, and collectors would do good service if they turned their attention in these directions.—EDS.]

Reviews.

THE BUTTERFLIES OF NORTH AMERICA, by W. H. EDWARDS. 2nd series; part vi. New York: Hurd and Houghton. London: Trübner and Co. 4to. 1877.

A further instalment of this beautiful work. It contains 5 plates with descrip-

tive text. The first plate is devoted to *Satyrus Wheeleri*; the second to *Papilio Asterias* var. *Calverleyi*, and a bifurmed example (5 figures in all); the three others to the wonderful forms of *Papilio Turnus*, and the dimorphic forms of its ♀ (hence including *Glaucus*, in eleven figures, and with details of transformations). The lady artist, Mary Peart, who draws the figures, has done her part of the work (as usual) in the most admirable manner; and the way in which the author has treated the purely descriptive and biological matter is, to say the least, exhaustive and masterly. The text referring to *P. Turnus* is a complete life history of the species in all its phases. Although it was only in 1862 that the late B. D. Walsh asserted his belief that *Glaucus* was nothing more than a form of the ♀ of *Turnus*, it appears that so long since as 1832, Ridings had taken them *in copula*; the fact has over and over again been subsequently proved by breeding from the same batch of eggs. How many others of the multitudinous so-called species of Butterflies may be in similar case, time alone can determine. Mr. Edwards speaks of the dimorphism in *Turnus* as without a strict parallel among Butterflies, because it is not seasonal and is subject to geographical limitation, inasmuch as north of about 40°, the dark ♀ is scarcely, or rarely, found. It appears to us that the African *P. Merope* offers a parallel; only that in it the ♀ is polymorphic, and when we consider that in Madagascar *Merope* (supposing *Meriones* to be only a form of that species) has an unaltered ♀, it would seem that with it also geographical influences are at work.

COLEOPTERA SANCTE-HELENÆ. By T. VERNON WOLLASTON, M.A., F.L.S. Van Voorst, 1877: 8vo, pp. i—xxv, and 1—256, col. pl.

This, the last of the many valuable contributions to geographical entomology by its lamented author, results from a visit to St. Helena, where, with Mrs. Wollaston, who herself collected and studied the *Lepidoptera* with considerable success, he spent some months (October, 1875, to February, 1876), residing in Plantation House. The chief results were chronicled by him at the time in this Magazine, vol. xii, pp. 156 and 252; and it is a subject of regret that they could not have been published before Mr. Melliss's apparently exhaustive work on the physical, historical, and topographical features of the island, as the very peculiar beetle-fauna discovered by Mr. Wollaston would have formed by far the most interesting characteristic of its animal productions.

Two hundred and three species (based upon some 10,000 specimens, mounted and examined) are recognised by Mr. Wollaston as occurring in St. Helena, whereof fifty-seven are undoubtedly imported, the majority of them being indeed cosmopolitan, seventeen more are in all probability accidental visitors, and the one hundred and twenty-nine remaining are considered indigenous. Of these, the *Rhynchophora* comprise no less than ninety-one; only thirty-eight species representing the whole of the rest of the beetles. There are no *Hydradephaga*, *Philhydrida*, or *Longicornia* (the first of these being indeed absent, even when the certainly and probably accidental visitors are counted); the *Necrophaga* and *Trichopterygidæ* are represented by one, *Coccinellidæ* and *Lamellicornia* by two, the *Priocerata* (*Ela-teridæ* and *Anobiidæ*) and *Phytophaga* by three, the *Brachelytra* and *Heteromera* by six, and the *Geodephaga* by fourteen species, respectively. It will thus be seen that groups of world-wide distribution are either entirely absent or very poorly represented, whilst the weevils alone number nearly three-fourths of the whole fauna.

This curious feature is still further emphasized, by the fact of no less than fifty-four of the ninety-one *Curculionidæ* belonging to one family, the *Cossonidæ* (in England, we have nine, out of over 3000 indigenous species of all families). This small volcanic island, therefore, which is almost cleared of its native timber, is still probably more richly stocked with wood-infesting and herbage-loving weevils than any other spot on the earth's surface of equal area; and the conviction irresistibly arises that it was once a land thickly covered throughout with timber trees. Of the *Cossonidæ*, the author was compelled to characterize eleven new genera and forty new species, containing many eccentric modifications of eyes, antennæ, thorax, and rostrum, abnormalities in form and size, and unexpected differences of surface (asperate, wrinkled, and brightly metallic). The *Anthribidæ* are next in importance, with twenty-six species, whereof seventeen are new, and one represents a remarkable glabrous and polished Acaroid new genus, manifestly related to *Xenorchestes*, one of the most peculiar of the Madeiran forms. Another, *Homœodera nodulipennis*, has an enormous and apparently malformed excrescence at the apex of each elytron. Next to these are some strictly endemic new phases of *Bembidium* (possibly hereafter to be generically separated), Trechoid, of minute size, small-eyed, large-limbed, very rounded and shining, and living within damp stems of tree-ferns at lofty elevations. Among the remaining memorabilia, is the occurrence of the Madeiran anomalous Endophlœid, *Cossyphodes Wollastoni*, Westw., belonging to a genus only found elsewhere at Cape-town and in Abyssinia.

In completeness of execution and precision of expression, this yields to none of its late author's earlier classical works:—even the wonderful occurrence of a single misprint (*Trigosita*, p. 43), but directs attention to the general accuracy,—as the exception is said to prove the rule.

Obituary.

Thomas Vernon Wollaston, who, for so many years, assisted very materially in upholding the status of British Entomologists in the eyes of their continental brethren, and who retained to the last his original love for our meagre Coleopterous fauna, died very suddenly of hæmorrhage of the lungs, on the morning of Friday, the 4th January last, at his residence, 1, Barnepark Terrace, Teignmouth,—to the great loss of science, and deep regret of all who knew him. In him, we have lost a man, distinguished above all for accuracy and minuteness of observation (indeed, the few errors into which he fell in his many writings are owing to his punctilious over-care), for elegance and intelligibility of expression, for extreme liberality and unfailing innate courtesy, for a capability of continuous mental exertion, and for a persistency of purpose truly astonishing, even without considering his weak bodily condition. The scientific importance attaching to his numerous works, especially in connection with insular faunæ, is so universally recognised by Entomologists, that comment on their value is superfluous.

Mr. Wollaston was born on 9th March, 1822, at Scotter, in Lincolnshire,—the youngest son of a large family, of which Major Wollaston, of Shenton Hall, Nuneaton, is the present head. Dr. William Hyde Wollaston, the celebrated chemist, belonged to a junior branch of this family, of which Dr. W. Wollaston, author of "The Religion of Nature" (1722), was a direct ancestor some way back.

Mr. Wollaston was educated chiefly at the Grammar School, Bury St. Edmunds,

and, in 1842, entered at Jesus College, Cambridge, taking his B.A. in 1845, and his M.A. in due course, and becoming a Fellow of the Cambridge Philosophical Society. He also became a fellow of the Linnean Society in 1847. He resided at Cambridge for a time, until symptoms of delicacy in the lungs compelled him to pass the winter in Madeira in 1847. On his return, he lived for a few years in Thurloe Square, Brompton, and Hereford Street, Park Lane, until pulmonary weakness drove him to King's Kerswell, near Torquay, whence he removed to Teignmouth, where he is now buried. He passed many winters in Madeira, and, in 1866, visited the Cape de Verdes, extending his favourite study of island forms still further during a stay of six months in St. Helena at the end of 1875 and beginning of 1876. The success attending his collecting in the latter island, indeed, incited him to so much physical exertion, unfelt at the time in consequence of the salubrity of the climate, that he broke down on the homeward voyage, which was exceptionally cold and rough. Another stay at Madeira thus became necessary, but was apparently not sufficient to enable him to resist any longer the attacks of the disease which, though it had for thirty years kept him in a constant state of physical debility, had been unable to prevent him from constant work. Of the cost of that work, the following extract from a letter received just before his death will give an indication:—"Indeed, the constant warfare between physical incapacity and will was a curious feature, even at Madeira, where half my work was actually written in bed, and when suffering more or less from bleeding of the lungs; or else while sitting in a chair in the garden, basking in the sunshine." Mr. Wollaston in January, 1869, married the youngest daughter of his friend Mr. Shepherd, of Teignmouth, but leaves no issue.

A list of some of his works will be found in Hagen's invaluable "Bibliotheca Entomologica," and in the Royal Society's List of Scientific Papers. The forty-two publications therein enumerated, however, by no means represent the whole, even up to the date of those works, as many of his minor writings have been omitted, including his first contribution to entomological science, which was in vol. i (1843) of the *Zoologist*, upon the *Coleoptera* of Launceston, written while a student at Cambridge, where, with the late Rev. Hamlet Clark and Rev. J. F. Dawson, he acquired his taste for Entomology. As regards British insects, in addition to various communications of local interest in the *Zoologist* and this Magazine (wherein his last paper on indigenous beetles appeared in July, 1872, and includes a description of a new species of *Brachelytra*, *Scopæus Ryei*, erroneously referred by M. Fauvel to *S. sulcicollis*, from which it differs *toto cælo*), he will be remembered by his discovery of many species new to our fauna, especially of *Pentarthrum Huttoni*, representing a new genus of his favourite family the *Cossonidae* (1856), his revision of *Atomaria* (Trans. Ent. Soc., 1857), his enticing notes on collecting in the *Entomologist's Weekly Intelligencer*, and his excellent "Notes on Collecting" in the *Entomologist's Annual* for 1855. His general descriptive papers, on *Coleoptera* from New Zealand, Japan, Morocco, and other widely separated localities, will be found in the publications above mentioned, and in the *Annals and Magazine of Natural History*, the *Journal of Entomology*, and the *Berliner entomologische Zeitschrift*. So long ago as 1856, his attention was directed to the importance of the subject of variation of species, on which he published a work of 208 pages in length in that year; and at the time of his death he had just completed a most arduous undertaking, the description of known Madeiran land shells, which, under the title of "Testacea

Atlantica," will shortly be published by Messrs. Lovell Reeve, & Co., in two volumes—a most evident proof of his having "died in harness." His most important work, however, is undoubtedly his classical "Insecta Maderensia," published in 1854: a quarto volume of 677 pages, illustrated by 13 plates, drawn by Prof. Westwood, and engraved by Mr. F. Smith, and probably one of the most interesting and valuable of its kind. After the acquisition of his typical Madeiran collection (mounted and arranged with a precision peculiar to himself) for the nation by the Trustees of the British Museum, he published a more complete account in the shape of a Museum Catalogue in 1857, and another, containing the whole of the Canarian Coleopterous fauna, in 1864. Further acquisitions resulted in the "Coleoptera Atlantidum," 1865; and his Cape de Verde journey was followed in 1867 by the "Coleoptera Hesperidum." His last separate work, the "Coleoptera Sanctæ-Helenæ," 1877, is reviewed in the present Number, and is an astonishing instance of the power of exact knowledge, as it incontrovertibly proves the existence of a special endemic fauna, in the shape of a peculiar family, which had practically eluded former observers. This peculiar family, the *Cossonidæ*, was always a favourite one with Mr. Wollaston, who specially monographed it, and who described some 255 new species in it, as against 67 discovered by all other naturalists. His next favourite group was perhaps the *Colydiidæ*.

Mr. Wollaston has, in the introductions to the various works on insular faunæ above named, elaborately discussed and analyzed the results of his investigations of the Madeiras, Salvages, Cape de Verdes, and St. Helena, with the conclusion that their really endemic Coleopterous inhabitants cannot be satisfactorily referred to any geographical area now existing, but rather to some Atlantic region of which they are the sole representatives in modern times.

Apart from his high standing as a man of science, Mr. Wollaston will be remembered as emphatically a gentleman, and, if possible, still more emphatically as an instance of the power of mind over material.

Andrew Murray, F.L.S., was born in Edinburgh on the 19th February, 1812, the son of Mr. W. Murray, of Conland in Perthshire. He was educated for the law, and became a Writer to the Signet, practising as such in Edinburgh for some time. His earliest entomological paper (on two new *Buprestidæ*) appeared in 1852 in the *Annales de la Société Entomologique de France*; this was soon followed by many others, including a Catalogue of the *Coleoptera* of Scotland (1852), a Note on the Metamorphoses of *Phyllium*, and a Monograph of the genus *Catops* (1856), numerous Notes on the *Coleoptera* of Old Calabar (where we believe he had a brother—a missionary), a paper on the conditions of *Pediculus*, as affected by the races of men on which it is parasitic (1860); the most important of all was probably a Monograph of the *Nitidulidæ*, of which the first portion appeared in the *Transactions of the Linnean Society*, vol. xxiv (1864), but unfortunately, owing to difficulties with the Council respecting the expense the work entailed, it was never completed. Probably finding the legal profession ill-suited to his tastes, he came, in 1860, to London, and was appointed Assistant Secretary to the Royal Horticultural Society, which position he held for some years, and, up to the time of his death (which happened on the 10th of last month), he retained an intimate connection with the Society, having long held a seat on its Scientific Committee, and, for a few months before his decease, he was its Scientific Director. Mr. Murray's position on the above-named Committee enabled him to enlarge his knowledge of the habits of insects injurious to vegetation, &c., and, in 1868, he became engaged upon the formation of a collection illustrative of

economic entomology, in connection with the South Kensington Museum, resulting in the admirably arranged collection that now forms so attractive a feature in the Bethnal Green branch Museum; the first of a proposed series of Hand-books, explanatory of this collection, recently appeared, in which he treated upon the Linnean "*Aptera*," an unlucky title, as that Order is now as completely exploded as is the Linnean system of Botany, still, the Hand-book is very useful, and must have cost its compiler a vast amount of trouble. Last summer, when the agitation respecting the Colorado Beetle created an unreasoning, and, to some extent, ridiculous, scare in the public mind respecting that insect, resulting in the passing of a hasty Act on the subject, Mr. Murray was selected to proceed at once to any locality in which its occurrence was reported, in order to investigate the matter.

Although it was as an Entomologist (especially as a Coleopterist) that Mr. Murray acquired a wide and well-deserved reputation, it would be unfair to his memory not to allude to some other branches of Natural Science at which he assiduously worked. In 1866, he published a well-known work on the Geographical Distribution of Animals, illustrated by a large number of useful maps. As a Botanist, he for many years paid particular attention to the *Coniferae*, and published many papers on them; but his chief work in this department (which was to have been published by the Ray Society) never appeared. In 1873, he made an expedition to America, visiting Utah and California, we believe as reporter on one of the gigantic mining schemes, and, during this journey, he made many and valuable observations. But his health apparently suffered, although it was only for a few months before his death, which was somewhat sudden, that any serious symptoms manifested themselves. Mr. Murray was strikingly original, and, on several scientific points, held opinions looked upon as slightly heretical; somewhat uncouth in figure, and with a countenance that rarely relaxed into a smile, he yet had a kindness of manner that made him respected by all, and a fund of dry humour that told irresistibly upon his hearers, although uttered with what almost amounted to an appearance of unconsciousness on his part.

At the Scientific Committee of the Royal Horticultural Society, his familiar figure will long be missed. He was elected a Fellow of the Linnean Society in 1861, and, for some time, was on the List of the Entomological Society, but he rarely attended, and his name has ceased to appear in connection therewith for several years.

ENTOMOLOGICAL SOCIETY OF LONDON: 16th January, 1878.—PROFESSOR J. O. WESTWOOD, M.A., F.L.S., President, in the Chair.—*Anniversary Meeting.*

The following gentlemen were elected Members of the Council for 1878, viz., H. W. Bates, F.L.S., G. C. Champion, W. L. Distant, J. W. Douglas, Rev. A. E. Eaton, M.A., E. A. Fitch, F. Grut, F.L.S., G. Lewis, R. Meldola, F.R.A.S., E. Saunders, F.L.S., F. Smith, J. J. Weir, F.L.S., Prof. Westwood, M.A., F.L.S.

Subsequently the following Officers were elected, viz., H. W. Bates, President; J. J. Weir, Treasurer; F. Grut, Librarian; and Messrs. R. Meldola and W. L. Distant, Secretaries.

Professor Westwood read an Address on the Progress of Entomology.

It was moved by Mr. McLachlan, and seconded by Mr. Stevens, that the thanks of the Society be accorded to Prof. Westwood for his Address, and that it should be printed; which was carried unanimously.

It was moved by Mr. Dunning, and seconded by Mr. Fenn, that the thanks of the Society be given to the other Officers: Messrs. Weir, Grut, and Meldola replied, and the proceedings terminated.

NOTES ON SEXUAL DIMORPHISM IN *EREBIA MEDEA*.

BY H. GOSS, F.L.S.

I believe attention was first called to the occurrence of two forms of the female of *Erebia Medea* by Mr. George Wailes, in the Entomological Magazine. In a paper at p. 39 of the first volume of that journal, on the insects found in Castle Eden Dene and its vicinity, Mr. Wailes says:—"With regard to *Hipparchia Blandina*," (*Erebia Medea*) "I may observe that it is somewhat singular that the males "never have the broad brown band on the posterior wings instead of "the bluish ash one, whilst the females may be considered as divided "into two great varieties, equally common, distinguishable not only by "the colour of that fascia, but by the greater distinctness of the ocelli, "which, in the variety η , Stephens (that with the bluish ash fascia, "which I conceive should have been the typical variety), are rather "obscure, and approach, in appearance, those of the males."

All the British specimens of *E. Medea* with which I am acquainted, have been caught in Silverdale, near Carnforth, Lancashire, from which locality I have, through the kindness of James Murton, Esq., received specimens nearly every August during the last sixteen years.

The specimens from this locality include both forms of the female mentioned by Mr. Wailes, which are found flying together at the same time of the year, and one form seems quite as common as the other.

The difference between these two forms is chiefly observable on the under-side.

I will first call attention to the peculiarities in what I believe to be the second or diverging form. In this form the under-side of the fore wings is tinged with fulvous, between the base and the band, as in the European species *Erebia Neoridas*, and the ocelli, of which there are almost invariably four in each wing, are more clearly defined than in the other form, wherein they "approach in appearance," as Mr. Wailes observes, "those of the males."

In the hind-wing, which in this species is divided into what Newman styles four "compartments," the third "compartment," or as I should term it, the discal band, is ochreous-brown, or in some specimens whitish-ochreous, and in this band are a few very indistinct and minute white dots.

The other form of the female, or that which more nearly approaches in appearance that of the male, differs from the form before described in the following particulars: the under-side of the front wing is less strongly tinged with fulvous between the base and the band; the third (from the costa) of the ocelli in the marginal band is almost invariably

wanting; the second compartment of the hind wing, or median band, is of a somewhat darker brown colour; the third compartment or discal band is bluish ash colour, and the eyes therein are rather more distinct, and the hind wings are less rounded in form.

These two forms of *E. Medea* are probably well known to almost all lepidopterists, but one of my reasons for calling attention to their occurrence is, that they were referred to by Mr. Wailes as "*varieties*," and although one form doubtless is a "*variety*" of the other, in the sense in which a naturalist like Mr. Darwin uses that term; yet it is not, in my view, a variety, in the sense in which that word is commonly used by collectors of *Lepidoptera*. I would submit that the word variety should be reserved for abnormal specimens of any species of either sex; such as those caused by disease, or by the larva having fed on an unusual food-plant, or by having been subjected to unusual climatal conditions, or by any other cause not operating constantly and regularly in the production of any second form, and that it should not be applied to a diverging form which constantly occurs, is confined to one sex, and is probably a species in the course of formation.

Instead of speaking of these two forms as *varieties*, I think it would probably be more correct to regard them as instances of sexual dimorphism.

Assuming that we regard them as such, the question naturally arises as to which of them is the oldest or the type? Mr. Scudder says,* "that in all cases of colorational antigeny, it is the female, and "never the male, which first departs from the normal type of colouring "of the group to which the species belongs."

My experience of *E. Medea* certainly leads me to agree with Mr. Scudder, so far as that species is concerned, and I consider that one of the two forms of the female of this species which most nearly approaches the male in appearance, that is, the form in which the discal band is bluish ash colour, is to be regarded as the type (female); and that the other form, in which the discal band is ochreous-brown or whitish-ochreous, is the diverging form. If this opinion be correct, then this species (*Erebia Medea*) forms an exception to the rule, according to Mr. Darwin, who observes: † "When the sexes of butterflies differ, the male, as a general rule, is the more beautiful, and "departs more from the usual type of colouring of the group to "which the species belongs. Hence, in most groups the females of "several species resemble each other much more closely than do "the males."

* Proceedings of the American Academy of Arts and Sciences. Vol. xii, 1877, p. 152.

† The Descent of Man, and selection in relation to sex. 2nd edit., 1875, p. 310.

If we do not consider this species an exception to the rule stated by Mr. Darwin, then, according to this rule, as I understand it, *half* the females and *all* the males in this species depart from the type. Upon this point, Mr. Scudder remarks:* “If, on Darwin’s theory, “sometimes one-half, and sometimes three-quarters of a species has “diverged from the type; why does it never happen that only one-fourth of the species diverges? This seems to be a very pertinent “and damaging enquiry.”

It will be observed from my description of these two forms of *Erebia Medea*, that the differences between them lie altogether on the under-side of the wings, and chiefly on the hind wings. This is unusual and exceptional, according to Mr. Scudder, who states that: “Whenever antigony, colorational or structural, manifests itself in the “wings of butterflies, the difference between the sexes almost invariably occurs upon the upper surface and generally upon the front “wings only.”

As I have before stated, all the specimens of *Erebia Medea* with which I am acquainted have been obtained from the same district. I should therefore be glad to hear from those who have taken this species in other localities in Great Britain, especially in Scotland, whether, in their experience, the two forms of the females to which I have called attention occur elsewhere, and if so, whether they are represented in the same relative proportions.

I have communicated these notes, not because I consider them of any intrinsic value, but in the hope that they may have the effect of directing increased attention, on the part of lepidopterists, to those colorational and structural peculiarities in various forms, the study of which cannot fail to throw some light on the question of the origin of species.

Surbiton Hill, Surrey :
6th February, 1878.

NATURAL HISTORY OF *BOARMIA ABIETARIA*.

BY W. BUCKLER.

I figured the larva of this species as long ago as 1863, but not the less do I feel indebted to the Rev. Bernard Smith for kindly sending me eggs in July, 1876, and thus giving me the opportunity to become more thoroughly acquainted with all its changes.

The food which is generally given for the larva is fir; the examples I had in 1863 chose birch in preference to fir; Mr. Dorville, I remember, found a larva once on whortleberry, which he reared to maturity

* Proc. Amer. Acad., *ante cit.*, p. 153.

on the same plant ; but from Mr. Machin I learnt that though he had formerly taken the larva *very sparingly* on oak, beech, pine, and spruce fir, it was not until many years afterwards that he discovered the larva to be quite common on yew (*Taxus baccata*) ; and from subsequent experience was convinced this tree was the favourite and proper food. For enlightenment on this important point I am greatly indebted to Mrs. Hutchinson, who, in June, 1876, most kindly presented me with three fine full grown larvæ which she had reared on yew, and I used this food most successfully to rear the larvæ from the eggs which Mr. Smith gave me.

These eggs were laid on July 30th, by a female moth confined in a coarse muslin sleeve over a branch of yew ; however, in part, she disregarded the branch and extruded the eggs through the interstices to the outside of the muslin where they adhered. The larvæ hatched August 12th and 13th, and fed away well ; when, however, it became necessary to change their food, their complete assimilation to the colour of the under-side of the leaves caused me, from time to time, to overlook one or two, and thus my stock, at first numbering twenty-seven, were reduced to twelve by the end of the year.

Their time of hibernation began about the middle of October, and lasted in a very partial way until the following spring, as they frequently moved a little and nibbled their food during that period : at the end of March, 1877, they fairly waked up, began to moult, and thrive, and the most forward individual attained full growth by the 21st April, entering the earth on the 28th, and followed by the others at intervals up to the 9th May. The moths, ten in number, *i. e.*, eight males and two females and all finely developed, were bred from June the 8th to 21st.

The egg in shape is oblong, elliptical, and has a depression on some part of the side, its surface finely ribbed lengthwise and pitted between the ribs ; the colour a light subdued green, glistening with a pearly lustre, changing on the seventh day to a paler tint of greenish-drab, and again on the fourteenth day to a deeper hue of olive-grey, when the embryo shows through the shell as a dark line, and on the next day it hatches.

On escaping from the shell the larva is a slender little creature, with an ochreous-green head, a very pale greenish stripe down the back, a blackish-olive stripe on the side, a whitish stripe below, and the belly dark olive-green. When nine days old it is about a quarter of an inch in length, the colouring of the stripes rather browner, and within the pale stripe of the back appears an extremely fine dark green

dorsal thread; at this time when disturbed it is an active little looper, but, otherwise, often hangs by a thread from a twig motionless: when a fortnight old, the dark stripes begin to open into very fine parallel lines. At the age of five weeks, it is a little more than three-eighths of an inch long, of uniform moderate substance, with anal legs well developed, ground colour light brown, with darker lines and paler edges to them, showing much of the characteristics of the mature state, viz., blackish sub-dorsal and lateral marks at the hinder parts of some of the segments, and thick blackish dashes below the spiracular region; the ventral surface dark brown with paler lines; it is now rigid and stick-like, and as it has the habit of drawing the anterior legs up in a bunch close to the head, and as the anal legs are stout and thick, it has the appearance of being stoutest at each end.

During the winter it seems to grow a little, and towards the approach of spring its length varies from half an inch to five-eighths, and the stoutness in proportion: as it approaches full growth its ravages become apparent; it often eats away all the leaves on one side of a yew stem before attacking those on the opposite side; and when it has quite stripped the end of a twig it still keeps to the bare stick as a comfortable resting-place, returning to it, even after feeding at some distance, by help of the strong silk thread attached to the twig from its spinneret, just as in its more juvenile days; at this more mature age, however, the thread is not easily broken, and always drawn forth in its leisurely progress, both on leaving and regaining its bare stem, to stretch itself along it at full length and embrace it with its legs as it settles itself for a day's sleep: it seems to be only at night that it feeds or moves, unless disturbed, for when I had three or four examples asleep on twigs openly before me for many hours, no movement occurred beyond the mere expulsion of a pellet of frass at intervals; probably, at large, on a yew tree it would be completely hidden from view.

The full-grown larva measures one and a half inch in length, and about three-sixteenths, or nearly, in diameter throughout, though the head is a little less than the second segment, its lobes rounded and well defined on the crown; the segmental divisions indicated by a fold of the skin; beyond the thoracic segments each has two faint wrinkles anteriorly across the back, and three or four towards the end, rather deeper on the sides where the skin is much puffed and puckered, especially along the spiracular region; the muscles of the ventral and anal legs largely developed; the tubercular warts rather prominent, especially the hinder dorsal pairs, which are larger than the front pairs, and as well as those along the sides are on little tumid eminences; of

the ground colour there are two varieties, one is light ochreous-brown having conspicuously paler cream-coloured patches on the back of several segments, the other variety is dark greyish-brown with paler patches, sometimes of light cinnamon-brown, often palest on the fifth, ninth, and tenth segments; the head is much freckled with reddish-brown, and has a brown conspicuous spot on the front of each lobe, and another just above each papillus; the dorsal line on the thoracic segments is but just indicated by very short double black marks at their divisions, but it is more complex on the other segments, being composed of a fine central pale thread within two lines or series of brown freckles, which widen gradually as they approach between the second pairs of tubercles, and then as gradually contract towards the end of each segment; these are followed in a parallel direction on either side of the back by a pale line edged outside with a line of brown freckles, some lighter some darker, and after an interval of ground colour, by the pale sub-dorsal stout line, edged on both sides with a thin line of brown freckles; the front pairs of warts are black on the fifth, sixth, seventh, eighth, and ninth segments; and the hind pairs, though pale in part, are involved in a strong black mark which, flowing from them, darkens the parts of both adjacent lines to the segmental division; sometimes, but not often, these black markings are present on the four hinder segments, otherwise the warts only bear a black dot; along the side occurs a faint pale wavy line, edged below with black, but this is interrupted for a space just behind each lateral black wart, and again continued to the segmental division; the spiracles are of the ground colour, roundish-ovate in form, and strongly outlined with black, and in front of each is a short line of a few black freckles; lines occur on the belly but are very faint; each tubercular wart emits a fine short bristly hair, and these hairs are rather numerous on the head, the thirteenth segment, and anal legs.

When full-fed, and beginning to contract for its change, the colouring of the larva is turned to a dingy smoky-green.

Apparently it makes no appreciable cocoon, and a few days before the moth is disclosed the pupa makes its way upwards towards the surface of the earth.

The pupa is about three-quarters of an inch in length, stoutest across the ends of the wing-covers, where its diameter is a quarter of an inch, and from whence it tapers gradually to the end of the abdomen, which is furnished with a tapering projection, separating near the end into two fine short points; the surface of the thorax and wing-covers smooth, the abdominal rings very finely punctate, their divisions smooth, and of a dull violet-brown colour; all the other colouring dark brown and glossy.

SOME NEW CONSIDERATIONS ABOUT PLANT-LICE.

BY J. LICHTENSTEIN.

In reply to my "Enquiry about plant-lice" (p. 175, *ante*) I have had the pleasure of receiving some very interesting communications from various quarters; and, after watching with the greatest care the cycle of life in about half-a-dozen plant-lice, from the fecundated egg up to the adult female, I arrive at the following conclusions:—

Ordinarily, insects are diœcious, that is, each sex is already separate in the egg, and two eggs are necessary to produce a male and a female. But the *Aphides* are monœcious, that is, a single egg is sufficient to produce, not only one male and one female, but a great quantity of males and females, thus evidently the two sexes are included in the fecundated egg. I do not know that this is mentioned anywhere, but I have seen very few works on embryology, so, perhaps, it is already known and recorded, and also the difference between a diœcious and a monœcious egg has been discovered.

At all events, in the *Homoptera-diœcia* (*Cicada*, *Psylla*, *Aleurodes*) a very good character thus exists to distinguish them from the *Homoptera-monœcia* (*Aphides*). (I make a reservation about *Coccidæ*.) But as the single mother-louse (which, of course, possesses no separate sexuality, any more than the egg itself) gives birth to a second and third stage of generation equally agamous, and it is only in the fourth stage that male and female appear in separate forms, the matter becomes far too elaborate to be treated in a single note like this. So I now content myself with enquiring only of your readers if they are aware whether the fact of the monœcious nature of the *Aphides* has been mentioned or not.

Relative to my enquiry about the sexuated forms of plant-lice, I have received the following highly interesting communications:—

Dr. Franz Löw, of Vienna, knows *Pemphigus Boyeri* (subterranean) and *Pemphigus spirothecæ* (gall-louse) as giving birth in the winged state (my pupiferous form) to sexuated unwinged lice without rostrum, but he does not believe that the last mentioned species has an underground stage in the cycle of its life.

Prof. Derbès, of Marseilles, says that *Pemphigus cornicularius* has been the object of his studies, and he will shortly publish the result. The pupiferous form, which he calls "ailé du printemps," appears in the spring, deposits its pupæ on *Pistacia terebinthus*, and the remainder

as in *Phylloxera quercus*. The sexuited individuals copulate in the spring, and the female deposits a single egg, which endures through the year, and gives birth to the agamous stem-mother only in the following spring (we find here again the error committed by Balbiani of giving the time of appearance as a character—Balbiani says “œuf d’hiver” for the *Phylloxera*, and Derbès has “ailé d’automne” and “ailé du printemps” for the *Pemph. cornicularius*, although in insects having such a complicated generation as the plant-lice the same forms can appear at any time of the year).

C. V. Riley, of St. Louis, says of *Schizoneura ulmi* that “it curls up the leaves in spring, and the winged females (my pupiferous form) resort to the bark and bring forth the sexuited individuals, which are bark-suckers, and lay the *winter-egg* (thus also using the objectionable term of Balbiani) under the bark.” Riley does not believe the insect to be subterranean in any stage of its life.

Rudolph Leuckart, of Leipzig, has also observed the sexuited form, unwinged, without rostrum, of *Pemphigus spirothecæ*.

And to-day, I find here, under the bark of elm (*Ulmus campestris*), the sexuited female of *Tetraneura ulmi*, dead, close to an enormous single egg, from which, undoubtedly, will come the stem-mother, which has to form the galls in the spring. How happy would poor old Freiherr von Gleichen be, if he were still alive (he died in 1783), to hear that the male form of *Tetraneura ulmi* for which he looked day by day during eight years, has been found, and that the cycle of life, of which he described the gall-period so accurately, is now entirely, or at least very nearly, known.

Waiting for further information, I only give here the following indications as means to guide those entomologists who would like to discover one of the yet unknown forms of a very common insect. Under the bark, or in the crevices of the bark, of the elm, principally stunted shrubs (“rabougris”), I find a dry, apterous, little female louse of 0.41 mill., *without rostrum*, and having short, 4-jointed antennæ; and close to her a large egg of 0.35 mill., thus nearly as large as the mother. I hope to be able to follow up observation of the further stages of life of this insect. I also now find, at liberty, as many eggs of *Schiz. corni* as I like, but as they are not in a condition adapted to my theory, I reserve further communication respecting them for another number of this journal.

Montpellier: 16th January, 1878.

DESCRIPTIONS OF TWO NEW BRITISH SPECIES OF *NEMATUS*.

BY P. CAMERON.

NEMATUS HIBERNICUS, *sp. n.*

♀. Antennæ a little shorter than the thorax and abdomen, black, moderately stout, of nearly uniform thickness, the 3rd joint a very little longer than the 4th, the others becoming gradually shorter, the 9th conical, a third shorter than the 3rd. Head a little narrower than the mesothorax, the vertex finely punctured, covered with a short down, shining, the clypeus and labrum white, the former with a slight emargination. Thorax black, covered with a short down; the tegulæ white. Legs white, the basal half of the two anterior, and nearly the whole of the posterior femora, the apical quarter of the posterior tibiæ and the apical three-fourths of the posterior tarsi, black. Wings hyaline, the costa and stigma sordid white; the 1st submarginal nervure is absent, in the 2nd submarginal cellule is a horny point, the 3rd submarginal cellule is almost a parallelogram; the 2nd recurrent nervure is received immediately in front of the 2nd submarginal. Abdomen a little longer than the thorax and head, thick, broad, the apex acuminate, the cerci small, thin; saw broad, projecting. Length, $1\frac{3}{4}$ lin.

In the absence of the 1st submarginal nervure, in the punctured vertex, with invisible sutures and pentagonal area, this little form agrees with the species of the *fulvipes* (= *brevis*, II.) group, but the clypeus is notched and white, and the antennæ do not taper so much towards the apex. Judging from the description, it must be a very near ally of *N. filicornis*, Thoms. (which Thomson states resembles the *fulvipes* group, but differs in the emarginated, white clypeus, while the antennæ resemble those of *Blennocampa*), but it differs from that species in many points. Thus, Thomson gives the antennæ as being "breves, corpore dimidio evidentè breviores," while in *hibernicus* they are decidedly longer, the 3rd joint too is not a third longer than the 4th, nor can the wings be said to be "lenissime fumatis," while *filiformis* again has the middle tibiæ marked with black, and the tarsi testaceous; the tegulæ again are "fusco-testaceis."

Taken by Mr. King, near Dublin.

NEMATUS PLACIDUS, *sp. n.*

♀. Antennæ nearly as long as the body, thin, filiform, the 3rd joint a very little longer than the 4th, the rest a little shorter; black, brownish on the under-side from the 2nd joint. Head narrower than the mesothorax, black, the labrum and palpi white; clypeus almost truncated at the apex, which is piecous; vertex punctured, the pentagonal area and sutures indistinct; antennal fovea large. Thorax black, half shining, the mesonotum with a few punctures, tegulæ and pronotum white; the pleuræ shining, for the greater part brownish. Wings clear hyaline, costa and stigma white; the 1st submarginal nervure is distinct; the 3rd submar-

ginal cellule is a little longer than broad; 2nd recurrent nervure received a good way in front of the 2nd submarginal; there is a small horny point in the 2nd submarginal cellule. Legs clear white, the apex of posterior tibiæ and tarsi (except at the extreme base) fuscous. Abdomen as long as the head and thorax, thickish, bluntly rounded at the apex, black, the anal segment pale brownish-white; cerci pale, long, pointing downwards. The saw does not project. Length, $2\frac{1}{4}$ lin.

This species seems to be most nearly related to the group of *Fuhræi*, with which it agrees in the form of the body and antennæ, but the face is not so sharply pointed, the clypeus is truncated at the apex, and the body has much more black on it. From the *pallipes* group (which have the anus white) the form and colour of the antennæ separate it, and the same remark holds good with *hyperboreus*.

Taken in England by the Rev. T. A. Marshall, or, possibly, by his late father.

31, Willowbank Crescent, Glasgow:
15th January, 1878.

DESCRIPTIONS OF TWO NEW SPECIES OF BUTTERFLIES FROM
WEST AFRICA.

BY HERBERT DRUCE, F.L.S., F.Z.S.

PAPILIO ZOROASTRES, *n. sp.*

Form of *P. echerioides*, but larger. Upper-side black, with the bands pure white instead of cream colour, as in *P. echerioides*, the band on the anterior wing more broken into spots, and those close to the apex much smaller, a small white spot below the third spot of the band nearest the apex and close to the outer margin. Posterior wing crossed by a wide white band, much dentated on the outer margin, a submarginal row of four large white spots, crossing the wing from the apex to near the anal angle, the fringe black and white.

Under-side much the same as *P. echerioides*; the anterior wing with a large white spot at the end of the cell, and a small white spot close to the apex. Posterior wing with the basal third rich reddish-brown, below which it is white to beyond the middle, the outer half shaded with light and dark brown, the white spots as above.

Exp. 3; inch.

Hab.: Fernando Po.

Mus., Druce.

CRENIS VADIMONIS, *n. sp.*

Upper-side: anterior wing dark brown. Posterior wing dark brown from the base to beyond the middle, where it shades off into light reddish-brown, the outer margin dark brown, crossed below the middle, near the outer margin, by a row of very indistinct black spots.

Under-side: anterior wing yellowish-brown, crossed beyond the cell by an ill-defined band of dark brown, the apex pale brown, crossed by a wavy line and three black spots. Posterior wing pale greyish-brown, crossed near the base and at the middle by two wavy brown lines, and from the costal margin to the anal angle by a row of seven contiguous ocellated spots, the fourth the smallest; a submarginal wavy brown line.

Exp. $2\frac{1}{2}$ inch.

Hab.: Cameroons.

Mus., Druce.

DESCRIPTIONS OF FOUR NEW SPECIES OF *PRONOPHILA*.

BY W. C. HEWITSON, F.L.S.

PRONOPHILA ORSEDEICE.

Upper-side red-brown. Both wings with a rufous spot in the cell, both crossed beyond the middle by two macular bands of rufous spots, small and indistinct on the anterior wing, large on the posterior wing. Anterior wing acute at the apex. Posterior wing with some small rufous spots on the outer margin.

Under-side. Anterior wing rufous, with a large, pale brown spot at the apex, and other rufous spots between the median nervures, all traversed by a series of four black spots, three of which are marked by very indistinct white spots. Posterior wing pale brown, crossed before the middle by a broad band of red-brown, followed by a series of five red-brown, eye-like spots, each marked by a minute white spot; a submarginal, zig-zag, red-brown line. Exp. $2\frac{5}{10}$ inch.

Hab. : Ecuador (Buckley).

Very different in form from any other species, but most nearly allied to *P. Propylea*:

This and the three following species are in my own collection.

PRONOPHILA PELINEA.

Upper-side black-brown. Both wings slightly dentate. Anterior wing with a quadrifid subapical white spot.

Under-side rufous-brown. Anterior wing as above, except that there are two rufous spots, one in the cell, and the other between the second and third branches of the median nervure, and that the apical spot is larger and irrorated with brown. Posterior wing undulated throughout with paler colour, and irrorated with white. A small white spot near the costal margin before its middle, and two similar spots below the middle. A minute white spot towards the anal angle. Exp. $2\frac{1}{2}$ inch.

Hab. : Bolivia (Buckley).

PRONOPHILA PALEPOLIS.

Upper-side dark rufous-brown. Both wings slightly dentate. Anterior wing crossed beyond the middle from the costal margin, where it is divided into two minute parts to the second branch of the median nervure, by a hexafid band of white.

Under-side dark brown. Anterior wing as above, except that there is a subapical grey spot. Posterior wing irrorated with grey, a spot of white on the middle of the costal margin, crossed beyond the middle by a broad grey band, broken below the apex, traversed by a series of minute white spots, and bordered inwardly by a zig-zag black line. Exp. $2\frac{5}{10}$ inch.

Hab. : Bolivia (Buckley).

PRONOPHILA PALADES.

Upper-side dark black-brown. Anterior wing crossed by a broad band of white.

from the costal margin at its middle, to the first branch of the median nervure, straight on its outer border, dentated on its inner margin. Posterior wing with an oblong, white, nearly central spot, the outer margin dentate.

Under-side paler brown. Both wings with a submarginal, linear band of black, undulate on the posterior wing. Anterior wing with the white band as above, and a pale brown subapical spot undulated with dark brown. Posterior wing with the white spot as above, except that it is extended to the abdominal margin, followed by a band of grey-brown, traversed by a series of minute white spots.

Exp. $2\frac{1}{10}$ inch.

Hab. : Ecuador (Buckley).

Most nearly allied to *P. Pullantis*.

Oatlands, Weybridge :

February, 1878.

DIAGNOSES OF THREE NEW SPECIES OF PSYLLIDÆ.

BY DR. FRANZ LÖW.

TRIOZA EGOPODII.

Caput et thorax fulvi, rubro-fusci vel obscure sanguinei, mas supra multo obscurior, abdomen infra pallide ochraceum, supra olivaceum, incisuris pallidis angustis. Vertex dimidia latitudine paulo longior, foreolis duabus subquadratis. Coni frontales $\frac{2}{3}$ — $\frac{3}{4}$ longitudinis verticis fere æquantes, crassiusculi, apice obtusi et nigri, non divergentes. Clypeus niger. Antennæ basin alarum posticarum fere attingentes, albæ, articulis basalibus rufescentibus, duobus ultimis et apice octavi nigris, articulus tertius $2\frac{1}{2}$ —3 tam longus quam quartus. Pronotum in medio paulo brevius quam ad latera, $\frac{1}{4}$ longitudinis verticis æquans. Elytra $2\frac{1}{3}$ tam longa quam lata, extra medium maxima latitudine, apice obtuse angulata, plus minusve fuscescentia, nervis concoloribus; pars basalis subcostæ $\frac{1}{4}$ longitudinis elytri vix superans; radius costæ parallelus; cellula radialis fere ubique eadem latitudine et paulo tantum latior quam spatium angustissimum cellule discoidalis; pars radialis costæ 3— $3\frac{1}{2}$ tam longa quam pars discoidalis costæ, que fere semper longitudinem rami furcalis quarti habet, petiolus furcæ primæ $2\frac{1}{2}$ — $2\frac{3}{5}$ tam longus quam ramus furcalis primus, hic extra medium marginis posterioris situs; ramus furcalis primus et tertius plerumque æquali longitudine. Alæ hyalinæ. Pedes pallide brunnei, femoribus obscurioribus. Lamina genitalis maris longitudinem segmenti genitalis æquans, lateribus in medio retrorsum paulo dilatatis. Forceps fere longitudine laminae genitalis, trigona, basi valde lata, $1\frac{1}{2}$ tam alta quam lata, apice acuto retrorsum vergente. Valvula feminae inferior longitudinem segmenti præcedentis æquans vel paulo longior, sensim acuminata, valvulam superiorem non superans.

Long. corp. maris 1.8—2 mm., *feminae* 2.2—2.4 mm.

Habitat in *Ægopodii podagrariæ* foliis bullato-monstrosis, paginam inferiorem diligens.

Austria, Bavaria, Fennia.

TRIOZA DISPAR.

Mas supra niger, infra et ad latera fulvus vel rufo-fulvus; femina tota rufo-fulva vel obscure aurantiaca vel fusco-sanguinea; abdomen in utroque sexu fuscis duabus nigris supra ornatum. Vertex dimidia latitudine vix longior, foreolis duabus rotundis. Coni frontales vix dimidia longitudine verticis, ad basin crassi, ad apicem acuti, non divergentes, maris nigri, femine fulvi. Clypeus niger. Antennæ basin elytrorum attingentes, albæ, articulis duobus ultimis nigris, articulo primo maris nigricante, femine rufo-fulvo, articulus tertius $2\frac{1}{2}$ — $3\frac{1}{2}$ tam longus quam quartus. Pronotum in medio vix brevius quam ad latera, circiter $\frac{1}{3}$ longitudinis verticis æquans. Elytra maris hyalina, nervis brunneis, femine pallide fulva, nervis concoloribus, $2\frac{1}{3}$ tam longa quam lata, extra medium maxima latitudine, apice obtusissime angulata; pars basalis subcostæ $\frac{2}{7}$ elytri longitudinis æquans; radius rectus, costæ non parallelus; cellula radialis apicem versus sensim attenuata, ejus spatium latissimum ad summum $1\frac{1}{2}$ tam latum quam spatium angustissimum cellulæ discoidalis; pars radialis costæ quam plurimum $2\frac{1}{2}$ tam longa quam pars discoidalis costæ, quæ longitudinem rami furcæ quarti paulo superat; ramus furcæ primus longitudine tertii; petiolus furcæ primæ $2\frac{1}{4}$ — $2\frac{1}{2}$ tam longus quam ramus furcæ primus, qui paulo extra medium marginis posterioris situs est. Alæ hyalinæ. Pedes pallide brunnei, femora ad basin plus minusve nigricantia. Lamina genitalis maris fusca vel nigra, segmenti genitalis longitudinem æquans. Forceps pallide fulva, apice nigra, fere longitudine laminae genitalis, basi lata, sensim attenuata, ejus apex truncatus retrorsum angulum acutum formans et antrorsum in cuspidem brevem productus. Valvula femine inferior longitudinem segmenti præcedentis æquans vel vix superans, apice obtusa, valvula superiore vix brevior. Genitalia femine colore ventris.

Long. corp. maris 1.9—2.2 mm., femine 2—2.3 mm.

Habitat in pagina inferiore foliorum bullato-monstrosorum *Taraxaci officinalis*.

Austria.

TRIOZA UNIFASCIATA.

Caput et thorax fulvi vel sordide fulvi, leviter pruinosi, supra lineis et maculis nigro-fuscis vel rufo-fuscis; scutellum semper flavum vel rufescens; abdomen maris nitide nigrum incisuris fulvis angustis, primum ejus segmentum ad latera rubrum, supra nigrum; abdomen femine ful-

rum, supra fasciis nigro-fuscis, infra fasciis griseis, primum ejus segmentum supra et ad latera nireum. Vertex dimidia latitudine rix longior, margine postico subrecto, forcipolis duabus magnis, trigonis, plerumque obscuris. Coni frontales longitudine verticis, valde proclives, apice acuti, non divergentes. Clypeus niger. Antennæ basin alarum posticarum paulo superantes, nigre, apex articuli secundi et fere totus articulus tertius testacei, articulus tertius $1\frac{3}{4}$ —2 tam longus quam quartus. Pronotum in medio paulo brevius quam ad latera, circiter $\frac{1}{3}$ longitudinis verticis æquans. Elytra hyalina, nervis fuscescentibus, $2\frac{2}{3}$ tam longa quam lata, extra medium maxima latitudine, margo anterior cum posteriore apice angulum subrectum formans; nervus clavalis in medio puncto atro; pars basalis subcostæ $\frac{1}{4}$ elytri longitudinis æquans; radius basi fere rectus, apicem versus curvatus et costæ subparallelus; pars radialis costæ 3— $3\frac{1}{2}$ tam longa quam pars discoidalis; hæc plerumque $\frac{2}{3}$ tam longa quam ramus furcalis quartus; ramus furcalis tertius $1\frac{1}{4}$ — $1\frac{1}{2}$ tam longus quam primus; petiolus furcæ primæ $2\frac{1}{2}$ —3 tam longus quam ramus furcalis primus, qui paulo extra medium in marginem posteriorem oblique excurrit. Alæ hyalinæ, earum appendix basi macula oblonga, atra. Pedes anteriores et medii nigri, posteriores flavo-albicantes. Lamina genitalis maris brunnea, utrinque processu longo, recto, forcipem obtegente. Forceps nigra, tam alta quam lamina genitalis, angustissima et antrorsum curvata. Valvulæ femine æquali longitudine, segmenti præcedentis longitudinem æquant, acuminatæ, inferior nigra, superior flava vel rufa, apice atrata.

Long. corp. maris et femine 2—2.2 mm.

Habitat in *Salice purpurea*.

Austria.

More detailed descriptions of these three species and of their biology, illustrated with figures, will appear in the *Verhandlungen der zoologisch-botanischen Gesellschaft in Wien*.

Wieden, Hauptstrasse 47, Vienna: January 10th, 1878.

Note on the genus Aleurodes.—The only species known to Linné was so like a small moth that it was considered by him to be Lepidopterous, and he described it under the name of *Phalæna-Tinea prolella*. It was also taken to be Lepidopterous by subsequent authors; even Réaumur, who gave an excellent description of the larva and accurately observed its mode of life, contented himself with saying that the structure of the rostrum is altogether so different from that of other *Lepidoptera* that this alone might be deemed sufficient to characterise a new class of *Phalæna*. So it continued to be placed among the *Lepidoptera* until Latreille, in 1795, discovered that it belonged to the *Homoptera*, and placed it with the *Aphidina*.

Burmeister, however (in 1835), considered that it consorted better with the *Coccina*; and, lastly, Westwood (in 1840), seeing that it differed in important points from both *Aphidina* and *Coccina*, created for it a new Family, in which view he was supported by Dr. Signoret in his excellent monograph on *Aleurodes* (Ann. Soc. Ent., France, 1868), to which I am indebted for most of the particulars I now give.

Many species are now known, and the perfect insects, which are very like small moths, are found, chiefly between the months of April and October, in gardens and sheltered places in woods, where they may be seen in rapid but short flight towards sunset. They are best captured, according to Signoret, by placing over them when at rest a small glass tube, from which they are easily transferred to a larger benzined tube (a killing-bottle or laurel-leaf collecting-bottle would serve equally well). The best means I have found for preserving them for examination is to gum them with tragacanth on to black card.

The insects have peculiar reniform eyes, generally bipartite; an ocellus just above each eye; a short, thick rostrum of three joints; antennæ of seven joints; and four opaque wings of nearly equal size, covered with a delicate mealy powder of a white or pale yellow colour, sometimes also having a small black spot. From the similarity of size and colour the species are difficult to separate, the small distinctions being, according to Signoret, chiefly in the relative length of the joints of the antennæ and in the structure of the eyes; to which I would add that the examination of the forceps-like armature of the genitalia of the male will, in all probability, show a difference of structure in the several species, similar to that found to exist in other sections of the *Homoptera*, as well as in other orders.

But it is more easy and satisfactory to differentiate the species in the larval state, for they then vary not only in colour but in character;* generally at first transparent but becoming more or less opaque and yellow as they get older,—sometimes black or brown variegated with white; some are smooth, others are furnished more or less copiously with hairs on the back; while others are provided with tubes from which, a pale farinaceous matter is secreted, which in one species (*A. Jelinekii*) forms tufts. In general almost all are bordered by a pale or transparent waxy secretion, forming a kind of fringe all round the body; but some are covered with a rather thick protective secretion.

The oval pedunculated eggs are laid, often in great numbers, on the under-side of the leaves of trees or plants; from them, in about twelve days, the larvæ are hatched; these, in almost the same number of days (according to the observations of Heeger, after three moults), become pupæ; and these again assume the perfect form in almost the same time; so that a generation is perfected in little more than a month, and throughout their earlier existence the insects remain always on the same plant or leaf. In the perfect state they fly readily, and some species apparently hibernate when adult.

In this country the natural history of *Aleurodes* has been very little studied. Stephens, in his Catalogue (1829), gave five species as British, but of these three were found to belong to the *Neuroptera*; and Walker, in his List of British *Homoptera* (1860), enumerated six species, mentioned below with the addition of the respective food-plants, on which the larvæ often abound:—

* Parity to this occurs with some species of *Lepidoptera* which are hardly to be distinguished from others when in the ultimate form, but exhibit valid differences of structure when in the larva-state.

proletella, Lin., on Celandine (*Chelidonium majus*).

brassicae, Walk., on cabbages.

fragariae, Walk., on strawberry plants.

loniceræ, Walk., on wild honeysuckle.

phillyreæ, Huid., on *Phillyrea* and different species of *Cratægus*, *Mespilus*, and *Pyrus* (Walk.), and on *Rhamnus alaternus* (Sign.).

carpini, Koch, on hornbeam.

These are all admitted by Signoret to be good species, and he adds nine others as European, all of which are doubtless to be found in Britain. They are—

rubi, Sign., on bramble.

caprææ, Sign., on *Salix caprææ*.

quercus, Sign., on oak (*Quercus pedunculata*).

avellanae, Sign., on hazel.

fraxini, Sign., on ash-trees.

immaculata, Heeger, on ivy.

dubia, Heeger, on ash-trees.

Jelineki, Frauent., on laurustinus.

aceris, Geoffr., on *Acer platanoides* (not a native tree, but introduced from Europe nearly 200 years ago, and now common); probably also on sycamore and maple, as in the parallel case of *Rhinocola aceris* (vide vol. xiii, p. 42).

In the Verh. d. k. k. zool.-botan. Gesells., 1867, Herr von Frauenfeld enumerates the species of *Aleurodes* known to him, including *A. euphorbiae*, Löw, found on *Euphorbia peplus*, but while he reckons it as doubtfully distinct he does not indicate the species to which it may possibly be referred.

There exist, therefore, with regard to the natural history of *Aleurodes*, not only much that is curious, but also, considering the paucity of observers, the great probability of much remaining to be learned, and of new species to be discovered. I have too little opportunity of working in this direction to be able to entertain the expectation that I can do much, but I have written this note in the hope of enlisting the attention of British entomologists, possibly of some of those who have been accustomed to rear small *Lepidoptera*, or, at any rate, of some of the more enterprising of the rising generation of investigators.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 9th February, 1878.

Secretion of water-beetles.—The following curious note from Mr. T. T. Cooper's "Mishmee Hills" (King & Co., 1873), p. 178, has naturally escaped the attention of M. F. Plateau, who, in his learned treatise "Sur une Sécrétion propre aux Coléoptères Dytiscides" (Ann. Soc. Ent. Belg., xix, pp. 1—10), would otherwise, doubtless, have had something to say upon its subject:—"In the evening, when we camped, at the Bramapootra, some of the men collected a number of edible beetles. These little insects, which are a species of water-beetle, are found in immense numbers during the cold weather in the dry shingly bed of the Upper Bramapootra. They are about the size of a finger-nail, with bronzed wing-shields, and when handled exude a liquid resembling walnut-juice, of a strong but not unpleasant odour. The Khamtees seemed to consider them a great delicacy when boiled, and for several days the odour of the beetles seemed to impregnate their bodies, to their intense

"satisfaction." The precise locality appears to be just before reaching Bramakund. If I had myself observed this quotation when I had the pleasure of meeting Mr. Cooper at Bristol, soon after its publication, I should of course have tried to obtain further particulars.—E. C. RYE, 70, Charlwood Road, Putney, S.W.: *January, 1878.*

Pœcilus cupreus, var. affinis, Sturm.—I observe that Baron Chaudoir, in his excellent little monograph of this group in L'Abeille, 1876, after defining the above named variety as not differing from the type in size or build, and as having only the two basal joints of the antennæ red, and the femora red also, remarks that it appears not to occur in England. It is, however, not very uncommon here. In my own collection, I have five examples of it, all from the London district, and I have seen many others. Stephens' variety *rufifemoratus* is obviously also identical with it, and is indeed properly so referred by Chaudoir himself, *l. c.* p. 18: it is recorded both in the "Illustrations" and "Manual," and is mentioned in Wilson & Duncan's "Entomologia Edinensis" and Murray's Catalogue of the Coleoptera of Scotland, so that it is difficult to see the ground for Chaudoir's remark. I may observe that Chaudoir says this variety is usually blue or black, but that he has four specimens of the more or less greenish-bronze of the type: my specimens are, two bronze-green, two bright blue-green, one nearly black.—ID.

Staphylinus fulvipes in the New Forest.—On two occasions last year, whilst staying at Lyndhurst for a few days, I had the good fortune to meet with a specimen of this rare and very pretty insect. Both captures were decidedly "flukes," as I shook the first out of moss in Beechen Lane on March 29th, whilst the second was taken running on the ground in a grassy ride at night, attracted thither by the light of a sugaring-lantern, at the end of July. This second capture was effected in the same wood where, in 1876, I took *Quedius dilatatus* at sugar. *Staphylinus fulvipes* has not, I think, been recorded from this district before: hitherto, Folkestone, Holme Fen, and the Glasgow district seem to have been the localities most favoured by it.—W. A. FORBES, Cambridge: *February 11th, 1878.*

Apatura Iris in the New Forest.—Perhaps it may interest some of your correspondents to know that I captured a female *A. Iris*, August 5th, 1877, in Stubby Enclosure, near Dury, in the New Forest. This is the insect I believe which Mr. Porritt mentions as having "*seen alive in a collector's box,*" as I recollect showing it to a lady and two gentlemen near Hurst Hill, when *C. sponsa* was being caught in such abundance. Although *A. Iris* is constantly to be found in several other places in England, this is the first recorded capture of it in the New Forest for many years; so I am informed by Mr. Jerrard, the well known collector at Lyndhurst. It came and perched on a very small oak tree, and at first I took it for a *Sibylla*, which insect I was then taking, and it was only when in the net I discovered what I had got. Although I obtained several ova none of them proved fertile. The swarm of *C. sponsa* at Hurst Hill was something to be remembered. I had never seen anything like it. Although I had no killing-bottle or lantern, between the hours of 4 and 7 p.m., I captured nearly thirty, most of them in broad daylight, sweeping three at a time off the tree with the net. Of course at that early hour they were very skittish and not easily approached; however, I obtained a very good series.—H. NEALE, Salisbury: *January 19th, 1878.*

Notes on Pyrameis Tameamea.—By the kindness of the Rev. T. Blackburn, I have lately received a good series of *Pyrameis Tameamea*. This fine insect has been very ill-used by entomologists. In the first place, Mr. Blackburn tells me, that the name should have been *Ka-mè-ha-mè-ha*, the vowels pronounced after the continental style and the h's strongly aspirated and almost guttural. The word means "The 'lonely one,'" *Ka*, or, in some dialects, *Ta*, being the definite article. Eschscholtz, the original describer, called it *Tameamea* (*mea* = "thing!"). Mr. Kirby, misled perhaps by Kotzebue's spelling in the body of his work and not knowing the etymology of the name, added an *m*, so it stands in his Catalogue as *Tammeamea*, a word of no meaning. Then the figure of the upper-side in Kotzebue, while correctly enough coloured, is very coarsely drawn, and in these days of hair-splitting might well pass for that of some other species. On the other hand, the figure in plate 25 of the "Genera," while drawn with Mr. Hewitson's usual correctness, has apparently been coloured from such a faded specimen as to be at first sight unrecognisable. The figure of the under-side in Kotzebue is tolerably correct for some specimens; in others the colour is duller and more uniform, with the whitish median fascia, and also the pale pinkish ante-marginal one, quite obsolete; in others, one or two of the irregular spots of the median fascia are very distinct and the rest of the markings nearly sunk in the ground colour; again, the ground colour instead of being a dull olivaceous green is sometimes what might be called an olivaceous-ochreous: in these last, one can, however, hardly say that there is any ground colour, the shades are so numerous and intricate as to be difficult to depict and impossible to describe. The olivaceous patch on the apical portion of the under-side of the fore-wing varies also in shade, conforming to that of the hind-wing. This patch and the whole of the hind-wing have always a more or less silky lustre in fresh specimens. The only sexual difference is that the female appears to be usually the larger.—N. C. TUELY, Mortimer Lodge, Wimbledon Park: February 11th, 1878.

Notes on the occurrence of Notodonta bicolora in England.—On the 10th June, 1865, I beat one example out of birch (when beating for *Coleoptera*), into an umbrella net; it is now in the collection of Mr. Barrett. I told Mr. Charlton, who was with me at the time in Burnt Wood, Staffordshire, and we immediately got a long stick and commenced beating in earnest. Mr. Charlton beat two (*in copula*) out of birch; three others were captured on the wing, two by me and one by Mr. Charlton, from 4 p.m. till dusk. They remind one of *Spilosoma menthrasti* in their mode of flight. We decided to keep the females alive for the purpose of obtaining ova; they were placed in a perforated zinc box lined with newspaper: the one we obtained *in copula* loose, the others pinned; they were all in my care. After we arrived home I transferred the un-pinned female to a paper bag, in which I had previously put a few birch leaves. I obtained 186 eggs the following week; they are green and hemispherical, changing to almost chocolate in the centre previously to the emergence of the larvæ. I fed the larvæ on birch, and 22 changed to pupæ, and 7 perfect insects came out the following season, at separate times; 15 pupæ were alive until 1867, but never emerged. The larva is green, whitish on the back, with several yellow lines, the spiracular line interrupted; it much resembles that of *N. chaonia*. My friend, Mr. Joseph Sidebotham saw the larvæ several times, and the late Mr. Doubleday was aware that I was feeding the species. The pupæ were enclosed in

cocoons amongst the fallen leaves, close to the surface of the earth, in my breeding cage.—JOSEPH CHAPPEL, 22, Boundary Street, Hulme, Manchester: *February 4th, 1878.*

On the numerical proportion between Micro- and Macro-Lepidoptera in the Tropics, &c.—In the “*Horæ Societatis Entomologicæ Rossicæ*,” vol. xiii (1877), Professor Zeller has described, in his usual excellent manner, a vast number of new exotic *Micro-Lepidoptera* (*Chilonina*, *Crambina*, *Tortricina*, *Tineina*, and *Pterophorina*), the greatest part of which were collected by Baron v. Nolcken in Bogotá, where the capture of these small moths and the study of their natural history were made by the Baron objects of primary consideration, and not, as by others previously, deemed to be of inferior importance, and the specimens are therefore in finer condition than any others brought to Europe from tropical South America. The memoir also includes a large number of species in the collection of Dr. Staudiner, obtained from all parts of the world, many of the finest having been brought from Panamá and Chiriqui by Herr H. Ribbe, and from the Chanchamayo taken by Herr Thamm.

The studies of Professor Zeller lead him to the conclusion that as yet we are only at the very beginning of our knowledge of exotic *Micro-Lepidoptera*, considering not only that, with regard to them, immense regions have not been in the least explored, but also that in the countries that have been visited by collectors they have been very insufficiently reared for. Nevertheless, he believes there are sufficient grounds for the following propositions:—

- 1.—That in tropical countries small or even the smallest *Lepidoptera*, both of brilliant and inconspicuous species, are not less abundant than the *Macroptera*.
- 2.—That the *Tortricina* are there but poorly represented (as also is the case in the South of Europe), their place being taken by Tortriciform *Tineina*, such as *Cryptolechia* and *Hypercallia*.
- 3.—That the products of the higher and highest localities have a strikingly European character.

But, on the other hand, with regard to geographical distribution, and the number of genera, species, or individuals, he holds that, in the present state of our knowledge, no conclusions are admissible.

The memoir occupies 286 pages (there are evidently more to follow), and is illustrated by two excellent coloured plates of an upper and lower wing of species described.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *January 3rd, 1878.*

Description of the larva of Tephrosia punctulata.—I received a few eggs of this species, together with the parent-moth, from Mr. J. R. Wellman, of London, on June 14th, 1876. They were oval, and of a dingy smoke colour. On the 25th of the same month the young larvæ emerged, and in colour were uniformly bright yellow. They fed upon birch, and by the end of July had attained their full-growth, when I took down my notes as follows:—Length, about an inch, and of moderate bulk in proportion; the head has the lobes rounded, and is about the same width as, or a trifle narrower than, the second segment; body of uniform width throughout, is rounded above, but a little flattened ventrally; segmental divisions well defined, and each segment rather numerously divided transversely into sections, which give the skin a somewhat rough appearance.

Ground colour a bright apple-green, the head tinged with yellow; two yellowish-white lines, having a yellowish pulsating line between them, form the dorsal stripe; sub-dorsal lines yellowish-white, and there are two other lines of the same colour, but much finer and indistinct, between them and the spiracular region: segmental divisions yellow.

The ventral surface is of the same colour as the dorsal area, with pale central and side lines, and the segmental divisions yellow.

The larva forms a cocoon below the surface of the ground, by drawing particles of earth rather firmly together with silken threads.

The pupa is nearly half-an-inch long, and moderately stout in proportion; it is of the ordinary cylindrical shape, attenuated to the anal point, which is not very sharp; the wing-, leg-, antenna-, and eye-cases are well defined, those of the antennæ being conspicuously ribbed; there are also two short but distinct points extending outwardly forward from the head. Colour almost uniformly dark mahogany-brown.—GEO. T. PORRITT, Highroyd House, Huddersfield: *January 4th, 1878.*

Note on the Egg of Tephrosia biundularia.—Last May Mr. E. Birchall sent me eggs of this species, which I had much interest in examining under the microscope.

The egg is oblong, cylindrical, and full, more conical at one end than the other; the shell of dull appearance without any gloss, but also without any reticulation or granulation, except just in the centre of the fuller end, where there is a small circular patch of oval reticulation; the colour of the egg is a light bright green.

Of course this description shows the egg to be perfectly of the geometer type, but in the point of being devoid of ornament, except in the centre of one end, it is like the egg of *Charæas graminis*; the shell of this egg (which is of the usual *Noctua* form) is evenly granulated all over, in a very fine pattern, but has in the centre of the top a small star or rosette as its ornament.

After this I should be extremely glad to get a few eggs of *Tephrosia crepuscularia* (of Doubleday's List), and if any one who is in the habit of taking that species, would remember me at the proper season, I should be thankful to him, and would make the best return in my power.—J. HELLINS, Exeter: *January 9th, 1878.*

Reviews.

THE MIDLAND NATURALIST: edited by E. W. BADGER and W. J. HARRISON. Vol. i, No. 1. London: Hardwicke and Bogue. Birmingham: Cornish Bros. January, 1878.

Another addition to the list of British Natural History periodicals, which, from the very careful manner in which the opening No. is got up, looks as if it intended to take an important position. The secondary title is "The Journal of the Associated Natural History, Philosophical, and Archaeological Societies and Field Clubs of the Midland Counties." The idea appears to have been started in 1874, but it was not until 1876 that it took any serious form. At present, the "Union" consists of no less than seventeen local societies, and more are confidently expected to join. Even in this country, few are aware of the multitudinous Natural History Societies and Field Clubs that exist in the thickly-populated midland and northern counties of England.

In 1875 we noticed (vol. xii, p. 90) the establishment of the "Naturalist," the Journal of the West Riding Consolidated Natural History Society (a Union, now, of about twenty associations), which appears regularly. The journal now under consideration is slightly larger, and slightly higher in price; and, comparing it with some of the later Nos. of the "Naturalist," shows evidence of better editing in the way of avoiding printer's errors, &c. Let us hope it may continue in the way it has commenced. We welcome this as we do every journal conducted in the same spirit, and are disposed to accord all praise to the courage of its conductors for starting such a periodical in these flattest of all times in our industrial centres.

The contents are of the most varied nature, entomology being, apparently, rather at a discount; but a few notes by the Rev. C. F. Thornehill, M.A., contain sensible observations and advice as to the differences that exist between merely forming a collection and acquiring habits of observation, with the power and will of communicating discoveries to brother naturalists. We have seldom seen a local journal that held out greater promise of becoming important and useful.

THE NATURAL HISTORY AND ANTIQUITIES OF SELBORNE, by the late GILBERT WHITE: edited by THOMAS BELL, F.R.S., Professor of Zoology in King's College, London. 2 vols., 8vo., pp. i—lix, 1—507, and 1—410. London: J. Van Voorst, 1877.

No work on natural history has a greater claim to the title of an English "classic," than "White's Selborne." No book of the kind has gone through so many editions; there is none in which the deductions from personal observations have been so little disputed or so generally confirmed. It may confidently be predicted that after the lapse of centuries (during which the amount of "force" expended in paltry squabbles over the priority of names and kindred subjects, that engage the attention of naturalists at the present day, will be enormous) the works of De Geer, Réaumur, Gilbert White, and a few others, will remain monuments of patient investigation and sincerity of purpose.

In the abstract, it might be said that there was no necessity for another edition of "White's Selborne." But there are special circumstances connected with this edition that cause us to value it above all others.

Some years ago, the now venerable Thomas Bell (ex-president of the Linnean Society) took up his residence at the parsonage formerly occupied by Gilbert White; a more charming or fitting retreat for a naturalist it would be difficult to find. In Bell, the 'naturalist' is, as it was in White, and as it is in more than one of our prominent students of natural science, combined with the antiquary and archæologist, and it would have been impossible to find any one more competent to edit the writings of an author of such kindred tastes.

The principal portion of the first volume consists of the well-known letters, albeit with copious notes, and an exhaustive memoir, and concluding pages bring Gilbert White out as a poet, and of no mean importance. The following ultra-conservative lines, on an ill-mended road, are amusing:

"Cramm'd up with furze, with faggots, and huge stones,
What a rough road of glass, hard flints, and bones!
Blockheads are always busy'd in the wrong;
Mend not at all, and one might get along."

The second volume contains several hitherto unpublished letters and memo-

randa, both direct, and concerning members of his family, in which his brother, the Rev. John White, takes a prominent position. One of the most interesting portions of this volume is a reproduction of Gilbert White's account book, when he was at Oxford, in 1752-4. We glean from this, not only his extreme exactitude in financial matters, but also, that he had a good deal of human nature in his composition, and was not ashamed to own it.

The two volumes are illustrated by plates after photographs taken by the editor, representing some of the more important local references, and by *facsimiles* of letters, &c. We think these volumes might justly conclude the list of editions of "Gilbert White;" at any rate, no other can be more complete.

ENTOMOLOGICAL SOCIETY OF LONDON: 6th February, 1878.—H. W. BATES, Esq., F.L.S., &c., President, in the Chair.

The President nominated Prof. Westwood, and Messrs. J. W. Douglas and F. Smith, Vice-Presidents for the year.

Mr. Weir exhibited three specimens of an *Atypus* (which Sir S. S. Saunders considered to be *A. Sulzeri*) from near Lewes.—Also a remarkable spider from Madagascar; and a living example of a small *Philodromus* from the New Forest, marked in imitation of lichen.

Mr. McLachlan exhibited a series of a remarkable new Dragon-fly from Ecuador belonging to the genus *Euthore*, and three other species of the same genus, in illustration of a paper on the *Calopterygina* collected by Mr. Buckley in Ecuador and Bolivia.

Mr. Meldola exhibited a singular example of *Leucania conigera* taken at Willesden, in which the colour and markings (including the white stigma) of the fore-wings were partially reproduced on the left hind-wing.

Mr. Meldola read extracts from a letter to Mr. Darwin from Dr. Fritz Müller, from Santa Catharina, Brazil, concerning the habits, &c., of several South American *Lepidoptera*. One of the *Sphingidæ* in that locality had a proboscis (exhibited) of 22 centimètres in length. Another species of the same family exhaled a strong scent which proceeded from an odoriferous organ indicated by two pencils of hairs at the base of the abdomen. The flowers of a species of *Lantana* are yellow the first day, orange the second, and purple the third, and Dr. Müller entered into interesting details with respect to the species of butterflies that respectively visited the flowers in their different conditions of coloration, proving considerable appreciation of colours in these insects. Finally, he alluded to a secondary sexual character existing in the genus *Callidryas* and some others, the costal margin of the anterior-wings being sharply serrated in the ♂ and smooth in the ♀. Mr. Meldola said that in the British Museum there is a South American specimen of *Macrosila Cluentius* with a proboscis 23.5 centimètres (= 9¼ inches) in length.

In the discussion that ensued, Mr. Butler alluded to the extent to which this serration is present or absent in various groups of *Callidryas*, and the genera formed at its expense.

Captain Elwes (present as a visitor) exhibited a beautiful collection of nature-painted butterflies, executed by a process invented by Dr. Sériziat, of Collioure (Eastern Pyrenees), from whom he obtained the collection, and who is willing to supply others.

Mr. Champion exhibited twelve species of the genus *Cetonia* collected by Mr. J. J. Walker at Besika Bay and other localities in the Mediterranean; also a specimen of *Anthicus bimaculatus* taken by Mr. J. T. Harris at New Brighton.

Mr. May exhibited a *Carabus intricatus* which he was assured had been taken at Fulham.

Mr. Goss exhibited specimens of *Erebia Medea* in illustration of the dimorphic condition of the ♀ in that species. (For details see present No.).

Sir John Lubbock read a paper "on the colouring of British caterpillars," especially concerning those of butterflies and the larger *Sphingidæ* and *Bombyces*, principally with reference to the principles laid down by Darwin, Wallace, &c., to the effect that dull-coloured, green, and smooth-skinned caterpillars are eaten by birds, whereas, those that are spiny or hairy, or brightly coloured, are rejected. In the course of tabulating the different caterpillars he found that whereas the green ones are not hairy, the majority of the brightly coloured are. A long discussion ensued, in which the President, and Messrs. Weir, McLachlan, Meldola, Butler, Douglas, Goss, Weale, &c., took part.

Mr. C. O. Waterhouse read papers on a new Dragon-fly from Borneo, on a new species of *Chernetidæ* from Spain, and on the Coleopterous family *Lycidæ*.

WEST-LONDON ENTOMOLOGICAL SOCIETY:—

St. Mark's Institute, George Street,
Grosvenor Square: February 14th, 1878.

To the Editors of the Entomologist's Monthly Magazine.

GENTLEMEN,—The Members of the West-London Entomological Society have seen with regret in your Magazine the remarks upon their last Exhibition, extracted from the "Echo," December 8th, 1877.

The usual invitations were forwarded to you, and it appears unfortunate no one could have been present sufficiently informed upon the subject to fairly represent you as an authority, which could not be expected from an unscientific quarter.

To fill the wall-spaces in so large a room, it was thought necessary to invite exhibitors of Natural History generally, and hence such subjects were introduced. Mr. Burton contributing largely, Mr. Keilich, and others.

It was admitted to have been the most successful Exhibition on record, and the proof that in the two evenings more than 1600 visitors were present.

With regard to the Butterfly Pictures which seem to have called forth the principal remarks, they, although very artistic, were not intended to represent the science, but merely as ornamental decorations, although, doubtless, many an entomologist in his early days has derived much pleasure in their production, and been given an impetus to farther researches in the study of Entomology.

The Exhibition Committee are anxious that your readers should have some idea of the magnitude of the Exhibition.

In the first place the life-history of nearly 400 species were represented, including the following: *Papilio Machaon*, *Melitæa Artemis* and *Cinxia*, *Vanessa c-album*, *Limenitis Silylla*, *Aporia cratagi*, *Sphinx concolvuli*, *Acherontia Atropos*, *Deilephila galii*, *Macroglossa bombyliformis*, *Cynatophora* (all except *ocularis*), *Acronycta* (all except *strigosa* and *myrice*), *Cucullia* (all except *serophulariæ* and *guaphalii*), *Diphthera Orion*, *Heliothis pelliger* and *dipsacea*, *Dicycla oo*, *Clostera anachoreta*, *Endromis versicolor*, *Hydrocampa nymphæalis*, *Bolys terrealis*, *Pionea stramentalis*, *Ephestia elutella*, *E. interpunctella*, &c., &c.

Dr. Harper contributed a long series of *Colias Edusa*, many most extraordinary varieties: they represented every shade of colour, from the deepest orange coloured *Edusa* to the whitest form of *Helice*, it being impossible to say where *Edusa* left off and *Helice* commenced; a series of *Liparis monacha* varying from nearly white to quite black. Black and intermediate vars. of *Bombyx quercus*, some extraordinary vars. of *Liparis dispar*, *Argynnis Paphia*, *Spilosoma menthastris*, *Agrotis segetum* and *corticea*, and others.

Mr. Walter Weston, vars. of *C. Edusa*; under wings those of *Edusa*, while the upper were the ordinary var. *Helice*; hermaphrodite *Anthocharis cardamines* and beautiful varieties of *Lycæna Adonis*, *Arctia villica*, &c.

Mr. Meek exhibited *Hydrilla palustris* and *Meliana flammea* from the Fens of Cambridgeshire, June, 1877; also the following from the Norfolk marshes; *Nonagria brevilinea*, "bred" (this being the first specimen ever bred; the larvæ was found by Mr. Pankhurst in Horning Marsh, last June, while searching for *M. flammea*), *Nonagria cannae*, *Senta ulvæ*, *Schænobius mucronellus*, *gigantellus*, *Calamotropha paludella*, *Penthina paludana*, *Sericoris Doubledayana*, &c., also a fine specimen of *Sesia andreniformis* from Swanscombe Wood, *Madopa salicalis* from Petersfield, and *Eupæcilia curvistrigana* from the south coast, and a very beautiful collection of *Coleoptera*, comprising many thousand specimens, formed by the late Mr. T. Wilkinson, of Scarborough, also a case of *Hymenoptera*, all named.

Mr. Smith a curious var. of *Leucania conigera*, fore wings ordinary form, while the upper side of the left hind wing has the marking of the upper side of fore wing; the central spot being exceedingly conspicuous.

Mr. Godwin a pretty group of larvæ, pupa, and imago of *A. æneana*, arranged on preserved specimens of their food-plant.

Mr. T. Eddles and T. Whyatt preserved larvæ of many species, arranged on their natural food-plant.

Mr. Brigg a large box of varieties, including *H. Janira*, *L. Adonis*, *Alexis*, *Corydon*, &c.

Mr. Hilman a large case of beautifully preserved specimens of *Arachnida*, all named.

In conclusion, we beg to state that nearly fifty members and friends exhibited over 200 cabinets, drawers, boxes, cases, &c. Trusting you will find space in your valuable magazine for the foregoing remarks,

We remain, Gentlemen, your obedient Servants,

E. G. MEEK, H. J. BURTON, W. SMITH, R. E. BULL, E. MAPLESTON,
Committee of Management of the Exhibition.

[We have much pleasure in publishing the above letter. But it goes to prove that the writer in the "Echo" (whoever he may have been) gave no unfair report, and was more "scientific" than our correspondents give him credit for. If one thing more than another would prevent us from attending an exhibition of this nature, it would be the knowledge that "pictures" such as those condemned by us, and by the offending journalist, formed part of it. One of our local societies (to its honour be it said) has scrupulously forbidden that such objects should form part of its exhibitions. Our correspondents of the "West-London" (and the officials of other societies) would do well to follow this example. We repeat that "such things only excite the pity of scientific men and the ridicule of others." The manufacture of "pictures" only represents so much time thrown away, and the needless destruction of myriads of beautiful insects, without (in most cases) even the satisfaction of knowing that any purpose whatever has been served—not even that of lessening the numbers of *obnoxious* species.—EDS.]

NOTES ON BRITISH *TORTRICES*.

BY C. G. BARRETT.

(Continued from vol. xiii, page 159).

Some time ago, Dr. Wood sent me for examination a smoky-black Tortrix, taken by him near Ledbury, Herefordshire, which I did not then recognise; but Prof. Zeller, on seeing it, pronounced it to be a variety of *Grapholitha nigricana*, H.-S.; and I now see that it agrees precisely in form and size, and in such of the markings as are visible, with specimens from Germany. It is, however, a very dark, almost melanotic, form, with the usual markings nearly obliterated.

Dr. Wood tells me that he took it among Scotch and spruce firs in June. Heinemann says it occurs among *Pinus picca*.

This species—which is totally distinct from *Endopisa nigricana*, Steph. (*nebritana*, D. L.)—has not hitherto been recorded in this country, and a short description, from typical specimens, may be useful.

Alar. exp. 6 lines. Head, thorax, abdomen, and wings dark grey. Fore wings with indistinct blackish markings, consisting of the angulated margin of a basal blotch, the curved and indented margins of a large triangular dorsal blotch (of which margins the anterior is the most distinct), a slender fascia from the middle of the costal margin to the anal angle, a large apical blotch, and a spot above the anal angle. On the costal margin, between the middle and the apex, are four pairs of faint lustrous streaks. Cilia blackish, *intersected by two oblique paler streaks near the anal angle*. All the markings are indistinct, the general appearance being of faintly darker indented bars all along the fore wings. The most characteristic markings are the two pale streaks across the cilia near the anal angle, and these are visible in Dr. Wood's specimen.

The habits of its larva appear to be unknown, and the insect must be difficult to see on the wing. It also appears to be very local, being hitherto only recorded from Germany and Greece.

Dr. Wood has also had the good fortune to meet with a most interesting, and apparently permanent, aberrant form of *Brachytenia Hartmanniana*, L. (*scriptana*, H.). In it the ordinary creamy-white ground colour of the anterior wings is replaced by clear white, and the ordinary markings are intensified to a sharp steel blue-black, the black streak below the large costal blotch being also extended and curved posteriorly. This, with the addition of faint steel-blue curved clouds in the apical white space, gives the variety a very distinct appearance, which is enhanced by the darker hind wings and the deep black colour of the head and front of the thorax.

Several specimens were taken in Herefordshire, all of them on

trunks of *apple* trees, the ordinary form of *Hartmanniana* occurring *only* on willows in the same neighbourhood. This is strongly suggestive of the influence of the food upon colour.

This also has been submitted to Prof. Zeller, with a very singular result; he says—

“My North American *albeolana* ♂ is similar on the anterior wings, but has *whitish* posterior wings; *both* may be only *scriptana*, var.”

It would be strange if a North American insect should be proved to be identical with a well-known European species, by the discovery of a striking aberration of the latter.

Pembroke: 11th March, 1878.

REMARKS ON SOME BRITISH HEMIPTERA-HETEROPTERA.

BY O. M. REUTER.

(Continued from page 131).

PILOPHORUS CINNAMOPTERUS (Cat., 34, 1). It is said (in vol. xii, p. 102), that *Camaronotus cinnamopterus*, Fieb., Dougl. and Scott, Brit. Hem., i, 359, 1, is not, as stated by Reuter in his “*Revisio critica Capsinarum*,” part ii, 85, 1, the *Cimex bifasciatus*, Fab., Mantissa, ii, 305, 264. Stål confirms Fieber’s view, and refers the latter insect to the genus *Closterotomus* of this author.

But in the Syst. Rhyng., p. 242, Fabricius says, concerning his *Capsus bifasciatus*:—

“7. *C. ater*, elytris testaceis, strigis duabus albis.

Lygaeus bifasciatus, Ent. Syst., iv, 177, 152.

Cimex clavatus, Linn., Syst. Nat., ii, 729, 97?

Habitat Lipsiæ.”

This diagnosis agrees much better with *Pilophorus* (= *Camaronotus*) *cinnamopterus* than with the *Closterotomus*. The former has the elytra fulvous or cinnamon-brown (= *testacea*), with two snow-white, very narrow, bands (*strigæ*) across them; the latter has the elytra fuscous (scarcely paler than the head and pronotum), with three pale, testaceous, rather broad bands (*fasciæ*), or in the ♂ only one whitish band across the cuneus.

All the authors previous to Halm have also regarded *C. bifasciatus*, Fabr., as not belonging to *Closterotomus*. Schrank, in his *Fauna Boica*, ii, p. 86, 1139, had described *Piloph. cinnamopterus* under the name of “*Capsus bifasciatus*, Fab., Syst. entom., 725, n. 142.” This is clear from Schrank’s descriptions: “Länglich; nussbraun; zwei schmale Binden über die Halbdecken weiss * * *

Die Fühlhörner muschelbraun: das zweite Glied am Ende schwarz, die folgenden sehr dünn, das vierte am Grunde weiss. Die vordere Binde der Halbdecken erreicht kaum den Innenrand." Fallén (Mem. Sv., 118, 6) has confounded *Piloph. clavatus* and *cinnamopterus* under the name of *Capsus bifasciatus**, but Zetterstedt has described both species under the names of *clavatus* (Ins. Lap., 278, 3) and *bifasciatus* (l. c., 277, 2), the latter being = *cinnamopterus* of Kirschbaum. I have seen the typical specimens of Fallén and Zetterstedt in the Museum at Lund. Also Hahn, in his "Icones" (i, tab. 23), regards the *Capsus bifasciatus*, Fabr., as synonymous with the true *clavatus*, giving the species the name of *Pilophorus bifasciatus*. Herrich-Schäffer, in Nomencl. entom., has cited *bifasciatus* under *clavatus*,† and the same author has described *Closterotomus bifasciatus*, Hahn, et auct. recent., as a new species, under the name of *Capsus biclaratus* (p. 48); under this name, the species is also preserved in the Museum of the University at Berlin.

In the Wanz. Ins., Band iii, fig. 232, Hahn, has, however, figured this last species (♀) as *Phytocoris bifasciatus*, and has cited (p. 7) as synonymous, *Capsus bifasciatus*, of Fabricius (!), of Fallén (!) and of Herrich-Schäffer (!), and also *Lygeus bifasciatus*, Fabr., and *Cimex sphegiformis*, Rossi (!). But in the same volume, fig. 265, *Globiceps sphegiformis* is figured as *mas* of "*Capsus bifasciatus*, Fabr.," and, as synonyms, are noted: "*Capsus id.*, Zett., Fabr., and Fallén (Hemipt. No. 6.—Cim. No. 5 cum *C. clavato* confusus)."‡ Thus Hahn has figured and described as *bifasciatus*, of Fabricius, three generically distinct species, viz.: *Pilophorus clavatus* (Icon., i, t. 23), *Closterotomus bifasciatus*, Fieber (= *Calocoris biclaratus*, H.-Sch., mihi), and *Globiceps sphegiformis*, Rossi (W. I., figs. 232 and 265); but he knew not the true Fabrician species with the diagnosis: "*ater*, elytris *testaceis*, *strigis* duabus *albis*."

The more recent authors are also very doubtful concerning the application of the name *bifasciatus* (vide Kirschbaum, Rh. Wiesb., p. 109, 35). Flor has not cited Fabricius under "*Capsus bifasciatus*, Hahn" (p. 488, 11), but under *C. clavatus*; and Fieber has cited *Capsus bifasciatus*, Fabr., both under *Closterotomus* and under *Camaronotus clavatus*! Stål has not mentioned *Closterotomus bifasciatus* in

* The *Closterotomus* is not yet found in Sweden.

† The *Capsus bifasciatus* of Herrich-Schäffer (Nomencl., p. 48), however, = *Globiceps sphegiformis*, Rossi.

‡ "*L. niger*, antennarum articulo primo pedibusque ferrugineis, coxis et trochanteribus albidis; fasciis elytrorum duabus argenteis; thoracis angulis anticis in forma dentium adscendentibus.

his "Hemiptera Fabriciana" otherwise than in the index, ii, p. 122, but he had not seen all the species which are there enumerated, and he has told me that he can *not* give any sure indication of the typical *Capsus bifasciatus* of Fabricius.

The application of this name by Zetterstedt, is not only earlier, but much more in accordance with the diagnosis of Fabricius than that made by Hahn, in Wanz. Ins., vol. iii. This circumstance, and the fact that the *Phytocoris* (or *Capsus*) *bifasciatus* of Hahn includes two very distinct species, are, to my mind, sufficient reasons for adopting the nomenclature of Zetterstedt. Thus I regard *Capsus cinnamopterus*, Kirschb., and *Capsus bifasciatus*, Fabr., as identical.

The following is, therefore, the proper synonymy of the above-named species:—

I. CALOCORIS BICLAVATUS.

Capsus biclavatus, H.-Sch., Nomencl., 48.

Phytocoris bifasciatus, Hahn, W. I., iii, 7, fig. 232 (♀).

Capsus id., J. Sahlb., Mon. Geoc., 121, 68; Kirschb., Rh. Wiesb., 48, 35;
Flor., Rh. Livl., i, 488, 11.

Closterotomus id., Fieb., E. H., 261, 1.

Calocoris variegatus, Reut., Rev. crit. Caps., ii, 32, 3 (*nec* Costa).

II. GLOBICEPS SPHEGIFORMIS (Rossi).

Capsus bifasciatus, H.-Sch., Nomencl., p. 48. *Id. mas*, Hahn, W. I., iii, p. 48, fig. 265.

III. PILOPHORUS CLAVATUS (Linn.).

Capsus bifasciatus, Fall., II. Sv., 118, 6 (descriptio, excl. diagn.).

Pilophorus bifasciatus, Hahn, Icon. i, t. 23.

IV. PILOPHORUS BIFASCIATUS.

Lygaeus bifasciatus, Fabr., Ent. Syst., iv, 177, 152.

Cimex id., Schrank, Faun. Boic., 86, 1139.

Capsus id., Fabr., Syst. Rh., 242, 7; Fall., II. Sv., 118, 6 (diagnosis, excl. descr.); Zett., Ins. Lapp., 277, 2.

Capsus cinnamopterus, Kirschb., Rh. Wiesb., 135, 10, etc.

PILOPHORUS PERPLEXUS (Cat., 34, 2). This species is regarded by Mr. Saunders (Synops., ii, p. 287) as only a variety of *P. bifasciatus*, Fabr. Mr. Scott has kindly sent me a specimen of *perplexus*, which I have submitted to a careful examination, and the result thereof with both the other British species, is that *P. perplexus* is very distinct from *bifasciatus*, and much more nearly allied to *clavatus*. The European species could be arranged according to the following tabulation:—

- 1 (2). Body rather broad. The elytra cinnamon-brown; the *whole width* of the space between the posterior band and the apex brown, shining; the posterior band of the corium quite straight (the band across the clavus *in a line* there-

with). The fourth joint of the antennæ white, brown only at the apex. Head cinnamon-brown. On *Pinus*.

1. P. BIFASCIATUS, Fabr., Zett.

- 2 (1). Body narrower, posteriorly more widening. The space on the corium between the posterior band and the apex, *only between the cubital nerve and the exterior margin*, piceous, shining. The fourth joint of antennæ only at the base whitish, but the third joint on the basal half whitish or testaceous.
- 3 (8). Upper-side without long, straight hairs.
- 4 (5). Head dark cinnamon-brown, very little narrower than the base of the pronotum. The colour of the elytra cinnamon-brown; the posterior band of the corium quite straight (the band across the elavus in a line therewith). The second joint of the antennæ only about one-fifth longer than the basal width of the pronotum. Food-plant unknown. From Greece ... 2. P. FUSILLUS, n. sp.
- 5 (4). Head and thorax fuscous, more or less with a bronzy tint. Head considerably narrower than the base of pronotum. The colour of the elytra dark brown or olive-brown, with a dull velvety appearance in certain lights.
- 6 (7). The transverse band of the clavus a very little *above* the posterior band of corium, and *united* thereto; the latter a little oblique and curved. The second joint of the antennæ very little or scarcely longer than the posterior width of the pronotum. On *Quercus* ... 3. P. PERPLEXUS, D. & S.
- 7 (6). The transverse band of the clavus distinctly *above* the posterior band of the corium, and *not united* thereto; the latter straight; the second joint of the antennæ at least one-third longer than the basal width of the pronotum. On *Salix, Populus, Betula, Alnus* ... 4. P. CLAVATUS, Linn.
- 8 (3). Upper-side, with long straight hairs. On *Salix* and *Alnus incana*.
5. P. CONFUSUS, Kirschb.

Obs.—Mr. Saunders (Synops., p. 287) has described *P. bifasciatus* as *narrower* than *clavatus*, but this is not correct. Kirschbaum has already said (Rh. Wiesb., p. 137) that his *cinnamopterus* differs from *clavatus* by the *broader* pronotum. Is it possible that the British Hemipterists have confounded two species? *P. bifasciatus* in Sweden and Finland is found only on *Pinus* (Prof. Kirschbaum has also taken this species on *firs*), but Mr. Saunders and Dr. Fieber indicate that it lives also on oaks. This, if referring to one species, would be a very peculiar feature, for scarcely any other of the *Capsidæ* lives on *Coniferae* and also on foliage-trees.

PILOPHORUS CLAVATUS (Cat., 35, 3). *Capsus bifasciatus*, Sahlb., Mon. Geoc., 91, 1, cited by the authors as identical with this species, belongs to *Calocoris biclavatus*. I have examined the types of Sahlberg.

(To be continued).

NOTES ON AFRICAN HEMIPTERA-HETEROPTERA.

BY W. L. DISTANT.

SCUTATA.

CANTHARODES RUTHERFORDI, *n. sp.*

Ochraceous, variegated with black punctures, which are generally confluent. Head, with apical half of central lobe and suture of lateral lobes, black. Eyes pitchy. Antennæ black, pilose, first joint luteous at base, first and second joints longest, sub-equal, third rather shorter than fourth. Rostrum ochraceous, pitchy, tip black. Pronotum with a median transverse impression. Scutellum with a transverse impression near the base, enclosing a narrow space, which is broadest at the centre; immediately behind this it is prominently gibbous and slightly ridged on the disc, from which to the apex it is abruptly deflexed. The ground colour of the anterior half of the pronotum, and of the enclosed space at the base of the scutellum, slightly ferruginous. Under-side of body and legs black; apices of tibiæ and basal joints of tarsi thickly setose, ochreous. Long. 16 mill.; greatest lat. 14 mill.

Cameroons (Rutherford).

Differs from *C. cænosa*, Westw. (the only other known species of the genus), in being much more irregularly punctured, and in the different colour of the fore and middle tibiæ, which, in *C. cænosa*, is luteous. The 4-lobed space across the pronotum of that species is only faintly indicated in *C. Rutherfordi*, which can also be recognised by the more gibbous and posteriorly deflexed scutellum. The pygidium is also slightly exerted, which character Prof. Westwood informs me is not exhibited in either sex of *C. cænosa*.

COPTOSOMA HILARIS, Walk., Cat. Hem.-Het., pt. 1, p. 85, No. 18.

= COPTOSOMA PARTITA, *id.*, *l. c.*, No. 20.

From a careful examination of the types of the above in the Brit. Mus., the only difference I can detect is in the phraseology of the description.

STENOZYGUM SCULPTICOLLE, Stål.—*Strachia sculpticollis*, Stål, Ö. V. A. F., 1855, p. 182, 1; *l. c.*, p. 59, 1. *Stenozygum sculpticolle*, Stål, Hem. Afr., i, p. 185, 4 (1864).

This species is subject to great variation, and, having examined a large number of specimens, extreme forms of which viewed alone might mislead as to specific value, I herewith give diagnoses of the varieties.

Var. a. Posterior border of prosternum, mesosternum, and metasternum, coxæ, trochanters, and base of femora, luteous.

Mongo-ma-lobah. Isubu (W. Africa).

Var. b. Similar to *var. a.*, with the addition of two irregular black spots at the base of the scutellum, divided by a central yellow fascia, which does not extend beyond the central elevated portion. Disc of abdomen beneath yellowish. Membrane brassy-green.

Camaroons.

Var. c. Two irregular and inconstant spots on the disc of the pronotum, which in some specimens are linear, in others very waved and having almost the appearance of being four in number; in others they are amalgamated into one spot. A broad band extends across the base of the scutellum and coria, dark bluish. On the under-side the pectoral spots coalesce. The ground colour of this variety ranges from bright yellow to purplish-red, and the membrane, generally pale ochreous, is, in some specimens brassy-green.

Mongo-ma-lobah. Camaroons.

Var. d. Head and pronotum dark bluish, the latter with an irregular median reddish streak, extending from the anterior to the posterior borders, widening posteriorly in some specimens. Scutellum and coria marked as in *var. c.* Abdomen below with a sub-marginal row of four, somewhat rounded, spots, and an irregular apical one, dark bluish.

Mongo-ma-lobah. Camaroons.

BATHYCGELIA DISTINCTA, *n. sp.*

Sub-ovate, lateral angles of pronotum slightly prominent; greenish-testaceous above, thickly and finely punctured. Head and anterior half of pronotum pale greenish-yellow, the last of which is much less densely punctured, and has a transverse row of four greenish-testaceous spots. Antennæ obscure olive-green, apex of third and fourth, and apical half of fifth joint, black; third joint longer than the second, fourth and fifth equal. Membrane brassy. Rostrum, legs, and under-side of body, pale olive-green. Apex of rostrum pitchy. Tibiæ setose. Long. 13—15 mill.

Isubu.

Apart from structural characters, its smaller size and the transverse row of four spots on the anterior half of the pronotum, at once distinguish *B. distincta* from the other three species of *Bathygelia* at present known to science.

1, Selston Villas, Derwent Grove,
East Dulwich.

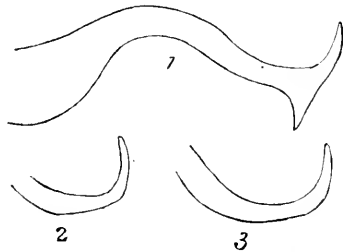
March 2nd, 1878.

DESCRIPTION OF A NEW BRITISH *TYPHLOCYBA*.

BY JAMES EDWARDS.

TYPHLOCYBA DOUGLASI, *n. sp.*

♂ deep yellow, inclining to orange; ♀ paler, with the elytra milk-white; apex of elytra broadly fuscous in both sexes.



Crown somewhat obtuse. Pronotum nearly one-third longer than the crown. Elytra in ♂ deep yellow inclining to orange, in ♀ milk-white, the apex broadly fuscous in both sexes, the limits of the colour sharply defined and extending inwardly from the base of the first or costal cell to a point about the apical seventh of the claval suture. Nerves of the membrane deep yellow in ♂, paler in ♀. Wings

opaque white, nerves distinctly yellow.

Length, $1\frac{1}{2}$ line. Expanse, 3 lines.

This very distinct species, which I have great pleasure in naming in honour of my esteemed friend Mr. Douglas, is remarkable for the great development of the genital appendages in the male, these being nearly twice as large in proportion to the size of the insect as in any other species with which I am acquainted. The accompanying figures of the *inner* genital process of *T. Douglasi* (1), *T. rosea* (2), and *T. cratagi* (3) will serve to show the excessive development of those parts in the first named species. The species is scarcely likely to be confounded with any other, except perhaps that the female might be passed over as a variety of *rosea*, with which species it agrees in the venuration of the wings.

Beaten from fir in March and blackthorn in September, in two localities near Norwich.

Bracondale, Norwich:

11th March, 1878.

DESCRIPTIONS OF SIX NEW SPECIES OF *SPHINGIDÆ*.

BY HERBERT DRUCE, F.L.S.

CHEROCAMPA BELTI, *n. sp.*

General appearance of *C. virescens*; primaries much darker green, mottled with blue, glossy, blue-green; a black spot at the end of the cell, and a pale line crossing the wing from the middle of the inner margin to the apex. Secondaries black, crossed near the middle by a dull green band; the outer margin green; body above black green, below red, with a row of white spots on each side. Under-side: primaries red, shaded with green and brown near the apex; secondaries red, crossed below the middle by an indistinct brown line.

Exp. $3\frac{3}{4}$ inch.

Hab.: Nicaragua.

Mus. T. Belt.

CHÆROCAMPA SALVINI, n. sp.

Primaries dark red-brown, palest near the anal angle, the costal margin and the apex pale brown, a pale brown line crossing the wing from the inner margin near the base to the apex. Secondaries dark brown, the fringe white. Under-side dark brown, shaded with red and yellow, an indistinct pale line crossing the wing near the outer margin. Abdomen above dark brown, with a pale line down the middle, sides pale brown; under-side almost white.

Exp. 2¼ inch.

Hab. : Guatemala (O. Salvin).

Mus. Druce.

CHÆROCAMPA TITANA, n. sp.

Primaries : upper-side brown, crossed from the inner margin to the apex by six pale bands, the two middle ones the widest, the apex very pale brown, a black spot at the end of the cell. Secondaries black, crossed by a band of five pale brown spots. Under-side : primaries pale yellowish-brown, darkest at the base, crossed by several indistinct brown lines; secondaries the same with the outer margin, darker brown. Abdomen brown, with two pale lines down the middle, and a pale line on each side; the under-side much paler brown.

Exp. 3¼ inch.

Hab. : Chiriqui (Arcé).

Mus. Druce.

CHÆROCAMPA LÆLIA, n. sp.

Primaries light brown, crossed by several very indistinct pale lines. Secondaries black, crossed beyond the middle by a reddish-brown band. Under-side pale pinkish-brown, the outer margins of both wings brown. Abdomen brown, palest on the under-side.

Exp. 2¼ inch.

Hab. : Chiriqui (Arcé).

Mus. Druce.

CHÆROCAMPA LIBYA, n. sp.

Closely allied to *C. Lælia*; the primaries darker brown, crossed by seven dark lines. Secondaries black, crossed from the anal angle to near the apex by a band of reddish-brown. Under-side reddish-brown, darkest at the base of primaries; a submarginal row of black spots crossing both wings, the outer margins pale brown. Abdomen dark brown, paler on the under-side; three indistinct lines down the middle on the upper-side.

Exp. 3 inch.

Hab. : Chiriqui (Arcé).

Mus. Druce.

DARAPSA ELARA, n. sp.

Primaries light olive-green, crossed beyond the middle from the inner margin to near the apex by a dark band of green, a dark spot at the end of the cell. Secondaries, from the base to near the middle, black, crossed by a pale green band, the outer margin dark green. Under-side light yellowish-green, thickly irrorated with dark scales; primaries, from the base to near the middle, but not reaching the costal margin, dark brown; two faint waved lines crossing from the apex to the anal angle, the one nearest the outer margin very indistinct. Secondaries crossed by a dark line close to the base. Abdomen greenish-brown above, much paler on the under-side.

Exp. 2¼ inch.

Hab. : Paraguay.

Mus. Druce.

NOTES ON THE *ANTHOMYIIDÆ* OF NORTH AMERICA.

BY R. H. MEADE.

The American *Anthomyiidae* are very little known. Most of the other families of American *Diptera* have been more or less completely investigated, by Say, Loew, Osten-Sacken, and others; but the only entomologist who attempted to describe any of the American flies belonging to the genus *Anthomyia* of Meigen, was the late F. Walker, who, in his list of the *Diptera* in the British Museum, and the "Insecta Saundersiana," recorded a number of new species: his descriptions, however, are so imperfect, that it is impossible to identify many of the species without reference to the types.

Last year, I received, through the kindness of Baron C. R. Osten-Sacken, a considerable collection of North American *Anthomyiidae*, from the Museum of Comparative Anatomy at Cambridge, Mass., with a request that I would examine and compare them with European species: having done so, I have drawn up a few remarks upon the results I obtained, which may be of some interest to British entomologists.

On looking over the collection, it struck me, in the first place, that the number of species was small in proportion to the number of specimens; and next, that the number of the smaller and feebler species was greater in proportion to that of the larger and more highly developed forms, than occurs in Europe. I only determined 121 species in the collection. There were few, if any, peculiar forms among them; they could all be arranged in the same genera, as the European species; they had the same sombre colours and ordinary forms which are so familiar to us; and many of the common European kinds were so closely represented, that it was difficult to say, in some instances, whether they were exactly the same, or closely analogous species.

I will briefly run over the different genera, following the arrangement which I sketched out in vol. xi of this Magazine, pointing out those species which seem common both to America and Europe, and shortly alluding to some others that seem to call for especial notice.

The genus *POLIETES*, of which the well-known *M. lardaria*, Fabr., is the principal species, is not represented in the collection.

In the genus *HYETODESIA* (*ARICIA*, pt. Macq.), I determined seven distinct species, several of which closely resemble European, as *M. lucorum*, Fall., *A. lugubris*, Mgn., and *A. obscurata*, Mgn., but none of them, I think, are quite identical.

In the genus MYDEA (ARICIA, pt. Macq.), I found ten species, only one of which was similar to any in Europe, viz., the common *M. pagana*, Fabr., which has a yellow scutellum.

In SPILOGASTER, there were eleven species, one or two of which closely resembled European species, but were, however, distinct. One fly in this genus possessed several interesting characters, which deserve especial notice. There was only one male in the collection, and it bore a remarkable resemblance to *Cyrtoneura* (*Myospila*) *meditabunda*, Fabr. The fifth longitudinal wing vein was curved in a similar manner towards the fourth vein, though in a less degree; the spots upon the abdomen, and the general colour, size, and appearance, were also very like those of that fly; but it differed in having the eyes naked, and the arista furnished with much shorter hairs.

The genus HYDROPHORIA was represented by three species, all of small size; one of which was similar to *M. ambigua*, Fall.

In the genus DRYMIA, I found, as in Europe, one well-marked species only, which exhibited all the peculiar characters seen in the *M. hamata* of Fallén, but was quite distinct from that common fly.

I only found two species belonging to the genus HYDROTÆA, both of which seemed identical with the common European *M. dentipes*, Fabr., and *M. armipes*, Fall.

The genus LASIORS contained two species, one closely resembling *L. cunctans*, Meig.

In OPHYRA, there were two species, one of which appeared to be identical with the well-known *M. leucostoma*, Fall.

The genus LIMNOPHORA contained eight species, two or three of which closely resembled European ones; but none of them appeared to be quite identical. In the European species of this family, of which the *A. compuncta*, Wdm., is the type, the eyes of the males are sometimes separated by a rather wider space than is usual among the *Anthomyiidae*, except in *Cynosia*, *Lispa*, &c., and this character was marked in an exaggerated degree in all the American species, so that it was difficult to determine by the eyes alone, whether they should be placed in the genus *Limnophora* or *Cynosia*.

HOMALOMYIA: there were five species belonging to this genus, three of which seemed identical with the common European *M. canicularis*, Lin., *A. scalaris*, Meig., and *A. incisurata*, Zett. It is most probable that these common flies, which abound in and about our houses in Europe, have been imported into America, like the house fly, *M. domestica*.

AZELIA: the only species in this genus corresponded with *A. Stægeri*, Zett.

ANTHOMYIA: in this genus, as now restricted, I determined eight species, one of which seemed identical with *M. radicum*, Lin., and another with *M. pluvialis*, Lin.

A large number of small flies in the collection could be referred to the genus CHORTOPHILA: I made out as many as twenty-nine distinct species, several of which were similar to European forms, viz., *C. floccosa*, Macq., *A. angustifrons*, Meig., *A. gilva*, Zett., *A. vittigera*, Zett., and *A. flavo-scutellata*, Zett.

The genus LISPA contained three species, one similar to *L. tentaculata*, De Geer, and another to *L. uliginosa*, Fall.

CARICEA: this genus contained but one species, which seems to be very common in America, as there were numerous specimens of it in the collection; it was of considerable size, and the females bore a remarkable resemblance to those of *M. impuncta*, Fall., but the males were very different, and quite characteristic of the genus.

CÆNOSIA: I made out sixteen species belonging to this genus, many of which were very similar in their characters to European ones; but I could only identify one, which was apparently identical with *A. pygmæa*, Zett.

In conclusion, I must express a hope that some American Dipterist may take up and describe the species of this interesting family inhabiting his own country, which bear, as I have endeavoured to show, such a remarkable affinity to the same tribe of flies in Europe.

Bradford: *March*, 1878.

Natural History of Argynnis Paphia.—As it was from a single example only that I made my observation of the early stages of this species in 1861–62, I was very glad to receive from my friend, the Rev. J. Hellins, in August, 1876, eight eggs, which, with about twice as many more, had been laid by a captured female; and which enabled me to verify and supplement my previous work in a very satisfactory manner. Before giving the dates of each stage in the life-history of the examples, which these eggs produced, I will remark that, as before, the hatching took place about a fortnight after the eggs were laid, and not, as stated by Von Prittwitz (see E. M. M., vi, p. 223), delayed till after hibernation.

The eggs were laid July 30th and 31st, 1876; the larvæ hatched August 13th and 14th, and were placed on potted plants of *Viola canina*; they soon crept under the leaves, and I did not see them again till April 6th, 1877, when I detected one, and subsequently four others, which had survived the perils of hibernation; one of these five I afterwards lost; one, when full-grown,* was preserved by Lord Walsing-

ham ; one was sent to Mr. Hellins (who had lost every one of the larvæ he retained during hibernation), and the imago bred June 30th ; and two I kept myself, and treated with such success, that the pair of butterflies, a male and female, which I bred on June 26th and 27th, were larger and finer specimens than any I possessed before.

The egg in shape is a dumpy cone, laid erect on the flattened broader end, and rounded off at the top ; the shell with about twenty tolerably prominent, longitudinal ribs, some not reaching to the top, where the others converge on a central embossed space, having again a spot of finer reticulation in its middle ; the reticulation between the ribs is not very prominent ; the colour at first pale greenish-yellow and glistening, in about a week it turns paler, and in the middle of the second week paler again, with a leaden-grey blotch near the top showing the place of the larva's head. The young larva on hatching breakfasts on the egg-shell, and is worth describing minutely, because its appearance changes so much after a moult ; it looks shortish, of even bulk ; the ground colour ochreous-yellow, the head shining blackish-brown, a dingy olive collar on the second segment, all the usual warts large, shining, of a deeper tint of the ground colour, and furnished with stiff bristles ; on the 7th, 9th, and 11th segments a pair of lateral, deep, dull brownish-ochreous spots which enclose the hinder trapezoidal and the upper lateral warts ; on the 13th, the four trapezoidals are soldered into a plate.

On its first appearance in spring, the larva is no more than one-eighth of an inch long, having apparently moulted but once before hibernation ; the special ornamentation of 7th, 9th, and 11th segments is gone, though the ground colour is still ochreous ; it now moults, and though similar to its previous ochreous appearance, yet the colours are fresher and the ground is seen to be varied by a dorsal line of brown, widening somewhat diamond-fashion through each segment, and met by oblique lines from two darker brown subdorsal spots, placed at the beginning, and a similar pair of spots at the end of each segment ; the sides brownish, broken with ochreous, with a paler subspiracular region, the belly brownish, head black, the pale ochreous parts glossy, the brown parts dull, several series of warts, each with a bristly hair, all now seen in the situations of future spines. After another moult, sometime between April 12th and 20th, the spines appear, short and stumpy alike, pinkish-brown in colour, with black tips and branches ; head and body now black, with double lines of whitish-violet on the back ; length of the larva now, about three-sixteenths of an inch. At the next moult, after about ten days, the details and colours are much as before, and the general appearance is very dark and black ; another moult, and the larva soon becomes three-eighths of an inch long, and shows the two lines on the back to be ochreous-yellow, and the sides brownish-ochreous.

From this point, I shall speak especially of one individual, the most forward, to which I paid especial attention, keeping it apart from the rest ; this one moulted again on April 29th, when it seemed much exhausted, and waited four hours before moving, and then hid itself under another leaf, remaining there without further movement for twenty-nine hours more, and only beginning to feed again on 1st of May : it now ate out small segments of circles from the edges of the violet leaves, and, after eleven days' steady feeding and growth, I found its length had increased to five-eighths of an inch ; the spines at this stage differed in colour, those of the upper row being pinkish-ochreous with black tips, the first pair blunt, those of the lower rows black with reddish bases.

The *penultimate moult* occurred on 13th May, and gave the *extra length to the first pair of spines behind the head*, with their blunt tips black; all the other spines amber-yellow; on the same day, only three hours later, another individual was well over the corresponding moult, and to this one also I devoted especial notice; of the remaining two larvæ still kept together, it will be enough to say here that they showed the extra length of the front spines on the 15th and 16th of May; the growth of all continued, and in seven days the first, specially noted above, was a little over an inch in length, and the second about an inch; neither appeared up to this time to feed very often, but each made a good meal twice a day.

I observed the first larva, in preparation for its last moult, fixed, belly upward, to the under-side of a leaf, on 20th of May, and remaining quite still until noon of the 25th, when I noticed it moving its anterior legs a little free from the leaf, a circumstance which claimed my whole attention: it was but a slight movement, and was repeated at intervals of about half-an-hour, until between two and three o'clock in the afternoon, when it began to stretch its front segments downwards from the leaf, making the fore part of the back concave, and then presently gently reversing the movement; it continued thus at short intervals to increase the stretching curve of the body so much, that, by ten minutes past three, its hold on the leaf was retained only by the fourth pair of ventral legs and the anal pair, when suddenly the skin snapped asunder, close to the head, with quite a shock to the larva, which instantly returned its ventral legs to the leaf, while the elastic skin, relieved of its tension, was, of itself, from the impetus of the rupture, gliding backward; the anterior legs were held back until divested, and then returned forwards to their natural position one after the other, but kept just free from the leaf, each pair being elevated in unison for a moment, and let fall, as though to test their complete freedom; otherwise the larva remained passive, the skin only continuing to move backward, and, while passing the ventral legs, each foot in turn was lifted up out of it, and then replaced on the same spot of the leaf, and when the old skin had shrivelled up together at the end of the body, the larva, with all the ventral legs, took two steps forward, and drew forth the anal pair free; at the first breaking of the skin the head became exposed, with the old head-piece adhering to the parts around the mouth, but now, at last, the larva gave its head a sudden twist or two, and the old piece fell off: from the rupture of skin to this final riddance, the operation occupied nearly ten minutes; the spines were all uncovered in a remarkably small and rudimentary, wet, and flaccid condition, the front pair even smaller than the others; but now this pair began gradually to grow, and in fifteen minutes were far longer than ever, and in another half-hour all the other spines had grown considerably, both in length and rigidity, and the larva remained still after this for two and a half hours longer. The second larva gave me the opportunity of verifying these observations on May 27th, commencing its last moult at 5 p.m. on that day, and behaving in precisely the same fashion; and when I saw the front legs held back, and again dropped forward with the natural motion of relief, after being freed from the old skin, I was reminded of the familiar manœuvre of one's being helped off from behind with the sleeves of a tight overcoat. This second larva had fixed itself on only a part of a leaf, too narrow to admit of any stepping forward, but it knew how to meet this difficulty, for, when the sloughing arrived at the first ventral legs, the larva fidgeted a little with the anterior legs, but finding nothing they could

touch, and remembering that no advance was possible, it kept its place, till the final moment came, and then disposed of the difficulty by arching the hinder part of the back convexly downwards from the leaf, and, with a strong effort, pulled out the anal legs by a downward, not a forward, motion. The largest larva previously noted made enormous meals for the last ten days, freely exposing itself on the violet plants, but on the 7th of June, towards evening, it became restless, and wandered actively over the plants, the earth, and protecting glass cylinder, impatient of confinement, and, late at night, found its way to the lino covering at top; next morning it was still there, but much shortened, and engaged at intervals in adding to a layer of silk already partly spun; in the afternoon it turned itself round, so as to insert the anal leg hooks in the small tuft of silk prepared in one spot, deliberately testing the strength with each foot in turn by a visible pull, the ventral legs holding on to the thinner silk layer spread before the tuft, but the head and front legs quite free from it; thus it remained for nearly five hours, and then suspending itself only by the anal legs, changed to a chrysalis on the 9th of June.

The full-grown larva measures from about one and a half to one and five-eighths of an inch in length, in proportion rather stout; the broadish head has the lobes produced angularly on the crown by projecting tubercles with stout pointed hairs, ocelli prominent; the second segment wider than the head, and the bulk again increasing to the fifth, decreasing again from the tenth to the thirteenth; the spines are in three rows on either side, bulbous based, pointed, and branched with finer spines, hair-like, of varying lengths; in position they are subdorsal, lateral, and sub-spiracular, six on a segment, except that the thirteenth has only four spines, and the three thoracic segments have on their sides *only two* spines, and these placed on the segmental divisions laterally, *i. e.*, one between the second and third, and one between the third and fourth; as some compensation, however, the first pair of subdorsal spines, as already noted, are of extra length, with blunt tips, and directed over the head, and there are also on each of these segments from three to five wart-like tubercles, each bearing a pointed bristle; similar bristled warts, in a transverse series, are seen on the belly of the fifth, sixth, eleventh, and twelfth, and the intervening segments have a longitudinal row of four or five just above the outside of each ventral leg. The colour of the head and its numerous hairs is black and glistening, with a marbling of pale yellow on the crown, upper lip ochreous; down the whole length of the back are two stripes of brilliant yellow, rather inclining to ochreous and sulphur at either end, separated only by a black dorsal line; these stripes are still more conspicuously relieved by a black velvet-like bordering of markings, broad and unbroken, as a spot in front of each subdorsal spine, though finely edged outwardly with brownish-ochreous, and also behind the spine with the same colour, and two faint curving lines of it breaking there the black; the ground colour of the sides, just as far as the lowest row of spines, is velvety-brown, adorned along the middle by a series of rather fusiform, black, velvety marks, one on each segment, intersected in the middle by the lateral spine, and finely edged with brownish-ochreous; some short rudiments of other fine ragged lines of this colour occur on parts of the ground, but become very faint along the spiracular region, where a few freckles appear of lighter ochreous; the oval spiracles are black; the spines are of a reddish-ochreous colour, with their extreme tips and branches black; the belly is of a dull blackish-brown, abruptly contrasted with the side, and rather inclining to

chocolate-brown at the segmental divisions; the warts paler and glistening, hairs black; the anterior legs black, shining, and hairy, as are the ventral and anal legs above, but pinkish and smooth below, with a fringe of black hooks on the feet. The chrysalis, about an inch long, when seen sideways, is deepest across near the end of the wing-covers, and the largest projecting points; seen in front, it is broadest across the bases of the well-defined wing-covers, which project laterally in curved ridges from the thorax—itsself rather sharply keeled in the centre,—from this is a deep depression, and thence again the abdomen swells out in a backward tapering curve to the point by which it is suspended; in the subdorsal region, on each side of the back, is a row of obtuse, tapering, prominent points, smaller in the depression, and much smaller still on the thorax; a larger pair at the head are suggestive of ears; the pupa skin is of a dull fawn-colour, varied with paler, and with fine brown reticulation; there is a line of brown along the spiracles, and a stripe of darker brown on each side beneath the abdomen, a fine, rather wavy line of dark brown near the margin of the wing-covers, and in the depression of the back are large glittering golden basal spots to the points there, and the tips of the other abdominal points have a similar golden lustre.—WILLIAM BUCKLER, Emsworth: *March 11th*, 1878.

Abnormal antennæ in Hemiptera.—Having noticed that Dr. Buchanan White (p. 93 *ante*) mentioned some abnormal peculiarities in the antennæ of *Hemiptera*, possibly the following may be of interest. In a specimen of *Phytocoris populi* in my possession the first joint of the right antenna has a proportionate length of 27 to 42 in the left antenna. The antenniferous process is almost obliterated; and the elongated basal portion is absent, the joint being of uniform width as far as the middle. The other parts of the insect are normal.—A. BUCHAN-HEPBURN, Junior Carlton Club: *February 26th*, 1878.

Re-occurrence of Dianthæcia capsophila and Lithosia caniola in South Wales.—I have already recorded the occurrence, in 1876, of a specimen of *Dianthæcia capsophila* on this coast: last summer I found a second specimen sitting on a rock in the day time. About the same time I met with another old Dublin acquaintance—a hairy larva found crawling on the rocks near Tenby, on June 27th, which spun up immediately, and produced *Lithosia caniola* on July 30th; and a few days later, another specimen was swept up under the cliffs, when working for *Tortrices*. This species also has therefore established itself along the coast of South Wales.—C. G. BARRETT, Pembroke: *11th March*, 1878.

Apatura Iris in the New Forest.—I am interested in Mr. Neale's note (p. 233 *ante*) of the capture of *Iris* in the New Forest, as the extreme rarity, according to my experience, of that species in the largest oak forest in England, or, I may say, in Europe, is remarkable.

During the last seventeen years I have spent many months in the New Forest, frequently staying there for five or six weeks together, from the end of June until the beginning or middle of August—sometimes for three or four seasons in succession—but I never caught, or even saw, *Iris* there, except on one occasion, that was on August 1st, 1874, when a large ♀ descended from an oak tree and settled in a sallow bush just out of reach of my net. After spending about a quarter of an

hour on the willow, apparently engaged in the business of oviposition, she flew up into the oak, soared round it five or six times, and then again descended to the willow, and this time most obligingly placed herself within easy reach of my net, and was captured.

The New Forest is, I think, too far west to be much favoured with the presence of *Iris*, which, judging from the localities in which I have seen and caught it, or from which I have received it, appears more partial to the south-eastern, eastern, and east-midland counties. All the specimens in my possession, except the ♀ above mentioned, are from Sussex, Kent, Lincolnshire, or Northamptonshire.—II. Goss, The Avenue, Surbiton Hill: *2nd March*, 1878.

Luminous Lepidopterous larva.—In reading Mr. Thomas P. Bigg-Wither's most interesting recent book, "Pioneering in South Brazil" (Murray, 1878), I have been especially struck with one passage, which seems to me to deserve serious attention from Entomologists. This passage is in chapter 4 of vol. i, pp. 301—303, and is here reproduced:—

"Before concluding this chapter, I should mention another class of insect which was now beginning to force itself upon our notice, first, by its wondrous beauty, and, secondly, by the terrible punishment it has the power of inflicting upon whomsoever it touches. This is the tribe of the hairy caterpillars. Every evening after sunset, the borders of the camp clearing were lit up with many scores of these luminous caterpillars, most of which emitted light from every ring or band of their bodies.

"The phosphorescence was not confined to the under part of the animal, as in our common glow-worm, but shone out also from the back and sides. The optical effect was that produced by a railway train when running at night with all its carriages lit up. The varieties of these caterpillars were legion. Their bodies were protected by triple coats of mail, that is to say, they were covered with a hairy substance which, in some species, took the form of moss, and, in others, of groups of stag-antlers. To attempt to touch these creatures with the naked hand, was a scarcely less hazardous undertaking than plunging one's hand into a live hornet's nest. Each hair, or point, has the power of inflicting a sting as painful as that of a certain venomous species of red ant very common in parts of the forest, so that, if by chance, as not unfrequently befell us when working on the *picada*, one of these caterpillars happen to drop off a tree on to the hand, or, worse still, on to the nape of the neck, the pain is almost unbearable, the spot on which the creature falls immediately becoming inflamed, and afterwards swelling up to a great size. The best cure for these most painful stings is the immediate application of some strong spirit, either *cachaça*, brandy, or ammonia. Birds will not touch these caterpillars, their chief enemies appearing to be certain species of black ants, which I shall have occasion to refer to later on, and also the large kinds of wasps and hornets.

"Frequently, at night, as many as four or five individuals would mount up the palm tree walls of my hut, forming a most beautiful illumination. Notwithstanding that the phosphorescence in these caterpillars extends over almost the whole of their bodies, the light they give is not brilliant, like, for instance, that of the great fire-beetles, but is of a most soft and subdued character.

“They are especially numerous about the months of October and November. As a class, they are, I think, without exception, the most beautiful of all the lower animal organisation of these forests, whether seen by day in their wonderful moss-like garments and brilliant colours, or by night, when shining in all the splendour of phosphorescent light.”

Mr. Bigg-Wither gives (p. 303) a life-sized illustration of one of these larvæ, which I regret cannot be here reproduced, as an application to the publisher for a stereotype of the block in the usual way, although courteously endorsed by the author himself, has failed to induce a departure from the rule, adopted by the particular house, of refusing such propositions. The drawing, however, most unmistakably represents the larva of a Lepidopterous insect, although, being done by a non-entomologist, the number of ventral legs is Tenthredinous. Its hairy or spiny covering is arborescent and long, suggestive of certain *Nymphalidæ* among the *Rhopalocera*; but the head is that of a moth-larva, and, joined to our knowledge of the urticating properties of *Cnethocampa* in Europe, it is to the *Bombycidæ* that one would be in preference inclined to refer it, if not to the *Saturniidæ*, and it may be noted that the larvæ of *Saturnia io*, *S. maia*, and other North American species, are notorious for stinging.

Mr. Bigg-Wither's observations upon insects are very numerous and very good, equal in fidelity to (if not so scientifically expressed as) those in Mr. Belt's excellent work on Nicaragua. I may instance his figures, &c., of the *Catagramma* on p. 199 of vol. i, which (christened “Oitenta Oito” or “88,” from the markings on the under-side of the lower wings) would not disgrace any purely descriptive work. It is, therefore, quite impossible to allow his record of the existence of luminosity in a Lepidopterous insect to pass by as not worthy of credit, or as based on erroneous observations; and I have therefore applied to him for such further particulars as might be in his power to give, suggesting also the possible objection that these larvæ might have accidentally acquired luminosity from crawling upon some phosphorescent material (though such an objection would be quite unwarranted by the context). He kindly writes as follows:—

“I have consulted my various notes, and other documents in my possession, with a view to giving you the further information that you are anxious to have.

“I find that the colour of the caterpillars, represented in my book, was light sea-green; that it is from a sketch taken by my friend Mr. Edwards (mentioned in the ‘Introduction’); and that it is described as a ‘phosphorescent stinging caterpillar.’ This is the sum total of the information I possess about this particular specimen.

“I find, however, by my other notes, that, in the month of November, 1872, our forest camp, on the banks of the Ivahy, produced caterpillars, amongst others of the following three distinct characters: (1) luminous *smooth* caterpillars; (2) luminous *hairy and stinging* caterpillars; (3) *non-luminous hairy and stinging* caterpillars. Of these, No. 3 might or might not have been luminous at certain times.

“Five years and more of interval between now and then (1872) will naturally somewhat detract from the value of mere recollections, especially on such matters as relate to natural history science—a subject which, though especially interesting to me in my private capacity, yet did not form one of the objects of the expedition. These recollections, however, are altogether against the theory of the stinging cater-

pillars in question being rendered luminous by having accidentally crawled in luminous matter. Their chief beauty, as I remember it, was in the evenness and regularity of their illumination, the railway train simile being *very* exact in this respect. I am not learned in Entomology, much as I always delight in using such powers of observation as I, in common with most 'country born and bred' people naturally possess, otherwise I should have at once recognised the value of this seemingly new observation.

"I regret very much indeed that I should now have got no specimens of these caterpillars; though, from mere curiosity and admiration of their beauty, I did, at the time, actually skin and stuff several of the most striking kinds of each of the three varieties named; but long before we could emerge from the Wilds, these delicate specimens had been utterly ruined.

"I never preserved any of these caterpillars alive, so as to follow their metamorphoses, so cannot identify them with any particular moth."

I have Mr. Bigg-Wither's permission to publish these notes, and I can only express a hope that lepidopterists may find them as interesting as I do. Mr. H. W. Bates informs me that in all his South American wanderings, he never met with any similar instance; but the Amazon district in which he travelled so much is close to the Equator, while Mr. Bigg-Wither's investigations were confined to the Tibagy and Ivalhy rivers, under the tropic of Capricorn, 1500 miles further south, a district never visited by collectors. Mr. Keith Johnston, however, tells me that in his recent journey in Paraguay, he, though not an entomologist, was struck by a curious caterpillar which he often observed in that country, and which, from his description, is apparently the same as that figured by Mr. Bigg-Wither. It was of a very bright (almost emerald) green, with long mossy filaments on the back, and was possessed of urticating properties, as the natives gave warning. Mr. Johnston, however, never observed any phosphorescence in these larvæ, possibly because he never camped out by night in the forest,—a habit compulsory in Mr. Bigg-Wither's case, from his surveying duties. The district in which Mr. Johnston saw these larvæ is close to that traversed by Mr. Bigg-Wither.

The only case of phosphorescence in the *Lepidoptera* known to me, is that recorded by B. A. Gimmerthal, as occurring in the larva of *Noctua occulta*, in Bull. Soc. Nat. Moscou, 1829, vol. i, p. 140. In Ann. Soc. Ent. France, 1832, p. 424, this fact is referred to by MM. St. Fargeau and Rambur as entirely unknown before; but M. Boisduval, without giving any instances, observed (*l.c.* p. 425) that he was aware of the luminous property in larvæ (presumably Lepidopterous).

From a notice in Silbermann's Rev. Entom., i, p. 266 (quoted by Kirby and Spence, Introd., 7th ed., 1856, p. 510; not in 1st ed.), Boisduval's knowledge was founded on an observation of some caterpillars found on grass stems, one hot evening in June, and which spread a phosphorescent light. These, he thought, belonged to *Mamestra oleracea*, though they seemed unusually large. They were certainly not the larva of *Noctua (Polia) occulta*; and none of them assumed the pupa-state, either from want of care or from their luminosity arising from disease.

As the economy of the European *Noctuida* is so well known, I think it may be fairly assumed that the luminosity in the two instances mentioned by Gimmerthal and Boisduval is abnormal (however inexplicable), and not persistent, as is apparently the case in the South American larvæ observed by Mr. Bigg-Wither.

In *Diptera*, there are a few instances of phosphorescence known. Pallas (Kleine Notizen, 1781, iv, p. 396) records it in *Culex*; Wahlberg (Efv. Vet. Akad. Förh., 1848, v, pp. 128—131), in *Ceroplastus sesioides*, bred from *Polyporus fomentarius*; and *Chironomus* is noticed as giving a strong light, near Lake Aral, in Zool. Rec., xii, p. 470.

It is unnecessary here to refer to the many cases of phosphorescence in *Coleoptera* (beyond the observation that the "insect-larva" referred to by Hagen, as described by Reinhardt, is that of a beetle). The existence of it in *Homoptera* is, I believe, now discredited.—E. C. RYE, 70, Charlwood Road, Putney, S.W.: *March*, 1878.

"*The first great national Entomological Exhibition.*"—This exhibition took place at the Royal Aquarium, Westminster, from the 9th to the 23rd March, and to it a large number of amateurs and a few dealers contributed of their stores. The great majority of the collections consisted of British *Lepidoptera*, some species being rare, but mostly they were the same over and over again, often in long series of ten, twenty, or thirty examples each, *usque ad nauseam*. There were also some excellent collections of preserved larvæ, and illustrations of insect economy. British insects were otherwise represented by three or four full collections of *Coleoptera*, one of *Hemiptera*, one of *Hymenoptera*, and a few excellent microscopic preparations; of exotic insects there were two or three collections of *Lepidoptera* and *Coleoptera*. The representatives of the other Orders were few and casual in miscellaneous collections. Truly it was a brave show, as old Pepys might have said,—a show and nothing more. But *cui bono*? "Ay, there's the rub."

The true purpose of an exhibition of objects of Natural History has been well expressed by Professor Huxley* in his remarks upon museums, which are quite as applicable, or even more so, to exhibitions like this now under notice. He says, "I dare say many of you, seeking knowledge, or in the laudable desire to employ a holiday usefully, have visited some great natural history museum. You have walked through a quarter of a mile of animals more or less well stuffed, with their long names written out underneath them; and, unless your experience is different from most people, the upshot of it all is that you leave that splendid pile with sore feet, a bad headache, and a general idea that the animal kingdom is a 'mighty maze without a plan.' What the public want is easy and unhindered access to such a collection as they can understand and appreciate; and what the men of science want is similar access to the materials of science." And, referring specially to birds, he goes on to say that one of the general public "does not want to compare a hundred species of the sparrow tribe side by side, but he wishes to know what a bird is, and what are the great modifications of bird-structure, and to be able to get at that knowledge easily. What will best serve his purpose is a comparatively small number of birds carefully selected, and artistically as well as accurately, set up; with their different ages, their nests, their young, their eggs, and their skeletons side by side; and a tablet telling the spectators what they are and what they mean. For the instruction and recreation of the public such a typical collection would be of far greater value than any many-erred imitation of Noah's ark."

For the purposes of a scientific entomological student—the examination of structure, general and minute, the comparative anatomy, the place in nature, and

* "Lecture on the Study of Biology."

the knowledge of the natural history of any insects—such an exhibition as this “National” one was quite useless; and, therefore, entirely failed in accomplishing so much of that part of the programme which said it was to be “of interest to those who devote their attention to this branch of the Science.” They knew all before, or could not learn here.

With regard to the other part of the programme that the exhibition was to be “interesting and instructive to the public generally.” Well, “a thing of beauty is a joy for ever,” a poetic dictum which is true enough if the impression of the beauty be not a mere transient emotion, but becomes part of the mental treasury of an individual. In this sense the exhibition of exquisitely formed and coloured insects might result in æsthetic advantage, both positive as an occupant of men’s minds, and negative in assisting to shut out unworthy objects therefrom for the time being. To what extent this may have been effected in this instance is one of those hypothetical things that may be affirmed or denied, but neither proved nor disproved. We think that without any illustrative lectures or explanations calculated to inform the spectators of the nature and value of entomology as a science such a miscellaneous exhibition as this was only “caviare to the general.”—that is the uninstructed multitude. We also think it was a mistake to place it in connection with such sights as “Zazel the renowned,” and all the other sensational attractions of the Royal Aquarium; and we heartily pity those of the exhibitors of any pretensions to science, who must have seen themselves and their favourite objects of study advertised in the streets of London as a further attraction to the Westminster show “free of charge.”

Devoid as this exhibition was of true scientific interest, almost the only result we can expect is an increase of mere butterfly- and beetle-butchers, of whom too many already exist.

“*Butterfly Pictures.*”—In the last number of the E. M. M. appears an address from the Committee of the “West-London Entomological Society,” protesting against the severity of some of the remarks made in that Magazine on their recent exhibition of insects, &c. To this address the editors append a foot-note, from which I make the following extract, “We repeat that ‘such things only excite the pity of ‘scientific men, and the ridicule of others.’ The manufacture of ‘pictures’ only ‘represents so much time thrown away.’ I not only deny this latter statement but I assert the exact converse. I *assume* that the “pictures” are the collections and handiwork of *poor* and *ignorant* men—of men in a humble station of life, whether in town or country—I assume, also, that humble and “unscientific” though they be, they are, nevertheless, capable of appreciating beauty, form, colour, and ornament. Am I then to be told it is “a waste of time” for these poor men, on one of their rare holidays, to go out and catch “butterflies,” or, after a hard day’s work, to walk miles into the woods, and spend the night there (as I have known them do) in search of “moths”? This, I think, will scarcely be maintained. But then the subsequent “arrangement” of their spoils! the “geometrical” and “fantastic” pictures! How are they to know better? To whom or to what are they to apply for information? Is there any *harm* in such a picture on the wall of a poor man’s room? Which is the more “ridiculous,” such a picture, or that of whole “rows” of rare species in the wealthy collector’s cabinet? What do the vast majority of these latter know or

care about "science"? Why! many of them have not even the credit—which belongs, at any rate, to the poor man—of collecting their own specimens! Is it not as great an enjoyment to the hard-working mechanic to look at his "picture," collected by himself with much pleasurable toil, and arranged so as to gratify his eye, as it is to the rich man to look over his "rarities," purchased probably, and arranged, not from his own scientific knowledge, but from information imparted by others more experienced and "better up" in the subject than himself? Why debar the poor man from this enjoyment? Why sneer at his ignorance? Why "ridicule" his idea, simple perhaps, yet genuine, of beauty and harmony? In these days of "strikes" and enforced idleness, when thousands flock to the public house and beer shop—when, as is admitted on all hands, there is no greater social difficulty than that of providing suitable amusement for the working man in his leisure hours, it appears to me that those who, by ridicule or opposition, turn him away from one (however limited in its extent) of the purest, healthiest, and most harmless recreations within his reach, incur a very grave responsibility indeed. For thirty years I have been a "collector," and during that period I have visited, in a collecting sense, many of our manufacturing towns, as Sheffield, Manchester, &c., and also many country places. Whenever, during those visits, I have seen a "butterfly picture," I can honestly and conscientiously say that I have seen it with unalloyed pleasure. In such cases, whether seen in the labourer's cottage or the mechanic's shop, I can always say with much confidence, "this man at any rate loves the fields and the woods more than the public house and the beer shop." But the Editors urge further that it is not merely a waste of time, but that it involves the "needless destruction of myriads of beautiful insects." Surely this cannot be intended as a *serious* argument. I might take exception to the somewhat exaggerated estimate of "myriads" of insects, but let that pass. Whether we count them by thousands or tens of thousands, the Editors must know that the whole of them, in the ordinary course of nature, perish in a few weeks, whether captured or not, and with the exception of a few hibernating specimens, vanish as completely as if they had never existed. Why not, then, preserve these "beautiful" insects to be "a joy for ever." If fantastically and unscientifically arranged, why not? "*Non cuivis contingit adire Corinthum.*" We cannot all be learned or scientific." An ignorant man, who thinks that the sun and not the earth moves, may admire a glorious sunset as much as a Newton or a Laplace—perhaps more; and so, I humbly conceive, may a man admire and enjoy his "insect picture," though he be no Linnæus, and be unable to say to what division, genus, or species, each specimen may belong. I might add much more, but I indulge myself with the hope that these few remarks may induce the Editors to modify, to some extent, the severity of their condemnation, considering that such unqualified condemnation may tend to discourage and dishearten—a result which, I am sure, they neither wish nor aim at. But be this as it may, "*liberavi animam meam,*" and I would say to every working man who may read this, and who, without one jot of scientific knowledge, collects and arranges insects for his own amusement, "You have my best wishes, and your 'pictures' will always find in me a warm admirer and supporter."—J. GREENE, Rostrevor, Clifton, Bristol: *March 6th*, 1878.

[It is only fair that "counsel's opinion" in favour of the manufacture of "pictures" should be given due publicity. Mr. Greene objects to the word

* The comparison drawn by our correspondent is a very just one.—EDS.

"myriads." We are quite sure he would not do so if he had seen some of the "pictures" or "designs" that we have seen, not composed of entire insects, but of such parts of them as suited the "artist's" purpose, such as the eye-spots of *Vanessa Io*, the orange-tips of *Anthocharis cardamines*, &c. He is quite justified in assuming that we have no wish to discourage our working collectors, the majority of whom we believe to be fully of the same opinion as ourselves with regard to "pictures." We do not by any means desire to turn away the working man from the pure, healthy, and harmless pursuit of entomology; on the contrary, we earnestly wish to encourage him in it. And, while sharpening his powers of observation by studying his captures, it seems to us he will not be likely to visit the public house,—where he might be tempted to go to show his "picture," if he made one. We request that any further remarks on this subject may be in as few words as possible.—EDS.]

Obituary.

Édouard Perris died very recently at Mont-de-Marsan (Landes), France, in which town he was long resident. Entomology in general (and in France in particular) has sustained a loss that it will be difficult to make up. The name of Perris is worthy of being placed in the same category as those of his two great compatriots, Réaumur and Léon Dufour. Of the latter of these he was a disciple; but Dufour especially excelled as an anatomist and physiologist, whereas Perris was emphatically a biologist, and there are few who have done so much in the patient working-out of the life-histories of insects, and above all of *Coleoptera* and *Diptera*. He was not a systematist, and rarely described new species, or, if he did so, the descriptions did not apply to the imagos only, but to their habits and metamorphoses also. The notices of his discoveries have enriched the pages of (chiefly) the *Annales de la Société Entomologique de France* for nearly forty years, sometimes as short articles, sometimes in the form of monographs, as in the case of his "*Histoire des Insectes du Pin maritime*," which was commenced in 1852, and continued appearing almost annually by large instalments up to 1857, illustrated by 10 plates, probably forming the most complete work in existence on the insects affecting a particular plant or tree. What was perhaps his earliest paper appeared in 1838; his latest (or nearly so) was a lengthy article in the "*Annales*" for 1876, under the title of "*Nouvelles promenades entomologiques*," giving the results of his observations in the form of a calendar for an entire year, and teeming with biological information on nearly all Orders of insects; a supplement thereto was read at the Meeting of the Society, on the 12th December last.

At this moment we are not sure of his exact age, but he was advanced in years. In May, 1876, he wrote, "*Je regrette que mon âge m'empêche de faire de longues chasses et à grandes distances comme jadis*," but the handwriting was firm and distinct. In the town of Mont-de-Marsan he held the position of "*Vice-Président du Conseil de préfecture*." His collections, which must be very rich biologically, have been left to his fellow-townsmen and co-worker Dr. *Émile Gobert*.

George Guyon. This gentleman, although little known to the present race of entomologists, devoted much of his time to the examination of insects of various Orders, especially *Coleoptera*, and also to such collecting as his delicate health per-

mitted. He resided at Ventnor and Richmond alternately; and so enjoyed opportunities for study in good localities; one of his best captures being *Lithocharis maritima* on the Isle of Wight coast. He became a Member of the Entomological Society in 1850. He contributed some notes to the "Intelligencer," and various scattered small papers to the "Zoologist." Some of his minute investigations are recorded in the Transactions of the Royal Microscopical Society. Mr. Guyon (a near relative, as we believe, of the Hungarian General of the same name) died at his residence, South Cliff, Ventnor, on 28th February last, aged 53.

ENTOMOLOGICAL SOCIETY OF LONDON: 6th March, 1878.—H. W. BATES, Esq., F.L.S., &c., President, in the Chair.

Mr. J. Woodgate was elected a Member.

Mr. Moore exhibited, at the request of Sir W. H. Gregory, late Governor of Ceylon, a very extensive series of coloured drawings executed by native artists, illustrating the transformations of a large number of the *Lepidoptera* inhabiting that island. It was hoped that the Government of Ceylon might be induced to publish them.

Mr. H. Goss exhibited a collection of fossil insects from the leaf-beds of Bourne-mouth, obtained by Mr. J. S. Gardner. There were numerous *Coleoptera* and some *Neuroptera*, including a finely-preserved anterior-wing of an *Æschna*.

Mr. McLachlan exhibited four recently published parts (relating to entomology) of the great Russian work, "Fedtschenko's Travels in Turkestan." One of these concerned *Coleoptera*, two related to *Hymenoptera*, &c., and one to *Arachnida*. Attention was drawn to the excellence of such of the plates as had been executed entirely in Russia.

Mr. J. P. Mansel Weale read notes on South-African insects: first, on the variation in *Pieris Severina* and *Mesentina*, apparently suggesting that one is a form of the other: secondly, on the habits of *Termes trinervius*, especially with regard to the cephalic process of the "soldiers," which he found have a duct running through it, and a perforation at the end, through which a gummy liquid was excreted, smelling strongly acid and discolouring litmus paper*: thirdly, on the metamorphoses of *Pyrgus Elma* and *Ismene Florestan*, the larvæ of both of which fed principally during the night.

Mr. E. Saunders read "Remarks on the hairs of some of our British *Hymenoptera*," from microscopic examination, of nearly all the genera of *Aculeata*. He found branched or plumose hairs characteristic of the *Anthophila*, but of no use for subdivisional classification; he suggested that they might be of use in collecting pollen. Those of the *Fossores*, *Heterogyna*, and *Diploptera*, were simple.

Mr. Butler read a paper on the natural affinities of the Lepidopterous Family *Ægeriidae*, in which he repudiated the existence of any structural affinities of these insects with the *Splingidae*, and suggested a relationship with the *Pyrales* on the one hand and the *Gelechiidae* on the other.

The Secretary read a paper, by Mr. A. H. Swinton, on the "Biology of Insects as determined by the emotions."

Mr. P. Cameron communicated a paper on some new genera and species of *Tenthredinida*.

* This habit was noticed by Osten-Sacken in connection with *T. Rippertii* in Cuba.—R. McL.

NOTE ON DIMORPHISM AND ALTERNATION OF GENERATIONS IN
CYNIPIDÆ.

BY J. E. FLETCHER.

At the beginning of March, I confined in a leno bag five specimens of *Neuroterus numismatis* on a little oak in a flower pot, kept indoors. The oak has now six small but almost fully expanded leaves, and on the more fourteen unmistakable galls of *Spathogaster vesicatrix*—the unquestionable produce of the former insect.

I have experimented with three other species, but the oak on which I placed one (*Dryophanta scutellaris*) died at the close of winter: the others are as yet uncertain.

Happy Land, Worcester :

April 17th, 1878.

NOTES ON BRITISH *TENTHREDINIDÆ*.

BY P. CAMERON.

MACROPHYA RIBIS, Schr.

Thomson (Hym. Scand., i, 253) having reversed the names of *M. ribis* and *M. albicincta*, Schr., it may be as well to point out their distinguishing points, the more especially, as they are mixed in most collections, a fact no doubt owing to the absence of any mention of the difference in the sculpture in most of the descriptions. The three species of this group found in Britain may be separated as follows:—

A. Abdomen and pronotum without white markings, scutellum strongly punctured.

ribis, Sch.= *albicincta*, Th., nec Sch.

B. Abdomen and pronotum with white markings, scutellum faintly punctured.

Vertex, scutellum and coxæ with white markings; sides of abdomen black; tegulæ partly black; ♂ with apex of abdomen black beneath.

albicincta, Sch.= *ribis*, Th., nec Sch.

Scutellum and coxæ black; pleuræ and abdomen marked with white; ♂ with apex of abdomen beneath white.

albipunctata, Fall.

Albipunctata is apparently the rarest of the three. Compared with *albicincta*, it is smaller, and has the head and thorax less pilose, the scutellum is black and less convex, there are no marks on the vertex; the mouth and tegulæ are white, the antennæ are shorter, while the white marks on the pleuræ form a ready means of separating

the two. Thomson gives *M. crassula*, Klug, as a synonym of *albipunctata*, but this is not the case, Klug's species being larger; it has yellow instead of white markings; the mark on the pleuræ is larger, the pronotum is broadly marked with yellowish-white, the hinder tibiæ are not black at the base, nor is the stigma testaceous; the 2nd recurrent nervure is almost interstitiate, while in Fallén's species it is received near the middle of the cellule.

There seems to be some ambiguity about what has been written concerning the larva of *M. ribis*. Schrank describes the larva as being green, with two minute dots on the head, and as feeding on *Ribes*. Dours (Cat. Syn., 22) states that it lives on the gooseberry, and has for parasites *Pygostolus sticticus* and *Mesoleius armillatorius*, Gr., = *luteifrons*, Gr. (according to Goureau). Kaltenbach, on the other hand, says that it is suspected to have a similar history to *albicincta*. The larva he describes as being very like that of the latter; the head orange-yellow, with a black mark on vertex and anus, and without any lateral markings. It may be added further, that Rondani (in his paper "Degli Insetti nocive e dei loro parassiti, Bull. Ent. Ital.," vi) states that *M. ribis* feeds on *Ribes rubrum* and *grossularia*, but it is evident from the list of parasites he gives that his observations refer to the too-well-known *Nematus ribesii*.

TAXONUS FLETCHERI, *sp. n.*

Black, shining, covered with a scattered pubescence, the labrum, edge of pronotum and tegulæ, white; legs reddish, paler at the base, and at the anterior tibiæ in front; the apex of the tibiæ and tarsi black; wings almost hyaline, costa and stigma black, marginal nervure nearly interstitiate. Length, 2 lines; alar exp. $5\frac{1}{4}$ lines.

This little insect stands between *T. glabratus*, Fall., and *T. albipes*, Thoms. From the former it may be easily known by its smaller size (it is three-quarters of a line shorter than my smallest ♂ of *glabratus*, and one and a quarter than the largest), white tegulæ and edge of pronotum; the body wants the coppery-violet tint, and the apices of the tibiæ are black. *Albipes* agrees with it in having the tegulæ white, but it has the pronotum entirely black, the body almost glabrous, the legs are yellowish-white, and the four anterior tarsi and apices of tibiæ are not black, while it is also a larger species.

One ♂ taken by Mr. J. E. Fletcher of Worcester (after whom I have named it), near that place on the 30th July, 1877, on alder.

SELANDRIA ANALIS, Thoms.

With reference to my remarks (E. M. M., xiii, p. 197), I may

mention, that Dr. Van Vollenhoven has given me a type of his *Selandria cercipes*, which is, without doubt, identical with the *analisis* of Thomson. The latter name having priority, must be adopted. Mr. C. W. Dale has sent me a *Selandria* from Glanville's Wootton, which seems to be *analisis*; but the yellow mark on the last segment is smaller than in the specimen I had from Holland.

ERIOCAMPA ÆTHIOPS (E. M. M., xiii, 192).

I sent a specimen of this insect to Prof. Zaddach of Königsberg, who tells me that it is a new species, and that to name it *æthiops*, after a totally different insect had long been known under that name (to say nothing as to the uncertainty about the true Fabrician insect), would only lead to fresh confusion. With these remarks I am inclined to agree, and I would propose the name of *caninæ* for it, being a rose feeding species.

NEMATUS COMPRESSICORNIS, Fab.
= *vallator*, Voll.

This is probably a common species in England. It has been sent me by Mr. C. W. Dale and by Mr. J. E. Fletcher. The larva has been described by Van Vollenhoven (Tijd. Ent., i, 191, pl. 12; Zool. S. S., 7855).

NEMATUS BETULE, Retz.

De Geer, Mém., ii, 261, 15, Tab., 37, fig. 23; Htg. Blattw., 219, 53; Voll., Tijd. Ent., vii, 184—187, pl. 12. Thoms., Hym. Scand., i, 104, 28; Brischke and Zaddach, Schr. Ges. König., xvi, pl. 6, fig. 16. I found the easily-recognisable larvæ of this species at Lairg, Sutherlandshire, last June.

NEMATUS ERYTHROGASTER.

Thoms., Hym. Scand., i, 103, 27 (1872), *nec* Norton, Proc. Ent. Soc. Phil., iii, 8 (1864). A single specimen of this insect has been taken at Worcester by Mr. Fletcher. Its nearest ally is *N. conjugatus*, Dbm., from which it may be known by having the whole of the oral region and the back of the abdomen luteous, the 3rd submarginal cellule is shorter (in *conjugatus* it is longer than broad), the 2nd recurrent nervure is not received at such a great distance from the submarginal, while the wings themselves are clearer and the nervures and stigma blacker. As Thomson's name is inadmissible, I would propose for it the name of *crassiventris*.

NEMATUS CANALICULATUS.

Htg., Stett. Ent. Zeit., 1840, Brischke and Zaddach, Schr. Ges.

König., xvi, 79. *Nematus stenogaster*, Foerster, Verh. ver. Rhein., xi, 339, pl. 6, fig. 46. *Nematus pleuralis*, Thoms., Opus., 628, 32; Hym. Scand., i, 117, 41. I captured this insect on the banks of the Shin, Sutherlandshire, in June, among birch. It is very closely related to *N. caprea*, Pz. (*Kirbyi*), but differs in the granulated punctured pleuræ, less shining body, of which the ground colour is decidedly reddish, the pale yellow legs and sordid luteous stigma. The head also is broader in comparison to the length; it retreats more inwardly before and behind; the eyes project more, the face is longer and whitish-yellow. The legs are longer in proportion, and the femora have only a short thin black line on their apical half. Brischke suspects that the larva feeds on the aspen.

NEMATUS TURGIDUS, Zaddach, l. c., 82.

= *pallicerus*, Thoms., nec Htg., Voll.

Two specimens of this rare species were sent me by Mr. C. W. Dale. It belongs to the same group as the last mentioned species, but it has the colour much lighter, being light reddish, with very little black.

NEMATUS ARCTICUS.

Thoms., Hym. Scand., i, 134, 62. Taken by Mr. Joseph Chappell in the Manchester district (I presume), and by the Rev. T. A. Marshall. The only British species with which it can be confounded is *rumicis*, from which it differs in having the antennæ longer, thinner, and not entirely black, the wings likewise wanting the yellowish tinge, while the incision in the clypeus is deeper.

31, Willowbank Crescent,

Glasgow: March, 1878.

NOTES ON PEMBROKESHIRE *TINEINA*.

BY CHAS. G. BARRETT.

I have hitherto abstained from contributing any notes on the *Tineina* of this county, more especially because I have found it impossible to ascertain, to my own satisfaction, the names of several species belonging to different genera, some of which, indeed, I believe to be novelties, but, as it may take a long time to prove this, I think it better not to defer any longer a short notice of some other interesting species.

Ochsenheimeria Birdella. Several specimens swept up among rough herbage in a damp meadow, in August; apparently common.

O. bisontella. A single specimen swept off a hedge-bank; quite an unexpected occurrence.

Tinea misella. When I came here, three years ago, this was common in the stable, and must have fed on old stable manure, but the broom has exterminated it there I fear.

Tinea merdella. Much too common in the house. An old muff tied loosely in paper, and laid under a chest of drawers, proved highly attractive to the females, and I reared a large number from the eggs they laid. Of course, *pellionella*, *tapetzella*, and *fuscipunctella* accompanied it. I am not sure that this species (?) is not a simply yellow form of *pellionella*, with which it closely agrees in form, position of spots, and *size in both sexes*. Moreover, the two forms *cross* freely. The cases also are much alike.

Tinea nigripunctella. It is curious that I meet with this—reputedly scarce—species wherever I go. I have even caught it in my hand in a London street. At Tenby I have found it sitting on a house door, here it occurs rather frequently; but, from the description of building which it principally frequents—here and elsewhere—its larva may be suspected of tastes and habits which can hardly be described as decent, much less fastidious.

Teichobia Verhuellella. Not at all uncommon in the quarries in sheltered rocky places, where ferns grow freely. The larvæ are now feeding. I have seen them to-day, March 15th, in the fronds of *Scolopendrium vulgare*, sometimes feeding under the fructification, or making blotches in the substance of the frond—true *mines* in fact—but generally burrowing down the midrib for some distance, leaving the burrow nearly full of excrement, but always having a little case *made of the scales of the fructification* at the entrance of the mine or burrow. Some plants of *Asplenium trichomanes* were also much infested, the substance of the pinnae being eaten out, so that they turned brown. The cases on these fronds were almost as large as the pinnae. Some small plants of *Asplenium ruta-muraria*, growing in the sheltered chinks of a rock, were almost destroyed by these larvæ, the fronds being completely eaten out, so that the larvæ had carried their cases down the stipes, or even to the young uncurling fronds, or fixed them to the rock close by.

I have not yet been able to find a single larva on *Asplenium adiantum-nigrum*, but I lately found some on *Ceterach officinarum*, on a plant which was growing amongst infested *Asplenium trichomanes*.

Nemophora metaxella. In marshy places, among the hills, but not very common.

Nemotois minimellus. Common in damp meadows, among rank herbage—*Scabiosa*, *Centaurea*, &c.

Prays Curtisellus. Not very common, but remarkable for the occurrence of an exaggerated form of the large *type*-specimens, with the ground-colour singularly pure white.

Harpella nemorella. Rather common in lanes, among wild honey-suckle, in July.

Depressaria pallorella. In lanes, and on the cliffs, sitting on hedges at night, or flying at dusk; autumn and spring; not very common.

D. rotundella. With the last, but commoner.

D. capreolella. Scarce. Generally found flying in the afternoon sunshine in April, not much the better for hibernation. One specimen raked out from a sandhill, in September, was really fine, but—it vanished. I have wasted much valuable time in searching the radical leaves of *Pimpinella saxifraga*—ineffectually—for the larva.

D. rhodochrella. One or two specimens raked out from sandhills, having blackish head and thorax, and I think certainly *not subpropinquilla*.

D. pulcherrimella. Taken, and larva found and reared, from damp fields, among *Bunium flexuosum*.

D. badiella. Coast sandhills, and under cliffs.

D. pastinacella. Coast sandhills, but not very common.

Gelechia gerronella. Baten out of furze bushes under the cliffs along with *G. senectella*.

G. distinctella. On coast sands, apparently scarce.

G. costella. Larvæ in plenty on *Solanum dulcamara*, under the cliffs at Tenby.

G. leucomelanella. I found this very local species rather commonly along a strip of undercliff, among *Silene maritima*, last August. It is rather sluggish, and will only move in the most favourable weather. In the previous year I looked for it in vain.

G. instabilella. Common on the cliffs and salt-marshes.

G. obsoletella. I found a great number of larvæ last autumn on plants of *Atriplex*, eating the *seeds*, *leaves*, *shoots*, any part in fact (like *costella* in *Solanum*), but *not* particularly in the *stems*. One specimen of this species has already emerged indoors.

G. Sircomella. One specimen only, among *tæniolella*. I am inclined to think (with Mr. Sang) that this is only a form of *tæniolella*, with the fascia obliterated.

Anarsia spartiella. Variable, some specimens being nearly as large and dark as *A. genistæ*.

Ecophora Lambdella. Half-a-dozen specimens occurred last summer under the cliffs, generally beaten out of old furze bushes. I hope that I have the larva in decayed furze sticks. This is a sluggish insect, and not easily induced to fly.

Butalis senescens. In the limestone quarries, in June, apparently scarce, but very hard to see.

B. fusco-cuprea. Several specimens swept up from long grass and rank herbage under the cliffs, in July.

Aerolepia granitella. Common everywhere in the autumn, and—hibernated—in the spring, but a real nuisance, along the undercliffs. It was already common there on a warm evening early in the present month—March. The larva is equally common in June, in the leaves of fleabane by the road-sides.

Glyphipteryx Thrasonella. The unicolorous bronzy form (*Cladiella*) and intermediates are almost as common here as in the Norfolk fens, and I have found here, in addition, occasional specimens of a peculiar livid bluish, or pale steely-colour, very curious when the moths are alive.

Perittia obscurepunctella. Not scarce, among honeysuckle in the lanes, in April.

Coleophora gryppipennella. In lanes and quarries, among wild rose.

C. virgaureæ. Common under the cliffs, among *Solidago*.

Laverna lacteella. In lanes, scarce.

Asychna terminella. A few larvæ found in leaves of *Circea luteiana* near Saundersfoot, in the autumn. Only one specimen reared.

Elachista Bedellella. In the limestone quarries, apparently not common.

E. collitella. On June 21st, 1875, I found a minute whitish *Elachista* in some numbers on the sandhills at Tenby, skipping from grassblade to grassblade, or flying very short distances in the shelter of the bent-grass (*Ammophila*). This species (which I have not met with since) Mr. Stainton believes to be the true *collitella* of Duponchel, not before observed in the British Isles and distinct from *subocellæa*, Steph. It is most nearly allied to *triseriatella*, Stn., but has the black dots rounder, larger, and much more numerous—from twenty-eight to thirty in number,—and distributed over the disc of the wing as well as along the fold. At the apex is a double bar of blackish scales. This is one of the smallest species in the genus.

Cemiostoma Wailesella. Apparently common among *Genista tinctoria*, in meadows.

Bucculatrix maritima. Most abundant in salt-marshes. Sometimes the tiny white-ribbed cocoons may be seen on almost every blade of the wiry grass which grows among the *Aster* in the mud.

Although this list is fairly long, it must not be taken to imply that *Tineina* are well represented here; the contrary is the fact. The company may be select, but it certainly is not numerous, and the number of usually common species which here seem to be rare or absent, is really extraordinary. Perhaps this is only what may be expected on the mountain lime-stone.

Pembroke: 25th March, 1878.

NEW GENERA AND SPECIES OF LONGICORN COLEOPTERA.

BY H. W. BATES, F.L.S.

CYRTOGNATHUS PLANICOLLIS, *n. sp.*

Oblongus, minus convexus, niger, subnitidus, subtiliter coriaceus: capite antice verticali; mandibulis apicem versus dilatatis; thorace valde transversali, plano, subtilissime punctulato, lateribus anticis fortiter bispinoso, angulo postico etiam dentato, acuto; elytris apice ad suturam breviter spinosis, supra subtiliter punctulatis et obsolete bicostatis: pedibus gracilibus, femoribus tibiisque subtilis denticulato-asperatis, tarsorum articulo penultimo anguste bilobo.

♂. *Antennæ corpori longitudine æquales, 12-articulatæ, articulo 3^{io} valde elongato, lineari, compresso, articulis 3—5 subtus denticulatis, 3—11 apice incrassatis, et extus paulo productis.* Long. 18 lin.

Northern Borneo (Mr. Everett).

Nearest allied to *C. granulatus* (Thoms.), but much smaller and less convex, with thorax still flatter on the disc. The mandibles also are quite different in shape, being gradually dilated from the base to the hooked apex, and plane above. The penultimate tarsal joint has in *M. granulatus* rounded lobes, but in *C. planicollis*, narrow and pointed lobes, more so than in *C. forficatus*. The third antennal joint is greatly elongated, and beneath denticulated, in both species, but in *C. planicollis* it has (with the much shorter 4th joint) the further peculiarity of being flattened.

HOPLIDERES NYASSÆ, *n. sp.*

Late oblongus, parallelogrammicus, supra opacus, ♂ fulvo-castaneus, ♀ niger: capite grosse reticulato-punctato; thorace lato, transversim quadrato, lateribus fere ut in H. spinipenne acute 5-spinosis; clytris alutaceo-opacis, et subtiliter creberrime punctulatis, basi grossius intricato-punctatis, lateribus infra humeros paulo serratis, apice ad suturam simplicibus: corpore subtilis fere nudo, alutaceo-punctulato.

Antennæ maris corpore paulo longiores; articulis linearibus, apice haud spinosis, sparsim punctatis: femine corpore triente breviores. Long. 18 lin.

Belongs undoubtedly to this genus, although the general form of body is different; the elytra especially being parallelogrammatical, convex, and with a considerable posterior declivity, whilst in the other two known species they are somewhat dilated beyond the middle, with expanded lateral margins and very gradual posterior declivity. The ♂ is of a tawny-chestnut hue, paler on the elytra, and the ♀ dull sooty-black; but I suspect the ♂ specimen to be somewhat immature. The explanated lateral margins of the thorax are still broader than in *II. spinipennis*, and in the ♂ are separate from the disc by a rather distinct groove: there is also a distinct dorsal channel in this sex.

Lake Nyassa; discovered by Mr. E. D. Young, R.N.

CACOSCELES LACORDAIREI, *n. sp.*

C. Ædipus, Lac. Genera, viii, p. 65. *Atlas*, pl. 82, f. 1.

The illustrious author of the "Genera" naturally mistook the only species he found in continental collections for the *Ædipus* of Newman, which appears to be an exceedingly rare insect. I acquired, some time ago, from one of Mr. R. Trimen's collections a specimen ticketed "Mossel Bay, S. Africa," which agrees exactly with Newman's description, and is a very distinct species from that of Lacordaire. In the true *Ædipus* the anterior angles of the thorax are dentiform, the antennæ are longer, their joints much more slender and *not cupuliform*, but simply a little produced on one side at their apices; the colour moreover is wholly dark chestnut, instead of tawny-castaneous as in *C. Lacordairei*.

The thorax is relatively much broader. With regard to the armature of the sides, it would be better defined as consisting of two broad teeth, the front one of which is obliquely curved, and the second extremely acute, and subspiniform at its apex.

CNETHOCERUS, *nov. gen.*

Gen. Priono affinis. Corpus totum maris sericeo-pubescentis, feminae nudum. Oculi supra fere contingentes. Antennæ maris corpore longiores, articulis 3—11 opacis, dense irregulariter strigosis, apice utrinque acute productis: feminae corpore breviores, articulis 3—11 sublinearibus, apice paulo productis, 3—7 lateraliter, 8—11 omnino ut in ♂ strigoso-opacis. Thorax ut in Prionis typicis, transversim quadratus, lateribus tridentatis.

CNETHOCERUS MESSI, *n. sp.*

Priono coriario paulo magis elongatus, minus convexus; castaneo-fuscus, ♂ supra pubescentia incumbenti fulvo-sericeo vestitus; capite thoraceque punctato-scabrosus; elytris obtuse, indistincte, subcostatis, apice late rotundatis, supra basi scabroso-punctatis deinde subtiliter aluticeo-punctulatis: pectore fulvo-hirsuto; abdomine ♂ subopaco, ♀ nitido, irregulariter punctato.

Hong Kong. From Herr Mess, of Munich. I have since received, for examination, a Japanese specimen, from the Berlin Museum, through E. von Harold.

DEROBRACHUS ASPERATUS, *n. sp.*

Elongato-oblongus, supra omnino intricato-punctatus, nitidus, niger, elytris maris interdum castaneis; thorace utrinque equaliter trispinoso; elytris nullo modo costatis, apice ad suturam spinosis; antennis ♂ corpore paullulum brevioribus; articulis 1—3 asperato-punctatis, 3 supra sulcato, 4—5 lateribus, 6—11 omnino, subtiliter acute strigosis: pedibus asperato-granulatis et punctatis: corpore subtus laevi, pectore lateribus punctatis et fulvo-pilosis. Long. ♂, 1 in. 9 lin. ♀, 2 in. 3 lin.

Costa Rica, Mt. Irazu, alt. 6–7000 ft. Rogers. Coll. Godman and Salvin, and H. W. Bates.

SYNONYMICAL NOTE.—*Paranæcus Olivieri*, J. Thomson, Rev. et Mag. Zool., 1877, p. 270, = *Apotrophus simplicicollis*, H. W. Bates, Ent. M. M., vol. xii (1875), pp. 48–49.

Bartholomew Road, Kentish Town:
April, 1878.

LIST OF THE HEMIPTERA OF NEW ZEALAND.

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

When sufficient material has accumulated, I hope to be able to publish a Synopsis of the *Hemiptera* of New Zealand; but, as in the meantime I can (thanks to the kindness of Mr. C. M. Wakefield and Captains Broun and Hutton) add considerably to the list presented in 1873 to the Otago Institute by Captain F. W. Hutton, it may not be out of place to give now an account of our present knowledge of the New Zealand *Hemiptera*.

HETEROPTERA.

Tribe SCUTATA.

In Captain Hutton's list referred to above, fifteen species of this tribe are reported. The next and only other list of New Zealand *Hemiptera* that I have seen is in the concluding part of the Insects of the voyage of the Erebus and Terror, published by Mr. Butler in 1874, in which eleven *Scutatae* are mentioned, two of the names in Captain Hutton's list having been reduced to synonyms, and two others not being mentioned at all. In the following list, four of the names of species mentioned by Captain Hutton are considered as synonymic; but I am able to add two species to the list. In cases where I have seen no New Zealand examples of the species, I give the authority for

entering it in the list: in other cases I mention only the captors of the specimens in my possession. In the case of new species, preliminary diagnoses are given; fuller descriptions will be given in the Synopsis.

Family SCUTELLERIDÆ.

1. *Calliphora imperialis*, F. "New Zealand;" British Museum Catalogue. I have seen no specimens.
2. *Peltophora pedicellata*, Kirby. Auckland, Mayr (in the *Hemiptera* of the voyage of the *Novara*). I have seen no specimens.

Family ASOPIDÆ.

3. *Æchalia consocialis*, Boisd. (= *Pentatoma Schellebergi*, Guér., = *Raphigaster perfectus*, Walker, according to Butler *l. c.* Walker described his *R. perfectus* as having the 3rd joint of the antennæ longer than the 2nd or 4th; in other respects his description agrees with *consocialis*).
Captain Broun.

4. *Cermatulus nasalis*, Westw. (= *Raphigaster pentatomoides*, Walker, according to Butler *l. c.* Walker's description does not quite tally with my specimens, but I have no doubt that Mr. Butler is right).
Messrs. Broun, Hutton, and Wakefield. Common.

Family CYDNIDÆ.

5. *Geotomus leptospermi* (= *Æthus leptospermi*, Butler).

Messrs. Broun and Wakefield. A note is appended to one of Mr. Wakefield's specimens, stating that he "once found this in numbers on the sea beach at Sumner, either floating in salt water pools or crawling on the sand."

6. *Chærocydnus nigrosignatus*, n. sp.

Ovate, rather convex, especially below; brownish-testaceous, coarsely and remotely punctured with brown; sides of head, pronotum and basal half of front margin of corium with long reddish-brown bristles. A ring on the crown prolonged towards the apex of the head, a spot near the inner margin of each eye, the front margin very narrowly, two somewhat curved and irregular transversely oblong spots on each side of the disc, and a small spot near the hind margin within the posterior angles of the pronotum, three basal spots and apex of scutellum, some irregular spots on the disc of the corium, the basal half at least of the femora, and the tarsi towards the apex, as well as most of the under-side of the body, piecous-black. (Frequently the black markings cover the greater part of the head, and form two transverse fasciæ—not reaching the sides—on the pronotum, while the central basal spot of the scutellum is prolonged in a fine line to the apical spot, and the spots of the corium are

more or less confluent, with, in addition, indications of a row of spots near the anterior margin). Membrane testaceous-brown, speckled with darker. Antennæ 4-jointed, the first two joints reddish-brown and the last two brownish-black; the 1st joint short and stout, the 2nd much thinner, gradually thickened upwards and much the longest of all, the last two stout, fusiform, the 4th being longer than the 3rd. Tibiæ with stout reddish-brown spines. ♂ ♀. Length, 4—5, breadth, 3—3½ mm.

Messrs. Wakefield and Hutton.

The only description of the genus *Chærocydnus* that I can find is in the Table of Genera of the *Cydnidæ* in Dallas' Catalogue; and of the only species in that genus (*foveolatus*, A. White, Zool. Voy. Erebus and Terror) I can find no description at all, and suspect that it has not been described. *C. foveolatus*, whatever it may be, is an Australian species, and may be identical with *nigrosignatus*, though the latter has not any characters meriting the term *foveolatus*.

Family SCIOCORIDÆ.

7. *Dictyotus polysticticus*, Butler.

Messrs. Broun, Hutton, and Wakefield. Common.

Though Mr. Butler (*l. c.*) does not give *Pentatoma vilis*, Walker, as a synonym of this species (and, indeed, mentions it as a species possessed by the Museum), I have little doubt that Walker founded *vilis* on a specimen of *polysticticus*. Should such be the case, *vilis* is the older name (*polysticticus* being only a catalogue name till the insect was described by Mr. Butler), and should be adopted, if any of Walker's names of *Hemiptera* are to be adopted.

8. *Sciocoris Helferi*, Fieb. Mayr, *l. c.* I have seen no New Zealand examples of this European species.

Family HALYDIDÆ.

9. *Platycoris immarginatus*, Dallas. British Museum. I have seen no specimens.

Family PENTATOMIDÆ.

10. *Nezara viridula*, L. British Museum. I suppose the determination of this widely spread species is correct. The next is very close to it.

11. *Nezara Amyoti* (White), Dallas.

Captain Broun. In addition to typical specimens, there are three examples (more or less fuscous-brown, with a greenish tint) which seem to be immature individuals of this species.

Family ACANTHOSOMATIDÆ.

12. *Rhopalimorpha obscura*, White.

Messrs. Broun, Hutton, and Wakefield.

Rhopalimorpha similis, Mayr, is, I feel pretty sure, the same as *obscura*, White. Dr. Mayr says that *similis* differs from *obscura* in having the 2nd joint of the antennæ longer than the 3rd, but in the figure of *obscura* (Voy. Ereb. and Terror, pl. 7, fig. 8) the antennæ are so formed. The other points of difference are merely in colour, and my specimens show all the points of both, except the lighter coloured band (very indistinct in the figure) between the hind angles that *obscura* is described as having, and which may have been an individual peculiarity in the specimen described by my namesake. In the meantime, therefore, I consider *similis* synonymic with *obscura*.

13. *Anubis vittatus* (= *Acanthosoma vittatum*, F.).

Messrs. Broun, Hutton, and Wakefield. Common.

I suppose Dallas' determination of this species is correct. The only description I have seen is in the *Systema Rhyngotorum* (165. 52), and is very short. In that work it is said to be a native of the Cape of Good Hope; but I believe it is not known as an African species. Stål places it in his genus *Anubis*.

(To be continued).

Note on the British species of Pilophorus.—Dr. Reuter's characters of our three species of this genus are most clear and precise, and, to my mind, distinguish them apart perfectly. The reason why I did not admit *perplexus* as a species in my synopsis was, that all the specimens in my collection were clearly referable to one species. I had dark specimens named as *perplexus*, and light ones as *cinnamopterus*, and I had reasons for thinking that these forms represented the two species as defined by Mr. Scott. On referring, however, to Dr. Reuter's table in your last number, I see that all mine are clearly referable to *perplexus*. Since I wrote my synopsis, I have received the true *bifasciatus* = *cinnamopterus*, taken from fir trees (all my others are, I believe, from oaks), and I am bound to confess that I did not see the difference between it and *perplexus*, before reading Dr. Reuter's remarks.

In "British Hemiptera," Messrs. Douglas and Scott appear to have included both species under *cinnamopterus*, as they say: "One example beaten from *Pinus sylvestris*, * * and two others off oaks." Their description, however, appears to be taken from the true *bifasciatus*.

The fact that the *bifasciatus* of my synopsis = *perplexus*, explains the character there given: "narrower than *clavatus*."—EDWARD SAUNDERS, Holmesdale, Upper Tooting: 17th April, 1878.

Note on Trioza agopodii, Löw.—At p. 228, *ante*, Dr. Löw has described a new *Trioza*, *T. agopodii*, and noted it as taken in "Fennia." This is not quite correct, for the specimens, sent by me to Dr. Löw, were not found in Finland, but were taken near Stockholm by Prof. Boheman.—O. M. REUTER, Helsingfors: 7th April, 1878.

Deformity in an Ichneumon.—I possess a ♀ of *Amblyteles Cerinthius*, Gr., in which the right eye is congenitally obliterated, except a small globule placed close to the ocellus on the same side, without the usual space between them. In the situation properly belonging to the eye there is nothing but a blank, of the same appearance as the rest of the head. The small aborted eye thus thrown back out of its place seems to be about one-twelfth of its proper size; it has distinct facets like the other eye, and presents a granular surface different from that of the ocellus with which it is in juxtaposition. The ocellus is distorted from a spherical into an oblong shape, and enlarged (as if by way of compensation) to about twice its natural size, forming, with the eye, a bilobed visual organ overhanging the occiput. The head projects somewhat backwards in this place, but is otherwise free from malformation. The usual yellow streak, which should occupy the inner orbit, is absent on the imperfect side and visible on the other. I have further to remark upon this species that it belongs to the genus *Amblyteles*, to which I was not able to refer it in the Catalogue, as I had then no specimens, and the insect is not mentioned by Wesmael. Both sexes were bred together by Mr. Scott from *A. Atropos*. The male is not described; it differs slightly from the ♀ in having the antennæ black, with the two basal joints yellow beneath, and in wanting the dark suffused stain at the base of segment 3. Long., ♂, 7 lin.; ♀, 5½ lin. Stephens mentions the species as found near London; Gravenhorst describes the ♀ from Italy.—T. A. MARSHALL, St. Mary's Rectory, Antigua: 8th March, 1878.

Trachyphlæus laticollis near *Dumfries*.—Last autumn I found one specimen of this rare species in flood-refuse here, along with a fine variety of *Cassida chloris*.—W. LENNIX, Crichton Institution, Dumfries: 27th March, 1878.

Luminous Lepidopterous larvæ.—As regards the question of luminous caterpillars, I have, on reading the last No. of the E. M. M., recalled to my recollection a special case of a green smooth caterpillar, banded (or striped) with yellow, and spotted with red, to which I was attracted one evening in December, 1872, by the beauty of its luminosity as it moved along upon the ground in one of the forest paths in South Brazil. I recollect keeping this caterpillar alive through the night, and in the morning killing it by immersion in spirit, and afterwards cleaning and roughly stuffing it. It was about 1½ inch long, and perhaps ⅔ inch diameter in thickest part.

Unless there are other larvæ so like the larvæ of *Lepidoptera*, as to be easily mistaken for these latter by a non-scientific observer like myself, there can be no doubt that this also was a case of a luminous Lepidopterous larva.—THOMAS P. BIGG-WITHER, Furze Hill, Redhill: 3rd April, 1878.

The date of Cramer's works.—Cramer's "Papillons Exotiques" originally appeared in 34 parts, and the exact dates of publication have remained uncertain, as the first two vols. are dated 1779, and the others 1782; although the preface at the beginning of vol. I is dated December 2nd, 1774. I am indebted to the kindness of Mr. H. W. Marsden for a collation of a copy of the work in his possession, in the original covers, according to which the actual dates of publication appear to be as follows:—

Vol. I, pls. 1—84	was published in	1775.
85—96	„ „ „	1776.
„ II. „ 97—192	„ „ „	1777.

There is little doubt that vols. III to IV were published by Stoll after the death of Cramer, as there is a gap of two years between vols. II and III; and there is internal evidence that everything after pl. 253 at latest should be attributed to Stoll.

Vol. III, pls. 193—264	was published in	1779.
265—288	”	”
” IV, ” 289—336	”	”
337—384	”	”
385—400	”	”

Stoll's supplementary volume is dated as follows:—

Pls. 1—8	-	-	-	-	1787.
” 9—42	-	-	-	-	1790.

The title-page is dated 1791.

There is, I think, little doubt that the dates on the title-pages may be neglected; that the dates on the wrappers of the parts, as above quoted, may be accepted as correct; and that the III and IV volumes of the “Papillons Exotiques” should be attributed to Stoll. I have not been able to ascertain the precise date of Cramer's death.—W. F. KIRBY, Museum of Science and Art, Dublin: *4th April*, 1878.

Pupation of Elachista Gregsoni.—Early in March I received from Mr. Sang, of Darlington, a number of *Elachista* larvæ, which he believed to be those of *E. Gregsoni*. As soon as these larvæ assumed the pupa state I was startled by an appearance I had not before observed; the entire pupa is protected and partially concealed by a silken tent, just like the pupa of *E. rufocinerea*, which, till now, I had thought to be the only species of the genus in which the pupa was thus protected. From these pupæ sixteen specimens of the imago have now emerged, and I find that Mr. Sang was quite correct in referring them to *E. Gregsoni*.

It may be that *Elachista nigrella* has no distinct specific existence, and that some error of observation has crept in, when a brown-headed larva was assigned to *E. nigrella*. Probably, if ever *E. nigrella* should be freely bred, it and *E. Gregsoni* would be found to be the same species.—H. T. STAINTON, Mountfield, Lewisham: *April 13th*, 1878.

Description of the larva of Acidalia promutata.—On September 7th, 1875, I received half-a-dozen young larvæ of this species from Mr. J. G. Ross, of Bathampton, near Bath. They fed on *Polygonum aviculare* until hibernation, which, in their case, extended over an unusually long period, as, in the spring following, they did not recommence feeding until long after other hibernating species I had had begun to do so, although kept under precisely the same conditions. This, however, cannot be taken as the natural habit of the species, whatever may have been the cause in this case, as my larvæ were consequently not full grown until quite the end of June, or several weeks after the imagos ought to have been on the wing at large. Length nearly an inch and a half; the head has the lobes rounded and is of equal width with the second segment: body slender, cylindrical, and of almost uniform width throughout, tapering very slightly indeed towards the head; segmental divisions tolerably well defined, but do not overlap each other, in the marked way which characterizes so many of the species in the genus: skin distinctly, but very evenly transversely ribbed.

Ground colour of the dorsal surface and head a very pale slaty-olive; a dull olive stripe extends throughout the centre of the dorsal area, and encloses within it a very fine interrupted pale medio-dorsal line; this olive stripe, however, is much darker on the last three segments than on any of the others; there is a pale yellowish, not very well defined, line along the sub-dorsal area, but there are no perceptible spiracular lines; spiracles distinct, black. Ventral surface uniformly of a pretty very pale slaty-blue colour. The pupa is nearly half an inch long, smooth and polished, tolerably cylindrical, but attenuated towards the anal point; compared with the larva it is very stout.

Ground colour of the dorsal surface pale brown; head and segmental divisions chocolate-brown; wing-cases yellowish-green; the anal tip brown. The imagos began to emerge July 23rd.—GEO. T. PORRITT, Highroyd House, Huddersfield: *April 10th*, 1878.

"*The first Great National Entomological Exhibition.*"—Concerning the late "National Exhibition" I heartily approve of the Editorial remarks in the last number of E. M. M. The fact alone of calling the Exhibition "National" sufficed to deter me from sending my collections when solicited to do so in the invitation I received. Again, the place of exhibition, redolent of mountebanks and acrobats, should surely have warned one, that notoriety is not an equivalent to loss of self-respect.—GEO. NORMAN, Ben Rhydding: *April*, 1878.

Review.

EUROPEAN BUTTERFLIES AND MOTHS, Part I, by W. F. KIRBY; based upon Berge's Schmetterlings-Buch. Cassell, Petter, & Galpin. 4to. 1878.

In this work it appears to be in contemplation to give one 4to coloured plate in each part (Part I also contains an additional plate of anatomical diagrams). That in this first part contains figures of three species of *Papilio* (with larvæ, &c.), one of *Doritis* and two of *Thais*. If the same degree of excellence be maintained the illustrations will leave little to be desired, and the work will be a marvel of cheapness. The descriptive text is well written although brief. In the anatomical introductory remarks we think Mr. Kirby has overstepped himself. Alluding to *Articulata* generally we read that "they breathe by tracheæ when they live in air, and by gills when they live in water." This conveys a wrong impression. All true insects breathe by means of tracheæ, as is stated by the author in the succeeding paragraph; the distinction sought to be given should have been expressed by the terms "stigmata" (or spiracles) and "branchiæ" (or gills); but even then the words would be misleading, for probably as many aquatic insects possess stigmata as branchiæ, and some both. Concerning Butterflies we read that "the pupæ are suspended by the tail and are often fastened by a girth round the body as well"; the term "suspended" can only apply rigidly to the *Nymphalidæ*.

The general excellence of the work is such that we heartily recommend it. Any attempt to break up the insular prejudices of exclusively "British" collectors is a step in the right direction, and we sincerely hope the enterprising publishers will not find these too strong for them.



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