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“ By mutual confidence and mutual aid  
Great deeds are done and great discoveries made.”  
POPE'S ‘Homer.’

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“In nomenclature, it is a sound plan to revert to some standard authority; and, supposing that described and named objects be at any subsequent time re-described and named as new, to strike out such new names as soon as the fact shall be pointed out, and substitute the old names in their right of priority: in all instances subsequent to such authority, the best rule is, that the name first published be received.”

EDWARD NEWMAN in ‘*Grammar of Entomology.*’





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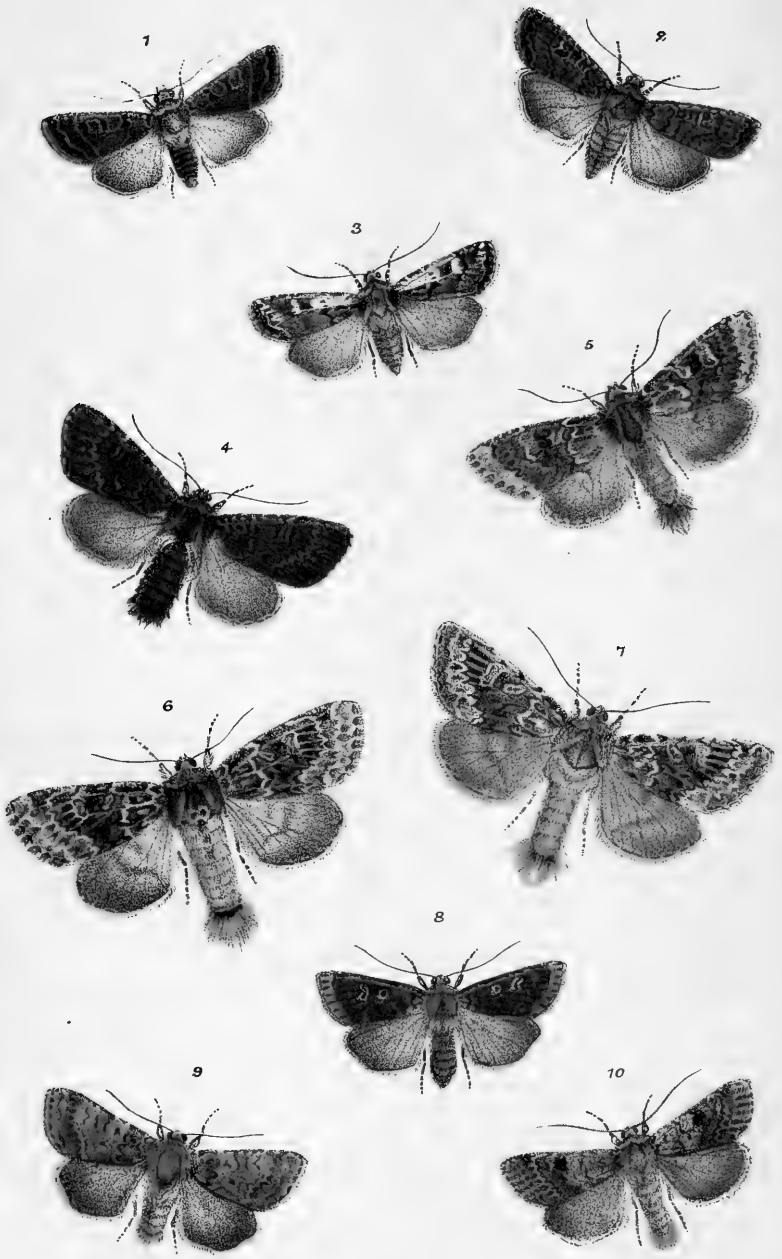
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## THE MACRO-LEPIDOPTERA OF UNST.

By J. JENNER WEIR, F.L.S., F.Z.S.

(WITH COLOURED PLATE.)

THE British Isles, small as they are when compared with some of the larger European countries, yet extend over almost eleven degrees of latitude, *viz.*, from  $50^{\circ}$  to nearly  $61^{\circ}$  N. lat.

The South of Cornwall and the Scilly Isles are about in the latitude of Dieppe, and the North of Shetland in that of Bergen in Norway, and further north than Cape Farewell in Greenland.

Mr. McArthur last year (1883), from the latter part of May till the beginning of September, collected insects in Unst, the most northern of the Shetland Isles, between  $60^{\circ}$  and  $61^{\circ}$  N. lat., or but little more than five and a half degrees from the Arctic circle. In this high latitude it is quite unnecessary to use a lantern for collecting in summer; the moths can be plainly seen on the flowers at midnight without artificial light. The nocturnal species fly from about 11.30 p.m. to 12.30 a.m., the period during which they can be taken lasting but one hour, so that the entomologist has to make the best use of his time. This Mr. McArthur appears to have done; and, taking every advantage of his opportunities, has returned with a most interesting and valuable series of Lepidoptera, which supplement those collected by him on Mainland, of which descriptions were given by me in the 'Entomologist' for the year 1880, vol. xiii., pp. 249-251 and 289-292; and 1881, vol. xiv., pp. 278-281.

The following species new to the Macro-lepidoptera of the Islands have been added, viz. :—

<i>Sphinx convolvuli</i> ,	<i>Agrotis cursoria</i> ,	<i>Noctua glareosa</i> ,
<i>Hadena exulis</i> ,	<i>A. lucerneae</i> ,	<i>N. xanthographa</i> .

These species, added to thirty-eight previously taken, raise the total number to forty-four ascertained to inhabit the Shetlands; of this number but thirty-two species were taken in Unst, including two butterflies, viz., *Pyrameis cardui* and *Vanessa atalanta*.

I am indebted to the kindness and courtesy of Mr. Clarence E. Fry for the examination of the most remarkable specimens, and for the opportunity of figuring them. Mr. McArthur has also permitted me, with equal kindness, to examine the bulk of the collection, for which purpose I visited him at Brighton.

The following remarks I deem worthy of putting on record :—

*Hepialus humuli* var. *hethlandica*.—The varieties of this species are more uniform in their markings and colouring than those obtained farther south, most of the species being tawny, with darker markings. The silvery males are rare, and never are quite like the normal form of the species, the thorax being always darker.

*H. vellela*.—These are not so brightly coloured as those captured on Mainland.

*Noctua festiva*.—A most beautiful series of this species was captured, some of a very rich chestnut-colour, with well-defined markings, as rich in colour as *N. brunnea*; and others, of the var. *conflua*, with the markings almost obsolete. Of these, three varieties are figured, Nos. 8, 9, and 10.

*N. glareosa*.—This is one of the gems of the collection; the ground colour of the upper wings, instead of the usual gray, is of a rich dark brown, *vide* figure 1.

*N. xanthographa*.—The specimens are mostly very dark, some with the distinct yellow spots, from which the name is derived; and in others the reniform and orbicular stigmata are almost obsolete.

*Hadena exulis*.—Of this insect, so rare in Britain, few were taken, but they are fine and large, and vary exceedingly; the yellow markings in some are very well-defined bands; a reference to the plate, Nos. 5, 6, 7, will show this peculiarity better than the most elaborate description. This may be regarded as the

most valuable species taken. The Rannoch form of the insect is also figured (No. 4) for comparison.

*Agrotis cursoria*.—Some of these are as dark as the *Noctua glareosa* figured; others are light, but with all the markings very sharply defined. These latter are very unlike the normal form. Figures, 2 and 3.

*A. porphyrea*.—The specimens are dark, and often strongly marked; others suffused; but all quite unlike those from Arran. There is almost an entire absence of the usual purple colour.

*A. lucerneæ*.—These are very large and dark.

*Pachnobia hyperborea*.—The general tint of the specimens is red, and they are more uniform in appearance even than those from Mainland.

*Dianthæcia conspersa*.—These are all of the true Shetlandic coloration, but lighter; some with the markings nearly obliterated, and of a dark leaden brown colour.

*Aplecta occulta*.—These are somewhat intermediate in colour between northern and southern specimens.

*Dasypolia templi*.—All the specimens are smaller than those taken in Mainland.

*Emmelesia albulata* var. *thules*.—The specimens, as a rule, are even darker than those figured in the 'Entomologist,' vol. xiii., plate 4, figs. 4 and 5.

*E. venosata*.—The ground colour of these is dark gray, but none were captured so dark as those from Mainland.

*E. nanata* (?).—I am not quite certain whether the specimens captured are really this insect, but am inclined to think they are extreme boreal varieties of it; some are very strongly marked with two dark bands across the fore wings; all are darker than the southern form. They are evidently the same insect as that figured in the 'Entomologist,' vol. xiv., plate 1, figs. 2 and 3; *vide* also p. 303 of the same volume.

*Melanippe montanata*.—It is singular to find that the specimens of this insect from Unst are finer than those from Mainland. They vary considerably in the intensity of the ground colour of the wings from light to dark gray, but none are white in this respect.

*Campptogramma bilineata*.—The colour of these is peculiarly suffused, with very faint markings; the singularly dull appearance presented can scarcely be described.

*Cidaria immanata*.—The coloration is peculiar, but uniform; some have the central band red, as observed before in specimens from Mainland. This coloration is common enough in the allied species *C. russata*; but I believe, except in the form from Shetland, not known to occur either in Scotch or English *C. immanata*.

The remainder of the species taken do not present any important differences from the ordinary forms of the insects from Shetland to call for remark.

I have examined Mr. McArthur's diary, and find he took up his residence in the most northern house in the British Isles; so that this collection may be said to have been obtained in the veritable Ultima Thule.

The weather was distressingly bad; and when I read day after day such entries as "Stormy and wet, no chance of getting out;" "Dull day, no sun, no luck at all;" "Raining very fast, could not get out;" "Very stiff from the tumble last night;" "Stormy, still a prisoner;" I cannot but admire the resolution of Mr. McArthur. But he was at last beaten; and on September 8th he writes, "Nothing at all doing since 28th; so have made up my mind to go."

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## NOTES FROM WITHERSLACK.

By EDMUND SHUTTLEWORTH.

"WHAT a wretched season this has been for collecting!" one hears entomologists say on all sides. Granted that the weather has not been as propitious as it might have; but, taking all things into consideration, I have not found the season such a very unproductive one.

Unfortunately I have not collected much this year owing to want of time, but what I have done has been, in my estimation, very satisfactory, the following being an account of the first week spent by me at Witherslack this year, *viz.*, from Saturday, June 30th, until Saturday, July 7th.

On Saturday, June 30th, the day was very fine and warm, the sun shining brightly, and I took a nice series of *Pterophorus parvidactylus* flying over the flowers of wild thyme, upon which plant the larva feeds; also *P. lithodactylus* and two or three *P. osteodactylus* from among golden-rod. I was fortunate enough

to fill up my series of *Photodes captiuncula*. This little Noctua, which is very difficult to catch on the wing, owing to the rapidity of its flight and the harmonising of its colour with surrounding objects, was sunning itself upon the flowers of the ox-eye daisy, and was thus easily captured. *Xanthosetia hamana* was just out, and occurred at intervals; and the *salmacis* variety of *Lycæna agestis* was tolerably abundant. *L. alsus* and *Thanaos tages*, although plentiful, were worn.

Having heard, or read somewhere, of the attractive influence exerted by yew trees on Lepidoptera, I determined to take the opportunity of verifying the statement, so in the evening as it was getting dusk I sallied out, armed with a light long-handled net, to some promising-looking trees. Truly, I had been rightly informed, for not only moths, but Coleoptera, Diptera, innumerable columns of gnats and flies of all sorts, together with clouds of midges (which bit awfully hard), swarmed around "the attractive yew." I soon secured a series of *Batodes angustiorana*; and then devoted my attention to a small moth which was flying about, which proved to be *Eupithecia distinctata*. *Boarmia rhomboidaria*, *Camptogramma bilineata*, and *Hepialus humuli* were so common as to become a nuisance; especially *C. bilineata*, which, in the uncertain light, appeared like everything else except itself.

Monday, July 2nd, was fair but cloudy, with a slight wind. On that day I went upon Meathop Moss, and took a nice lot of the following:—*Acidalia fumata* and *Aspilates strigillaria* in very fine condition; *Chortobius davus* (nearly all males) plentiful, but rather worn; *Scodonia belgiaria*, one, a female, which laid a nice batch of eggs, which duly hatched, and are now feeding upon willow; two specimens of *Hyria auroraria*; and sundry *Euthe- monia russula*, *Agrotis porphyrea*, and *Anarta myrtilli*. The females of *A. strigillaria* and *A. fumata* I find lay freely when left in a pill-box. The eggs of *A. strigillaria* are straw-coloured, oblong in shape, and slightly broader at one end, on the top of which is a circular indentation. When viewed through a small pocket-lens they had the appearance of minute grains of wheat. They were not laid in any particular pattern or manner, but higgledy-piggledy, singly or in clusters, all about the box. The eggs of *A. fumata* are of a pale greenish colour when fresh laid, but soon change to a pinkish hue, are oval in shape, taper

slightly at one end, and are ribbed, the ribs being formed apparently by a series of small indentations running parallel to each other all round and from end to end of the egg. They were laid end on round the sides of the pill-boxes. The rain came on about 4 o'clock, and continued until 7, when I went to a rough, rocky piece of ground, about half a mile from the inn, and tried sugar, but no moths came to it; and the rain, which began to fall again about 10 p.m., soon washed it away. I found *E. pulchellata* and *Bryophila perla* sitting on the rocks; and netted one *P. osteodactylus*, and a few *Pseudoterpna cytisaria*, *Eubolia palumbaria*, *Nudaria mundana*, *A. remutata*, and *E. distinctata*.

On Tuesday, July 3rd, after I had finished setting my previous day's captures, I collected some larvæ which were feeding upon the flower-heads of the ox-eye daisy. The head is a lightish brown; the body smooth and greyish in colour, with black dots placed in pairs on every segment. It bends over the leaves of the flower, and feeds concealed upon the petals, making a kind of gallery in them. I am inclined to think that it pupates in the flower, as I found two chrysalids in the flower-heads. The pupa is longish and slender; the wing-cases and thorax dark brown, almost black on the shoulders; body light brown, with a reddish tinge on the edge of the segments on the back; and the whole is generally darker above than below. I have since bred the moth, and found it to be *Sciaphila octomaculana*. The larva of *Nudaria mundana* was common on the lichen-covered walls. In the afternoon, which was dull, close, and thundery, I went searching for insects at rest upon rocks. Rock searching is terribly back-aching work, but a good many insects may be taken in this way, repaying a careful searcher. I used no net, but simply boxed the moths as I found them, and succeeded in taking the following:—*E. pulchellata* (seven; I also found the larva about a quarter grown upon the foxglove), *A. promutata* (two), *H. velleda* (two), *P. cytisaria* (three), *Hadena glauca* (one), *Acronycta rumicis* (two), *Nudaria mundana* (three), *Sciaphila penziana* (one), and a few other small things. In the evening I again tried the yew trees, and took *E. distinctata*, *P. captiuncula*, *Eupœcilia sodaliana* (four), a very dark variety of *Gnophos obscurata*, *Plusia v-aureum*, *P. iota*, and *Axylia putris*.

Wednesday, July 4th, was cloudy and thundery. I spent the morning upon Faraway Moss, where I captured the following:—

A nice lot of *H. auroraria*, as fine as bred, all males but one; a goodly number of *Chortobius davus* in splendid condition, and all females (it will be remembered that those I took on Meathop Moss were nearly all males, and worn), *A. fumata*, *A. strigillaria*, and *Euthemonia russula*.

I was busy setting until evening, when I again successfully worked the yews, and obtained a dozen more *E. distinctata*, two *E. sodaliana*, one *A. aversata*, two *A. incanaria*, two *Emmelesia alchemillata* on the wing, one *E. pulchellata*, and two *H. dentina* sitting upon the rocks.

Thursday, July 5th, was dull, showery, and windy, with occasional gleams of sunshine. I spent a couple of hours on Faraway Moss in the morning, and took *H. auroraria*, *A. myrtilli*, and one or two larvæ of *Bombyx callunæ*. The wind falling towards evening I started off, in company with a friend, upon sugaring intent; and although we remained out the whole night until 5 a.m., and the evening was apparently all that could be desired, our only capture at sugar was a solitary *A. rumicis*. I swept the heath for larvæ of *A. myrtilli*, but had not taken many when I broke my net. However I caught the following moths flying at dusk:—*Mamestra furva* (one), *A. putris*, *A. porphyrea*, *H. velleda*, *N. mundana*, *E. alchemillata*, *H. auroraria*, *Pelurga comitata*, *E. nanata*, and a few Tortrices.

On Friday, July 6th, the morning was cloudy at first, and then clear; the sun shone intensely hot, but a strong south-west breeze blowing made it very difficult to use the net. Fortunately I found a sheltered spot at the back of some birches on the Moss, and after working for three hours was rewarded with two dozen *H. auroraria*, sundry *A. myrtilli*, and *C. davus*. Walking home along the roadside I saw and captured my first specimen this year of *Vanessa cardui*, which was seated upon a thistle-head. It was apparently a hibernated female, as it was very much worn.

In the evening I again worked the yews, and caught *E. alchemillata*, *A. incanaria*, *E. decolorata*, *E. distinctata*, *E. subfulvata*, and some Tineæ and Noctuæ.

On Saturday, July 7th, the weather was very similar to that of the preceding day. I spent the morning on the heath, and took *A. myrtilli*, *H. auroraria*, *L. mesomella*, *H. sylvanus*, *C. russata*, *E. russula*, *C. davus*, and *Crambus margaritellus*.

In the evening I was out for a short time, and took a few *X. hamana*, one *Scotosia vetulata*, one *A. incanaria* and *Gelechia sequax*; and then the rain came down so heavily that I was driven to my inn.

Taking weather and everything into consideration, I think I did a very good week's work.

I have also taken at Witherslack this year *E. rupicolana* and *P. microdactylus* among the *Eupatorium cannabinum*, and two *Depressaria albipunctella*, which were all new species to me; also larvæ of *Coleophora wilkinsoni*, *C. limosipennella*, *Micropteryx sparmannella*, *E. pulchellata*; imagines of *G. atrella*, *Crambus falsellus*, *Cecophora fuscescentella*, *Carsia imbutata*, *Schrankia turfosalis*, *Rivula sericealis*, &c.

Breeding has not been a great success:—*E. plumbeolata* (a few), *E. pulchellata*, *E. venosata*, *E. distinctata* (a few), *E. absynthiata*, *Dianthæcia capsophila*, and a few common species of Geometræ and Tortrices, making up the sum total.

I sincerely hope others have met with the same success in collecting that I have. If they have not, all I can say is do not be discouraged by your own want of success, and the melancholy reports of brother unfortunates, but stick to Teucer's maxim, *Nil desperandum*, and hope for a better harvest next year.

8, Winckley Square, Preston, August 30, 1883.

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## LEPIDOPTERA AT NOTTINGHAM.

BY W. T. WRIGHT.

IN giving a short review of the season, as regards Lepidoptera, I cannot do better than take each month in succession from February to August, inclusive, and enumerate my captures in each.

I commenced collecting on February 21st, thinking that the spring-like weather of the few days previous would no doubt start the early species from their dormant state. My conjectures proved to be correct, for *Hybernia rupicaprararia* and *H. progemmaria* were to be seen in abundance on the leafless twigs of the hawthorn. But these few days of congenial weather soon came to an end, and were followed by severe frosts and north-east



winds. This of course soon put a stop to the appearance of insects; and it was not until the middle of March that I went out again, but without result, as nothing came under my notice during the month beyond the two species already named.

During April, at "sugar" and sallow bloom, I had a busy time: *Teniocampa gothica*, *T. instabilis*, and *T. stabilis* came in countless numbers; also *T. gracilis*, *T. cruda*, *Gonoptera libatrix*, and *Scotosia dubitata*, but these latter were less common. Towards the end of the month *Selenia illunaria*, *Anticlea badiata*, and *A. derivata* were taken in fair numbers.

The month of May opened very cold; and it was not until the 15th that I was able to go out with any likelihood of success. The following species were taken in more or less abundance during the month, viz., *Odonestis potatoaria* (larva), *Rumia cratægata*, *Odontopera bidentata*, *Hemerophila abruptaria*, *Corycia temerata*, *Cabera pusaria*, *Fidonia piniaria*, *Eupithecia vulgata*, *Melanippe fluctuata*, *Coremia ferrugata*, *C. unidentata*, *Cilix spinula*, *Heliodes arbuti*, *Plusia gamma*, *Euclidia mi*, *E. glyphica*. The Diurni were only represented by the usual members of the family of the *Pieridæ* and *Anthocharis cardamines*.

June was a grand month as regards the weather; and, by referring to my diary, I find that every day I had some capture or other to record. June 4th, being a lovely day, I visited Newstead Park and the adjacent woods, near Mansfield. *Argynnis euphrosyne*, *Chortobius pamphilus*, *Polyommatus phlæas*, *Lycæna alexis*, *Satyrus janira*, *Syrichthus alveolus*, and *Hesperia sylvanus* were the only Diurni noted, but these were common. *Zygæna filipendulæ*, *Euchelia jacobææ*, and *Emmelesia albulata* were common on the pastures. I also took a pair of *Procris statices* in the same locality, this being the first time I have seen it in the county. In the woods, by beating the bushes, *Iodis lactearia*, *Lomaspilis marginata*, *Abraxas ulmata*, *Larentia pectinitaria*, *M. rivata*, and *M. galiata* were put up in good numbers, mostly in fine condition. *Melanthia albicillata* was evidently just coming out, a few only being taken. In a Scotch fir plantation many *F. piniaria* were seen flitting round the tops of the trees, but they were considerably worn. Two specimens of *Ypsipetes impluviata* in the same wood concluded my captures for the day.

My evening collecting during this month was fairly successful.

*Hepialus lupulinus* and *H. humuli* swarmed in every locality in which I searched; *H. sylvinus* and *H. vellea* were taken sparingly at Colwick Wood, two miles from Nottingham; *M. montanata*, *M. subtristata*, *L. didymata*, *Campptogramma bilineata*, and *E. vulgata* were everywhere a perfect nuisance to the collector. At sugar *Miana strigilis*, *M. furuncula*, *Acronycta psi*, *Axylia putris*, *Mamestra brassicæ*, *Agrotis segetum*, *Noctua plecta*, *Epunda viminalis*, *Phlogophora meticulosa*, *Euplexia lucipara*, and *Hadena oleracea* were all common. I found the flowers of *Lamium rubrum* to be a wonderful attraction to the genus *Plusia*,—*P. chrysitis*, *P. iota*, and *P. gamma* being seen nightly in great profusion at these flowers. Collecting off palings surrounding woods early in the morning produced *H. thalassina*, *Apamea basilinea*, *Cucullia umbratica*, *Abrostola triplasia* (common), *Notodonta camelina* (few), and *N. dromedarius* (one specimen), besides several of the species taken at sugar. A few each of *Smerinthus populi* and *S. ocellatus* were taken at rest on the trunks of poplar and willow trees.

The Diurni during July were very poorly represented by only the following five common species:—*A. adippe*, *S. janira*, *S. tithonus*, *S. hyperanthus*, and *H. linea*.

I found the sheltered avenues of gardens in the evening to be very productive:—*Arctia lubricipeda*, *A. menthastri*, *Liparis auriflua*, *Uropteryx sambucata*, *Selenia illunaria* (second brood), *Boarmia rhomboidaria*, *Abraxas grossulariata*, and *Halia wavaria* were all common; whilst occasionally I met with *Pericallia syringaria*.

At sugar, in the same localities, such common Noctuæ as *Xylophasia lithoxylea*, *Mamestra persicariæ*, and *Agrotis nigricans* were a pest.

In the woods sugar produced *Triphæna janthina*, *Agrotis corticea*, *A. tritici*, *N. augur*, *N. c-nigrum*, *Leucania comma*, *L. lithargyria*, *Thyatira derasa*, *Xylophasia rurea*, *X. hepatica*, *Caradrina cubicularis*, and many others in more or less abundance.

In the lanes at dusk, with the net, I secured good series each of the following:—*Metrocampa margaritaria*, *Hemithea thymiaria*, *Acidalia imitaria*, *Timandra amataria*, *Cidaria immanata*, *C. fulvata*, *C. pyrallata*, and *Pelurga comitata*; a splendid pair of *Cossus ligniperda* were taken at light, along with a specimen of

*Zeuzera æsculi*; *Sesia tipuliformis* was common on the currant trees when the sun shone.

Collecting during August has been quite a failure; I have never before experienced such a dearth in Lepidoptera. I tried sugaring almost nightly; but time after time I have returned home without having boxed a single specimen. *Vanessa atalanta* and *V. cardui* were the only Diurni to be found, but they have been extremely abundant. My evening captures with the net were also very disappointing, only *Epione apiciaria*, *Crocallis elinguaris*, *Ennomos tiliaria*, *E. fuscantaria*, *Scotosia dubitata*, *S. rhamnata*, *C. spinula*, *Charæas graminis*, coming under my notice during the whole month.

Taking everything into consideration I have no great cause to complain of the season just drawing to a close; but if we are to consider that the abundance or scarcity of the autumnal larvæ has anything to do with next season, I am afraid collectors will experience a much worse time than has been the case this year.

40, Long Hedge Lane, Nottingham, Oct. 23, 1883.

## A VOICE FROM THE MINEHEAD VALLEY.

BY THE REV. T. SEYMOUR ST. JOHN.

AN account of what I have been able to do in the entomological hunting-grounds of this neighbourhood during the "bad season" of 1883 may perhaps prove of interest. What I have to record must not be taken as a criterion of what can be done in this part of Somerset: first, because it is but the account of one season; secondly, my entomological experience and knowledge are as yet limited; and thirdly, I have not been able to give the time to research and investigation which others could. Still one of experience might, I believe, do great things about here, although I am unable as yet to record the capture of any great rarity, and write this in the hope that some one may be induced to try.

Standing on the top of the Quantock Hills, just above this house, and looking over the valley towards Willett Tower and the Brendon Hills, an entomologist would at once exclaim, "That ought to be a rare part for Lepidoptera." So, indeed, it looks:

plenty of woods; oak and beech copses; plantations here and there; a pine and larch wood stretching all along one side of Will's Neck; high hedges; plenty of grass-land; large tracts of rough ground covered with heather, bramble, and bracken; besides immense quantities of heath, &c., on the Quantocks; boggy, damp meadows in the bottom of the valley; abundance of shallows all along the railway line and elsewhere; high railway-banks bordered by woods;—in fine, a variety of ground not often met with within so small a compass.

Whether my own unfulfilled hopes and disappointments are the result of a bad season, or of my want of knowledge respecting Lepidoptera, or of both, I know not. However, the following is my report for the past year:—

January produced one specimen of *Hybernia rupicaprariva*; and during February I caught several specimens of *Lemnatophila salicella* flying round an ash; and in March, one *Xylocampa lithoriza* and two *Diurnea fagella*.

During April two or three turns at the shallows produced but the common *Tenioctampa gothica*, *T. stabilis*, and *T. cruda*. I took at dusk two *Selenia illunaria*, two *Cidaria suffumata*, and one *Anticlea badiata*. On the Quantocks I took by day a specimen of *Pachygnemina hippocastanaria*, on the 12th. One hibernated *Scopelosoma satellitia* alone represented the Noctuæ, caught at sugar.

When May arrived Diurni showed up by no means plentifully, my note-book recording the usual members of the Pieridæ, *Anthocharis cardamines*, *Argynnis euphrosyne*, and *A. selene*, but these were in no abundance. The Geometræ were represented but by few species, among which I noticed *Odontopera bidentata*, *Cabera exanthemaria*, *Lomaspilis marginata*, *Anticlea rubidata*, and *A. badiata*. Occurring in abundance was *Panagra petrariva*, *Melanippe montanata*, and *Cidaria suffumata*. The Noctuæ were very scarce, at least to me; *Xylophasia rurea* only was plentiful, although I saw a few others equally common, and one *Phytometra ænea*. Of the Micros I can only name *Pionea forficalis*, *Ebulea sambucalis*, *Tortrix ministrana*, *Spilonota roborana*, *Pardia tripunctana*, *Adela viridella*, and *A. fibulella*.

In June the only butterfly different from those mentioned in May, which came across my path, was a hibernated *Vanessa cardui*. Without comment I give a considerable number from the

list of my captures this month:—*Hepialis velleda* from the top of the Quantocks, *Nola cristulalis*, *Arctia menthastri*, *A. lubricipeda*, and *Bombyx quercus*. Noctuæ were scarce, and sugaring almost useless: I took *Acronycta rumicis*, *Axylia putris*, *Agrotis porphyrea*, *Noctua plecta*, and *Dicranura furcula*. Geometræ were more plentiful, some of those which I noticed being *Iodis lactearia*, *Acidalia fumata*, *Numeria pulveraria*, *Larentia pectini-taria*, *Emmelesia affinitata*, *E. alchemillata*, *E. decolorata*, *Eupithecia castigata*, *Ypsipetes ruberata*, *Melanippe unangulata*, *Eubolia palumbaria*, and *Anaitis plagiaria*.

July proved a wet month in a decidedly rainy district; hence my list of captures and notes is limited, being as follows:—*Hepialus hectus* and *H. lupulinus* abundant everywhere; *Macroglossa stellatarum* was common; *Euchelia jacobæ*, *B. quercus*. Noctuæ were still scarce at sugar, *Thyatira batis* and *Apamea basilinea* being among the few to put in an appearance. Of the Geometræ I took *Ourapteryx sambucata*, *A. aversata*, *Halia waryana*, and *C. fulvata*. I also captured a few *Crambus pine-tellus* and *Botys urticata*.

Being from home nearly the whole of August, I can only record *B. quercus*; and of the Noctuæ, *Hydroœcia nictitans*, *Neuria saponariæ*, *Heliophobus hispidus*, *Charœas graminis*, and *Plusia iota*. *P. gamma* has been a perfect plague throughout the autumn. The Geometræ include *S. illunaria* and *Y. elutata*; and the Micros, *C. pinetellus*.

The best bit of hunting I have had at all this year was on the evenings of from October 22nd to 25th, when I visited two clumps of ivy covered thickly with blossom. The evenings were still and very dark, but moths were feeding each night in plenty; and a pleasant time I had. I took *Himera pennaria* (two, at light), *Thera simulata*, *C. psittacata*, *C. miata*. Of the Noctuæ, *Orthosia lota*, *O. macilentus*, *Anhocelis lunosa*, *A. litura*, *Cerastis spadicea*, *Scopelosoma satellitia* (two varieties), *Hoporina croceago*, *Xanthia ferruginea*, *X. rhizolitha*, and some others.

In conclusion I may mention that *B. rubi* and *Saturnia carpini* are plentiful on the Quantock Hills, although I have not succeeded in capturing either on the wing; so also is *Anarta myrtilli* on Will's Neck. One strange fact I may add, which is that I have only seen one species of the genus *Xanthia*, although fallows are so plentiful.

*EPUNDA LUTULENTA* AND ITS VARIETIES.

BY W. F. DE V. KANE.

SEVERAL variations of this insect are described by Guenée and Herrich-Schäffer, none of which seem to me to correspond to the dark brown form taken in Scotland; in Galway, by Mr. More; and in Sligo, by Mr. Russ. This passes I find under the name of *luneburgensis*, but I think erroneously; and, if I am correct, it should be described and named as a distinct variety, being constant in coloration, and not confined to either sex or locality.

*E. lutulenta* (W. V.) is given as follows:—Of a dark sooty gray, with pencillings scarcely visible, and only the reniform streak and sublateral line somewhat better marked, and joined to shadings of somewhat warm brown. The female darker, with hind wings of a uniform dusky colour. This I take to be pretty much the English normal type of *E. lutulenta*.

Guenée describes three varieties as follows:—

*Consimilis* (St.), female var.—Of paler gray, but with pencillings as slightly marked.

*Lutulenta*, Hüb., female var.—Of a gray mouse-colour, with the two median lines very slenderly, but distinctly, marked in black, the sublateral being more strongly marked. Hind wings white to the centre, with a median line scarcely visible above, but on under side a well-marked lunule opposite the cellule. South France.

*Sedi*, male and female (Bdv. in litt.).—Of ash-coloured gray, with deeper median band; all the lines well marked, duplicate, bordered with warm brown. The stigmata clearer, but the lower portion of the reniform shaded blackish. The hind wings of female of lighter hue than in the type, with traces of a median line. Central and South France.

Guenée states that he has never seen var. *luneburgensis*, but, “judging from the figures of Herrich-Schäffer, considers it to approximate closely to our form,” *i. e.*, I presume that of *E. lutulenta* (W. V.).

On reference to the illustrations in question, it will be seen that the two female (?) insects are represented of different shades

of brown, with all the lines drawn broadly in a paler tint, as also the outline of the stigmata. Hind wings of both darkly shaded. In fact the darker specimen reminds one strongly of *Imperina cespitis* in general colour and manner of pencilling.

The female (?) var. of H.-Schäffer, neither in depth of colour, marking, nor in being confined to one sex (?) seems to correspond to the Scotch and Irish insects to which I refer.

Staudinger's short description of the two varieties tallies with the above, and more forcibly illustrates the dissimilarity I allege to exist:—

“Ab. et var. *luneburgensis* (Frr., H.-S., Gn.). — Nigricans, fasciis distinct. albis.”

“Ab. et var. *sedii* (Gn.), *lutulenta* (Dup., iii., 18, 1). — Omnino cinerascens. fasciis distinct. nigris.”

In the Doubleday European collection there is a dark ashy gray variety, with blackish and light gray delineation, marked “*luneburgensis* ;” and in the fine cabinet of Mr. Tugwell, of Greenwich, there are two Scotch specimens, one of which is a dark ash-coloured gray, with sepia brown lines and markings distinctly traced, and not very narrow, bordered with paler shading. Orbicular distinct, of pale area on darker ground. Reniform only partly traceable.

The above description I wrote down when examining the specimen, and it will be seen to correspond pretty nearly with Guenée's *sedii*.

The other is the dark brown form, which occurs in the West of Ireland also, and is exactly identical. It may be roughly described as having the exact coloration of *E. nigra*, i. e., a deep sepia brown-black, with (as in *E. nigra*) pencillings indicated, not in colour, but in the glossy texture of the wing. I have seen both male and female of this variety, the hind wings of the latter being dusky. In fact, the insect seems only distinguishable from *E. nigra* by the antennæ of the male, and the dentation of the sublateral line on the fore wings of both sexes.

Sloperton Lodge, Kingstown, Co. Dublin.

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## ENTOMOLOGICAL NOTES, CAPTURES; &amp;c.

THE SEASON AT ILFRACOMBE.—In common with many of your contributors, my brother and I found this an exceedingly bad season. At Ilfracombe we sugared four or five times, but were only rewarded by a few *Xylophasia polyodon*, while our efforts during the day did not meet with much better success. Later in the month (August), at Jersey, I was able to take a few *Colias edusa*, but even there the insects were by no means plentiful.—C. DASHWOOD SNELL; St. John's College, Oxford, Nov. 5, 1883.

LEPIDOPTERA AT CAMBRIDGE.—My entomological researches during the past year have been confined to the environs of the town of Cambridge, and it is surprising what a long list of Lepidoptera may be made out in the town itself and its immediate neighbourhood. If it is so with all towns, as I suppose it is, what a long article might be written on urban Entomology. I have noticed among the Diurni, within a radius of two miles from the centre of the town, *Argynnis selene*, *Vanessa urticæ*, *V. io*, *V. polychloros*, *V. atalanta*, *V. cardui*, one specimen of *Apatura iris* (in 1868, but none since), *Arge galathea*, and four species of the genus *Satyrus*. *Colias edusa* and *Gonepteryx rhamni* not only fly in the suburban meadows and gardens, but along the streets in the centre of the town. The same remark may be made respecting *Anthocharis cardamines* and the genus *Pieridæ*. *Chortobius pamphilus* and *Hesperia sylvanus* may be seen just outside the town; and I used to see *Papilio machaon*, but have missed it of late. I noticed that the larvæ of *Pieris brassicæ* seemed this year much less infected with *Apanteles glomeratus* than usual. Among the Sphingidæ I have met with *Smerinthus ocellatus*, *S. populi*, *S. tilix*, *Acherontia atropos*, *Sphinx convolvuli*, *S. ligustri*, *Chærocampa elpenor*, and *C. porcellus*; but all appeared this year in less abundance than usual.—A. H. WATERS; Willoughby House, Mill Road, Cambridge.

ABNORMITIES IN LEPIDOPTERA.—It was with considerable satisfaction that I read Mr. Harding's notes in the November 'Entomologist' (Entom. xvi. 257) on the above subject, and in the hope that they may be of interest I append the following notes. In 1877 I bred a male specimen of *Bombyx callunæ*,



minus the left hind wing, but perfect in every other respect. During the larval stage I failed to notice any peculiarity. Also, in the same year, I reared from a brood of *Liparis dispar* the constantly recurring variety in the male (figured in this magazine some time since), with the "crescent-shaped" pieces missing from the hind wings. There is no doubt that this is a subject which would repay careful investigation. In support of the theory that the variation is caused in the larval stage, I would refer to the 'Entomologist' for November, 1878, vol. xi., p. 186, in which I mention two varieties of *Vanessa io* bred from larvæ in that year. After a careful examination of one of these, my friend Mr. Barwell Turner writes as follows:—"Although apparently melanic, this variety is not so, the dark appearance being due to other causes than coloration. The colour (or absence of it?) in the upper wings is most extraordinary, with a semi-metallic glaze in the parts usually a clear dark red-brown in normal specimens. On microscopic examination (in sunlight) this appears to be due to the absence of the typical Vanessid scales, which are replaced by short reddish brown hairs, the glazy appearance of the wing surface being seen through these. These hairs may represent undeveloped plumules or scales; but why the other plumules on the wing are well and normally developed is hard to imagine. The eye-spot is hardly so brilliant as in ordinary specimens. The under side is of the usual character." I recollect when taking these larvæ crowding them into a tin box, which had the usual effect of making them perspire; and I believe this to have been the cause of retarding the scales on some parts of the imago in their growth. Like Mr. Harding I should like to know what other entomologists have noticed on this interesting point.—HENRY MARSH; Leeds, November 16, 1883.

LATE APPEARANCE OF VANESSA ATALANTA. — Several fine specimens of *V. atalanta* emerged in my breeding-cage on Friday, November 9th, 1883. Has any other collector seen such a late emergence of this species? — G. D. SMITH; 7, Constitution Street, Aberdeen, November 16, 1883.

ACHERONTIA ATROPOS.—A specimen of this insect was sent to me in the latter part of September, having been caught by some friends of mine in their dining-room. I believe it is the first specimen of *A. atropos* which has been captured in this neigh-

bourhood this season. I will also remark that on the 30th of April I saw here the first specimen of *Pieris rapæ*, which species has been more than usually abundant, both in the spring and summer broods. It was also very abundant at Ramsgate. I may also remark that vegetation in our garden has been particularly free from larvæ of Lepidoptera and other insects this season: I think this is attributable in a great measure to improved gardening, *i. e.*, carefulness in clearing away all kinds of refuse, and I think the improved mode of cultivation generally throughout the country, the substitution of iron fencing for hedges, iron sheds, and various improvements of the same description, have not been taken into consideration in accounting for the diminution of Lepidoptera of late years, less shelter allowing them fewer chances of escaping destruction both from birds and storms.—CLARA KINGSFORD; Barton House, Canterbury, Oct. 31, 1883.

THE NEW (?) FORM IN THE GENUS ZYGÆNA.—I think it is scarcely advisable at present to raise the form of *Zygæna loniceræ*, described by Mr. W. Prest (Entom. xvi. 273), to the distinction of a named variety. As I stated at the meeting of the London Entomological Society, when Mr. Prest's specimens were exhibited, I bred a number of exactly the same form in *Z. filipendulæ* from cocoons collected at Onchan, in the Isle of Man, in June, 1873. At the date of the meeting I was under the impression that I had none of the specimens in my possession; and it was not until two or three weeks ago, when looking at the genus in my cabinet, I found that there was one of the specimens in my series of *Z. filipendulæ*. It is of exactly the same colour as Mr. Prest's variety, *Z. eboracæ*, has the same washed appearance, has the same narrow brown border to the hind wings, and the same white (though, as in Mr. Prest's specimens, indistinctly so) cilia. I remember distinctly that at the time I bred the specimens many of them were crippled, and I attributed the variation to a probably diseased condition of the larvæ. But whatever the cause may be, I have no doubt that under similar conditions the same form would occur all through the genus.—GEO. T. PORRITT; Huddersfield, December 1, 1883.

SCIENTIFIC NOMENCLATURE. — Mr. Prest, in his note on *Zygæna lonicera* (Entom. xvi. 273), does not give his authority

for saying that Ebor was the ancient name of York. Possibly he means Eboracum; but, if he does so, it is difficult to see how he arrives at the name *eboracæ*, which, having no meaning, is certainly open to objection as a new name.—C. A. BRIGGS; 55, Lincoln's Inn Fields, December 5, 1883.

COSSUS LIGNIPERDA IN IRELAND.—In Mr. Birchall's 'Catalogue of the Lepidoptera of Ireland' (1868) this insect is mentioned as occurring in "Wicklow, apparently scarce." The late Mr. R. W. Sinclair, in his 'Notes on Irish Lepidoptera,' says, "The larvæ at Leixlip" (Co. Dublin). I am able to mention two other counties where the larvæ have occurred, *viz.*, Waterford and Kings Co. In June last I was brought about two dozen of these highly, but not pleasantly, perfumed larvæ. They were found in a large oak recently felled in this locality. I was told that they tumbled pell-mell out of their tunnels as soon as the axe began its work. These larvæ I kept in a large tightly fitting tin box, perforated with holes for the admission of air, and too small for their escape. They seemed to thrive fairly well for several months, but never appeared to increase in size. Having been from home for some time I took a look at them on my return, and was surprised, and a good deal disappointed, to find only two. Where the rest disappeared to I cannot positively say, but surmise that they were devoured by the others. This was not a case of the "survival of the fittest," for their repast did not at all agree with them, and they died quite lately, and were preserved. The other locality is along the banks of the Nore, near Castletoun, Kings Co. The larva was found here in ash trees by Mr. J. Neale, one of the masters of Newtown School, Waterford.—[Rev.] WILLIAM W. FLEMING; Clonegam Rectory, Portlaw, Co. Waterford, December 3, 1883.

SESIA BEMBECIFORMIS AT LEICESTER.—On the 23rd March, 1883, having heard that labourers were cutting the osiers on an osier bed belonging to the Leicester corporation, I obtained the kind permission of the town surveyors, and, with the assistance of a friend and my saw, I obtained upwards of 150 sticks with nearly full-fed larvæ of *S. bembeciformis* in them. Not having room for them all, I sent the greater number of them to friends. The results from those retained were as follows:—Out of twenty-four pupæ, carefully taken on May 14th from the sticks, I only

obtained nine imagines; out of these two were cripples, and the others were not of a bright colour. Out of the twenty-four sticks placed in a cage, with the holes downwards and covered in two inches of sand, I obtained twenty-three perfect specimens, and but one cripple. These emerged during June, from 6th to 16th, the cripple being last. I therefore think it the best plan to keep them in the osier sticks. I regret that I have no more for friends, and should like to know results of those sent away. I might say that in no instance did the larvæ reach more than ten inches in the sticks from the root. A great many larvæ were knocked out and killed by the rough way in which the sticks were cut. I found twenty-eight living larvæ on the ground, which I preserved. —W. TRISTRAM; Havelock Cottage, Gosling Street, Leicester, December, 1883.

PERONEA COMPARANA DOUBLE-BROODED.—During the month of June I collected a number of puckered leaves on the strawberry-plants for larvæ of *Peronea comparana*. A few days later I went for more, but to my surprise I found a lot of sparrows at work, the leaves being torn and pecked bare of both larvæ and pupæ. However, I bred a quantity in July. Again, in September, I visited the place, and got a fresh supply of both larvæ and pupæ; the moths came out up to the middle of October. I saw no difference in the variations from the earlier brood. Some few years ago I saw large beds of strawberry entirely destroyed, the moths rising up in thousands. This species seems to vary considerably; some of them like *Peronea schalleriana*, but not as large nor yet as bright in coloration. —J. B. HODGKINSON; 15, Spring Bank, Preston, November 14, 1883.

COLEOPTERA IN 1883.—On the few occasions I have been able to devote to "sweeping" this season I have found Coleoptera in some parts of Surrey abundant. My first venture for this purpose was to Esher and neighbourhood on May 14th. The weather was comparatively fine and mild, though showery at times. Several things were rather common, such as *Prasocuris aucta*, *Phyllobius alneti*, *P. oblongus*, a few *P. calcaratus*, and *Ceuthorhynchideus troglodytes*; also took two or three specimens of *Liophlæus nubilus*, *Grypidius equiseti*, *Gymnetron pascuorum*, and about a dozen of *Lema melanopa* and *L. cyanella*. Visiting the same locality on three Saturdays in June, I swept some half-

dozen *Anthocomus fasciatus*, a few *Chrysomela staphylæa* and *C. polita*, and several *Phyllobii*; also *Phædon cochleariæ*, *P. betulæ*, and *P. tumidulum*; *Gastrophysa polygoni*, *Priobium castaneum*, and a host of other things. On July 7th I journeyed to Farnham. This spot is worth working, and I have wondered how it is that so good a locality is neglected. I commenced sweeping for *Malachius ruficollis* shortly after my arrival, and captured some thirty specimens; I also found *Prasocuris marginella* rather common; *Erirhinus maculatus* common on willow; *Donacia linearis* common on bulrushes; with the latter I found *D. typhæ*, *D. lemne*, and seven *D. sagittariæ*; in close proximity to the latter I discovered a specimen of *Anomala frischii*. *Gyrinus marinus* was very abundant: I obtained about forty in one dip with my net. Continuing my researches at Esher on August 6th and September 22nd, I captured a late *Donacia bidens* on each occasion, and about fourteen *Malachius ruficollis*. Sweeping among the marshy places, I netted several *Chrysomela didymata*, *E. hyperici*, *C. polita*, and *C. staphylæa*; also a dozen *Coccinella 19-punctata*, some *C. hieroglyphica*, *C. 22-punctata*, and *C. 11-punctata*, to say nothing of swarms of *C. 7-punctata*; *Adimonia suturalis* and *A. caprea* were everywhere; *Scirtes hemisphæricus* was also in some numbers, and likewise *Plectroscelis subcærulea*. On September 29th I went for *Plagioderma armoraciæ*, but owing to wet weather I was able to obtain only six. However, on the following Saturday my friend Mr. Cripps procured about two dozen specimens from the same locality. Taking the season from beginning to end, I have every reason to be satisfied with the results of my exertions. — G. LEWCOCK; 40, Oxford Road, Islington, N., November 15, 1883.

A WATER-INSECT ATTRACTED BY GLASS.—With reference to the notes in the 'Entomologist' (Entom. xvi. 286) on water-beetles mistaking glass for water, I have several times noticed some of the smaller species do so, which reminds me of an instance where a specimen of *Gerris lacustris*, L., was found by me on the floor of a room in front of an open window in the suburbs of this town in 1869. The creature in aiming at the glass must have just missed it, and so passed into the room, where it lay helpless. Its home could not have been less than a quarter of a mile away.—J. E. FLETCHER; Worcester, December 3, 1883.

HEMEROBIUS? OR CHRYSOPA?—In two successive months past (Entom. xvi., pp. 259 and 284) I noticed references to lacewing flies, under the name of *Hemerobius*. The descriptive remarks in the first, and the odour alluded to in the second, of these communications, render it all but certain that the insects in question must belong to the genus *Chrysopa*, and probably to the species *C. septempunctata*, which is the chief of our “stink-flies.” This insect was commoner than usual last summer. *Hemerobius* and *Chrysopa* appertain to distinct families, *Hemerobiidæ* and *Chrysopidæ*.—J. E. FLETCHER; Worcester, December 3, 1883.

ENTOMOLOGICAL EVENINGS AT THE ROYAL AQUARIUM. — On December 3rd the usual Monday evening meeting was held on the invitation of Mr. Carrington, and was well attended. Among the many specimens of insects exhibited were especially to be noted those by Mr. Billups, which included forty-eight species of Ichneumons, including *Ophion minutus*, *Ichneumon sanguinator*, *Phylodiætus fabricator*, &c.; a handsome series of sixty Diptera, many being rare; a number of Aculeate Hymenoptera; also a box containing the life-history of the celery-fly (*Tephritis onopordinis*), with their parasites reared on the day of the meeting; all these were very beautifully mounted. Mr. Mera's exhibit was bred *Fidonia conspicuata* and *Corycia tenerata*. Mr. E. H. Jones brought bred examples of *Cucullia gnaphalii* and *Acronycta alni*, reared by himself. Larvæ of Sphingidæ, preserved by Mr. Edward Lovett in a saturated solution of alum, as an experiment in 1880, drew much attention from those present, on account of the success of the system. Mr. Jobson showed two varieties of *Apatura iris* from the New Forest. Mr. Cooper's box contained very fine varieties of *Polyommatus phlæas*, *Arctia caja*, *Stauropus fagi*, and *Boarmia repandata*. The most striking exhibit of the evening was a very remarkable variety of *Abraxas grossulariata*, the centre of the anterior wings being richly suffused with bright orange-colour; none present had seen this form before. This, with others, all having a tendency to the abnormal orange coloration, was taken during the past season by Mr. Gee in a garden in Islington. Mr. T. W. Hall showed a box containing types of Lepidoptera taken at Folkestone in 1883, during three weeks in June and July, when upwards of 2000 specimens were obtained, including several rare

and interesting species. Mr. Southey brought a box of Lepidoptera, among which was a *Deiopeia pulchella* from Southend, in Essex. Mr. Payne showed a box of Geometræ. Much attention was given to some photographs and remarks upon the Lepidoptera of Hudson's Bay by Mr. Walton Haydon, who had just returned, after a residence there of upwards of five and a half years.

HAGGERSTON ENTOMOLOGICAL SOCIETY.—Although the season has been greatly decried by collectors of Lepidoptera, yet the good selection of insects shown at the Pocket-box Exhibition, held by the above Society on the 15th November last, proves that, although species were undoubtedly scarce, yet there are many earnest and persevering workers in the neighbourhood of London. Limited as the show was to this year's taking, it must have been a pleasant surprise to any visitor, having a knowledge of Entomology, to observe the number of species present usually considered as "good things." The habit of order and neatness, so necessary to the entomologist, was very observable in many of the boxes exhibited, those of Mr. Charles Boden being especially worthy of mention, including as they did many of the Tortrices and Tinea. His *Sesiæ* were beyond praise, both for setting and condition, a long row of both *Sesia chrysidiformis* and of *S. cynipiformis* figuring prominently; his *S. chrysidiformis* bred from dock being larger than those from sorrel. Among his Tortrices I noticed *Mixodia bourchardana*, *Chrosis audouinana*, *Coccyx pygmæana*, and *Ephippiphora nigricostana*. Among the Crambites, *Phycis adornatella*, *P. subornatella*, *P. carbonariella*, and *Pempelia palumbella*. Among the Tinea, *Solenobia inconspicua*, *Coleophora inflatella*, and *Tinea bistrigella*. The box shown by Mr. J. A. Cooper contained several good species and rarities; two dark *Stauropus fagi*; three of that favourite of variety-breeders, viz., *Arctia caja*, one of which was very dark and suffused, and one black *repandata*. His *Melitæa artemis*, fed upon honeysuckle, were of large size, and claimed a large share of admiration; as did also the very fine *Angerona prunaria*, exhibited by Mr. T. Hockett, who also showed some exceptionally large *Saturnia carpini* and *Liparis dispar*. Among the noticeable varieties was that of *Polyommatus phlæas*, taken on the wing by Mr. J. Lusby, at High Beech, in which the usual zigzag series of black spots on the fore wing were grouped in the centre of the disk. Among the rarities may be numbered *Xylina conformis*,

shown by Messrs. T. Cooke & Son, who also exhibited *sparganii* from the Dover district, and a varied series of *Acronycta alni*. Mr. E. Upton showed *Boletobia fuliginaria*, which he had bred during the year; and some more of the same species, larger but not so dark, were shown by Mr. J. A. Clark. The latter gentleman's exhibit was very extensive, comprising among other good species a peculiar variety of *Tæniocampa gothica*, some well-marked *Platypteryx falcula*, three species of clear-wing, viz., *S. ichneumoniformis*, *S. cynipiformis*, and *S. culiciformis*; and a very fine captured *Deilephila lineata*. Some peculiar varieties of *Arctia caja* were exhibited by Mr. O. C. Goldthwaite, and a long row of *Diphthera orion*, some of which had remained in the pupa state two years. Some very dark *Ypsipetes impluviata*, large *Coremia propugnata*, and varied *Melanippe hastata* were seen in Mr. Harper's box; and some striking varieties of *Vanessa atalanta* and *V. cardui* in that of Mr. Geo. Muncer. Mr. D. Pratt had evidently been repaid for working the shallows by an extraordinary form of *Tæniocampa munda*; he had also obtained during the season *Nyssia hispidaria* and *Geometra smaragdaria*. Some *Notodonta trepida*, bred from eggs from Epping, were also on view. Also a fine variety of *Diclya oo*, taken in Epping Forest, by Mr. H. Jobson. Also *M. hastata* and *Cucullia lychnitis*. Among the preserved larvæ exhibited were those of *N. zonaria* and *T. opima*, by Mr. J. M. Raine and Mr. H. C. Schooling. Mr. G. Clark, of Rannoch, exhibited a long row of that very northern species *Crymodes exulis*, among which were only two of the lighter variety. Mr. J. W. Russell and many other gentlemen also exhibited Lepidoptera of more or less value. Nor were the Coleoptera wanting in representatives, for the large case exhibited by Mr. H. Cripps contained many good species, as did also that of Mr. G. A. Lewcock, among which were noticeable *Malachius ruficollis*, *Anthocomus fasciata*, and *Donacia sagittariæ*, &c.—R. G. BURRY, Sec.

BOURNEMOUTH SOCIETY OF NATURAL SCIENCE.—At the Conversazione, held by the above Society in the Bournemouth Town Hall, on November 7th, among the various exhibits was a collection of Arachnida, and illustrations of the anatomy of Lepidoptera, and of specimens from other branches of Entomology.—J. T. C.



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## INFLUENCE OF METEOROLOGICAL CONDITIONS UPON LEPIDOPTERA.

BY W. F. DE V. KANE.

IN Entom. XVI., p. 265, Mr. South refers to the difficult question of the influence of meteorological conditions upon Lepidoptera. I heartily concur with him in thinking it of the highest interest, and regret to find that so few entomologists seem to give their attention to the subject. The influence which electrical phenomena exert upon the breeding and life-history of this delicate order of insects is a part of the enquiry which might be pursued with much advantage.

Those who breed the larvæ of delicate insects might well make observations in this direction. For my own part, however, I confess my belief that the subtle agency of electricity has only an important bearing on the subject in its secondary results, that is in the production of violent rains, storms, and heat. There can be no question that the electric fluid is largely responsible for the general meteorological conditions, and thus affects all living creatures; but until it has been shown to have not only immediate, but permanent, effects upon animal organisms, apart from the atmospheric disturbances produced by it, I doubt whether it can be ranked as a potent factor in the determination of the question.

That insects display great activity before a thunderstorm is, as Mr. South says, an interesting phenomenon, but may be well accounted for by the rise of temperature and heavy moist

condition of the atmosphere, very similar to the conditions which prevail on a good night for "sugaring." No doubt all living things are more or less affected for the time being by electrical influences, as well as by every change of the weather. Anglers are well aware of this. In Best's 'Art of Angling' there is a "Prognostic of Weather," which is pithy, amusing, and has, I fear, a reflex bearing upon the habits of anglers of that day, as much as upon those of the familiar insect referred to. It is this:—"Against rain, fleas bite more than common." I am inclined to think, therefore, that the electric fluid affects all living things very much as any other change of weather, and is transient, except in its secondary results.

I cannot help regretting, as I have done in a former communication on the subject, that a valuable source of knowledge is neglected by the comparative scarcity of brethren of the net in Ireland; for in the dissimilar meteorological conditions of the two islands we have a basis to go upon of considerable value in determination of questions of this very kind.

Here, in Ireland, thunderstorms very rarely occur, and when they do are of slight importance compared with the violence they develop in the sister country. The remarkable divergence, which is frequently observable in the character of the seasons on each side of the Irish Sea, is equally valuable as a diagnostic. Mr. South's suggestion that entomologists should keep a rough meteorological diary is a most valuable one; for again this year the dissimilarity to which I refer to has been remarkable.

The London Meteorological Office has characterised the past summer in England as remarkably dry, "Dryer," they say, "than any since the year 1869;" while the rainfall in Ireland, throughout almost the whole course of the summer, has been "excessive," though towards the autumn more favourable weather has been enjoyed.

Now if next year any considerable divergence as to the abundance of imagines, whose larvæ were bred this summer, is observed in the two countries, we may fairly found a conclusion on the premises. The summary of meteorological statistics issued by the London office seems to be of much importance to those who are interested in this whole subject.

I know that in England the season of 1878 was an excellent one for entomologists; but of the character of the preceding ones

I am ignorant, having passed them on the Continent. But since that year it cannot be said that a single season has been prolific. Now the meteorologist's record that every summer since 1879 has been notably deficient in heat, so that we have had five cool summers in succession; while those of the years 1874—78, inclusive, were above the average of warmth,—that of 1874 being “warm;” 1875, of normal temperature (though wet); 1876, very warm, inasmuch as there were only fourteen “cool” days (contrasting with fifty-five in that of 1879); while the summer of 1878 was, although somewhat rainy, above the average temperature. In the former period, that is before 1878, the rainfall averaged 5 per cent. in excess; in the latter no less than 18 per cent. above the normal amount.

Now as to the effect the amount of rainfall has upon the larvæ of lepidopterous insects, although I do not dispute it to be perhaps considerable (especially, I am inclined to think, upon day-feeders), yet I hold very strongly that sun heat is necessary, next to food, in promoting health, growth, and, in fact, general vital energy.

While the largest number of lepidopterous insects, either in larval or perfect state, do not object to damp (I refer to the greater portion of nocturnal Heterocera), yet there can be no question that all the Rhopalocera, and nearly all the Heterocera, are powerfully influenced by sunshine or warmth. A damp, nay a wet, night, so long as it is warm, is excellent for entomological research, not only for imagines, but for larvæ. And when one considers the numerous species that thrive in fenny and marshy places, and the abundant lepidopterous fauna occurring in those portions of the British Islands most noted for excessive rainfall, namely, the Lake Districts, South Devon and Cornwall, the South of Ireland and Killarney, the conclusion seems forced upon one that rain and damp of themselves are not prejudicial to by far the greatest section of the order of Lepidoptera. The damp heat of the Tropics seems to be entirely congenial, whilst the damp, but cold, climates of the world, on the other hand, seem almost devoid of this description of insect-life.

It is, of course, needless to offer any proof of the magical power of sun heat on these beautiful creatures; but a remarkable illustration of it once occurred to me, which I am tempted to adduce. Some few years since I had ascended one of the Swiss

mountains in quest of alpine species, until, reaching the confines of the snow limit, I sat down to eat my sandwich. I had disturbed a butterfly, which looked like *Melitæa artemis*, but, being rather fagged with the steep ascent, I watched it settle on a snow patch close by without giving chase. The sun then becoming suddenly overcast the insect remained like a spot on the snow, until, my lunch ended, I approached, and found it benumbed and almost lifeless. It was a female *M. cynthia*, which differs remarkably from the white-banded male, and approximates closely to *M. artemis* in size and colour, the latter insect, as I might have remembered, not occurring at that height, except in the degenerate form of var. *merope*. I killed the specimen by leaving it a little while built up in snow. Frequently also I have noticed *Rhopaloeera* dead on snow patches, doubtless from the same cause.

In fine I am disposed to think, though storms and unseasonable frosts are very potent causes of scarcity, yet that when we have another cycle of warm summers, no matter what the winters are like, we shall once more rejoice in plentiful entomological harvests. Mr. Dale's motto I heartily adopt, "Floreat Entomologia."

Sloperton Lodge, Kingstown, Co. Dublin, Jan. 8, 1884.

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## NOTES ON EXOTIC LEPIDOPTERA REARED IN 1883.

BY ALFRED WAILLY.

(Membre-Lauréat de la Société Nationale d'Acclimatation de France.)

FROM the 1st to the 16th of January two *Atlas*, three *Selene* and one hybrid *Roylei-pernyi* moths emerged from cocoons kept, like all the others, in a room without any artificial heat, after which time no moths of any exotic species emerged till May.

Of North-American Bombyces I had an immense quantity of *Cecropia*, *Polyphemus* and *Promethea* cocoons, from the moths of which I obtained thousands of fertile ova. The larvæ of *Cecropia* and *Promethea* were placed on trees in my garden without any protection (which, in fact, could not be given them), the consequence being that they were in course of time destroyed by their

numerous enemies, with the exception of a few *Cecropia*, one of which I found on a currant bush, as late as the 14th of October, in its last stage.

*Polyphemus* larvæ, reared on small oak trees, were protected by wire and fish-netting, and these magnificent larvæ formed their cocoons on the trees in spite of some heavy rains and unfavourable weather, from the 18th of September to the 7th of October. I only obtained three pairings of this species,—the first on the 20th, the second and third on the 23rd of June. As I stated, in several of my previous reports, it is difficult to obtain the pairing of *Polyphemus* in captivity. Of *Cecropia* I had nineteen pairings, from the 30th of May to the 19th of July; and of *Promethea* eleven or twelve pairings, from the 6th of July to the 14th of August. Many more pairings of these two species could have been obtained if the ova had been wanted. On the 25th of June a male *Cecropia* paired with a female *Polyphemus*; and on the 1st of July a male *Cynthia* paired with a female *Promethea*. I also find that on the 25th of June a male *Cecropia* paired with a female *Polyphemus*. The ova in the three cases were unfertile.

*Actias luna*.—Of this I had no cocoons, but received ova from France and from three American correspondents. Those from Illinois and Iowa hatched during the voyage, and the larvæ were dead on their arrival, or died shortly afterwards. On the contrary, the ova received from New York, in consequence of the much shorter distance, gave a rather satisfactory result. Many of the larvæ from these ova (the number of which was enormous) hatched during the voyage, lived, and thrived. These ova and young larvæ arrived here on the 28th of July, and the small number I had time to rear pupated about the middle of September.

*Hyperchiria io*.—With about fifty moths, from cocoons sent me from New York, which emerged from the 2nd of June to the 1st of July, I obtained fourteen pairings, which I consider a great success, as some of the moths were preserved for the cabinet. Some of the larvæ, bred on willows in the garden, had not yet pupated on the 15th of October.

*Ceratocampa (Eacles) imperialis*.—With fifteen pupæ only one moth emerged on the 1st of July; it was a fine male specimen. The moths in the other pupæ I found, later on, dried up, but perfectly well developed. I attribute the loss of these moths to

the sudden change of temperature just at the time they were about to emerge from the pupæ. On the 24th of July I received from Illinois fifty eggs of *C. imperialis*. These hatched the very day they arrived, and the following; but, although they were very active and looked healthy, they all died within a few days. My American correspondent was equally unsuccessful with the rearing of larvæ of the same brood. On referring to my article in the 'Entomologist,' on the rearings of 1881, it will be seen that I was very successful that year rearing the larvæ through all their six stages. I had that year artificial heat to force the moths out of the pupæ, the temperature being from 20° to 25°, sometimes 28°, centigrades.

*Dryocampa (Anisota) rubicunda*.—With a quantity of pupæ of this species I was unsuccessful also, obtaining one moth only on the 1st of June, the remaining pupæ having dried up.

*Orgyia leucostigma*.—Ova of this interesting little species I received from Iowa during the winter or early spring. The larvæ I bred most successfully, so did several British and continental entomologists. The larvæ began to hatch on the 12th of June, and the first moth appeared on the 5th of August. I bred a large number of the larvæ under glass; some were placed on trees in the garden for their acclimatisation, with what result we may perhaps learn next year.

*Hemaris tenuis*.—I had this year fourteen pupæ of a little sphinx sent to me as being *H. tenuis*, but which Mr. Kirby identified as being *H. diffinis*. Eight moths were obtained from these pupæ from the 7th to the 18th of June, but, in spite of all my contrivances, I could not obtain a single pairing. Only two eggs were found, which did not hatch.

*Apatura clyton*.—Larvæ of this species were sent to me from Illinois, and I received them in their dormant state on the 28th of March. They were fastened in groups to dried leaves of the *Celtis occidentalis*, commonly called the nettle tree, on account of its leaves resembling those of the tall or stinging nettle, *Urtica urens*. Most of the larvæ were on the under surface of the leaves, and there were about five or six dozens of them. Shortly after their arrival (I did not take notice of the exact date) these little larvæ commenced to come out of their state of lethargy, a few only on the first days; and in the course of two or three weeks all were alive. The difficulty, as soon as they had begun waking

up, was how to feed them. I had no *Celtis* of any species; and on a visit to Kew Gardens I found that the *Celtis* of all species could not break into leaf for about a fortnight. Some branches of an American maple with small foliage, grown under glass, were then given to me, and I tried this as a substitute, with twigs of other trees just coming out into foliage in the open air, such as elm, hornbeam, &c. Although the larvæ did eat a little, their progress seemed very slow; and a number of them died or escaped from under the glass which covered them. At last I obtained, from the magnificent nursery grounds of Mrs. Veitch & Sons, near Coombe Wood, five little trees of *Celtis orientalis*, which were all put for me into one pot. After carefully examining all the leaves on which the little larvæ had been placed, I only found two alive and in good condition. These were at once placed on the buds of the *Celtis*, which were just beginning to break, and from that time I had no more trouble with the larvæ; they never moved from the buds or leaves, to which they were firmly fixed with a few silk threads, always on the under surface of the leaves. I could not observe them except at the risk of injuring them, so I left them undisturbed; they seemed to eat only at night-time. It was only when the larvæ had reached their last stage that they could more easily be observed; they could then be seen eating in the daytime, but not so much as at night-time. Just about the time of this transformation (and this will give an idea of the size of the twigs which I called trees) all the foliage had disappeared, excepting a few leaves. I was then uneasy about the larvæ, when the first larva began its transformation on the 3rd of July, turning into a beautiful light green pupa on the 5th. The larva, when full grown, is about two inches in length. The transformation of the second larva commenced on the 8th of July, lasting the same time as the first. The first butterfly emerged on the 25th of July, and the second on the 31st. The following is the rough description of the larva in its last stage:—Body apparently green, but all covered with small yellow spots; slug-shaped, with bifid tail, like *Apatura iris*; face white; horns yellow at top, and light yellow on the sides; two white longitudinal stripes on the back, separated by a dark green line extending from the head to the tail; two other light yellow lines on the sides. Both butterflies happened to be females, which are deprived of the bright

metallic reflection of the male. The fore wings are orange-brown, with black markings and whitish spots; the hind wings very dark, almost black, except at the base, where they are suffused with brown; near the margin on the inner side a row of eye-like spots, round which on the outer side are five or six smaller spots, orange-brown; the eye-like spots are hardly visible on one of the two specimens. I have omitted to say that the larvæ were bred in the house.

*Limenitis disippus*.—This species I tried to rear in the open on willow. The larvæ for several weeks thrived very well during the spring, but they were ultimately destroyed by their enemies. Had I protected them with a muslin-bag, or bred them on a tree in the house, the rearing would have been very easy. I bred this species before, and I think it could be bred successfully in the open if the larvæ were protected from ants, wasps, and other pests.

The *Limenitis disippus* larvæ were sent to me from Iowa during the winter or early spring, and they were placed in the spring on the willows. I watched them coming out of their little willow-leaf cases when the sun was shining, and going in again after sunset.

*Darapsa myron*.—In April or May my little daughter found, in one of the flower-beds adjoining the house, on the surface of the ground, a pupa which I could not recognise, except as being a species of the Sphingidæ. It seemed to me a pupa of some *Deilephila*. About the middle of July a moth emerged from it unknown to me, and to other persons to whom I showed it. The colours were somewhat like those of *Smerinthus tiliæ*, but the shape was entirely different. Could it have been a natural hybrid between *S. tiliæ* and some *Deilephila*? This was hardly possible. What could it be? The pupa evidently was the produce of a larva which had fed in the garden. It was found at the foot of a jessamine, but, besides this, other climbers cover the house,—vine, honeysuckle, rose, Virginia-creeper, and ivy. I took the specimen, with its pupa-case, to the British Museum, to have the species identified by Mr. Kirby, and he found it to be *Derapsa myron*, a North-American species. Should any other specimens of this species have been captured it will be most interesting to know, and how it found its way to England. The following is the description:—Pupa light brown, speckled with black; coverings



of the head and thorax darker, speckled with black, and pale lines beneath; incisions of abdomen reddish brown; spiracles black. Moth:—Body and fore wings green; sides of the thorax with a pale stripe; fore wings varied with paler and darker green, with a dark green central dot, and with two transverse whitish lines, the inner one angulated, and edged outside with dark green; hind wings dull reddish orange, and angle greenish.

(To be continued.)

### NOTES ON THE PAST SEASON; WITH CAPTURES IN WEST NORFOLK.

(Concluded.)

BY EDWARD A. ATMORE.

AT the end of July and beginning of August I took a long series of *Orthotænia ericetana*, a species which, I believe, is seldom met with in such numbers. Its head-quarters appeared to be a field, which, not having been cultivated for the last year or two, was thickly over-grown with common low plants; from observations made, whilst boxing some of the specimens, I think that its larva would probably feed there in the stems and roots of *Mentha arvensis* or *Matricaria inodora*, perhaps both. Amongst the Tineæ taken during July I note *Gelechia anthyllidella*, *G. rufescentella*, *G. ligulella*, *Sophronia parenthesesella*, and *Opostega salaciella*, all of which were taken by sweeping low herbage on heathy places. At the end of the month and beginning of next (August) our alders contributed a fair share of species worth boxing, such as *Gracillaria elongella*, which was of frequent occurrence, and *Strathmopoda pedella*, which was plentiful but very local, being confined to a few of the older trees only; the latter species is easily dislodged from the branches by tapping, and when in the net is a quaint-looking insect, reminding me most forcibly of a Coleopteron. From the same trees, which produced *S. pedella*, a fine series of nearly three dozen *Bohemannia quadrimaculella* was obtained: this little gem seems very much akin in its habits to the Nepticulidæ, and certainly prefers sunny weather for its flight. On the heath, some two or three hundred yards from the spot where the three last-mentioned species were

taken, *Cleodora cytisella* was no rarity, although it must be considered here, as I suppose it is in most places, a very local species. All my specimens were taken among common brakes (*Pteris aquilina*), which, I believe, is reputed to be the probable food-plant of its larva. A large tract of the surrounding country seemed similar in every particular, but *C. cytisella* was only noticed on a few square yards of ground.

Early in August *Gonepteryx rhamni* was observed wherever alder-buckthorn (*Rhamnus frangula*) flourished; the other buckthorn (*R. catharticus*) I have not noticed within a radius of some ten or more miles. Towards the end of the month a few fresh *Vanessa cardui* were seen; and during September this butterfly was common in clover-fields. *Plusia gamma* now became very noticeable, its abundance being strikingly apparent on heaths, where scarcely a step could be taken without disturbing one or more specimens; now and then one, with what I fancied to be rather a different flight from its brethren, succeeded in tempting me into a pursuit, to end of course in disappointment and chagrin upon discovering that I had nothing more than a deceptive *P. gamma* in the net. About the middle of the month (September), whilst searching heather by night for larvæ of *Anarta myrtilli*, *Agrotis porphyrea*, *Eupithecia nanata*, and *E. minutata*, all of which were common, a few *Thera firmata* were captured at rest on the blossoms; but it was not an easy matter to select this species from among the much more numerous *T. variata* and *Cidaria testata*. At the same time I chanced to find *A. agathina* feasting on the blossoms of ling (*Calluna vulgaris*), but being late in the season for it only two or three specimens worth boxing and setting could be found; had the species been noticed a little earlier no doubt a fine series would have resulted.

Finding now that imagines, which would repay the trouble of collecting, were scarce (not that there was any paucity of common Lepidoptera), I turned my attention, by way of a change, to searching for larvæ, which mode of collecting certainly proved more remunerative. Amongst those found I note the following:—*Clostera reclusa* very common, with an occasional *Notodonta ziczac* and *Smerinthus ocellatus* on dwarf-sallow (*Salix repens*); *Peronea hastiana* in the tops, and mines of *Lithocolletis quinqueguttella* in leaves of the same; *Ypsipetes impluviata*, *Eupisteria*

*heparata*, and *Notodonta dromedarius* obtained by beating and searching alders; *Platypteryx falcata* not uncommon on leaves of alder, and most generally found in a silken web on the upper surface; mines of *Lithocolletis stettinella* also in leaves of alder; *Ephyra pendularia* on birch; some *Eupitheciæ* on seeds of *Angelica sylvestris*, &c. In the green fruits of alder were also obtained larvæ, of what there is every reason to believe will produce imagines of *Strathmopoda pedella*; and I noted that the lower fruits on the tree were mostly free from larvæ; but feeling sure that the larvæ must be somewhere on the trees which yielded the imagines so plentifully, a climb was resorted to, resulting in a good supply; and the higher one climbed the more larvæ could be obtained. To mention other larvæ met with would take too much space.

Several visits were made to ivy-bloom during October, but I have no remarkable captures to record therefrom. Certainly the usual common visitors to this attraction were well represented, such as *Xanthia ferruginea*, *Miselia oxyacanthæ*, *Phlogophora meticulosa*, *Noctua c-nigrum*, &c., with here and there an odd *Orthosia lota*, *O. macilenta*, *Anchocelis pistacina*, and *A. lunosa*. A few species, among which were *Himera pennaria*, *Pœcilocampa populi*, *Hibernia defoliaria*, and *Petasia cassinea*, came to light at the end of October and beginning of November; whilst *Calocampa exoleta* visited sugar. With these I close my list.

Finally, having read in your columns so many accounts of the unsatisfactory nature of the season in different parts of the country, I venture to think that my list of captures in this locality, for the year 1883, will prove satisfactory.

3, Haylett Terrace, Exton's Road, King's Lynn, Dec. 21, 1883.

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LEPIDOPTERA AT ABBOT'S WOOD AND EASTBOURNE  
IN 1883.

BY THE REV. CHAS. F. THORNEWILL.

ON July 2nd of last year I started for an insect-hunting excursion to Abbot's Wood, and took up my quarters at the "George Hotel," Hailsham, where I was joined the following day by the Rev. E. C. Dobree Fox; and having visited the

locality in 1881 and reaped a rich harvest of specimens I hoped to repeat my former pleasant experiences.

A few days' work, however, proved that my hopes were doomed to disappointment, and I can fully confirm the reports which have appeared from so many other collectors as to the unproductiveness of the season, for I found that "sugar" was utterly useless; and, although we persevered during the greater portion of our visit, the only good insects that we took from it were a couple of *Nola strigula* (of which I got forty in one night in 1881), and a similar number of *Cymatophora or.*

A still more ominous feature was the entire absence of larvæ. I used the beating-stick pretty freely for the first week, but with absolutely no result, and after that "accepted the inevitable." Trunk-searching, likewise, proved a failure, the only insect found in this way, except *Eudoreæ*, being a dark and well-marked *Cleora lichenaria*.

Butterflies were by no means common, with the exception of *Hesperia sylvanus*, which swarmed in the lanes and rides of the wood. We got a fair series of *Melitæa athalia* by dint of diligent working, but *Argynnis paphia* was very scarce; *A. adippe* never made its appearance at all, and even *Arge galathea* was by no means abundant.

The most productive plan of working proved to be "nothing" at dusk; and in this way we got a couple of *Cymatophora fluctuosa*, a goodly number of *Calligenia miniata*, and a perfect plethora of *Phorodesma bajularia*, the last-named insect flying in abundance just after sunset, but requiring some little agility to capture it, as it swiftly passed across from one oak tree to another. *Hemithea thymiaria*, too, proved a perfect pest a little later in the evening; and several fine varieties of *Angerona prunaria* fell to the lot of my companion, my captures unfortunately being confined to the common orange form.

Growing tired of our ill-success in the wood we determined to make for the sea, and during the latter part of our stay made numerous visits to Eastbourne and Beachy Head, with rather better results. There *A. aglaia* occurred, though not in great profusion, at the top of the cliffs below the coast-guard station, but was not easy to capture, as it frequented a decidedly dangerous spot, and our specimens were secured at the risk of our necks. We also found *Lycæna corydon* flying pretty freely lower down, and the

bright-tinted *Zygæna filipendulæ* was to be seen in all directions, while *Macroglossa stellatarum* now and then paid a brief visit, sometimes, but not always, darting off unharmed. One specimen only of *Odontia dentalis* turned up, but *Stenia punctalis* proved fairly abundant, especially in an old quarry near the Convalescent Hospital, where we also obtained a large number of *Acidalia interjectaria*. *Botys flavalis* appeared only a few days before we left, but seemed to be pretty common a little to the east of the coast-guard station, where also *Pyrausta ostrinalis* abounded in fine condition; and, a little nearer to the cliffs, the same remark will apply to *Herbula cespitalis*. In fact, it was amongst the Pyralides and Deltoides, on the whole, that we fared best, as, in addition to those already named, we took at Abbot's Wood good series of *Endotricha flammealis*, *Ebulea crocealis*, and *Rivula sericealis*, with a few specimens of *Herminia derivalis*, *Hypenodes albistrigalis*, and *Pionea stramentalis*; and a couple of Mr. Barrett's new addition to our list, *E. stachydalis*.

Mr. Fox had arranged to leave on the 19th, and, as we were doing so little, I returned at the same time, though I had originally intended to remain for another week; and I am afraid that the results of our visit will appear somewhat meagre; but the season was undeniably a bad one, and only a large amount of sheer hard work would have availed to obtain even what we did. Still, on the whole, I am by no means dissatisfied with my southern trip in 1883.

The Soho, Burton-on-Trent, January 3, 1884.

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## BIRDS IN RELATION TO LEPIDOPTERA.

BY FRED. W. FROHAWK.

THE question of the scarcity of Lepidoptera has engaged the attention of collectors for some time past, and to account for such scarcity many good reasons have been put forward.

One of the principal causes of such scarcity, not only among Lepidoptera, but among insects in general, I quite think is due to the greatly increasing numbers of one of their greatest enemies, *viz.*, birds, the country now in most parts abounding

with them. In every wood and hedgerow may be seen numerous insectivorous birds, and many of these, although comparatively small, destroy an immense number of insects in comparison to their size. The enormous quantity of insects destroyed by a single pair of blue titmice during the breeding season is well shown in that excellent work the 'Birds of Norfolk,' by Mr. Henry Stevenson, in which it is stated, on trustworthy authority, that a pair, which were closely watched from half-past three o'clock on a July morning until half-past eight in the evening, fed their young four hundred and seventy-five times. It is also stated that they appeared to feed them solely on caterpillars: sometimes they brought in a single large one, and at other times two or three small ones; and it is therefore impossible to say to what exact numbers their depredations extended. The above note, therefore, gives a good idea of the great destruction caused by those very common little birds.

In August I shot a goatsucker hawking for food, and from its mouth I took no less than a dozen various Noctuæ, just caught, no doubt, for its young. This bird feeds almost entirely on night-flying moths and beetles, taken on the wing during the two dusk hours in which they fly,—before sunrise and after sunset. The number of imagines thus destroyed must be very great.

Certainly since the Wild Birds' Protection Act has been in force birds of all kinds, especially the smaller sorts, as warblers and titmice, which feed principally on insects,—also the finches, which do their share at times,—have very greatly increased, and therefore it is obvious that insects must decrease; and during such mild winters as last, when no doubt most hybernating larvæ are frequently on the move, and therefore more conspicuous, would sooner become prey than if they remained quiet and hidden. I have seen flocks of golden-crested wrens (the smallest of European birds, and now extremely common), often in company with a flock of long-tailed titmice, together working a hedge in the winter for any morsel of insect-food they may happen to come across, and scarcely a branch or twig is passed without receiving a due share of their notice, and usually something found. During such a mild and open winter as last, birds survive and insects perish; and not only are birds enemies of insects in such winters, but mice are on the alert to devour any pupæ with which they may chance to meet.

It will thus be seen that birds exert a far greater influence upon Lepidoptera than is supposed at first thought; and although these remarks are but brief, yet they may lead to the expression of more general opinions on the point.

Upper Norwood, December 15, 1883.

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### ENTOMOLOGICAL NOTES, CAPTURES, &c.

IRREGULAR EMERGENCE OF LEPIDOPTERA.—Last year I was much surprised by the appearance of a specimen of *Acronycta tridens* in my breeding-cage towards the end of October, resulting from a larva obtained in the autumn of 1881. As members of the genus *Acronycta* are irregular in their appearance I did not take much notice of it at the time; but, as another specimen of *A. tridens* put in an appearance on the 13th of November this year (1883), I am inclined to enquire whether other entomologists, who are in the habit of breeding this species, have found specimens emerge so late in the season. My pupæ were kept in a room where there is always a fire, so that the emergence is more intelligible than the breeding of four specimens of *Platypteryx unguicula*,—three by my friend Mr. Harold Archer, of Ely, on the 8th and 10th of November; the other by myself, on the 8th of this month (December): both resulting from pupæ kept in fireless rooms, and the produce of larvæ which hatched from eggs obtained in May, and pupated towards the end of July. Of the pupæ thus obtained only some ten per cent. emerged in August, and the remainder are lying over till next season.—GILBERT H. RAYNOR; Hereward Hall, Ely, December 10, 1883.

SUSSEX LEPIDOPTERA—RHOPALOCERA.—In the December number of the 'Entomologist's Monthly Magazine,' p. 164, a list is given of the butterflies of Huntingdonshire, by Mr. Herbert E. Norris. It appears that during the years 1882—83 forty-two species were taken in that county, and the remark is made that "we must not forget that this county was the home of *P. hippothoe* and *P. machaon*, and that *P. machaon* was abundant in the fens, making a grand total of 48? (44) different species. This is a large proportion out of the 62 British species,

some of which are really unattainable." Mr. Norris also observes that he does not know where else such variety could be obtained in one shire. I think that my native county, Sussex, compares more favourably than Huntingdonshire with any other county, unless perhaps Kent, in this respect. Doubleday's 'List of British Lepidoptera' gives the names of 65 species of Rhopalocera; of these 55 have been taken in Sussex, viz.:—*Papilio*, 1; *Pieris*, 5; *Anthocharis*, 1; *Leucophasia*, 1; *Gonepteryx*, 1; *Colias*, 2; *Thecla*, 4, being all but *T. pruni*; *Chrysophanus*, 1, viz. *C. phlæas*; *Lycæna*, 8, being all but *L. arion* and *L. artaxerxes*; *Nemeobius*, 1; *Limenitis*, 1; *Argynnis*, 6; *Melitæa*, 2, excluding *M. cinxia*; *Vanessa*, 7; *Apatura*, 1; *Arge*, 1; *Satyrus*, 7, being all but *S. davus*; *Pamphila*, 3, excluding *P. actæon*; *Syrichthus*, 1; *Thanaos*, 1. To these may be added the rare *Lycæna bætica*, which may be indigenous, and has been taken in the county; and the American species, *Danaïs archippus*, which has twice occurred, viz., once at Lindfield and once at Keymer: making altogether a total of 57 species of butterflies which have been taken in Sussex.—J. JENNER WEIR; Beckenham, Kent, January 1, 1884.

LOCALITIES OF DIURNI.—I am compiling a list of Huntingdonshire Lepidoptera, and shall be glad if those entomologists who have resided in, or visited, the county will forward me a list of their authentic captures. I have prepared a map of the British Isles, showing the geographical distribution of Rhopalocera in the various counties; but I find that many of the captures are rather of an old date. I should, therefore, feel obliged if collectors would furnish me with a list of their captures of butterflies in their own counties, the nomenclature and numbering being the same as Meek's list. The list to contain only those species captured since 1875 inclusive, which will be a period of eight years. If several friends send from the same county it will be an advantage, as the lists can be compared. By this means I hope to be able to ascertain the number of species of butterflies in each county at the present time, and also the number of counties an insect is distributed over. This will be extremely interesting, as the area frequented by butterflies has in some cases diminished, as in the case of *Papilio machaon*; and the systematic collection of details to show their local distribution is still a desideratum. Remarks may be made on lists relating to their rarity or commonness. By the kind permission of the



Editors the receipt of lists will be acknowledged in the exchange column. Botanists have their census, and ornithologists publish their lists; Why should not we, therefore, know the distribution accurately of our butterflies? Probably even more important results may be derived as to the cause of certain kinds of distribution; and to this end I hope that entomologists will take the matter up heartily and promptly.—HERBERT E. NORRIS; St. Ives, Hunts, December 7, 1883.

*COLIAS EDUSA*.—The following notices of the occurrence of the above species have been sent for publication, *viz.*:—At Croydon, during September, by Mr. W. M. Geldart; also var. *helice*. By Mr. D. Chittenden, at Hythe, two specimens during the same month. The latter gentleman also records the occurrence of *Acherontia atropos* on the 9th of June.—J. T. C.

*COLIAS EDUSA* IN SWITZERLAND.—Having seen several notices lately in the 'Entomologist' about the occasional occurrence of *Colias edusa* in England, I should like to mention that while I was in Switzerland, in September, 1883, that species was the commonest butterfly to be seen; it greatly exceeded even the *Pieridæ* in numbers, and I could have taken many hundreds. On September 13th, shortly after leaving Chamounix, and climbing to a height of 1000 feet, I came across several specimens of *Erebia blandina*. A few days before a friend presented me with *Argynnis lathonia* in fair condition, which he had taken near Lausanne. On the 16th, while walking to Aosta, in the North of Italy, I met with *C. hyale* and several blues; also *Melitæa cinxia*, *A. aglaia*, and *Satyrus janira*. On the 17th I saw the beautiful *Doritis apollo* on the wing, the first time I have ever met with it out of a cabinet; also specimens of *C. hyale* and *S. semele*. As I was never out late at night I had no opportunity of observing the moths. It was most interesting to find at the height of 8000 or 9000 feet many signs of insect-life. Here the snow was flecked with small black flies, which were running over the surface in a most lively manner, at the summit of a pass called the Col du Bonhomme.—CHAS. E. M. INCE; 11, St. Stephen's Avenue, Shepherd's Bush, W., December 19, 1883.

VARIETY OF *LYCÆNA ARGIOLUS*.—On looking over some last year's captures I found a specimen of the above-named, which has the hind wings distinctly angled, in much the same manner

as those of *Gonepteryx rhamni*, except that the angles are not quite so prominent or acute as in the latter insect. In all other respects it seems to agree with the ordinary form of *L. argiolus*. It was taken about the end of May. I have never heard of any similar variation in this insect, and should like to know if such often occurs.—E. B. BISHOP; 3, Primrose Terrace, George Lane, Woodford, January 2, 1884.

FOOD OF GONEPTERYX RHAMNI.—What does *Gonepteryx rhamni* in its larval state feed upon besides buckthorn? I have found the larvæ here on both *Rhamnus catharticus* and *R. frangula*; chiefly the latter, which is common here, though I have never noticed it elsewhere. Surely there must be some other kind of food, as go where you will *G. rhamni* abounds.—C. A. SLADEN; Burghclere, Newbury, November 12, 1883.

REARING OF ATTACUS LUNA.—Referring to my notes on silk-producing insects (Entom. xiv. 85) further experience in rearing *Attacus luna* in the open air induces me to conclude that the incidence of its not passing the winter in the pupal state is entirely due to temperature, as the following will show:—During the past season I was fortunate in obtaining a plentiful supply of ova of this moth from two females impregnated by the same male. The bulk of the ova thus obtained hatched on the 11th and 12th of July, and the young larvæ were fed on walnut (*Juglans regia*), as on the occasion recorded in the notes adverted to. The larvæ passed without mishap through the usual moulting stages of their existence, and constructed cocoons in the early part of the following September, about one month later than previously recorded. The insect is still in the cocoon state, and likely to remain so until next summer, no doubt owing to the pupal transformation having taken place at a more advanced and cooler period of the season.—GEO. J. GRAPES; 2, Pownall Crescent, Colchester, November 29, 1883.

NOCTUA XANTHOGRAPHA.—I strongly suspect that the larvæ observed in such numbers by Mr. Geldart, during February last (Entom. xvi. 277), were those of *Noctua xanthographa*. He mentions that although several larvæ formed cocoons, yet he obtained no pupæ. The larva of *N. xanthographa* forms its cocoon from seven to eight weeks before it turns to a pupa, which causes some difficulty to those who wish to follow it

through its life-history. The best plan to ensure imagines is to let the larvæ form their cocoons in a common flower-pot, and, as soon as they have all gone down, bury the pot up to the rim in the earth, taking care to keep away mice, &c., by covering a piece of wire-gauze over the top. In this manner sufficient moisture will be obtained to prevent the larvæ drying up in their cocoons, which otherwise they will often do.—ALFRED SICH; 25, Branstone Road, Burton-on-Trent, December 20, 1883.

EPUNDA NIGRA AT BOURNEMOUTH.—*E. nigra*, being reckoned one of the "good things" of this neighbourhood, the local collectors look out for it every autumn at sugar; but, like many other "good things," it does not put in an appearance by any means with regularity. Since 1879 (when I took some four or five dozen) I have not seen a single specimen until this year, when, on the evening of the 2nd October last, I took a fine female off a gas-lamp, which within a week laid a large batch of eggs, from which, on the 13th of this month (November), the young larvæ emerged. I was utterly unprepared to receive them, and, like other "unexpected arrivals," they had to take pot-luck, which I am sorry to say they took with a very bad grace, for all of them died rather than eat anything I could procure for them at this season of the year. Newman gives *Galium mollugo* as the food-plant, but omits to mention where this can be obtained in the middle of November. Perhaps some entomologist will kindly say what I ought to have done under the circumstances, so that I may be prepared in case of any similar emergency in the future.—W. McRÆ; Bournemouth, November 18, 1883.

REARING LARVÆ OF TĒNIOCAMPA OPIMA.—Last season I received a fine batch of eggs of *T. opima* from Liverpool, from which I obtained a good supply of larvæ, which appeared healthy and did well until about a quarter fed; after which they began to sicken, and each day told of considerable loss, until all were gone, not one having reached the pupal state. They were fed on sallow (*Salix caprea*), which was supplied them every other day. It is my intention to make another attempt in the coming season, and I shall be glad of any information as to the best method of constructing an appropriate breeding-cage, and of the treatment of the larvæ. During the past season insects have been exceedingly scarce in this locality, even more so than in

that of 1882. Sugar had no attraction whatever.—THOMAS WALPOLE; 48, Westgate, Grantham, December 13, 1883.

ABUNDANCE OF *EXAPATE GELATELLA*.—Has the excessive abundance of *Exapate gelatella* been noticed in other parts of the country? In the West Riding of Yorkshire, at the end of October and beginning of November, it occurred in profusion. Here it seemed equally at home in all sorts of places,—gardens in the town, fields, palings, woods, &c., all being favoured with its presence. Near Bingley we are told “they arose at every step, and there must have been thousands of them.” In contrast to the scarcity of insects in the summer, autumn species seem to have been plentiful. I took *Dasypolia templi* and *Hybernia aurantiaria* about lamps almost in the town, and the latter has been common on lamps in the outskirts; and I do not remember ever noticing *Cheimatobia brumata* so finely and strongly marked as this year.—GEO. T. PORRITT; Huddersfield, Dec. 1, 1883.

[The last mentioned species, common in Epping Forest in most seasons, has been unusually so in this, and of large size and well marked.—J. T. C.]

LATE WASPS.—The mild and open weather which we have lately experienced, notwithstanding there has been a good deal of rain, has tended to keep insects astir long after their normal time for retiring. There having been no frosts of sufficient severity to kill off the mignonette in the gardens the hive-bees have, up to within a few days of the time I am writing, been doing their best to extract what little honey they could from the blossoms. But I have been more astonished at the number of wasps still about. Early in August I marked two very strong nests of *Vespa vulgaris*, which I expected would be of extra size, and consequently make good cabinet additions. One of these I took on the 16th of last month, but, unfortunately, I did not succeed in getting it out perfect: it was in very rocky ground, and got much crushed. I therefore determined to try the other on another opportunity. This I expected to be the larger of the two, so I kept my eyes on it at short intervals to watch how it went on. It was built in one of those small mounds in a hilly field, which go by the name of ant-hills. The excrescences, whatever they may be, are not solitary mounds, but are strewed thickly over the whole field, and are some sixteen to twenty

inches high, covered over with turf. This nest was built right in the centre of one of these turfy stumps, and I went several times to look at it with the object of taking it, but bided my time, as the sentinels at the entrance were always on the look-out, and showed an evident disposition to drive off not only any intruder, but even anyone who ventured to cast a sly glance at the entrance to their abode, and I ran several chances of being well paid out for peeping. So things went on till the 5th of November, when, armed with a fierce squib, I went prepared to play up Gun-powder Plot with the inhabitants; but I came back without the nest, the wasps being evidently all alive to my intentions, and were not only ready, but appeared anxious, to repel my attack; so, thinking discretion the better part of valour, I returned. I now left home for some days, and did not return till the 15th. The weather just about this time had assumed a wintry look, and we had several very thick white fogs, which hung about the ground all day, and a succession of white hoar frosts; so I concluded that the wasps would have succumbed to these influences. But no! when I walked up on the following morning to take another survey, what was my astonishment to find them working just as though it were summer time, going in and coming out in a constant stream. I did not want to look twice; so returned home, feeling convinced I could leave them while I went away again for a day or two. On the 23rd I came back, and felt I must take it then, or I might not have another opportunity. The weather had been dreadfully wet and stormy, and this morning the frost lay white upon the ground, and the grass was quite crisp under foot; so I started off fully determined to bring the nest home. On reaching the spot I soon saw that the inmates of the nest were still "all alive." There were wasps going out and coming in, but not in such numbers as before; and on looking in I saw that Cerberus was not there. So now was my time; and I set to work and dug away. My only object was to get a good specimen nest, so I took great pains, and succeeded in disclosing a beautiful nest of a creamy white colour, quite perfect, and of very large size. I got it up, and tied it up in my net as quickly as I could; but what with the jogging home over two miles of rough road, and its own weight, it got a good deal damaged; and it still remains in my net suspended; for by the time I put it in the inhabitants had found out what was the matter, and

came crawling out in large numbers with every demonstration of anger; and so they still do every time I look at them.—V. R. PERKINS; Wotton-under-Edge, November 25, 1883.

CRABRO VARIUS, *St. F.*—I had the pleasure of taking a pair of this small Fossor on the 1st of August last, near the Railway Station, Bickley, South Devon. The late Mr. Smith captured specimens in North Devon in 1870; these are the only two recorded captures of this insect in Devon.—G. C. BIGNELL; Stonehouse, January 2, 1884.

MICROMELUS PYRRHOGASTER, *Walk.*—I bred a male and female of this interesting Chalcid from *Mecinus collaris* galls, on the flowering stems of *Plantago maritima*. I have no doubt but that they were parasitic on these small beetles.—G. C. BIGNELL; Stonehouse, Plymouth, December 14, 1883.

NEW BRITISH ICHNEUMON.—I have found, among the insects taken in this neighbourhood during the last summer, a specimen of *Mesoleptus facialis*, Grav. (male). This is a most interesting addition to the British Ichneumons, as it appears not to have been found since Gravenhorst described the single example received from Spinola (*Ichn. Europ.* ii. 12); at least none of the later authors make any mention of it, nor is it in the Rev. T. A. Marshall's Catalogue. The insect is fully six lines in length, being larger than Gravenhorst's, but agrees with his in every other respect; and singular to relate the areolet in the right wing is only faintly indicated, whilst the left has it long petiolated, just as in his specimen; he says, "areola in ala dextra deficiente, in sinistra minutissima triangulari irregulari longepetiolata." It is scarcely right to place it among the *Mesolepti*, for, as Gravenhorst points out, the petiole of the abdomen is distinctly thickened behind, the spiracles being placed somewhat before the middle. The head is transverse, but not buccate. I should say the *Mesolei* was the proper group to place it in. The entirely black body, white face, and ring of antennæ, together with its size, make it very conspicuous and unmistakable.—EDWARD CAPRON; Shiere, Surrey, November 24, 1883.

HEMEROBIUS? OR CHRYSOPA?—Mr. J. E. Fletcher (*Entom.* xvii. 22) is quite right,—I should have put *Chrysopa*, not *Hemerobius*, in my remarks on the abundance of lace-wings; but

as I have no work on Neuroptera, and only knew the insects by their popular name, I adopted Mr. McRae's appellation (Entom. xvi. 235). However, on referring back to Mr. J. J. King's paper (Entom. xv. 28), I found out my mistake. Which does Mr. McRae really mean?—H. E. U. BULL; Foundry Lane, near Southampton, January 2, 1884.

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## REVIEW.

*Catalogue of British Hymenoptera (Aculeata)*. By EDWARD SAUNDERS, F.L.S. Colchester: W. H. Harwood. 1883.

THIS is a synonymic list of British Aculeate Hymenoptera, brought up to the present time in regard to recently added species and synonymy. The name of Mr. Saunders is a sufficient guarantee for the accuracy of the compilation, and to the enterprise of Mr. W. H. Harwood, of Colchester, in publishing this indispensable list, students of the group are indebted. Although a large number of British entomologists take more than a passing interest in the bees and wasps of this country, the complication of names has been hitherto such a detriment to their successful study that this list will be hailed with gratification. Cannot we persuade Mr. Saunders to add to the present boon a small and handy manual of this section of the Hymenoptera? Such a work would be as great an incentive to workers in this division as was Mr. Stainton's Manual to the Lepidoptera.—J. T. C.

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## OBITUARY.

WILLIAM BUCKLER.—We regret to announce that Mr. Buckler died on January 9th at Lumley House, Emsworth, Hants, from a short attack of bronchitis, resulting from a slight cold,—caught, we believe, on New-Year's Day,—which exhibited no serious symptoms until within two days of his death. Mr. Buckler was in his seventieth year. For the last five and twenty years he had almost entirely devoted his energies to delineating and describing the larvæ of our British Lepidoptera, reared from specimens received from many correspondents. The descriptions have

appeared from time to time in the pages of the 'Entomologist's Monthly Magazine,' but the magnificent drawings remain to be published, every larva described being most carefully and beautifully figured. The 'Intelligencer' contains a few short notes contributed by Mr. Buckler; but it is with the Ent. Mo. Mag. that he has been most intimately connected. Its first volume (1864—5) contained from his pen descriptions of the larvæ of six species of *Lithosia*, of *Leucania comma*, and of *Xylophasia scolopacina*; with notes on the larvæ of *Leucania littoralis* and *Caradrina cubicularis*. Not one of the twenty volumes has been without numerous life-histories from the pen of Mr. Buckler and his colleague the Rev. John Hellins, the current volume containing the descriptions of the larvæ of *Procris globulariæ*, *Zygæna exulans*, *Endromis versicolor*, *Meliana flammea*, *Bankia argentula* (*bankiana*), and *Apamea fibrosa*; this last written on December 3rd, and published in the January number. It was only last September that Mr. Buckler wrote:—"After investigating the life-histories of our Macro-Lepidoptera, and figuring their larvæ, since 1858, I have amassed more or less satisfactory notes and figures of about 850 species, beginning with the Diurni and ending with the Crambites. Hitherto my friends have been able to supply me with British examples, but it will be evident, from the numbers given above, that the time has come when there arises a yearly-increasing difficulty in obtaining ova or larvæ of the (comparatively) few species yet untouched; whilst the old adage '*ars longa vita brevis*' remains as true as ever; therefore it is, that in view of these pressing reasons, and after consulting the friends whose opinion I most rely on, I have, after some little hesitation, resolved to avail myself of continental aid. This resolve does not lessen my desire to take my notes and figures in all possible cases from indigenous examples; in every case, as before, I shall make a point of stating exactly and truthfully the source from whence my information is derived, so that there will be, I trust, no ground for complaint that I have ever attempted mystification, or added to the difficulties of the naturalists who take in hand the onerous and responsible task of settling the extent of our native fauna." Alas! how soon does the quoted adage apply to the gifted historian of our British Lepidoptera.—E. A. F.



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## SLEEPING POSITION OF *THANAOS TAGES*.



THANAOS TAGES.

ON the evening of June 12th last, when searching for *Lycæna medon* and *L. icarus*, of which I found several at rest on the heads of grasses, I noticed one grass head which seemed rather weighty, with what I at first took to be some kind of *Noctua* at rest; but, on closer examination, found it to be *Thanaos tages* at rest. The wings were held in exactly the same position as a *Noctua* when resting. The anterior wings entirely covered the posterior wings, the head bowed so as to touch the grass, and antennæ bent back parallel with the costal margin of the wings. The colours of both butterfly and grass-head upon which it rested were of wonderful similarity; and, coupled with the position taken up on the brown tuft, was a remarkable and perfect disguise.

Having my sketch-book with me at the time I was able to make a sketch of it on the spot, from which the above drawing was made.

FRED. W. FROHAWK.

Haddon, Upper Norwood, S.E., Feb. 5, 1884.

[We have to thank Mr. Frohawk for the above drawing on wood, which we have pleasure in presenting to our readers on his behalf.]

FURTHER NOTES ON THE LEPIDOPTERA-RHOPALOCERA  
OF HUDSON'S BAY.

BY J. JENNER WEIR, F.L.S., F.Z.S.

IN the 'Entomologist' for 1881, vol. xiv., pp. 97—100, will be found my previous communication on this subject. Mr. Walton Haydon, to whose great kindness I am indebted for the collection, has now left the district, and returned to England; at present he has no intention of again visiting Moose, where most of his captures were made, so that this will probably be my last notes on the Lepidoptera of Hudson's Bay. Mr. Haydon was five years and a half stationed at Moose, and as during the whole of the time he was on the alert to capture species new to the district, it may fairly be considered that, with the additions I now make to my former list, a very fair knowledge of the Lepidoptera-Rhopalocera of the southern arm of Hudson's Bay has been obtained.

In my previous paper I gave an account of seventeen species, being all that had been obtained in two years; three more summers' collecting have doubled this number. In my former list I gave the names of three British species of butterflies from Moose, and am now enabled to give three more, *viz.*:—

*Cænonympha tiphon*, Rott., var. *inornata*, Edw.—But few of these were taken; they are like the British *C. davus*, but even less marked with ocelli; indeed, on the upper side of the wings of two specimens I cannot discover any markings.

*Lycæna phlæas*, Linn., var. *americana*, D'Urban. — The wings of this variety are suffused with black, and but very faint traces of orange are visible; both sexes are as dark in colour as the males of *L. dorilis*.

*Pieris rapæ*, Linn.—No doubt introduced; at present rare.

The following six species are more or less closely allied to British, *viz.*:—

*Argynnis aphrodite*, Fab. ?—I am not quite certain that the three specimens taken are this species; they are much smaller than those figured by Edwards (Butt. N. Amer. Arg. t. 3, 1808); they more resemble in size his figure of *A. hesperis*, given in the same work (Arg. t. 7); and I should have considered them that species but for the fact that he describes the under side of the

secondaries of the latter species as having all the spots buff, some of them occasionally sprinkled with a few scales of silver; in the three Moose specimens all the spots are of a brilliant silver. The insect much resembles *A. aglaia*, but, like *A. atlantis*, the ground colour of the under side of the secondaries is of a rich chocolate.

*Grapta comma*, Harris. — Very much resembles *G. c-album*, Linn.

*Pieris protodice*, Bois. — Like a faded specimen of *P. daplidice*, Linn.; but one specimen was taken.

*Pamphila peckius*, Kirby. — Evidently the American representative of *P. sylvanus*, Fab.; common.

*Heteropterus mandan*, Edw. — Much resembles *H. paniscus*, Fab.; common in 1883, but not observed before.

*Nisoniades brizo*, Bois. — Closely allied to *N. tages*, Linn.; three taken.

Two European species, but not of British genera, were taken, viz.:—

*Eneis jutta*, Hüb. — It would seem to be rare, as Mr. Haydon took but one.

One specimen of the widely distributed *Danais erippus*, Cram., was captured, and also one of *Limenitis archippus*, Cram., which so closely resembles the Danaïne species, and departs in so remarkable a manner from the coloration of all other American and European species of *Limenitis*, that it is undoubtedly a case of mimicry; both sexes are alike in colour, and in this respect the mimetic resemblance differs from that between *Danais chrysippus*, Linn., and *Diadema misippus*, Linn., in which latter species the female alone mimics the Danaïne form.

Four other species remain to be mentioned, which have more or less close allies on the European Continent, viz.:—

*Maniola (Erebia) discoidalis*, Kirby. — Staudinger places this species next to the European *M. disa* in his Catalogue, with the remark, "an spec. diversa"; the insect from Moose is entirely without ocelli in all the wings, either on the upper or under side.

*Argynnis apherape*, Hüb., var. *tricoloris*, Hüb. — Whether the American *A. tricoloris* is distinct from *A. apherape* must be left for future investigation; the specimens from Moose are larger than my Russian specimens of *A. apherape*, var. *ossianus*, but I am

inclined to think them specifically identical; and that is the view held by Staudinger, but not by Edwards.

Three species of *Colias*, in addition to *C. erythème*, var. *kewaydin*, Edw., mentioned in my last paper, were captured, viz.: *Colias edwardsii*, Behr., *C. occidentalis*, Scudder, and *C. pelidne*, Bois.; but whether the four species are distinct from each other and also from other European species I am not able to determine; one of the *Colias pelidne* was caught at Little Whale River, 450 miles north of Moose. The *Pyrameis cardui* from Moose has two of the black spots on the upper side of the secondaries with blue pupils, approaching in this respect the Australian variety *kershawii*, which has three of the spots so marked.

It will be gathered from these two communications that the butterflies of Hudson's Bay are essentially of European type, several species being quite identical, others geographical races only of European species, some few American types of European genera, and one species only, *Phyciodes tharos*, which belongs to a purely American genus. I am therefore disposed to agree with Staudinger that the Lepidoptera of Labrador and the territory adjacent should be included in the European fauna.

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### THE STORY OF *ÆCOPHORA WOODIELLA*.

BY JOSEPH SIDEBOTHAM, J.P., F.L.S., &c.\*

THIS species occurs in the lists of British moths, but to most entomologists it is but a name, and very few have ever seen the insect itself, or know anything of its history. As I perhaps know more of it than anyone now living, it may be interesting to tell its story as far as I can.

This insect is figured in Curtis's 'British Entomology,' plate 304, and called *Woodiella*, and said to be "taken on Kersal Moor, Manchester, by Mr. R. Wood"; from this plate it has been copied with more or less success by Wood, Humphreys and Westwood, and Morris, but none of these authorities had seen a specimen.

When I first became a member of the Manchester Natural History Club—the old Banksian Society—in the year 1840,

\* Read before Lancashire and Cheshire Entomological Society, January 28th, 1884.

L. H. Grindon, Edleston, Kenderdine, my cousin Ashworth, S. Carter, G. Crozier, and many others being present, one subject discussed was this *Æcophora woodiella*. It was captured in some numbers by Robert Cribb, who lived in Oldham Road, Manchester, who gave a specimen to R. Wood to send up to Curtis to get named; and as it was new to the entomologists in the district, he also gave a pair to Samuel Carter, and I think one to Geo. Crozier. I cannot trace this specimen. On Curtis naming the insect *Æcophora woodiella*, Cribb was so angry that it was named after Wood, and so indignant that Wood should have claimed the moth as his discovery, that he refused to part with another specimen to anyone. He had in a box fifty or sixty specimens, which he showed now and then to Carter and others, but nothing would induce him to part with them. The place where he said he took the insect was an old rotten tree—I think alder—growing not far from the path on the Manchester side of Kersal Moor; and as he took Crozier to the place to look for it before the unpleasantness arose, I believe this was quite true. Carter, Crozier, Ashworth, and I and others visited the place many times, but never saw a specimen, and I believe no other has been seen either there or anywhere else. Some said that it was a foreign species, and this aggravated Cribb the more, as he had no foreign insects; nor could anyone tell where the species could have come from, as it was unknown elsewhere. Whether it was that vexation and disappointment caused Cribb to become intemperate or not I cannot say, but he did become so, and gave up all his collecting.

Samuel Carter, who had always an eye to doing a little stroke of business, used to try and tempt Cribb, when not sober, to part with his box of *Æ. woodiella*, but without success; one day, however, he met him, and offered to give him ten shillings for the box. Cribb said, "Well, you shall have it, but it is in pawn for five shillings at a beerhouse in Oldham Road; if you will give me five shillings to get it out of pawn, I will fetch it, and you must give the other five shillings when you get it." To this Carter agreed; however, he did not see the box or his five shillings, and Cribb kept out of his way for weeks; one day, however, they met, and after angry words, Carter, who was most anxious to get the insects, said he would give him ten shillings for it, and pay the money he owed besides; so they went together to the beerhouse: when they saw the mistress of the house she said—"Oh! you

have come for your box of flies, have you? I stuck it in the fire, as you never came to pay your score as you promised."

So endeth *Æcophora woodiella*, except the specimen in Curtis's collection, which is, I believe, now in Australia, and the two specimens belonging to Carter. These were sold with his collection of British insects to the Manchester Museum of Natural History, and when we handed that institution over to Owen's College the collection and two *Æ. woodiella* went with it; and there the two specimens were, in capital preservation, the last time I saw them. The trustees lent me the specimens to exhibit at a meeting of the Manchester Field and Philosophical Society; and I took a photograph of them, and I also made very careful drawings of them. The copies of Curtis's, Wood's, Humphrey and Westwood's, and Morris's are all more or less unlike the original species. We may hope it will some day turn up again, and I have no doubt it will. *Lymexylon navale*, a conspicuous species of beetle, is recorded as having been once taken, in 1828, in Windsor Forest, and so none had any in their collections, except from the Continent; whilst all this time it had been existing in Durham Park, where my friend Mr. Chappell found it one summer evening a few years ago. Since then we have found out its habits and history, and it has been found in scores and seen in hundreds in its haunts in the park. So with *Æcophora woodiella*; I believe we only want to know its habits to find it again: and in these days of blue ribbon armies we may hope the specimens, when found, will meet with a better fate than being burned in the kitchen of a small public-house.

Bowdon, Cheshire, January 9, 1884.

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### THE GENUS *CERCYON*.

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

THE species of this genus are usually very puzzling to beginners; this is by no means strange, if we remember that Stephens, in his 'Illustrations,' described no less than sixty species as British. These have since been reduced to seventeen, and one new one has been added; besides these, the closely allied genera *Megasternum* and *Cryptopleurum* must always be considered in any paper bearing on the Cercyons.

Whether we take their structure or their habits into consideration, the *Cercyonidæ* form the best connecting link between the *Hydrophilidæ* and the *Silphidæ*. In our catalogues and manuals they are usually placed immediately before the *Staphylinidæ*; it must however be admitted, at first sight, that there is a great break between *Cryptopleurum* and *Autalia*, and that the transition to *Leptinus* and the smaller *Silphidæ* is a much more natural one. This will become more evident if the anatomy of the groups is studied; in fact the *Cercyonidæ* might well be classed with the *Silphidæ*, but, on the other hand, their affinities to the *Hydrophilidæ* are so great that it seems hardly possible to remove them from that family. As regards habits they seem to belong to both groups; one or two species, like *C. aquaticus*, are almost, if not quite, entirely subaquatic; others, like *C. minutus* and *Megasternum*, prefer damp marshy places, but are also found in drier localities; the majority, however, are dung-feeders, and seem to rejoice in heat and sunshine, like the true *Necrophaga*.

The Cercyons are some of our great scavengers. In tropical countries they are very scarce, and in some regions seem to be unrepresented, their places being taken by the *Onthophagi* and *Scarabæi*. In summer they swarm all over our country; there is not a patch or heap of dung or decaying grass or rubbish that is not full of them. One or two species are found on the sea-shore, others are common in fungi; they may be taken by flinging refuse into water, when they rise to the surface, and they may be found by thousands in winter in flood rubbish. As a rule, however, only about one-half of the species will be found in the ordinary course of collecting; some of them are rare, and many are very hard to distinguish at first. It may therefore be of use to point out certain differences that may serve more easily to separate the species. The chief points to be noticed are size, and shape (whether round, oval, or pointed); striation (whether continued to apex of elytra or not); punctuation between interstices of elytra, and colour: the latter in some species is very constant, and a true mark; in others, as in *C. pygmaeus*, by no means reliable: this probably led Stephens into error with regard to many of his species, which are only immature varieties of other forms.

In *Cercyon* proper the prosternum ends in one point behind, and the mesosternum is very narrow: in *Megasternum* and

*Cryptopleurum* the prosternum ends in two points behind, and the mesosternum is very broad. Of the latter two genera, *Megasternum* has the sides of the thorax not reflexed, and the anterior tibiæ strongly excised outside at the apex; while *Cryptopleurum* has the sides of the thorax reflexed, and the anterior tibiæ entire.

The several species, however, may be easily distinguished without having recourse to the under side, and it will perhaps be best to say a few words about each in turn, dividing the Cercyons for this purpose into five groups.

The first group may be said to consist of *C. obsoletus*, *C. hæmorrhoidalis*, *C. hæmorrhous*, *C. aquaticus*, *C. flavipes*, and *C. lateralis*.

*C. obsoletus*, Gyll., is the largest species of the whole group, and may easily be distinguished by its size and nearly round form; in case, however, of any difficulty arising, it may be at once known by the fact that it has no impression at the base of the thorax: it is decidedly a rare species, and apparently prefers haystack refuse to dung. It has been found at Hanwell, Ealing, Notting Hill, Lee, Lerwick, and, I believe, near Burton-on-Trent.

*C. hæmorrhoidalis*, F.—The smaller size and more pointed elytra of this species distinguish it from *C. obsoletus*, which it much resembles in striation and punctuation; it possesses a strong depression at the base of the thorax. From *C. hæmorrhous* it may be separated by having the colour at the apex of the abdomen much less distinctly defined, and by the less strong punctuation of the interstices of the elytra. This is a common species. It is very abundant in hotbeds and dung.

*C. hæmorrhous*, Gyll., may be at once separated from the preceding by the small but distinct longitudinal impression at the base of the thorax above the middle of the scutellum, by its narrower shape, and by having the colour at the apex of the abdomen much more marked: its strong striation will also serve to distinguish it. Common in mud and by ditches.

*C. aquaticus*, Muls., may be at once separated from all other species by having not only the apex but also the margins of the elytra and thorax of a light red colour, the colour being most distinct and well defined, with no transitional space between the black and the red: it is a rare and local species, and appears to be entirely subaquatic. Dr. Power has taken it at Notting Hill and in Sheppy.



*C. flavipes*, F., may be separated by its black trophi (mouth parts), and also by having the apices of the elytra produced into a point; this is very evident if a carded specimen be held sideways against the light and examined with a lens. This distinction was pointed out to me by the late Mr. W. Garneys, of Repton. Very common.

*C. lateralis*, Marsh.—Very like the preceding at first sight, but the apices of the elytra are not produced. It is usually of a lighter colour, and the sides of the thorax are always broadly dull red. Some people, who have not seen a type of *C. aquaticus*, are apt to confuse it with that species, but the red margin in *C. aquaticus* is bright, narrow, and very clearly defined, while in *C. lateralis* it is broad and very obscure and merges into the dark colour of the disc of the thorax. Common.

The second group contains the two littoral species, *C. littoralis* and *C. depressus*, which may be separated from the rest of the genus by their flat, depressed, oblong shape; they vary in colour according to maturity.

*C. littoralis*, Gyll., is the larger of the two and has the striation of the elytra continued to the apex: it is very common on the coast, especially under decaying sea-weed.

*C. depressus*, Steph., is the smaller species, and has the striation obliterated at the apex. It occurs in many localities on the Devonshire coast, in the Isle of Wight, &c. It is not an uncommon species, and is found under the same conditions as the preceding.

The third group contains three very distinct and easily recognisable species, the colours being almost always constant in each: *C. unipunctatus*, *C. quisquilius*, and *C. melanocephalus*.

*C. unipunctatus*, L., is of a light yellow colour, and on each elytron is a distinct black semicircular spot, which join when the elytra are closed and present the appearance of one large spot; occasionally, but very seldom, the spots are nearly obsolete.

*C. quisquilius*, L., is about half the size of the preceding species, which it resembles in colour, except that the elytra are immaculate.

*C. melanocephalus*, L., is of a peculiarly bright reddish orange colour, with a well-marked dark triangle round the scutellum.

All these species are very common in hotbeds and dung.

The fourth group comprises the three smallest species of the family: *C. terminatus*, *C. pygmæus* and *C. nigriceps*.

*C. terminatus*, Marsh., is considerably larger than *C. pygmæus*; it is a longer insect and less contracted behind. As a rule, it seems to have the apex, sides, and suture of the elytra of a light reddish colour, but is occasionally found quite black. The punctuation of the striæ of the elytra is much stronger than in *C. pygmæus*, and this, with the other points of difference mentioned, will serve to distinguish it. Dr. Power tells me that he has always taken *C. terminatus* flying (generally near a wood-stack), and that he cannot identify it from dung, in which *C. pygmæus* abounds. He has taken it at Merton, Notting Hill, Ealing, Cowley and Hampstead, and it has occurred in the Hastings district.

*C. pygmæus*, Ill., one of the commonest species, is very variable in colour; the distinctions above given will separate it from *C. terminatus*. Light specimens may be distinguished from *C. nigriceps* by invariably having a dark space round the scutellum, which is absent in the latter species. It is often almost entirely black.

*C. nigriceps*, Marsh., is at once distinguished by its light-coloured elytra and dark thorax; it looks very like a minute *C. quisquilius*, but is half the size of that insect, and much rounder, more convex, and less distinctly striated. It occurs in Surrey, Norfolk, and other localities.

The fifth group contains *C. minutus*, *C. lugubris*, *C. granarius* and *C. analis*.

At first sight these species very closely resemble each other; they are all more or less pointed species, and have the apex of the elytra of a more or less reddish colour. They are larger than the species of the preceding group, but smaller than any species of the other groups, except perhaps *C. quisquilius*.

*C. minutus*, F., is larger than either of the other three species; it is round and not much pointed behind, and is broad and very smooth. The interstices of the elytra are almost impunctate, and the striæ of the elytra are obsolete at the apex. This is one of our rarest species; it does not occur in dung, but in damp situations. Dr. Power has taken it at Notting Hill, but I know of no other locality.

*C. lugubris*, Payk., is distinguished from *C. minutus* by the fact that the striæ of the elytra are plainly continued to the apex, and from *C. analis*, which it very much resembles, by having the interstices of the elytra smooth (like *C. minutus*), whereas in

*C. analis* they are very closely and evidently punctured: this last is a very good and constant character. Common.

*C. granarius*, Er.—This species appears to be a great puzzle to collectors. It is a comparatively recent split from *C. lugubris*, from which it is said to differ in having the second joint of the maxillary palpi more dilated, and in the punctuation of the elytra. It is probably mixed with the former species in collections, and not rare. It is a question whether it is at most more than a variety of *C. lugubris*.

*C. analis*, Payk., is almost exactly like *C. lugubris* in general size and shape, but, as has already been pointed out, it may be at once distinguished by having the interstices of the elytra closely and distinctly punctured. It is very common.

*Megasternum boletophagum*, Marsh., which at first sight bears a strong superficial resemblance to the species of the last group of the Cercyons, may be told by its smooth elytra and oval shape; by its colour, which is reddish with no distinct patch of a lighter shade at the apex of the elytra; and also by having the sides of the elytra tucked in, as it were, so that the edge is not seen. It is very common in fungi, but may also be found on the edge of water and in damp places everywhere.

*Cryptopleurum atomarium*, F., is one of the most distinct species of the group. It is very broad and round, although the apices of the elytra are somewhat pointed, and may be at once told by its opaque, dull appearance, which is caused by its very strong striation, and by the deep punctuation of the whole of its upper surface. It is very abundant in dung and in all refuse.

I am much indebted to Dr. Power for many hints regarding the species, and also for localities. In future papers I hope to be able to give similar hints with regard to other of the more minute and obscure genera.

The School House, Lincoln, Jan. 17, 1884.

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## NOTES ON THE PAST SEASON IN COS. DERRY AND DONEGAL.

BY W. HOWARD CAMPBELL.

I CANNOT say, with most of your correspondents, that the past season has been a bad one as regards Macro-lepidoptera. Although many common species were much scarcer than usual,

and several did not appear at all, yet the results of our entomological work have, in spite of unfavourable weather, been encouraging. As notes from the North-west of Ireland have not before appeared I shall give a list of the best of our captures during the season.

As we were unable to begin collecting before May, I can say nothing as to the early species. In May we devoted most of our attention to larvæ, and succeeded in taking the following species:—

<i>Bombyx callunæ</i>	<i>Triphæna fimbria</i>
<i>Odonestis potatoria</i>	<i>T. janthina</i>
<i>Crocallis elinguaris</i>	<i>Xanthia silago</i>
<i>Oporabia dilutata</i>	<i>X. cerago</i>
<i>Eupithecia rectangulata</i>	<i>Plusia pulchrina</i>
<i>Melanippe montanata</i>	<i>P. iota</i>
<i>Cidaria testata</i>	<i>P. chrysis</i>
<i>Agrotis agathina</i>	<i>P. interrogationis.</i>

In the same month we took in the perfect state:—

<i>Satyrus megæra</i>	<i>Anticlea badiata</i>
<i>Notodonta dromedarius</i>	<i>Cidaria russata</i>
<i>Odontopera bidentata</i>	<i>Tæniocampa rubricosa</i>
<i>Eupithecia castigata</i>	<i>Hadena thalassina</i>
<i>Ypsipetes impluviata</i>	<i>Anarta myrtilli.</i>

In June we took larvæ of—

<i>Eriogaster lanestris</i>	<i>Oporabia filigrammaria</i>
<i>Chelonia plantaginis</i>	<i>Cidaria populata</i>
<i>Saturnia carpini</i>	<i>Chesias spartiata</i>
<i>Notodonta ziczac</i>	<i>Dianthœcia conspersa</i>
<i>Himera pennaria</i>	<i>D. capsophila</i>
<i>Nyssia zonaria</i>	<i>Plusia festucae.</i>
<i>Larentia cæsiata</i>	

Imagines of—

<i>Satyrus ægeria</i>	<i>Thera variata</i>
<i>Hepialus velleda</i>	<i>Melanippe galiata</i>
<i>Chelonia plantaginis</i>	<i>M. ocellata</i>
<i>Arctia fuliginosa</i>	<i>Eubolia palumbaria</i>
<i>Platypteryx lacertula</i>	<i>Thyatira batis</i>
<i>Iodis lactearia</i>	<i>Acronycta rumicis</i>
<i>Scodiona belgiaria</i>	<i>Apamea basilinea</i>
<i>Lomaspilis marginata</i>	<i>A. gemina</i>
<i>Emmelesia albulata</i>	<i>Miana fasciuncula</i>
<i>Larentia pectinataria</i>	<i>Agrotis porphyrea</i>
<i>Eupithecia satyrata</i>	<i>Hadena adusta</i>
<i>E. vulgata</i>	<i>Cucullia umbratica</i>
<i>E. minutata</i>	<i>Plusia pulchrina</i>
<i>E. pumilata</i>	<i>Nyssia zonaria (our most</i>

important capture). My brothers, in company with our friend

Mr. J. N. Milne, took a number of larvæ of this species on sand-hills on the Antrim coast. That a species so local in England—a species the females of which are apterous—should be found in such a locality is certainly a most interesting fact. We have since succeeded in forcing two or three of the pupæ, and have thus made sure of the identity of the species; and there is no appreciable difference between the specimens we have bred and the ordinary English types.

In July, in addition to species already mentioned, we took larvæ of—

Demas coryli	Cymatophora flavicornis
Amphydasis betularia	Celæna haworthii
Eupithecia venosata	Hydrœcia nictitans
Cidaria miata	Anarta myrtilli.
Dicranura vinula	

Imagines of—

Satyrus semele	Cidaria prunata
Argynnis aglaia	C. populata
Nudaria mundana	C. testata
Ellopia fasciaria	C. comitata
Cleora lichenaria	Eubolia mensuraria
Venusia cambricaria	Anaitis plagiata
Acidalia scutulata	Thyatira derasa
A. inornata	Miana arcuosa
Emmelesia alchemillata	Abrostola triplasia
Eupithecia centaureata	Plusia chrysitis
Melanthia albicillata	P. festucæ.
Coremia minutata	

Noctuæ were to be found in great abundance during this month at the flowers of various grasses. Sugar was tried on several occasions, but without success.

In August we took larvæ of *Macroglossa stellatarum*, *Smerinthus populi*, *Dicranura furcula*, *Notodonta camelina*, and *Hadena pisi*. Imagines of—

Crocallis elinguaris	Agrotis tritici
Selenia illunaria	A. aquilina
Melanthia rubiginata	A. obelisca
Leucania littoralis	A. vallygera
Hydrœcia micacea	A. præcox
Charæas graminis	A. cursoria
Apamea fibrosa	Noctua glareosa
Celæna haworthii	N. umbrosa
Miana literosa	Polia chi
Caradrina alsines	Amphipyra tragopogonis.

All the Noctuæ above mentioned, *P. chi* and *C. haworthii* excepted, and a number of other species, were taken at ragwort. There is no other plant nearly so attractive as ragwort in this locality. We have, during the last few years, taken at least sixty species at its flowers.

Many of the August insects continued to be taken in September. In addition we took larvæ of—

<i>Orgyia antiqua</i>	<i>Notodonta dictæa</i>
<i>Bombyx rubi</i>	<i>N. dictæoides</i>
<i>Platypteryx lacertula</i>	<i>Agrotis porphyrea.</i>

Imagines of *Orgyia antiqua*, *Agrotis agathina*, and *Xanthia ferruginea*.

During October and November, owing to the inclemency of the weather, we did very little entomological work; ivy was a complete failure.

<i>Cidaria miata</i>	<i>Orthosia macilenta</i>
<i>Agrotis suffusa</i>	<i>O. lota</i>
<i>A. saucia</i>	<i>Anchocelis pistacina,</i>

usually pretty common, did not put in an appearance; only a few

<i>Cerastis vaccinii</i>	<i>Calocampa vetusta</i>
<i>Scopelosoma satellitia</i>	<i>C. exoleta</i>

were seen. A few larvæ of *Acronycta psi*, and some pupæ of *Notodonta dromedarius*, *N. ziczac*, and *Amphydasis betularia* were our only other captures during these months.

Ballynagard House, Londonderry, Jan. 2, 1884.

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DESCRIPTION OF A *PIERIS* NEW TO SCIENCE—  
*PIERIS SPILLERI*, MIHI.

BY A. J. SPILLER.

*Male*.—Expanse of wing 1" 8''; apex of anterior wings produced; posterior wings rounded. Upper side: All the wings bright canary-yellow, perfectly spotless, with the exceptions that the apex and a small portion of the costal and inner margin are dusted with black. Under side: Canary-yellow, unspotted.

*Female*.—Expanse of wing 1" 7''; apex of anterior wings not so pointed as in the male; posterior wings rounded; colour and markings similar to male. Under side: Anterior wings canary-yellow; costal and hind margins orange-yellow; posterior

wings dull orange-yellow, with row of four indistinct gray spots parallel to rounded hind margin.

Described from twelve specimens taken in Natal, six of which are in my own collection, and the remainder in the possession of Dr. Staudinger.

This species was captured by me in 1881, and would have been described prior to this had I not deferred in order to be certain that it had not previously been described. As the insect is not in the Cape or British Museum Collections, and is unknown to collectors of exotic insects who have examined it, and as Dr. Staudinger has pronounced it to be a new and interesting species, I beg therefore to name it after myself.

This species is evidently very rare in Natal; its flight is rapid and cannot be confounded with the similarly-coloured species of the genus *Terias*, these latter insects being feeble flyers.

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#### ENTOMOLOGICAL NOTES, CAPTURES, &c.

COLLECTING DURING 1883 SOUTH OF LONDON.—Most Macro-Lepidoptera have been decidedly scarce during the past season in and around this locality, many species appearing on the wing much behind their usual time. The following are some of the captures and notes made by me during the season:—*Brephos parthenias* was not fully out till April, and then much less numerous than usual. On June 30th I took a very fresh female *Anthocharis cardamines*, from its condition apparently only just emerged (the earliest I have taken this species is April 25th,—1880, a male). A female *Satyrus tithonus*, but worn, on September 14th. Other insects which put in a late appearance were *Metrocampa margaritaria*, in perfect condition, August 13th; *Ennomos tiliaria*, perfect, October 7th; and *Catocala nupta*, just out, September 28th. *Argynnis euphrosyne* I did not notice out until May 23rd, when they appeared somewhat abundantly. *Acidalia aversata* and *A. remutata* were unusually abundant during June, July, and August; some I took were of quite a tawny hue. June 30th, I obtained by beating yew trees several *Larentia pectinaria* and *Melanippe procellata*; also *M. unangulata* and *Phibalapteryx tersata*. I also took *Dianthæcia conspersa*, *Cucullia umbratica*, *Miana fasciuncula* at rest, and *Asthena*

*luteata*, on the same day. *Phorodesma bajularia* were flying very abundantly between seven and eight o'clock p.m., July 5th, when I succeeded in netting six fine specimens, but most of them were flying out of reach; I never before saw them so numerous at one time: this was at West Wickham. I also caught during the same month *Ellopiia fasciaria*, *Macaria liturata*, *Fidonia piniaria*; for the latter, Newman gives April and May as time of appearance, but I have generally found it most abundant about the third week in June. Also, during July, *Acidalia emarginata* and one female *Apatura iris*, taken on the wing, near Chatham; and *Pachynemina hippocastanaria* on August 13th. *Vanessa atalanta* was very plentiful during September and October. *V. cardui* was fairly common, and I took five in perfect condition on September 23rd, and noticed a great number of hibernated specimens during May and June. I did not try "sugaring" until the second week in October, when I then took on one evening *Amphipyra pyramidea*, *Scopelosoma satellitia*, *Miselia oxyacanthæ*, *Cerastis vaccinii*, *Anchocelis pistacina*, and *Xanthia ferruginea*; *Orthosia lota* on the 9th and 13th. *C. vaccinii* and *A. pistacina* were very abundant on most evenings at "sugar," and also at ivy bloom. During the same month, at gas-lamps, I took *Cidaria miata*, *Eubolia cervinaria*, and *E. tiliaria*, on the same evening; and a good series of *Hybernia defoliaria* on the 30th and 31st, including a very dark variety. I did not see one *V. io* during the whole season. The long row of palings surrounding part of Addington Park, on the West Wickham side, usually so productive of various moths, was quite a failure all through the season, as I searched them many times without any good result. On four occasions I searched them at seven o'clock a.m., in August and September, and not a lepidopterous insect was to be found.—FRED. W. FROHAWK; Upper Norwood, S.E., December 15, 1883.

HUNTINGDONSHIRE DIURNI. — The list of Huntingdonshire butterflies in the 'Entomologists' Monthly Magazine,' contained the names only of those species caught by myself within 1882-3, numbering forty-two. Mr. J. Jenner Weir having referred to the list, and given such an excellent one from Sussex, I should like to add those species which were omitted, but yet are authentic captures:—43 *Papilio machaon*, 44 *Argynnis lathonia*, 45 *Polyommatus hippothöe*, 46 *Melitæa artemis*, 47 *Vanessa c-album*, 48 *Satyrus semele*, 49 *Vanessa antiopa?*, 50 *Aporia cratægi*, 51



*Lycæna agestis*, 52 *L. alsus*, 53 *L. argiolus*, 54 *L. arion* (Newman's 'Butterflies,' p. 140.) This brings the total to fifty-two, or ten more, excluding *Hippothöe* and *Antiopa*. The reason I asked entomologists for their county lists was to compare numbers and kinds as to local distribution. The use is evident. Will those friends who intend to forward lists kindly do so as quickly as possible?—HERBERT E. NORRIS; St. Ives, Hunts, Feb. 7, 1884.

ABNORMAL EMERGENCE OF CHELONIA CAJA.—It may be interesting to the readers of the 'Entomologist' to know that I have just had three *Chelonia caja* emerge from the pupæ, one male and two females. They pupated in October, and are fine specimens. I have not in any way forced them; and the females have already laid about seventy eggs. I have also had *Attacus luna* emerge this month.—J. M. CLISSOLD; 23, Victoria Square, Clifton, December 15, 1883.

ABNORMAL EMERGENCE OF NOCTUA AUGUR.—On November 26th I was much astonished at the appearance of a moth in one of my breeding-cages; as I had not been breeding any insects which should emerge in the autumn, I had no reason to expect any apparition. It proved to be a small specimen of the above-named moth; and in the same box I also discovered a good many pupæ of the same species. The larvæ were bred from eggs in June; and having been kept out of doors I expected that they would hibernate in the usual way. I should be glad to know if such a thing occurs commonly.—C. S. BOUTTELL; 3, Chestnut Villas, Forest Gate, Essex, December 4, 1883.

REARING LARVÆ OF TÆNIOCAMPA OPIMA.—The great difficulty experienced in rearing this species from the ova by Mr. Walpole (Entom. xvii. p. 43), leads me to believe that a description of the method by which I have successfully reared *T. opima* to the pupal state may be interesting to some of the readers of the 'Entomologist.' On May 8th, 1883, I received a batch of eggs from New Brighton, Cheshire. I at once put them in a glass-top box, which I placed on my table to be examined every morning. On May 10th three or four larvæ hatched, which were semi-transparent and greyish, with the head and anterior segments darker. On May 11th all the eggs, between two and three hundred in number, hatched. I then procured a wide-mouthed, white-glass bottle, in which I placed some young shoots of willow

and saw. I then removed the lid of the glass-top box, and turned box, lid, and newly-hatched larvæ into the glass bottle, and closed the mouth with a cork. In removing the lid a few larvæ may be crushed, but this is unavoidable. On May 19th I changed the bottle for a larger one, but still on the air-tight principle. In removing the larvæ I do not touch them, but introducing a sprig of fresh food they gradually crawl on to the new leaves, and I remove the leaves and larvæ to bottle No. 2.; this has to be repeated till all the larvæ are removed. Great care must be taken not to place the food in when *damp*; the leaves should be gathered, if possible, in the sun, and if compelled to gather them in the damp they should be dried with a cloth before admitting them into the cage. On May 24th I replenished their food; their size was rapidly increasing, and they had twice moulted, and spun the leaves together after the manner of a *Tortrix*. When I found they had attained too large a size to be fed by the air-tight process, I procured a number of jam-pots, and placed about a dozen larvæ in each, with some sandy earth at the bottom for them to burrow in. I then placed in the food-plant and covered the pot with a piece of glass. When they became full-fed I either limited the number of larvæ or procured larger pots—always increasing the depth of earth for their pupation. Nearly all my larvæ grew to perfection, showing many beautiful varieties. I do not think I lost more than two or three dozen, which were killed by accident when changing their food. I have now a dozen jam-pots containing numerous pupæ. So far I have been successful. The number of imagines that will emerge is of course a matter of great uncertainty. The great advantage of this method is, firstly, the food-plant keeps fresh for some days, preventing the continual disturbance to young larvæ caused by frequently introducing fresh food; secondly, they are warmer and free from draught and sudden change of temperature. One thing is always to be remembered, *never* place them in the sun, or in a very hot place, as the moisture which would collect in the bottle would drown small larvæ. I am afraid many will think these notes superfluous, as this method is not original, but has been mentioned in 'Knagg's Guide'; and Mr. Stainton recommended, in the pages of the 'Entomologists' Companion,' glass cylinders and jam-pots, as many years ago as 1852. While writing this, a fine *Tæniocampa*

*opima* has emerged from one of the chrysalids.—C. G. HALL; 3, Granville Road, Deal, February 10, 1884.

EARLY SPRING LEPIDOPTERA.—I have already on my setting-boards a long series of varieties of *Hybernia leucophearia* and several *Nyssia hispidaria* taken in Richmond Park, Surrey. The former were taken in January, and the latter in the second week in February.—JOHN T. CARRINGTON.

LAPHYGMA EXIGUA.—On the 28th of last September I took a specimen of this little Noctua at light, at Romsey, Hants.—EDWARD BUCKELL; 32, Gibson Square, N., February, 1884.

HYMENOPTEROUS PARASITES OF LEPIDOPTERA.—The following list is uniform with those previously published. The names printed in small capitals refer to species which are not included in Marshall's Ent. Soc. Catalogue (1872). There are some specimens, which require further examination, that correspondents will not find mentioned in this list, but they are not forgotten; and I take this opportunity of thanking all who have kindly saved for me any of the parasites they have bred. These have been found useful to fellow-workers and to myself, and will materially help to extend the knowledge of our Ichneumon fauna.

*Trogus lutorius*, F., from *Sphinx ligustri* (G. T. Baker).

[ANISOBAS CEPHALOTES, Kriechb., from *Lycana iolas* (Baker); pupa from Hungary.]

*Eurylabus tristis*, Wesm., from *Dianthæcia capsincola* (G. H. Raynor).

*Platylabus rufus*, Wesm., from *Ypsipetes impluviata* (Raynor).

*Phæogenes melanogonus*, Gmel., from *Endopisa leplastriana* (G. Elisha).

*Cryptus obscurus*, Gr., from *Euchelia jacobææ* (Raynor).

*Agrypon flaveolatum*, Gr., from *Eupithecia pumilata*, *Ypsipetes impluviata* (Raynor).

PANISCUS FUSCICORNIS, Holmgr.?, piercing larva of *Lithostege nivearia* (Raynor).

*Campoplex mixtus*, Gr., from *Notodonta camelina* (J. A. Osborne).

*Casinarina vidua*, Gr., from *Abraxas grossulariata* (Raynor).

*Limneria chrysosticta*, Gr., from *Yponomeuta padella* (Raynor).

L. ELISHÆ, Bridgm., n. s., from *Ornix scoticella* or *Nepticula aucuparia* (Elisha).

L. *exareolata*, Ratz., from *Lithocolletis ulmifoliella* (Elisha).

L. *geniculata*, Gr., from *Depressaria heracliana* (Elisha).

L. INTERRUPTA, Holmgr., from *Phtheochroa rugosana* (Elisha).

L. *mutabilis*, Holmgr., from *Ephippiphora scutulana* or *E. pflugiana* (Elisha).

- L. VIRGINALIS, Gr., from *Endopisa leplastriana*, *Gracilaria stigmatella* (Elisha).
- Exetastes nigripes*, Gr., from *Hadena oleracea* (Osborne).
- E. n. ? s.*, from *Hadena pisi* or *Acronycta psi* (Baker).
- Exochus mansuetor*, Gr., from *Tortrix* on willow (E. A. F.).
- Pimpla instigator*, F., from *Triphæna fimbria* (Elisha).
- P. scanica*, Vill., from *Eurymene dolobraria*, *Endopisa leplastriana*, *Lithocolletis cavella* (Elisha).
- P. graminellæ*, Schr., from *Ephippiphora scutulana* or *E. pflugiana* (Elisha).
- Glypta vulnerator*, Gr. ?, from *Semasia rufillana* (Elisha).
- Bracon minutator*, F., from *Argyrolepis zephyrana* (Elisha).
- Colastes braconius*, Hal., from *Lithocolletis quercifoliella*, *L. lantanella* (Elisha).
- ASCOGASTER RUFIDENS, Wesm., from *Hybernia defoliaria*, *Tortrix* (C. G. Bignell).
- Acalius germanus*, Hal., from *Ornix scoticella* or *Nepticula aucuparia*, *Lithocolletis schreberella* (Elisha).
- APANTELES TETRICUS, Rhd., from *Satyrus janira* (Bignell).
- A. ruficus*, Hal., from *Agrotis præcox*? (G. T. Porritt).
- A. PERSPICUUS, Nees, from *Leucania litoralis* (Bignell); *L. pallens* (Raynor).
- A. glomeratus*, L., from *Phigalia pilosaria* (Bignell).
- A. brevicornis*, Wesm. (= *placidus*, Hal.), from *Tæniocampa miniosa* (Bignell).
- A. SPURIUS, Wesm., from *Vanessa urticæ*, *Arctia caja*, *Leucania litoralis* (Bignell).
- A. juniperatæ*, Bouché, from *Hybernia progemma*, *Cheimatobia brumata*, *Dianthæcia cucubali* (Bignell).
- A. LONGICAUDA, Wesm., from *Solenobia inconspicua* (C. J. Boden).
- A. FRATERNUS, Rhd., from *Aspilates citraria* (Bignell).
- A. bicolor*, Ns., from *Lithocolletis lantanella*, *L. lantella* (Elisha).
- A. vitripennis*, Curt., from *Diloba cæruleocephala*, *Miselia oxyacanthæ*, *Amphipyra pyramidea* (Bignell).
- A. fulvipes*, Hal., from *Xylina rhizolitha*, *Catocala nupta* (Bignell).
- A. NOTHUS, Rhd., n. s., from *Arctia menthastri*, *Anticlea badiata*, *Tethea retusa*, ? *Satyrus janira* (Bignell).
- MICROPLITIS FUMIPENNIS, Ratz., from *Tæniocampa miniosa* (Bignell).
- M. MEDIANUS, Rthe., from *Cerastis spudicea* (Bignell).
- Microgaster flavipes*, Hal., from *Boarmia repandata* (J. A. Cooper).
- THEROPHILUS NUGAX, Rhd., from *Eupæcilia roseana* (Elisha).
- T. tumidulus*, Ns., from *Semasia rufillana*, *Depressaria atomella* (Elisha).

*Perilitus scutellator*, Ns. from *Scopelosoma satellitia* (Hellins, Bignell).

*P. deceptor*, Wesm., from *Crocallis elinguarua* (Bignell).

*P. PULCHRICORNIS*, Wesm., from *Hybernia leucophearia*, *Anisopteryx æscularia*, *Cheimatobia brumata*, *Oporabia dilutata*, *Harpella geoffrella* (Bignell).

*Macrocentrus linearis*, Nees (var. *pallipes*), from *Depressaria alstræmeriella* (Elisha).

*Monodontomerus æreus*, Wlk., from *Homæosoma* sp. (Porritt).

*Eulophus ramicornis*, Geof., from *Cosmia trapezina* (R. M. Sotheby).

—EDWARD A. FITCH; Maldon, Essex.

ICHNEUMONS AND THEIR HOSTS.—The following list of Ichneumons, bred this year by one entomologist, plainly shows how much very valuable material is annually lost in this country where so many Lepidoptera are bred. The insects were bred by Mr. W. H. B. Fletcher, of Worthing, who not only saved them, but also very kindly has given me all the specimens, and for which I am deeply indebted to him. Amongst them are several which appear undescribed, whilst others are new to Britain; from *D. heracliana* was bred *Pimpla spuria*, Gr., noticed a short time ago in this Journal (Entom. xvi. 251). Since that notice appeared I have received two more males; these also have black coxæ. This insect might easily have the sexes separated, and most probably has in some collections, the male being mixed up with *P. examiner* and the female with *P. turionellæ*.\* From the same host was bred an Ichneumon which comes very near *I. gasterator*, Steph.; but Mr. Fitch has compared it with the two specimens in the British Museum, and says it is not that species. If that is the case, then I believe it is a new one. Two of the *Hemiteles* I recently described have also been bred: *H. incisus*, of which both sexes were bred, the male only is described; and *H. marginatus*, from *Chrysocorys festaliella*. A new species of *Anomalon* was bred, it is not more than half the size of anything yet described; and also a little *Tryphon*, of about 3 mm. in length, which, I believe, is also new: I am at a loss to know into what genus to put it. A *Limneria*, which I believe to be *L. cylindrica*, Brischke, is new to Britain; and both sexes of *L. dispar*, Gr.?, the female of which is undescribed. From *Gelechia notatella* was bred a small *Exochus*, which certainly is

\* Since the above was in print Professor C. G. Thomson, to whom I sent the insect, has written me that it is certainly his *P. strigipleuris*.

not described by Holmgren or Gravenhorst, and which I believe to be a new species. From *Eupæcilia udana*, taken at Wicken Fen, *Glypta pedata*, one of Desvignes' species, was bred. I am indebted to my friend Mr. E. A. Fitch for the names and following notes on the *Braconidæ*, for although I collect all I meet with I have not yet had time to study that group. *Rhogas irregularis*, Wesm., is not included in Marshall's catalogue, but is not by any means rare in Britain; two specimens bred from *A. unanimitis*. The green cocoons of *Microplitis spectabilis* ex *Luperina cespitis* are very distinct. *Therophilus clauthalianus*, Ratz., is larger than *T. tumidulus*, and doubtless a good species; it was named after *Penthina hercyniana* (*clauthaliana*, Ratz.) from which it was bred by Herr Saxesen. There are one or two Microgasterids still to determine. Altogether this collection of Ichneumonids contains more novelties than any similar quantity I have ever received.

*Ichneumon* n. ? s., from *Depressaria heracliana*.

*I. lepidus*, Gr., from *Depressaria heracliana*.

*Hypomecus albitarsis*, Wesm., from *Ephyra punctaria*.

PHŒOGENES CICUTELLA, Sieb., from *Orthotalia sparganella*.

*Mesostenus obnoxius*, Gr., from *Zygæna filipendulæ*.

*Hemiteles areator*, Pz., from *Coleophora fuscadinella*.

H. MARGINATUS, Bridgm., from *Ephyra orbicularia*.

H. INCISUS, Bridgm., male and female, from *Laverna epilobiella*.

*Hemimachus instabilis*, Foerst., from *Laverna epilobiella*.

*Anomalon* n. ? s., from *Chrysocorys festaliella*.

*Paniscus testaceus*, Gr., from *Nonagria geminipuncta*; *Dicranura vinula*.

P. TARSATUS, Brischke, from *Eupithecia vulgata*.

*Limmeria dispar*, Gr., male and female?, from *Coleophora genistæcolella*;

*C. albitarsella*.

*L. tibialis*, Gr., from *Coleophora gryphipennella*.

L. CYLINDRICA, Brischke, from *Gelechia inopella*.

*L. sp. ?*, from *Depressaria chærophylli*.

*L. rufipes*, Gr., from *Laverna epilobiella*.

*L. sp. ?*, from *Gonepteryx rhamni*.

L. MOLESTA, Gr. ?, from *Ephippiphora scutulana*.

*L. uncinata*, Gr., from *Acronycta alni*.

*L. sordida*, Gr., from *Lycæna alsus*.

L. VIRGINALIS, Gr., from *Gracilaria stigmatella*.

L. CONCINNA, Holmgr., from *Gelechia notatella*.

*L. transfuga*, Gr., ? var., scape black beneath, from *Tischeria emyella*.

L. INTERRUPTA, Holmgr., from *Eupæcilia udana*.

*Mesochorus vitticollis*, Holmgr., *Chrysocorys festaliella*.

*M. confusus*, Holmgr., from *Lycæna alsus*.

Tryphonid gen.?, from *Chrysocorys festaliella*.

*Exochus flavomarginatus*, Holmgr., from *Eudorea truncicolella*.

E. n.? s., from *Gelechia notatella*.

PIMPLA STRIGIPLEURIS, Thoms., from *Depressaria heracliana*.

*P. graminellæ*, Schr., from *Clostera reclusa*.

*P. sp.*?, from *Ephippiphora scutulana*.

*P. nucum*, Ratz., from *Gelechia anthyllidella*; *G. inopella*; *Laverna epilobiella*.

*Glypta consimilis*, Holmgr., from *Ephippiphora scutulana*.

*G. pedata*, Desv., from *Eupœcilia udana*.

*Lissonota impressor*, Gr., from *Luperina testacea*.

RHOOGAS IRREGULARIS, Wesm., from *Apamea unanimitis*.

*Chelonus sulcatus*, Jur., from *Eudorea truncicolella*.

APANTELES TENEBROSUS, Wesm., from *Gelechia* on *Atriplex*.

*A. viminetorum*, Wesm., from *Gelechia instabilella*.

*A. lacteus*, Nees, from *Gelechia inopella*; *Swammerdamia pyrella*?

*A. spurius*, Wesm., from *Ephyra orbicularia*.

*A. nigriventris*, Nees?, from *Notodonta dromedarius*.

*A. bicolor*, Nees, from *Lithocolletis spinicolella*.

*A. fuliginosus*, Wesm., from *Gelechia instabilella*.

*A. lateralis*, Hal.?, from *Simæthis fabriciana*.

*A. pallipes*, Rhd., from *Plusia gamma*.

*Microplitis spectabilis*, Hul., from *Luperina cespitis*.

*Orgilus obscurator*, Nees, from *Coleophora niveicostella*.

*Therophilus cingulipes*, Nees, from *Cochylis francillana*; *Chauliodus daucellus*; *Gelechia anthyllidella*.

*T. tumidulus*, Nees, from *Gelechia inopella*.

*T. clauthalianus*, Ratz., from *Ephippiphora scutulana*.

PERILITUS PULCHRICORNIS, Wesm., from *Eudorea truncicolella*.

*P. ictericus*, Nees, from *Gelechia costella*?

—JOHN B. BRIDGMAN; 69, St. Giles Street, Norwich.

PHYSIANTHUS ALBENS, AN INSECTIVOROUS PLANT.—There is a beautiful house, just under Table Mountain, with a fine garden, and at the entrance is an old stone wall covered with a singular creeper,—*Physianthus albens*. It was in blossom with highly-scented white flowers, but there is something most singular about it; the flowers are from an inch to an inch and a half long, and at the inside base the corolla is inflated and glutinous. Butterflies and moths are attracted, but no sooner do they insert the proboscis than they are caught, and cannot withdraw

it. All the small butterflies are soon closed over by the petals, which form their shroud. What astonished me most was to see moths two inches long fixed fluttering for hours quite unable to withdraw the proboscis. I extract the above remarks from a letter received from my uncle,—a fine old sportsman and naturalist, who resides in South Africa,—thinking they may interest your readers.—CLARENCE E. FRY; Watford, Feb., 1884.

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### REVIEW.

*Butterflies of Europe.* By H. C. LANG, M.D., F.L.S. Part XVII.  
London: Lovell Reeve & Co., Covent Garden.

THIS, the last part issued of Dr. Lang's very valuable work, is quite up to the standard of the best parts already published. It contains the continuation of the Satyridæ, and includes the genera *Erebia*, *Æneis*, and *Satyrus*. The coloured plates illustrating these confusing genera will be found most useful, on account of their accuracy. We understand that three or four more parts will complete the work, which will have the honour of being the first ever written to give collected figures arranged seriatim of all European butterflies; and will be undoubtedly the best book on the subject that has appeared since Herrich-Schäffer's 'Schmetterlinge von Europa.' In the latter work the plates are hand-coloured in the finest manner, which made the cost of its purchase beyond the means of most persons who take an interest in this subject; but in the case of Dr. Lang's work, chromo-lithography has furnished a sufficiently good text-book for all ordinary purposes.

Besides providing figures and descriptions of every strictly European species, the author has briefly described the remaining palæarctic species known up to the present date. Added, are short notices at the end of each family of such North-American forms as are most nearly allied to those of the palæarctic region, thus rendering the book very complete.

Before closing this notice, mention should be made of the excellently careful work of Mr. Horace Knight, for the firm of West, Newman & Co., who has drawn from nature all the figures of the species represented.—J. T. C.



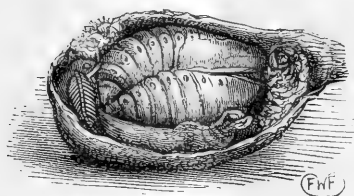
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## *SATURNIA CARPINI.*



SATURNIA CARPINI.

IN the beginning of the year 1882 I received a few cocoons of *Saturnia carpini*, which all produced imagines in due course, excepting one, which I opened some time after to ascertain the cause, and was somewhat surprised by finding two male pupæ enclosed in it, lying side by side. From one the moth had emerged, but instead of making its exit through the usual aperture in the cocoon, it had somehow managed to turn round and make its way to the opposite end, where it was fixed and dead; its wings, however, were somewhat developed. Upon referring to the above woodcut the details of this unusual incident may be more clearly understood: at the two ends may be seen the skins of the respective larvæ, which is the more remarkable as both pupæ have their heads in one direction. Probably the skin at the aperture was the cause of the moth being unable to escape. It would have been interesting had the way in which the larvæ spun up been noted.

FRED. W. FROHAWK.

Upper Norwood, S.E., March 24, 1884.

ENTOM.—APRIL, 1884.

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## RHOPALOCERA OF CARLSBAD.

BY THE REV. WILLIAM BECHER.

IN the year 1883 my brother Captain Becher and myself spent three weeks at Carlsbad, from June 24th to July 12th. During this period we worked hard collecting the Rhopalocera of the neighbourhood.

The weather, with one or two exceptions, was all that could be desired, warm nights and hot sunny days prevailing; indeed an occasional rainy day enabled us to thoroughly overhaul our captures, and arrange them ready for our return to England.

The town of Carlsbad is very picturesquely situated in the valley of the Peipel, on either side of that river, close to its junction with the Eger. We found comfortable quarters at the "Duke of Edinburgh," in the Schloss-platz. Nearly opposite our lodgings are some of the springs for which the town of Carlsbad is so celebrated; indeed its prosperity is owing to the medicinal virtues of the waters, which in many places are hot. With these, however, we have nothing to do; rather let us turn to the peculiarities of the town from an entomologist's point of view.

The valley, roughly speaking, runs east and west, with high hills abruptly sloping down to the river. Here and there some hollow or projecting spurs lend variety to the landscape, and give promise of fruitful hunting-grounds; a promise very often unfulfilled, as every entomologist knows who has ever explored fresh districts.

The all-important question of the flora of Carlsbad is a very difficult one to answer. I should say there is a considerable variety, including many well-known friends; but when one comes to enumerate the trees the task is less formidable. Pine is the most common tree, forming woods of great extent, and furnishing the inhabitants with the greater part of their fuel for the winter. Here and there the sombre foliage is relieved by a silver birch, or an occasional row of acacia gives variety to the scene. Down by the river bank the alder is abundant, while the moisture-loving willow is far from uncommon. The oak does not appear to be much cultivated, and, except in the gardens or in the neighbourhood of the town, can seldom be dignified with any

other name than brushwood. The lime tree is common in the streets; while two species of poplar, horse-chestnut, ash, and beech may be occasionally met with. In addition to this the cultivation of rose trees, for the sale of the flowers, is an important item in the trade of Carlsbad.

Our total number of species captured was fifty-five; but I think if we had been able to converse fluently with the peasants we should most probably have added to our list. Even boys, who in England are such a nuisance, at Carlsbad are willing, as the following incident shows, to help, and do not expect reward. One day my brother found himself followed by a troop of children, who annoyed him by the persistence with which they watched him. He refrained, however, from telling them in forcible German to betake themselves elsewhere, and patiently endured their company. After a while one of them went away, and returned with a fine female specimen of *Limenitis populi*. How on earth the lad managed it I do not know, as we always found this a most difficult species to capture.

Perhaps before I give further particulars in my notes it would be as well to explain where some of the localities I refer to are situated, but it ought to be borne in mind that replanting and felling may completely alter the character of some of the localities referred to.

We found the neighbourhood of the cemetery very good ground, especially on the road which runs between the tall timber on the one hand and the younger trees on the other. I should think the distance from our lodging would be about two or three miles, but, owing to the precipitous nature of the sides of the valley, we had to go some way round. The cemetery is on the north side of the valley, quite out of sight of the town.

Our second ground was rather a more extensive one, but it may be said to be to the right and left of the paths through the woods leading to the Echo and St. Leonhardts. The best way of reaching this ground is from the western end of the town past the English church, past a little place called Klein Verseilles, straight up a valley with grass in the middle and wooded on each side. At the top of the hill is an open bit of ground with several piles of timber, and is a sure resort for *Argynnis lathonia*.

Our third, and I think best, ground we only discovered towards the end of our stay, and I am sure it would well repay

more careful working. The best part is about three miles from the Schloss-platz, along the road to Marienbad to the south-east; in fact the road follows the river, and if you walk up stream you cannot miss it. The best part begins just where another road branches off to the left towards a mill on the river, but you must keep straight on along the steep bank on the right. If the weather is fine you will soon be busy, for this is a locality where *Apatura iris*, *L. populi*, *Papilio machaon*, *Vanessa c-album*, *Argynnis paphia*, and many others may be found, either enjoying some muddy spot left from the last shower of rain, or flitting from flower to flower. The best time to begin is 11 a.m., as we found repeatedly that it was perfectly useless working one's ground before that hour.

I will now give a list of the species captured, and the following notes are intended to give shortly the date and locality. I have adopted Dr. Staudinger's nomenclature and classification:—

*Papilio machaon*.—I obtained one specimen on the Marienbad road on July 3rd, hovering over a flower of the common parsnip.

*Pieris napi*, *P. rapæ*, *P. brassicæ*.—The two former were abundant on and after July 9th; *P. brassicæ*, however, appeared in fair numbers on the 11th.

*Leucophasia sinapis* only put in an appearance twice about June 29th, when we captured two specimens.

Of *Thecla pruni* we saw and captured a few on June 29th, on the brambles growing on the road-side beyond the cemetery.

*T. rubi* also was in poor condition and rare on July 10th.

The genus *Polyommatus* was represented by no less than five species:—

*P. virgaurea*.—It would be difficult to name a suitable locality where the males of this beautiful species did not abound;—in the little valleys surrounded by sombre pines on the Marienbad road; in the forest glades he is alike at home, at one moment exploring the hidden sweets of some favourite flower, at another disturbed by your careless step he vanishes with the peculiar flight of his race, just allowing one glance of his brilliant hue. We observed the male in scanty but increasing numbers up to July 5th, after which he was very common. The females, on the contrary, were very rare, having caught but four; the first on June 26th, the last on July 12th. Whether the females emerge from the pupæ later on, or whether from less obtrusive habits and

colouring they escaped our notice, I am unable to say. But I do know that we searched most diligently, and considered it a red-letter day when one fell to our net.

*P. hippothöe* was very rare; we caught only three on and after June 25th.

*P. alciphron* was rather more numerous than the preceding, but difficult to obtain in good condition; however we managed a nice series. One rather marked variety occurred:—On the under side of the right wing the spots were of normal size, but on the left unusually large; on both hind wings the two upper spots of the inner submarginal row were very large and pear-shaped.

*P. phleas* occasionally put in an appearance, but nowhere in large numbers.

Of *P. dorilis* we only took one specimen.

The genus *Lycæna* was fairly well represented, for we took nine species; but the thrifty habits of the peasants sadly interfered with our success: just as the "blues" were most abundant they set to work to cut and make hay of the coarse grass on the road-side, thus effectually spoiling the locality. In spite of this drawback the Marienbad road yielded—

*L. argus*, *L. medon*, and *L. hylas*, the latter in fair abundance on July 10th.

On the 11th my brother took one fine specimen of *L. meleager*.

*L. amanda* was fairly plentiful, but in very bad condition.

We took a few good specimens of *L. ægon*, on and after July 4th, beyond the cemetery and on the path leading to the Echo.

*L. optilete* is a very local species, but in fair numbers where it does occur. The only place where we met with it was on the top of the hill to the right of the path, among the young pines. Instead of going straight on up the valley leading to the Echo we turned to the right, keeping Klein Verseilles on the left and a large sandpit on the right; after passing the sandpit the path bends rather to the left and runs along the crest of the hill. It is very curious that, although the food-plant, *Vaccinium oxyococcus*, is most abundant elsewhere, this was the only locality where *L. optilete* occurred. Good specimens were scarce, on account, I suppose, of the young pines.

*L. acis* = *L. semiargus*.—A very common insect from June

25th to July 2nd, when it appeared to be on the wane. Amongst the long grass, at the upper part of the valley leading to the Echo, it was particularly abundant. In some specimens we noticed a tendency to vary on the under side. A male we captured has on the left upper wing two spots, shaped like the figure 8, between the discoidal spots and the usual row of black spots. In the female the basal spot is sometimes absent, and there is a faint trace of a marginal row along the hind margin of the hind wing.

*L. arion* we found in two localities. We took a fair number of this beautiful insect, but it was by no means so plentiful as the preceding. The valley leading to the Echo and the cemetery, or rather the road a little beyond, divided the honours between them from July 9th to July 11th.

Of *Apatura iris* I caught two males,—one under the pine woods beyond the cemetery on July 9th, the other on the Marienbad road on July 11th. The mud on the road proving irresistible, I made an easy capture.

*Limenitis populi*.—We took six of this graceful species, but I think we must have seen seven or eight more. Like *A. iris* it is fond of damp situations, but in more sheltered places, such, for instance, as the junction of two or more paths, where the trees throw a net-work of light and shade upon the damp ground. Sometimes a more open spot is chosen, but nearly always under or in the shade of some overhanging bush or tree. The female is very difficult to get uninjured, as very often there is a large piece taken out of the hind wings. Probably the large size and conspicuous markings make her a tempting prize for any passing bird. Date of appearance from June 25th to July 11th. We took one specimen of the male variety, figured by Dr. Lang as var. *tremulæ*.

The *Vanessidæ* were not absent:—

*Vanessa urticæ* was first observed near the Echo on July 2nd, and gradually increased in numbers.

My brother took *V. c-album* at rest on a pine branch as early as June 29th, but evidently it had hibernated. After July 4th it occurred more frequently, especially on the Marienbad road; and I have no doubt would, later on, be an abundant species in that locality.

I observed the larva of *V. io* feeding with *V. urticæ* on the common nettle.

We saw but one *V. atalanta* on July 10th.

*V. cardui* was common during the whole of our stay, but in very poor condition.

*Melitæa didyma* was met with only once, and that in bad condition, on the Marienbad road, July 12th.

*M. athalia* was in great abundance everywhere between June 27th and July 3rd.

*M. dictynna*, a nearly allied species, which I think succeeds *M. athalia*, occurred, but not in such profusion. We took a dark form of the female.

*Argynnis selene* was first taken on June 25th. On June 27th it was a perfect pest in every open glade; but after July 3rd we seldom saw any but worn specimens. My brother took a curious variety, which I believe is very uncommon, and may be roughly described as follows:—On the upper side of the fore wings the three basal spots form an irregular blotch of black; next to this, on the costal margin, is an oblique discoidal spot, then a row of black spots crossing the wing, much greater in width than height. The outer row of brown spots are retained on the hind margin, but their black setting in some cases joins the row I mentioned above. Hind wings black, with outer marginal row of seven brown spots. On the under side the markings of the fore wings nearly correspond with the upper side. The hind wings are remarkable for their dusky ground, throwing out the silver spots, which are altogether abnormal. The hind margin has the usual brown spots.

On July 10th and 12th we took five of that pretty little insect, *A. dia*. The chief locality was a sheltered hollow, on the right hand of the Marienbad road, where a white bedstraw, or *Galium*, was in full bloom. I do not think anyone would pass it unnoticed. The best plan is to stand on the hill-side above, so as to be prepared to swoop down on one's prey; but if this species is missed the first time, the chances are she will have the best of it over broken ground.

*A. amathusia*.—We took only one specimen, near St. Leonhardts, a female, on July 7th, which was rather a pretty variety.

*A. ino* was hardly less abundant than *A. selene*, both of them appearing at very nearly the same time. It was first seen on June 29th. By July 3rd the flight was over, for we met only with worn specimens.

*A. lathonia* was common, but not abundant, and was difficult to get in really good condition. The males were greatly in excess of the females. The grass banks and paths which separate the fields, in fact any bit of short grass, was almost sure to yield one or two. I remember one exception, having taken within a few yards no less than five, one of which was the largest female I ever saw.

The males of *A. aglaia* were abundant from July 4th, while the females were comparatively rare, although later on they became more common. Localities, Marienbad road and cemetery.

*A. niobe*.—We secured a few specimens of this beautiful species on the Marienbad road, on July 10th; and the var. *eris* was to be met with about the same date in the same locality, as well as beyond the cemetery.

*A. adippe* corresponds with *A. aglaia* in locality, but rather later.

Of *A. paphia* I took one specimen near St. Leonhardts, and another near the Echo; but the best locality was the Marienbad road, just before and beyond the spot where I took *A. iris*. First seen July 7th; still in capital condition when we left.

*Melanargia galathea* was abundant round a pond near St. Leonhardts. It was first seen on June 30th in considerable numbers, also later, on the Marienbad road. We took one slight variety, with only three, instead of four, spots on the under side of the hind wing.

*Erebia medusa* was met with in fair numbers just beyond the cemetery, and to the left of St. Leonhardts.

*E. œme*.—One specimen only.

*Satyrus alcyone* was just coming out when we were leaving. I took three on the Marienbad road, July 12th.

*Pararge hiera* was fairly plentiful near the cemetery, though difficult to get in good condition. First seen June 25th, when the flight appeared to be getting over.

*P. ægeria* var. *ægerides* was observed on June 30th, but we never took one in good condition, nor saw the type, *P. ægeria*.

*Epinephele janira* was common everywhere.

*E. hyperanthus* was equally abundant. The most marked variety was a male with two spots on the under side of the fore wing.

*Cœnonympha iphis* was very common everywhere from June 25th.



*C. arcania* was fairly plentiful on the Marienbad road.

*C. davus* was not numerous.

A few specimens of *Syrichthus serratula* were taken on the Marienbad road, on July 10th.

*Hesperia linea* and *H. sylvanus* were very common in suitable localities; the first preferring the woods, the other the open country.

The Heterocera we never attempted to work, but observed the following:—*Sesia culiciformis*, *Procris statices*, *Zygæna minos*, *Z. trifolii*, *Z. filipendulæ*, *Euthemonia russula*, *Chelonia plantaginis*, *C. caja*, *Bombyx quercus*, *Boarmia repandata*, *B. abietaria*, *Melanippe albicillata*, *M. hastata*, *Anaitis plagiata*, and many others.

The climate of Carlsbad is subject to sudden and great variations of temperature, but we were exceptionally favoured.

The cost of living, lodging, &c., is moderate up to the middle of July; after that the English season begins, and everything costs about double.

I ought to mention that a friend told me that *Vanessa antiopa* may be taken at Carlsbad occasionally.

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## ON THE METHODIC HABITS OF INSECTS WHEN VISITING FLOWERS.

BY ROBERT MILLER CHRISTY.

[IT having been thought desirable that the readers of the 'Entomologist' should be provided with a summary of the conclusions arrived at as the results of my somewhat lengthy observations on this subject, which have already appeared, I have pleasure in publishing the following remarks, which are extracted from a paper of mine, read before the Linnean Society on March 1st, 1883, and published in the Society's Journal ('Zoology,' vol. xvii., p. 186). As the details of my observations have already been given so fully, it has not been thought necessary to reproduce the tables published by the Linnean Society, in order to show more clearly at a glance the result of the observations, although the following remarks are, to some

extent, an examination of these tables, which show the number of species visited by each insect, the number of visits paid to each of these species, the total number of visits paid to flowers whilst the insect was in view, the order in which the species were visited, the colour of their flowers, and the number of visits paid consecutively to each species.]

The perusal, in 1881, of Mr. A. W. Bennett's paper, "On the Constancy of Insects in their Visits to Flowers,"\* first led me to pay attention to the matter; and I hope that my altogether independent observations will be found to supplement and corroborate his. Throughout all my observations I have endeavoured to adopt a method of procedure precisely identical with that described by Mr. Bennett. I regret that some of my earlier observations were not made so systematically as the later ones, and that I have been unable to distinguish between nearly all of the various species of humble-bee and between some of the species of plants. Altogether I am able to record the movements of 76 insects whilst engaged in visiting at least 2400 flowers.

No one, I think, who takes the trouble to wade through the details will deny that there is apparent in very many, if not in most of them, some powerful influence at work which induces insects, where possible, to continue visiting for a considerable time continuously the flowers of the same species of plant, neglecting meanwhile all other sorts. Of course it is utterly impossible to say (without perhaps a microscopical examination of the pollen a bee brings home) whether one insect on one flight from its hive or nest confines itself exclusively or principally to one species of plant; but, according to my observations, there seems to be great probability of its so doing.

So far as Table I. goes, it will be seen that the hive-bee is *perfectly* methodic in its habits; and it seems therefore to follow that this is the most valuable species to plants, and is also probably, on account of its methodic habits, enabled to get through the most work. Both my observations on this point and Mr. Bennett's lead to almost exactly the same conclusion.†

\* Read before the York Meeting of the British Association, 1881.

† Since the foregoing was written, however, I have observed a hive-bee that was not perfectly methodic. Near Saffron Walden I saw one visit *Anemone nemorosa* 1, *Ranunculus ficaria* 1, *Anemone nemorosa* 1, and *Ranunculus ficaria* again once, and

It would be interesting to ascertain whether the Ligurian bee or Mr. Blow's newly-introduced Cyprian bee, both of which are said to be more productive than our common hive-bee, are equally methodic—they could hardly be more so. Eight insects which I watched visited altogether eight species of flowers 258 times, or an average of about 32 flowers each. This species of bee is so perfectly methodic, that when I have carefully watched (as in observations No. 26 and 29) a number of individuals visiting frequently a variety of different flowers growing together, I have never yet been able to see a hive-bee change one species of flower for another; on the contrary, as in my best observation (No. 32), I have often seen flowers of another species, although often of the same colour, obviously rejected.

Table II. (Lepidoptera) shows a considerably greater degree of constancy than it would have done, judging from Mr. Bennett's observations, had I watched a larger number of species. In this class Mr. Bennett and I have, with two exceptions, observed different species. As it is, 12 individuals which I have had under observation have visited 99 flowers belonging to 15 species; but 94 of these flowers belonged to 12 species.

Table III. shows a fairly high degree of constancy or method on the part of the humble-bees, as 46 insects, of whose movements I have exact details, visited 1751 flowers belonging to 74 species; but 1605 of these flowers belonged to 46 species, 1733 belonged to 65 species, 1745 belonged to 70 species, and 1750 belonged to 73 species. Taking all my 55 observations together, it will be seen that one insect visited, whilst kept in sight, no less than 5 species of flower, 3 visited 4 species, 4 visited 3 species, 18 visited 2 species, whilst 29 (or rather more than half) visited one species only.

It will be observed that most of my observations have been made upon bees, which seem to me to perform the fertilization of at least one-half of all the flowers which are fertilized by insects in this country. As to butterflies I have seldom seen one whose

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it was then lost. The only other flower out around was *Primula vulgaris*. This was very early in the spring (April 6th), at which time, as in the autumn, as I have now reason to believe, bees are less systematic than at other times. The season this year, at the date named, was exceedingly unfavourable for bees, and very few flowers were out.

flight gave me the idea that the insect had the least notion as to where it was going. Generally their movements seem purposeless. Nevertheless some species, including the Fritillaries, are fairly methodic. Among the high Alps of the Canton Grisons, however, where some of my observations have been made, there are very few bees when compared with what we have in England, whilst the number of butterflies and moths is so great that it hardly bears comparison with the number here. I presume, therefore, that a large number of plants growing on the Alps are fertilized by Lepidoptera, although I have only a very few observations to that effect, as insects of this class are most difficult and unsatisfactory to watch.

We have now seen that insects do possess a decided preference for a number of successive visits to the same species of flower, although this is not invariably the case. It is quite needless here to treat of the great importance of this fact to the plants themselves, or of the numerous variations and modifications of colour, form, scent, and other particulars which the plants appear to have effected in their flowers with a view of inducing the insects to be thus methodic in their habits. I cannot doubt that Mr. Darwin is right when, in speaking of the probable reasons why insects are methodic, he says ('Cross- and Self-fertilization of Flowers,' p. 419):—"The cause probably lies in the insects being thus enabled to work quicker; they have just learnt how to stand in the best position on the flower, and how far and in what direction to insert their proboscides. They act on the same principle as does an artificer who has to make half a dozen engines, and who saves time by making consecutively each wheel and part for all of them."

Although so little is really known as to the sight of insects, Sir John Lubbock's observations have satisfactorily established the fact that bees can distinguish some at least of the colours, and that they show a preference for *blue*. Colour, however, is not the only sense which guides insects from one flower to another of the same species, although I believe it largely does so. Some other sense must have been called into use in observation No. 43, where a small humble-bee visited 15 flowers of *Digitalis purpurea*, some being white and others coloured; in observation No. 57, where a specimen of *Pieris brassicæ* visited flowers of *Geranium* which were both scarlet and pink; and in observation

No. 48, where a small humble-bee visited many times both red and white flowers of the same species of *Trifolium*. It is just possible that in these cases a sense of smell may have assisted.

During my observations on bees I have come to the conclusion that they have a *good* sight for short distances, but a *poor* sight for long distances. Often when visiting small flowers growing many on a plant, I have seen a bee reach out and, pulling down the next nearest flower, insert its proboscis. Their general movements whilst actually visiting flowers lead me to the belief that they see precisely what they are doing whilst so engaged. But if a bee be watched whilst not in the act of visiting a flower, its movements will be seen, I think, to be different. A bee seldom flies straightly and directly from one flower to another unless the second be very near the first, or so conspicuous that the bee can hardly help seeing it. On the contrary, a bee generally goes prowling about over the leaves, grass, or herbage with an irregular zigzag line of flight until it comes within sight of a flower belonging to the species of which it is in search. Then, too, a bee which is being watched will generally allow anyone to approach it closely, provided this be done steadily and quietly; but if approached roughly or quickly the bee flies off at once.

In opposition, however, to what has been already advanced as to the methodic habit of bees, I have several facts to bring forward. Bees very often do not seem to be at all systematic as to the number of times they visit the same flower, but often visit a flower more than once, as stated in observations Nos. 3, 21, and 43, but especially in No. 10. In No. 20 I even caused several heads of *Scabiosa succisa* to be twice visited by picking and again presenting them to the bee. My earlier observations, which were made in the autumn of 1881, seem to show that bees are less methodic at that time of year than in spring and summer, when many of my later observations were made, probably because there are fewer flowers then out. It is said that bees are unable to distinguish between some closely-allied species of flowers, such as *Ranunculus bulbosus*, *R. acris* and *R. repens*, and *Trifolium fragiferum* and *T. repens* ('Cross- and Self-fertilization of Flowers,' p. 416); and it is very possible that hybrids are thus formed, as in the genera *Verbascum* and *Primula* ('Forms of Flowers,' pp. 55 and 75). It is further noticeable in several of my observations (Nos. 34, 48, 55, 63, 68, and 70) that just before

I lost sight of my bee altogether it appeared to become wild, and paid a visit to some flower of a fresh and altogether different species (irrespective of colour), afterwards flying right away, although it had been perfectly methodic previously. I wish to refer also to observations Nos. 3, 4, 27, and 28. In all these cases humble-bees paid many visits to two different species of flower at the same time, passing alternately, without respect to colour, from one to the other after several visits. It is obvious that what has been just said does not apply to these individuals; and I can only account for their movements on this supposition, that if bees often visit one species of flower many times consecutively, because they can thus remember from one flower to the next the best way to alight and to reach the nectar of that particular species, so saving time, then these bees were a little more highly intellectual than their fellows, and could manage to work the two species together, although I should fancy more than two would puzzle them. Nevertheless there can be no doubt that insects, more often than not, do their work in the manner which I have spoken of as "methodic" or "constant," although the extent to which these habits are developed varies greatly in the different classes of insects, and even in the different species.

With Table III. before me, and bearing in mind the fact that bees show a preference for the colour blue, I have endeavoured to ascertain whether my figures show that bees are more methodic when visiting blue flowers than when visiting flowers of other colours. Unfortunately all my observations on the honey-bee have been made when the insects were visiting yellow flowers, so that nothing can be learnt from them; but of all the 55 humble-bees watched, no less than 26 visited more or less blue flowers, of which 12 were perfectly methodic, 9 were nearly so, and 5 not at all. Thirteen insects visited white flowers, of which 5 were perfectly methodic and 8 not at all; 11 visited yellow flowers, and 4 were perfectly methodic, 1 nearly so, and 6 not at all; 28 visited red flowers, and 7 were perfectly methodic, 9 were nearly so, while 12 were not at all; so that by this scale of comparison humble-bees are shown to be more methodic when visiting blue flowers than when visiting others; but this may be a mere coincidence. Further observation alone can decide the question.

TWO NEW SPECIES OF THE GENUS *COLEOPHORA*  
ADDED TO THE BRITISH FAUNA.

BY WILLIAM MACHIN.

*COLEOPHORA VIBICIGERELLA*.—I have pleasure in recording the occurrence of a fine specimen of this insect, which is new to England. It was taken by myself in a garden near Fobbing, Essex, in June last. The insect was observed on a leaf of *Convolvulus major* in a hedge, opposite a plant of *Artemisia vulgaris*, on which its larva had probably fed. Not recognising the species I sent it to my friend Mr. Warren, who stated he believed it to be the above-named species (which opinion Mr. Stainton confirmed), and that its larvæ feed on *Artemisia campestris* and *A. vulgaris*. Subsequently I went to search for the larva, but my friend had cut down the plant. I have searched in the immediate neighbourhood, where I found a fair quantity of plants of *A. vulgaris*, but have not succeeded in detecting its larva. I found no plants of *A. campestris*. This insect belongs to the *Vibicella* group, and bears some resemblance to a small specimen of *Coleophora conspicuella*.

*COLEOPHORA MARITIMELLA*.—This new species (lately named by Mr. Stainton) is one of the *Troglodytella* group of the genus *Coleophora*, but is smaller than that species, the wings more pointed, and darker at the apex. The young larvæ are hatched in the autumn, and again commence feeding after hybernation, early in the year, causing whitish blotches in the leaves of *Artemisia maritima*, but few attain their full growth till the end of June or beginning of July; the imagines appearing in August. The case is similar to that of *C. troglodytella*, but I think rather more slender. The larvæ appear to be widely distributed over the salterns near the Thames estuary, but is nowhere common. My first meeting with it was on the sea-wall at Thames Haven, but this wall suffered so much from the great snow-storm and gale, two years ago, as to need extensive repairs; and on visiting the place the following autumn I found the wall had been repaired for about a mile, and all trace of the wormwood which had grown there in plenty was entirely obliterated.

## SALE OF THE LATE DR. HARPER'S LEPIDOPTERA.

THE sale of a portion of this remarkable collection of Lepidoptera took place on the 20th and 21st of March last. The late Dr. Harper had amassed a very large number of the choicest varieties of moths and butterflies, and consequently the competition was spirited, and the prices paid were probably higher than have ever previously been given for Lepidoptera. The greater portion of the first day was occupied by the disposal of the Diurni. A fine variety of *Papilio machaon*, bred by Mr. Kay, of Bury, realised £4 5s.; the series of the genus *Colias* reached £24 9s.; one specimen of *Vanessa io*, with obliterated ocelli, sold for £4 10s.; and a black variety of *Limenitis sibylla* for £3. The total of the sale of butterflies alone amounted to about £220.

Among the Nocturni, the rarer clearwings caused a sharp competition; and a *Sesia vespiformis*, from the Waring collection, reached £3 5s. The Shetland series of *Hepialus humuli* var. *hethlandica*, forty-nine in number, went for £10 10s. Perhaps, with one exception, the highest prices paid for a single series was that of *Chelonia caja*, sold in fifteen lots, which reached a total of £92; and two varieties of *C. villica* went for £5 and £4 10s. respectively. *Orgyia cænosa* were sold at £7 7s. for a series of thirty.

It was amongst the Geometræ that the highest prices were obtained, both for series and individuals, during the two days' sale. The single specimen of *Nyssia lapponaria*, unique as a British species, was purchased by Mr. E. G. Meek for £13 13s. It would probably have been sold for a much larger sum, had not one of the competitors understood that it had been knocked down to him, and so ceased bidding. The series of *Boarmia repandata* went for £6 18s.; the var. *sodorensium* being eagerly bid for. In fact all the varieties, of even common species, taken in the Orkneys, Shetlands, or Hebrides, commanded high prices. Great interest was shown in the crowded room when *Abraxas grossulariata* was reached. These were divided into twenty lots, containing many remarkable varieties. There were amongst them about a dozen of the banded variety (fifth figure in Newman's 'British Moths'); and these were distributed, with



many others, over the lots. The total obtained for the series of *A. grossulariata* was upwards of £100; lots of ten specimens ran from £6 6s. to £7 7s. each. The genus *Eupithecia* went for £14; but this was not at all a high price, there being no less than 1136 specimens, including local forms.

For the Noctuæ the bidding was good, but perhaps not so high as in the former classes: for instance—*Noctua subrosea* went at, lot after lot, £2 per pair; the two *Xylina zinckenii* were not dear at £1 10s. each; *Heliothis scutosa* went for £3; whilst the unique *Catocala electa* reached £5 5s. The total of the first two day's sale was £896 for insects alone.

Amongst the larger buyers were Mr. E. G. Meek, no less than 221 lots for £422; others were M. Oberthür (Rennes, France), Messrs. Janson, Sydney Webb, C. A. Briggs, J. H. Leech, A. B. Farn, Rimington, Bird, Sabine, Wheeler, J. H. Clark, Howard Vaughan, S. Stevens, W. de V. Kane, H. A. Adams, Dr. Battershell Gill, Dr. Mason, Major Elwes, and Lord Walsingham.

It is impossible, with the space at our command, to give anything like a description of the various lots; but one cannot help remarking upon the magnificent collection of the genus *Colias*, which, it will be remembered, was shown at the Entomological Exhibition held at Westminster a few years ago. Many of these were figured in this Magazine; and the wonder is that these went at so small a price, when compared with other lots.

The Micro-lepidoptera still remain to be sold; and as they consist of the late Thomas Wilkinson's (Scarborough) collection, and many others, no doubt the sale, which will take place during May, will attract much attention. This latter portion of the late Dr. Harper's Lepidoptera appears to be even more important than that already disposed of, for it contains more perfect series of the various species than he possessed of the Macro-lepidoptera.

J. T. C.

#### ENTOMOLOGICAL NOTES, CAPTURES, &c.

ENTOMOLOGY IN SOUTH LONDON: A GOOD SEASON.—As a drop of consolation in the ocean of discontent, caused by the continuous bad seasons, and the notable failure during the past season of some of our best hunting-grounds, *e.g.*, the New

Forest, I have enumerated below the various species of Macrolepidoptera taken by me during the last year on a small piece of private ground, less than an acre in extent, and containing about ten yards of whitethorn hedge and one poplar tree, the said piece of ground being, I believe, within three miles of London Bridge on the south side. The Diurni were not numerous, being represented by *Pieris brassicæ* and *P. rapæ*, and their larvæ; *Vanessa urticæ*; and the larvæ, but no imagines, of *V. atalanta*. Among the Nocturni were *Smerinthus populi* and its larva; three of the genus *Arctia*, viz., *A. caja*, *A. lubricipeda*, and *A. menthastri*; and the larva of *Nola cucullatella*. The Geometræ were fairly represented, as I noted the occurrence of twelve species, viz.:—*Rumia cratægata*, *Crocallis elinguaris*, *Hemerophila abruptaria*, *Boarmia rhomboidaria* with its variety *perfumaria*, *Acidalia scutulata*, *A. incanaria*, *Halia wavaria*, *Abraxas grossulariata*, *Eupithecia centaureata*, *E. vulgata*, *Camptogramma bilineata* and its larvæ, and *Eubolia mensuraria*. The Noctuæ were more numerous than any other family, and form quite a surprising list for so limited an area. Nearly forty species were present in more or less numbers, some of them being far from scarce. Among them were *Acronycta psi* and *A. megacephala*; five of the genus *Leucania*, viz., *L. conigera*, *L. lithargyria*, *L. comma*, *L. impura*, and *L. pallens*, the latter two being very numerous. Those ubiquitous species, *Xylophasia lithoxylea* and *X. polyodon* were well represented, as were also *Mamestra brassicæ* and *M. persicariæ*, and an occasional *Dipterygia pinastri*. Four of the genus *Apamea* were visible, viz., *A. basilinea* and its larvæ, *A. ophiogramma* (but one), *A. gemina*, and *A. oculea*; also *Luperina testacea*; three of the genus *Miana*, viz., *M. strigilis* in three different forms, *M. fasciuncula*, and *M. literosa* (only one of the latter, however, being seen); *Caradrina morpheus*, *C. cubicularis*, *Agrotis exclamationis*, *A. segetum*, *Triphæna pronuba*, *Noctua c-nigrum*, *N. xanthographa* and its larva, *Anchocelis pistacina*, *Cerastis vacciniï*, *Xanthia ferruginea*, *Tethea subtusa*, *Cosmia trapezina*, *Euplexia lucipara* and its larva; three of the genus *Hadena*, viz., *H. chenopodii*, *H. pisi*, and *H. oleracea*; *Plusia gamma*; and a very fair number of unknown species among the Microlepidoptera. True, with the exception of *A. ophiogramma*, the list contains no rarities; but the very fact of one individual, a comparative

beginner, taking between sixty and seventy species so near home, in such a locality, and in an acknowledged bad season, ought to act as a relief to our despair, and a spur to further exertions in more suitable places during the coming collecting season.—T. W. HALL; New Square, Lincoln's Inn, Jan. 3, 1884.

A BANK HOLIDAY IN 1883 AMONGST LEPIDOPTERA IN CAMBRIDGESHIRE.—At this time of the year reminiscences of the past and anticipations of the future occupy no small portion of our time and thoughts. It is of the former that is suggesting the following little account of a most enjoyable day spent last August in my native county. Rather late in the forenoon I approached, in company with a young enthusiast, the scene for an instructive and pleasurable day of observation amongst the Lepidoptera of our county. On the slopes and flats of a somewhat down-like country our attention was drawn to the luxuriance of *Galium* in full flower, and presenting a most attractive appearance. We had not proceeded far before specimens of *Lycæna corydon* appeared in rapid succession. We were soon at work, and before long found that we had been fortunate in capturing good specimens of the following:—*L. corydon*, *Satyrus semele*, *S. tithonus*, *Polyommatus phlæas*, *Hesperia comma*, *Eubolia bipunctata*, *E. lineolata*, *Fidonia atomaria*, *Leucania comma*. The principal notes of observation I made were these:—That *E. bipunctata* invariably flew in pairs, and generally amongst a flight of *L. corydon*, making it at first a little difficult to distinguish them; but being stronger and more rapid on the wing we were soon alive to them, and successful in our captures. Next I noticed that several of *H. comma* were infested with a brilliant scarlet parasite, in appearance, and in form like a ladybird. I kept a few specimens in glass-topped boxes, and found that the merciless parasites before long relinquished their prey, under the influences of their unexpected confinement.—HAROLD ARCHER; The Close, Ely, January, 1884.

GONEPTERYX RHAMNI AND ITS FOOD-PLANTS.—Mr. Sladen's experience of *Gonepteryx rhamni* by no means coincides with mine. Here, in East Cheshire, *Rhamnus catharticus* is by no means common, and *R. frangula* is only grown in a few gardens; but the scarcity of *Rhamnus* is much exceeded by that of *Gonepteryx*. During about fifteen years' collecting in this

neighbourhood I have only observed two specimens of this insect, and both of those were seen at least twelve years ago. Several times, also, I have spent the month of August at Bournemouth, when I found *Rhopalocera* generally abundant; but there *G. rhamni* was far from common. Indeed it was not until the summer of 1880, when I visited the New Forest, that I ever saw *G. rhamni* in abundance.—H. H. CORBETT; Ravenoak, Cheadle Holme, Stockport, February 20, 1884.

*ZEUZERA ÆSCULI*.—I met with several larvæ of *Zeuzera æsculi* at Cambridge the year before last, but unfortunately failed to rear any of them. Can any of your correspondents suggest the best means?—ALBERT H. WATERS; Mill Road, Cambridge.

NOCTUÆ NEAR CAMBRIDGE: *ACRONYCTA RUMICIS*.—This species was very plentiful here in 1881, but has been scarcer ever since, and last year was not at all common. *Acronycta aceris*, too, which I always find in some abundance here, was in fewer numbers than usual. The only other Noctuid I met with worth mentioning were *Acronycta ligustri*, *Miana furuncula*, *Caradrina blanda*, *Agrotis puta*, and *Plusia chrysitis*, together with *Noctua c-nigrum*, the second brood of which was common in September.—ALBERT H. WATERS; Mill road, Cambridge.

EARLY APPEARANCE OF *EPIONE ADVENARIA*.—I think it may be interesting to some of your readers to hear that two of the above-named species are already on my setting-boards, the first having appeared on the 10th, and the second on the 14th, of March. They are from a batch of six that were reared from eggs. Is there usually an earlier brood than the July one mentioned by Newman?—PERCY RENDALL; 20, Ladbroke Square.

REMARKABLE NEST OF A CONGREGATING MOTH.—At the last meeting of the Linnean Society, March 20th, in illustration of his paper, "A Contribution to the Knowledge of the Genus *Anaphe*, Walker," Lord Walsingham exhibited a large and remarkable nest of a congregating moth, a species of the genus, from Natal. It contained a packed mass of cocoons, specimens of the larvæ, and of the mature insect. There likewise was shown a living example of a dipterous parasite, which had emerged from the moth-eggs on hatching. His lordship stated that the nest and contents had been forwarded to him by

Col. J. H. Bowker, of Durban, and that the larvæ were found alive on its receipt in England in August last. The nest was placed in the insectarium in the Zoological Gardens, Regent's Park, under the care of Mr. Thompson, and who was fortunate in rearing some of the insects. Many of the larvæ remained in the nest, but others, in companies of twenty to forty, occasionally marched out, moving in closely serried ranks, much after the manner of the larvæ of the procession moth (*Cnethocampa*). From December to February about 250 moths emerged, but from the difficulty of obtaining their natural food all died, though a pair bred and the eggs were hatched. The mature insect closely resembles the *Anaphe panda*, Boisd., though under the latter it would seem are several well-marked local races. The genus is found in West Africa, as well as Natal; but it appears that in the several species the colour, size, shape and material of the common nest, as well as the individual silky cocoons, markedly differ. Doubtless the habits of these moths, when still more fully known in their native haunts, will yet form a most interesting chapter to the traveller. Of *Anaphe* four species have hitherto been described, viz.:—*A. venata*, from Old Calabar; *A. ambigua*, from Angola; *A. reticulata* and *A. panda*, from Natal. To these Lord Walsingham adds—*A. carteri*, from the Gold Coast; and *A. infracta*, from the Cameroons.

IMPORTATION OF EPHESTIA PASSULELLA AND *E. FICULELLA* TO KING'S LYNN.—On February 6th I was informed that numbers of small moths were flying about a vessel which had just arrived here from Galveston, America (Texas), with a cargo of decorticated cotton-cake. On the same day a few of the moths were brought me, and at the time I thought them to be *Ephestia passulella*; but subsequently noticing that they varied considerably a few of them were sent to Mr. C. G. Barrett, from whom I learn that there are two species, viz., *E. passulella* and *E. ficulella*. On the following day (the 7th) I visited the vessel, and found that these moths were absolutely swarming in the hold amongst the cargo. Numbers of them continually issued through the hatchways into the open air as the cargo was being discharged. Cocoons, doubtless of these species, were plentiful on the outside of the bags in which the cotton cake was packed, and larvæ were also observed both without and within the bags. The cake has been stored in warehouses about the town, and I hear that it is

not likely to be disturbed for some months, in which case I anticipate that these two species will obtain a permanent footing here. Two years ago *E. passulella* was plentiful in and about the warehouses belonging to the dock company; but last year, although a search was frequently made, no trace of this insect could be found: probably the cake, or whatever the larvæ might be feeding upon, was removed from the warehouses. If this supposition be correct it would be quite sufficient to cause the insect to become very scarce, and thus account for its apparent absence last year.—EDWARD A. ATMORE; Exton's Road, Lynn.

EXAPATE GELATELLA IN SURREY.—At page 44 of the present volume of the 'Entomologist' a note occurs by Mr. Porritt, in which he states that this species was excessively abundant at the end of last October and beginning of November in certain northern parts of England. As a supplement to this information it may be interesting to record its capture at New Malden, Surrey; for although I have collected in this district for many years yet I never met with, or heard of, its being taken until December 2nd, when one flew into my umbrella. I also took another quite fresh from the pupa a fortnight later. Considering where its head-quarters are situated, it seems strange that this moth should have turned up here at all, but more especially that it should be six or seven weeks after its appearance in the more northern and colder part of the country.—H. T. DOBSON, jun.

IRREGULAR EMERGENCE OF LEPIDOPTERA.—During last October, November and December I took several larvæ of *Phlogophora meticulosa* on geraniums in the open and in a greenhouse. About the middle of December some of the first I took spun cocoons just under the surface of the earth placed in the breeding-cage. On February 4th, when I was placing fresh geranium leaves in the cage, I was surprised by finding a fine female on one side of the cage. Another appeared on the 7th inst.; and fifteen in the course of the next five days. There was no fire in the room where they were kept until about a fortnight before the appearance of the first on the 4th inst.—A. DRUITT; Christchurch, Hants, February, 1884.

PARONYMIC NOMENCLATURE.—At the last meeting of the Entomological Society, March 5th, Mr. J. W. Dunning, President, called attention to a paper entitled "Description of a *Pieris* new

to Science—*Pieris spilleri*, mihi," by A. J. Spiller, published in the 'Entomologist,' vol. xvii., p. 62. The species was taken in Natal in 1881 by Mr. Spiller, and he seems to have taken some pains to ascertain that it was nondescript:—"I beg therefore to name it after myself." The practice of naming a new species after its captor, simply because he first captured it, was to be discouraged: "names taken from persons should not be lightly applied; this distinction should be reserved for those whose works and scientific labours give them a claim to the admiration of posterity." The story, at once ludicrous and melancholy, of *Æcophora woodiella*, as narrated by Mr. Sidebotham (Entom. xvii. 52), should be a warning to nomenclators against the hasty imposition of personal names. If the attempt of one entomologist by this means to confer honour (often undeserved) upon another may be excused, what can be said for the man who is not content to wait till the compliment is paid him by another, but insists upon crowning himself? The President believed the case to be without precedent, and, as it was certainly a departure from good taste, he trusted Mr. Spiller would not find an imitator.

BLATTA AMERICANA.—Besides the *Ephestia* noticed (p. 93) as having been recently imported from America, I observed a number of *Blatta americana* (American cockroach) amongst the cargo of the same vessel. They were to be seen in various stages of development, some of them being as yet very small; others, although to all appearances full-grown, were still of a whitish colour, whilst not a few possessed the red colour characteristic of the fully-developed insect. Although they seemed to be very active, I hope that our climate will prove unsuitable for the naturalisation of this destructive pest.—EDWARD A. ATMORE.

BIRDS VERSUS INSECTS. — Birds undoubtedly have great influence in lessening the number of individual insects. All insectivorous birds feed principally if not entirely upon insects. Small birds have increased very much in numbers in this neighbourhood since the Wild Birds' Protection Act. I have taken notes of nests and eggs which I have found, and find that lately they have been more numerous. Birdcatchers used to catch scores of young goldfinches and linnets here before the passing of the Act. I can well remember the time when farmers in this district used to purchase birds' eggs, young birds, and the heads

of old birds, for a small nominal sum. This sadly decreased the birds; in fact, so much that many periodicals of that day lamented their destruction. A worse result, however, came to the farmers. The rapid multiplication of many species of insects caused serious damage to crops and other kinds of produce. The birds were eventually suffered to rest. The insects quickly disappeared, and the balance was restored. The problem to be solved is the reason of paucity of insects in certain seasons. Although birds are a powerful agency, their result is not so much seasonal as permanent. If the fluctuation of insects depended entirely upon the increase or decrease of birds, then the facts would be very obvious. Sometimes it happens that when birds are very numerous insects are so too. From personal observation I am inclined to think that the various meteorological changes are more potent. The numbers of insects in certain seasons can only be explained when the whole circumstances are known. As a rule these are complex. The study by many entomologists of certain species over a number of years, would probably help to ascertain the real causes of their abundance or otherwise.—HERBERT E. NORRIS; St. Ives, Hunts, February 11, 1884.

COLLECTING NEAR MANCHESTER.—I shall probably be staying at Manchester during the greater part of the summer, and as I wish, if possible, to try some sugaring during June and July, I shall feel much obliged if any of your correspondents can give me some information as to localities in the neighbourhood, and the best way of getting at them.—H. L. EARL; The Grammar School, Manchester.

TOURIST'S HANDBOOK OF EUROPEAN BUTTERFLIES.—We understand that arrangements have been concluded by Messrs. Macmillan & Co. with our correspondent Mr. W. de Vismes Kane to produce a new work, with illustrations, on the above subject. Further particulars will be announced, and the book will probably appear shortly. Such a handbook is much needed; and it will be to entomologists in the field what Dr. Lang's work on the European butterflies is in the library.—J. T. C.

ERRATUM.—In my description of *Pieris spilleri*, Entom. xvii., p. 62, line 32, for "costal and INNER margins are dusted with black" read "costal and HIND margins are dusted with black."—A. J. SPILLER.



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## VARIATION OF EUROPEAN LEPIDOPTERA.\*

BY W. F. DE VISMES KANE, M.A., M.R.I.A.

THE Author defined a species to be a group similar among themselves throughout their life-history and sexual development, with a common inherited characteristic difference in some stage of their development from all other groups of individuals. "Types," he said, "can thus be fixed on of sufficient permanence to render of great interest all records of their variation, since such records will in many cases eventually constitute the history of fresh species." It was such alterations of characteristics, giving birth to incipient species, that he intended to consider.

He then pointed out that there were apparently two controlling forces at work among living organisms,—namely, the law of persistence and the law of variation,—and that the naturalist was met at the threshold of his investigations by the problem of whether the variations ever exceed the limits of species so that one type merges by imperceptible gradations into another; and if this be answered in the affirmative, he has then to consider "whether generic distinction form inexorable limits to variation." There are certain groups of Lepidoptera which challenge retrospective enquiry into their past history, such as the Hesperiidæ, and especially the genus *Syrichthus*, of which there were about sixteen admitted European species, all so closely approximate that their synonymy is almost in a chaotic condition, *alveolus*

\* Abstract of a paper read before a Meeting of the Yorkshire Naturalists' Union at Barnsley, March 4th, 1884.

being the single indigenous British species. Again, *cassiope* and *blandina* are the only British representatives of the large genus *Erebia*, butterflies of uniform and monotonous coloration also, whose species (often inconstant among themselves in marking) graduate one into the other by very slight distinctions. The under side of the hind wings of *ligea* has a wavy streak of white running from the costa to the central area of the wing, where it terminates in a whitish angle, which angle only is preserved in the centre of the hind wings of occasional specimens of *euryale*, while the costal portion is represented and retained in a modified form in *neoridas* and *medea*. A similar and parallel case was pointed out as existing in the genus *Cænonympha*, where an irregular pale band on the under side of the hind wings varies greatly in delineation from *davus*, of the Scotch type, to *philoxenus* (*rothliebii*), and is fragmentarily reproduced in the ordinary British type of *pamphilus*, which, however, in the South European form, var. *lyllus*, shows the band almost continuous from costa to inner margin, and exhibits well-marked though small marginal ocelli.

Another remarkable phenomenon was also referred to, namely, what the author called topographical characters, such as that remarkable configuration of wing observed by Mr. Wallace among the Pieridæ and Papilionidæ of the Isle of Celebes; thirteen out of fourteen of the latter, and ten of the former, having either the strange elbow in the costa or the extremely pointed and hooked apex, which is not to be found in any of the most approximate species existing in the neighbouring islands of the Malay Archipelago or elsewhere.

Another example was pointed out, namely, the white neururation of the under wings of no less than six species belonging to four genera of South Russian Rhopalocera. These similar peculiarities seem to suggest a similar derivation.

The remainder of the paper was directed to such variation as is at present progressing, and these were classed in two categories—those which were temporary though recurrent, or persistent and hereditary, namely, aberrations and varieties.

Cases of sexual dimorphism, such as *Argynnis paphia*, ab. female *valezina*, were referred to, where the sexual tendency to a more sombre colour than that of the male was developed excessively, producing this extreme form. The physiological

test of fertile union with type was given as being the distinction between varieties and aberrations.

The Author then dealt with the moot question of the influence of food in producing variation, and exhibited a specimen of *Melitæa artemis*, which had been one of a vast army which appeared first in the larval stage in a locality in the county Clare, Ireland, and covered some fields with myriads of starving caterpillars, of which this one survived, and with numbers of others emerged next season, a stunted and pallid insect, no larger than the Alpine var. *merope*, and almost as faintly coloured. The stint of food, either by accident or by the effect of climate stunting the food plant, affects the size of the insect in all stages.

Many of the higher Alpine *Erebicæ* exemplify this in their dwarfed proportions, while insects in arid tracts in South Europe, whose food product has been stunted by drought, exhibit the same diminution of size. But it was pointed out that diversity of food did not produce variation in colour so usually as is commonly thought. One or two instances, such as *Abraxas grossulariata*, in which immediate aberrations are procurable by change of diet, were admitted, but these the author considered exceptional, and even when the larvæ were altered greatly in colour the imagines appeared of the normal type.

An instance of *Cleora lichenaria*, bred by the Rev. Joseph Greene upon an orange-coloured lichen, having orange spots scattered over the wings, was thought to have been an effect of mimicry, by which some of the variable species of Geometers, which rest with wings outspread, assimilate their colouring to that of the wall or tree trunk on which they settle.

The effect of climate was stated to be diverse in the case of the diurnal and nocturnal sections of Lepidoptera, the Heterocera of subalpine and polar regions having well-defined patterns and generally deepened tones of colour, while the Rhopalocera become bleached in hue and blurred in definition. The light and heat of the sun was shown, by examples of Central and South European butterflies, to render colours more warm and brilliant, while white is often replaced by silver, and coloured spots—as in some of the *Lycenidæ*—shine with metallic lustre as we travel south.

The effect of the law of heredity was next touched upon, and its power of rendering the type permanent in the case of some species was shown to be most potent, some butterflies, such as

*Vanessa antiopa*, and among the Geometers *Deiopeia pulchella*, ranging over a vast extent of the globe, and preserving their characteristics almost unaltered in every climate. This law of heredity often, too, asserts itself when we see a common generic tendency to revert to some ancestral characteristic. Possibly the occasional coalescing of the spots on the under side of Lycænidæ, and the tendency to supplant or vary the crimson of the Zygænidæ with yellow, may be explained in this way.

The purple tints on the under side of the hind wings of some Argynnidæ, which from the rich hues of *amathusia* grade down through *dia*, *ino* and *paphia*, and are unrepresented in its allied species *pandora*, are very variable in their depth of tone; and the remarkable variety of *paphia* taken by Mr. Barrett a few years ago, whose whole under side of hind wings was suffused with purple, was cited as a case of reversion to an ancestral type.

Cases of sexual dimorphism were then referred to, especially the blanched female aberrations which occur in the several species of *Colias*, i.e. *edusa*, *palæno*, *erate*, &c.

Reference was also made to the tailed female aberration of *Papilio memnon*, and the author denied that secondary sexual characters are more rarely found in the female than in the male, as is stated by Darwin to be the case in other fields of zoology.

After speaking of the success of Mr. Llewellyn in mating melanic specimens of *Tephrosia biundularia* and *crepuscularia*, and producing thereby a long series of like forms, thus actually almost producing a new species if it were kept long enough from intercourse with the ordinary type, he mentioned the extraordinary notch-winged aberration in our now domesticated *Liparis dispar*, which from time to time makes its appearance, and which might eventually become uniform and stable in its character, and recur chronically as a dimorphic variety.

Seasonal dimorphism was then illustrated by the striking and very different spring and summer broods of *Vanessa levana* and *prorsa*, which were formerly reckoned as different species, and a specimen of the third and intermediate form was shown, *ab. porima*, produced by forcing the insect in winter.

The var. *callunæ* of *Bombyx quercus* was instanced as in every probability having arisen from this seasonal dimorphism, in parts of the country where the early autumns obliged the

insect to change its normal habits. Hybrids the author defined to be irregular attempts to establish, "per saltum" and in a single generation, what natural law permits only to be effected step by step,—that is, the inauguration of a new species,—and the penalty for such infraction is extinction, and accordingly hybrids are infertile.

The authority of Boisduval was quoted to show that among such closely related species as some of the *Zygænidæ*, which frequently are found to couple unnaturally, the ova is invariably infertile. Deformities, monstrosities, and hermaphroditism were then touched upon very cursorily, and the influence of locality and soils were dealt with, the conclusion being that the influences exacted are very small, but may give rise to tendencies, developed subsequently into characters by heredity. Localities isolated from the rest of the world by lofty mountains, deep forests, or the sea, were pointed out to be thus the most productive of eccentric forms. Isolation begets peculiarity, and in the remarkable series of Shetland insects taken by Mr. MacArthur we have interesting evidence of the fact.

The Author summed up as follows:—"Of the past history of species we can only reason from analogy, but on comparison of the forms grouped together in one genus the student of classification cannot but be struck with many common points of resemblance which suggest that they are often nearly related to one another, at least ancestrally. But such conclusions must necessarily be merely speculative. We have firmer ground to go upon, however, when we deal with the evolution of species at present in progress. We find that the order of Lepidoptera is subject to many kinds of variation, some attached to one sex only, others depending on the season of emergence; some which are constant and hereditary, and others which are capricious and irregular in their appearance. Some, too, there are which I have termed 'generic;' that is to say, that many species of the same genus show a common tendency to vary alike in some particular, and this tendency seems to point to their derivation from a common stock originally. Whatever the exciting causes may be of deviation from the typical pattern, whether climate, soil, quantity, or quality of food, we have seen that the law of heredity is of paramount influence in developing variation so produced, and in transmitting and stereotyping it, as is clearly shown by

the results of close breeding, as induced sometimes in nature by isolation, as in the case of an island or alpine valley; or artificially, as in the instance already cited of the aberrant melanic forms of *T. crepuscularia* and *biundularia*, which have become permanent varieties, if not species, I am given to understand, in a wood in the neighbourhood of Barnsley, where they replace the normal type.

“Of the remote and primary causes of variation we as yet know but little with certainty, except in the case of the presence or absence of sunlight and heat, which without doubt is most potent in the development or degeneration of colour and distinctness of pattern; acting, as we have seen, inversely in the case of the nocturnal and diurnal divisions of Lepidoptera.

“As to the effect of diversity of food, I have ventured to express my belief that, with certain exceptions, it is not directly apparent in individuals, though, in common with other causes, it may eventually leave its impress on a race. But that its abundance or scarcity acts powerfully on the size and vigour of the insect in every stage is undeniable.

“As to those strange topographical characters, two cases of which I have brought under your notice, which are possessed in common by a number of insects peculiar to a particular district, I do not venture a suggestion, unless that in some way the law of mimicry, that most inexplicable of all natural powers, has asserted itself.”

The paper was then brought to a close by an appeal for more systematic scientific work; that facts bearing upon the topics reviewed that evening might be collected and written down as they occur, and that in forming collections more attention should be paid to local aberrations, and phenomena relating to the life history of any insect, no matter how common and well known. The possession of long series of variable insects was strongly recommended, the locality and date of capture of each specimen being indicated by a number referring to the entomologist's memorandum book; and the author referred to Mr. Bond's magnificent collection as being one of the few English ones which had been formed on such principles, and possessed a scientific interest of great value to a student of the laws of Nature.

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## NOTES ON EXOTIC LEPIDOPTERA REARED IN 1883.

BY ALFRED WAILLY.

(Membre-Lauréat de la Société Nationale d'Acclimatation de France.)

(Concluded from p. 33.)

LEAVING the American species, I now come to my—

Hybrid, *Roylei-Pernyi*. — In my report on the rearings of 1882, which appeared in the 'Journal of the Society of Arts,' 19th and 26th of January, and 2nd and 23rd of February, 1883, long details on the rearing and descriptions are given of this new silkworm, which I had obtained by the crossing of *Antheræa Roylei* and *A. Pernyi*. This year (1883) would have been the third year of its existence, but I much regret to say that it has disappeared entirely, degeneracy being the principal cause; the same degeneracy having also showed itself with the *A. Pernyi* bred at the same time. Details on this subject will be given in my next report.

*Attacus cynthia* (*Ailanthus* silkworm).—This year, having no *Ailanthus* trees at my disposal, as I had at my former residence in London, I reared the worms most successfully on laburnum trees; a few also fed on lilac and the common ash. I had a considerable number of cocoons, the moths from which emerged from the 2nd to the 30th of June. I obtained thirty pairings, and therefore several thousands of eggs and larvæ. These I placed on most trees in the garden, some when young feeding well on the climbing rose-trees against the house, but they all disappeared with the exception of those on the laburnums and the few placed on lilac and ash. The first cocoons were commenced on the 1st of August and the last on the 27th of September.

*Actias selene*.—Of this splendid Indian species I only had a few cocoons, which were from my own rearing in 1882, and a few also which had been sent to me from Scotland and Germany, all from the same stock of ova obtained by me in 1882. Some of these cocoons, which I had partly cut open to see how many sound pupæ I could rely upon, were attacked by dipterous parasites; so were cocoons of other species, cut open for the same purpose. I have therefore come to the conclusion that it is dangerous to the pupæ to thus open the door to their parasitic

enemies. This habit of opening the cocoon to see if the pupa is alive is frequently resorted to, but it ought to be discontinued in consequence of the fatal effects resulting therefrom. Three moths I mentioned as having emerged in January. From the 4th of June to the 14th of July thirteen moths emerged, four females and nine males. The last female moth, which emerged on the 4th of July, and the last male, which emerged on the 14th, having come singly, were of no use for reproduction. The three other females, having emerged in company of males, all paired, which was a complete success as far as the pairings were concerned. The first pairing took place between 12 and 3.30 on the morning of the 21st of June, all the ova hatching without any difficulty from the 6th of July. I did not keep any ova of the second pairing, which took place on the 28th of June; but those I kept of the third pairing (29th of June) did not hatch, at least one larva alone hatched. The third and last pairing was that of the two finest and largest specimens, and it lasted a considerable time. How is it that the larvæ did not hatch? The same unfortunate result took place with other species, especially with the two last pairings of *Antheræa mylitta*. I cannot tell the cause to a certainty, but my opinion is that it is due to unfavourable weather, just at the time when the larvæ are on the point of hatching; the larvæ, through want of sufficient heat, have not strength enough to cut the shell of the egg, and die and dry up inside the egg. Details on the rearing of this species will be given later on. The last *selene* larva, reared in the garden on a pear-tree, did not begin to spin before the 11th of October.

*Actias atlas*.—Of this species I had a large number of cocoons of the Ceylon race, from which I only obtained ten moths, at intervals, from the 11th of July to the 26th of September; several moths were crippled, and there was no chance of obtaining a single pairing. With twelve cocoons of the large Himalaya race I obtained four moths, two females and two males, one of the latter, the last moth obtained, being a cripple. Two specimens, one male and one female, were very perfect and with splendid colours, and both measured over ten inches in expanse. These four specimens emerged from the 28th of August to the 28th of September. One cocoon I found later on, with a male dead moth inside the pupa-case, a thing of frequent occurrence.

*Antheræa mylitta (paphia)*. — Of this species I had four



different races: the Himalaya (sent by a correspondent in Calcutta); a few cocoons from Madras, which had hibernated twice and were in splendid condition; and cocoons from Ceylon and Bombay. Moths of these various races emerged from the 7th of June to the 13th of October, those of the Himalaya race alone emerging from the 17th of August to the 13th of October; and some may keep on emerging as long as the weather is mild. I have a magnificent series of moths of all shades of colours, from the bright golden yellow to the darkest brown and gray. My notes on this species cover nearly six pages of my book, and they could not here be reproduced, even if they were of sufficient interest. An experiment I made, in view of hastening the emergence of *mylitta* and *atlas* moths had the very opposite effect. I plunged the cocoons in sawdust, leaving only the upper ends outside: I even covered some of the cocoons with wadding during the winter and part of the spring. Now only a few moths emerged from these cocoons so protected, the remaining cocoons remaining still in perfect condition. On the contrary, the cocoons entirely exposed to a freer ventilation, produced moths almost without any interruption. So my plan for hastening the emergence of the moths turned out to be very bad, and I shall not of course repeat the experiment.

The number of moths I obtained was somewhat considerable, but the number of pairings recorded in my book is only six. The first took place on the 3rd of July; the second on the 6th; the third on the 9th; and the fourth on the 12th of July. Later on I had the fifth pairing on the 7th of August, and the sixth and last on the 18th of August. No larvæ hatched from the eggs of these last two pairings, although they were kept in a warm room. The first two pairings were of the Ceylon race; the third of the Bombay race; the fourth, a cross between a Bombay female and a Ceylon male; the fifth, a cross between Bombay male and Ceylon female; the sixth was of the Himalayan race. The rearing of the larvæ of the first four pairings was not successful, most of the larvæ dying when in the first or second stage; and I do not think oak, although they eat it, is a very suitable kind of foliage for this species. Only a few larvæ reached the third stage, and only five the fifth stage; three in the fifth stage soon died after moulting, leaving only two. I then discontinued the rearing, and sent these two remaining larvæ to

Mr. F. Moore, of the Bethnal Green Museum, who already had some in the first and second stages, together with *selene* in fourth and fifth stages. These larvæ were artistically drawn and painted by his son.

Before concluding, I shall say a few words respecting a most extraordinary specimen which I obtained from one out of the large stock of *Samia cecropia* cocoons I had this year. Whether the cocoon which produced this abnormal specimen differed from the *Cecropia* cocoons I could not tell; in fact, I never saw any difference in any after removing them from the cages, when empty. As to the locality it came from, it would equally be impossible for me to say, as I had a large number from various States: Wisconsin, Iowa, Illinois, New York, Delaware, and perhaps from other States.

A long and interesting description of this unique specimen has been written by Mr. W. F. Kirby, of the British Museum, which will be found in the 'Proceedings of the Entomological Society of London.' This specimen, if not a new species, I consider as being a most wonderful aberration of *Cecropia*, rather than the produce of a cross between *Cecropia* and some unknown species—but it will, in course of time, be known whether other such specimens have been found in America. This specimen, measuring  $6\frac{3}{4}$  inches in expanse, is not only remarkable for the great difference in the markings and designs on the wings, as compared with *Cecropia*, but also for the exquisite beauty and variety of its colours, which are arranged or blended so harmoniously together that they form a striking picture which few, if any, specimens of the same family could surpass or even equal.

This specimen was exhibited by me on the 3rd of October, at the Meeting of the Entomological Society of London, together with a number of various silk-producing specimens of those species which I have bred for a number of years. Conspicuous among them were specimens of *A. mylitta* (the Indian *tussah*), in their various shades of colour; also two giant Himalaya *Atlas*, male and female, of unsurpassed beauty, each measuring over 10 inches, as stated before. Together with these silk-producers were specimens of the little Sphinx, *Hemaris tenuis*, or rather *diffinis*; the specimen of *Darapsa myron* and its pupa-case, and the two specimens of *Apatura clyton* (bred by me from the larva), with

their pretty white pupa-cases, the green colour having disappeared after the emergence of the butterfly, as is the case with other species. I also exhibited some of the remaining larvæ of *Telea polyphemus* and *Hyperchiria io*, reared in the open air.

Tudor Villa, Tudor Road, Norbiton, Surrey, October, 1883.

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#### ENTOMOLOGICAL NOTES, CAPTURES, &c.

EPUNDA LUTULENTA AND VARS. — My amusement consists in collecting specimens of our insular Noctuæ from different parts of Europe, and I think that I can assist Mr. Kane. The typical *Epunda lutulenta* of continental authors is a relatively light-coloured insect (*vide* the figures of H.-S., 83 and 405, and of Hübner, 159; and also specimens in my collection), which we seldom see. Their *luneburgensis* (*vide* H.-S., 429 and 430) is our *lutulenta* proper in its various shades of depth of colour, and I doubt whether any one of these is sufficiently dark to justify its being set up as a distinct variety, for I have seen Kent specimens as dark as those from Morayshire. *Sedi* is no doubt the ash-gray variety passing here as *luneburgensis* (but why?). I certainly have received *sedi* from Germany under the name of *luneburgensis*, but I have set that down as done in deference to our English acceptance of the word; and this is probably the case with Mr. Doubleday's specimen. Herrich-Schäffer gives a figure, No. 428, which is a fair representation of *sedi*, and probably intended as such; but unfortunately, in the text below, the number is quite omitted. I have observed in other instances that our typical form is classed abroad as a dark variety, with a consequent confusion of names—ex. gr., *Acronycta leporina*: the continental typical insect is of a dead white ground colour; their *bradyporina* is just such as our *leporina*. Writing in a general way, I may add that many of the continental forms are so many shades lighter in colour, as well as larger in size, that were they found in Britain they would rank as light varieties. This is merely a confirmation of the well-known tendency to melanism generally observed in northern insects—I mean Britain contrasted with Central Europe.—N. F. DOBREE; Beverley, East Yorks.

DASYCAMPA RUBIGINEA IN SOMERSET.—It was my good fortune to take an excellent specimen of this moth on the 24th of last

month, while it was feeding on the blossoms of a box tree in my garden.—(Rev.) J. SEYMOUR ST. JOHN; Crowcombe Rectory, Taunton, April 19, 1884.

THE LEPIDOPTERA OF LONDON SUBURBS. — When I was a collector of Lepidoptera I had my attention frequently drawn to the circumstance noted by Mr. T. W. Hall, *viz.*, the numerous species that would occur within a small area in one of the “greeneries” that occur about the suburbs of the metropolis—greeneries, alas! which the builders have fearfully reduced in number since I quitted London ten years ago. It was a common occurrence that when going out after these insects into (say) Kent or Hertfordshire, to a distance of twenty or thirty miles from the metropolis, one returned home with boxes far lighter than one obtained as near London as Wimbledon or Ealing. Of course, when going to distant hunting-grounds, some species were taken which would not be found in the London district. My explanation is this—that owing to the destruction of woods and hedges, and the disappearance of fields about London, the yet remaining species of insects congregate in the few spots that afford food and shelter. And then, again, it is probable that the warmth of suburban London is rather liked by some species of Lepidoptera. If we are to credit (as I presume we may) the records left by the old aurelians, the vicinity of London used to be a first-rate collecting-ground. I fear that now many passably good insects I used to capture within a few miles of Charing Cross have vanished, and London collectors must travel to other localities for them; fortunately, the investigative abilities of our younger entomologists have discovered some capital spots which nobody visited or thought about when I first took net in hand. It would be vain (just to quote a few instances) to search about London suburbs in 1884 for *Argynnis selene*, *Vanessa cardui*, *Dicranura furcula* and *bifida*, *Notodonta dictæoides*, *Cucullia chamomillæ*, *Polia tincta*, *Trichiura cratægi*, *Lasiocampa quercifolia*, or *Boarmia roboraria*; at least I hope anyone who takes them there will mention the fact, but not name the precise spot.—J. R. S. CLIFFORD; Gravesend, Kent, April 2, 1884.

RETARDED EMERGENCE. — We have seen several instances of retarded emergence in Lepidoptera lately recorded in these pages, and especially amongst the larger species of moths. Possibly the reason why the notices appear relating to the larger species more

often than among the Noctuæ and Geometræ is because the larger ones are more often looked after, and the pupæ kept over in the hope that some of them may emerge in time. This is so in my case, and specimens of *Saturnia carpini* and *Dicranura vinula* are now emerging from larvæ fed in 1882. They are, however, malformed. There seems to me no sufficient explanation for such a retardation of Nature's natural course, unless it be in the fact that, being in the house, therefore in a dry site, they have lacked that moisture which they would have had in their natural habitats. This idea is further strengthened by the fact that, had the *D. vinula* been allowed to pupate on the trunk of a living tree, instead of on pieces of dry bark, they would have had a supply of moisture which they lacked in the loose pieces of bark. Some *Acronycta megacephala* which pupated in the same pieces of bark failed to emerge, which tends to show that moisture is necessary to their well-being. Some reason of course there must be, and although it is well known that *S. carpini* often stands over for two or even four years, yet I have not noticed the same thing occur with *D. vinula*. It would be useful to know why such things occur; and if entomologists would publish their experiences of a like nature some definite conclusion might be arrived at, and lead to a knowledge of the laws which govern such retardation. — W. A. WRIGHT; Secretary's Department, Inland Revenue, Somerset House, March 25, 1884.

COLOUR PREFERENCES IN NOCTURNAL LEPIDOPTERA.—Mr. L. P. Gratacap, of New York, writing in the 'American Naturalist,' says:—"For two seasons past (1881 and 1882) I have made fruitless attempts to reach some definite conclusions as to the relative importance of a few primary colours as attracting signals to night-flying insects. I do not know whether the plan adopted is original or not, and as it may yield some useful or interesting results in the hands of others I briefly describe it:—I made four or five sleeves, or cylinders open at both ends, of variously-coloured tissue papers, and drew them over common kerosene lamps with glass chimneys,—the familiar illuminating agent of all country homes,—thus improvising a very serviceable and inexpensive Chinese lantern. The advantage of this arrangement consists in the ease with which the coloured sleeves can be changed, any combination of colours being secured without removing the lights, and so a uniformity of light-power main-

tained at the several stations and for the several colours during one experiment. The method also permits a very easy adjustment of lights in their intensity, by raising or lowering the wicks, and thus allows the observer to test strength of mere illumination against attractiveness of colour as a hue for the insects. The planting of the lights seems important. I started by placing them in a row at long distances from each other. The defect of this arrangement appeared to be that the brilliancy of the first light, encountered by the insects coming upon it from its side or portion of the row, interfered with the visitor's freedom of choice as between that colour and another when the light from the others reached it in a dim and imperfect manner. The lanterns were then arranged in a square (four colours), whose dimensions were determined by the intensity of the several lights. The distance between the lanterns was such as to allow the limital circle of illumination of each at first to touch, and subsequently to intersect those of its neighbours. This distance was reduced until the separation between the lanterns was less than the radius of the circles of light which each threw around itself, the lights being of equal intensity. This proved unsatisfactory, and having devised no means of exhibiting a number of coloured lights so that the chances were equalised completely for insects coming from all sides, to choose according to any constitutional preference for one colour over another, I used only two colours at a time. The arrangement might be found useful to place four lanterns in two pairs, each pair of one colour, and in a diamond pattern, so that each colour appears equally prominent, no matter from what side the dazzled insect may approach the group. The apparent necessity for allowing the insect to choose instantly between the colours before it reaches either arises from the infatuation produced in the insects by the light, which once reached seems to obliterate all capability in the creature to free itself from its enticement, except in an irregular and accidental manner. My experiments proved nothing except the absence of any marked preference for certain colours over others, and the almost invariably greater charm exerted by the white lantern, which, on account of their translucency, appeared more brilliant than the coloured lamps."

EFFECT OF ARTIFICIAL HEAT UPON HYBERNATING LEPIDOPTERA.— On the 14th of January I was attending a village

concert not far from here, the room being crammed to suffocation, with no top ventilation. After enduring this state of things for about an hour I was agreeably surprised at the sight of a somewhat half-awake specimen of *Hydræcia micacea*, fluttering about the room not far from where I was sitting. After careering about for a few seconds it disappeared under the platform, and therefore vanished from my sight. To-day (January 16th) I saw and captured a good specimen of *Vanessa atalanta*, which I released soon afterwards, having already a large collection of bred specimens of that beautiful insect.—H. ARCHER; The Close, Ely.

PETASIA NUBECULOSA THREE YEARS IN PUPA. — On looking into my breeding-cages on March 4th I was much pleased to find a very fine female *Petasia nubeculosa*. It is from one of the eggs I received from Rannoch in May, 1881, and it has remained in pupa from June, 1881, until this present date, March 4th, 1884. One of the brood came out in March, 1882, two in April, 1883, and now one in March, 1884.—W. H. TUGWELL; Greenwich.

HYBERNIA PROGEMMARIA, var. FUSCATA.—During the month of March last I had the pleasure of taking and breeding some very fine and varied forms of *Hybernia progemmaria*. The fore wings are of one uniform dark brown colour, the three transverse lines show out very distinctly, being of a darker colour still, as do also the row of dots on the hind margin; whilst in some there is a row of light-coloured dots between the third line and hind margin. I have also some very good banded types. Of the var. *fuscata* the colour of the fore wings is one uniform dark soot- or smoke-colour, with hind wings a shade lighter, and the body black; the usual transverse lines and dots are altogether invisible, with the exception of the one across the hind wing. I should like to hear if the same forms are taken in any other locality.—J. HARRISON; 7, Victoria Bridge, Barnsley.

CAMPTOGRAMMA FLUVIATA AT BOURNEMOUTH.—On the evening of September 2nd, 1883, during a violent gale, accompanied by heavy downpours of rain, I boxed an excellent specimen of *Camptogramma fluviata* off some railings immediately beneath a gas-lamp in the Pleasure Gardens, Bournemouth.—WM. E. BRADY; 1, Queen Street, Barnsley.

DESCRIPTION OF THE LARVA OF GYMNANCYCLA CANELLA.—For the opportunity of studying this interesting species I have on two

occasions been indebted to the Rev. E. N. Bloomfield, M.A., of Guestling Rectory, near Hastings. In December, 1881, he kindly sent me several pupæ, from which I bred imagos the following year; and on September 13th, 1882, I further received from him a supply of larvæ which he had collected from *Salsola kali* growing on "blowing sand by the sea-shore at Camber, near Rye, East Sussex." They were of various stages of growth, those apparently full-grown being about three-quarters of an inch long, rather attenuated when crawling, but of fair proportions when at rest. The head has the lobes rounded, is slightly narrower than the 2nd, and still narrower than the 3rd, segment; body cylindrical, and of almost uniform width, tapering only a little at the posterior extremity; skin smooth, but not at all glossy, except on the anal segment, whereas the head and frontal plate are highly polished; segmental divisions well defined; there is also a slight transverse depression on each segment, and a puckered ridge along the spiracular region. The ground colour of the dorsal area varies from pale pea-green to dark green; head gray, more or less marked with intense black, some of the darker larvæ indeed having the cheeks and part of the face perfectly black. Dorsal stripe clearly defined, either of a darker shade of the ground colour, of whatever shade of green, or in some specimens purplish brown; subdorsal lines only faintly discernible, grayish; there are no perceptible spiracular lines; usual dots very minute, black, except those on the 3rd and 12th segments, which are larger, and white, encircled with black; spiracles also very minute, brown. Ventral surface uniformly of a paler shade of the ground colour. Another variety, which is evidently much less common than the preceding, has the ground colour dark olive, the dorsal line purple, and between it and the gray subdorsal lines another faint line of a paler purple; whilst along the spiracular region is a broad irregular stripe, brownish yellow in the centre, but edged above and below with gray; this stripe is really composed of a series of blunt wedge-shaped marks laid longitudinally, and the base of each mark adjoining the apex of the one following it. This variety, too, has the head black, and the mandibles dark sienna-brown. Ventral surface dingy olive-green. The larva spins small silken webs about the tops of its food-plant, *Salsola kali*; and when full fed descends below the surface of the sand, and forms a small oval cocoon composed of



grains of sand completely woven together with silk. The pupa is of very ordinary shape, about two-fifths of an inch long, evenly rounded, broadest at the thorax, and tapering gradually to the anal point. The whole surface is semi-translucent and polished, and all the parts are well defined. The eye-, leg-, and wing-cases are bright green, the thorax and abdominal segments yellow, the abdominal divisions brown, and a distinct green line, which shows through the translucent covering, extends through the dorsal area. The imagos emerged at the end of July and beginning of August.—GEO. T. PORRITT; Huddersfield, April 3, 1884.

NOTES ON CERTAIN TINEÆ.—Of the so-called species, *Gelechia ligulella*, *G. vorticella*, *G. tæniolella*, and *G. sircomella*, I feel sure that three, viz., *Gelechia ligulella*, *G. tæniolella*, and *G. sircomella*, are only forms of one. I took a large quantity of them this year; and they were swept from the *Lotus corniculatus*, different sexes in the different forms being freely paired. This is, I think, a convincing proof of their unity of species. *Gelechia vorticella* is so like the others that I should place it also as a form of the same species. If anyone takes *G. vorticella* freely, and would kindly allow me to inspect a series, I should thank him much and return them uninjured. I took a single specimen of *Retinia duplana* flying amongst fir-trees this year; it is a very distinct species, and has only hitherto, I believe, been before taken in Scotland in very small numbers. *Depressaria hypericella* has been bred this year from shoots of *Hypericum* by both Mr. Shuttleworth and Mr. Murray; it had not previously been noticed in the district. Some time ago Mr. Lacy took a specimen of *Æcophora minutella*, and this year I was fortunate in doing the same; it was flying, near dusk, across a road near farm-buildings. In August I first found larvæ of *Asychna terminella* mining in the leaves of *Circea lutetiana*, in dark places in the woods. In September, last year, I found and recognised mines of *Nepticula punctella* in sloe. I had before seen this larva, but had stupidly mistaken it for *N. plagicolella*. I now see that the latter is yellow, and makes a clear whitish blotch, preceded by a slender gallery; the former is green, and its mine is coiled like a watch-spring, afterwards extending round the edge of the leaf. The "frass" fills up the gallery, and makes it light brown. The imagos emerged very freely in June. About August I found mines, which appeared strange to me, in wild strawberry; these produced in June following

*N. arcuosella*. Other mines in the same plant produced *N. aurella*—at least I cannot separate them from that insect. Amongst alder-bushes in a swamp, in August, I happened to find reddish larvæ in reddish mines, which were suspected to be *N. alnetella*; in the latter part of June these emerged as *N. glutinosæ*. Last year, when breeding *Nepticula betulicolella*, I thought that another species was emerging with them from similar larvæ; but on a more extended trial this year I found that the two sexes differ considerably, and thus my doubts were solved. *N. betulicola* males are rather smaller and browner; frequently the fascia does not extend quite to the costa, and the head is fuscous, with white eye-caps. *N. betulicola* females are purplish from the base to the fascia, which extends quite to the costa, and the head is yellow. This insect varies in intensity of colour with the temperature and climatic conditions of the season. Some years ago, in a hot summer, I bred some as brilliant almost as *N. alnetella*. I had last autumn collected considerable quantities of yellow larvæ blotching thorn, in order to find out the larva of *N. ignobilella*, which I am unable to separate from that of *N. gratiosella*. The result was that I bred in May plenty of *N. gratiosella*, no *N. ignobilella*, and one *N. regiella* (in the room). As I had larvæ from Witherslack and Preston (*viz.*, from limestone and sandstone), I am unable to determine the district from which it came, but hope to do so this year. I have previously bred *N. ignobilella* from one of the localities, and it is very curious that none turned up this year. The *Nepticulæ* that frequent thorn on limestone appear to be *N. pygmæella*, *N. oxyacanthella*, and *N. atricollis*; those on sandstone, *N. pygmæella*, *N. oxyacanthella*, *N. gratiosella*, and *N. ignobilella*.—J. H. THRELFALL; Preston, Lancashire, 1884.

LARVÆ OF BRITISH MACRO-LEPIDOPTERA. — For more than twenty years our lamented brother entomologist, William Buckler, worked assiduously at portraying the British larvæ; many of his figures I have had the pleasure of seeing, but strangers who did not know him, when I say he was by profession a portrait-painter, will be able to understand how it is that his drawings are so very life-like; they place every drawing of larvæ that I have seen attempted completely in the shade, when compared with his beautiful productions. These have, since his death, been purchased by the Ray Society; they consist of about 4500 figures,

and there are also four volumes of original MS. notes. The Rev. J. Hellins, who has also about 1800 of his drawings and sketches (some are only portions, such as a segment or a particular part that was necessary to enlarge for better description), has, in accordance with the understanding which existed between him and Mr. Buckler, and with a view of making the work, which is proposed to be published, thoroughly complete, placed the whole of them at the disposal of the Society; and from the whole amount of these drawings, some of which are in duplicate, no doubt the choicest will be selected for publication. The volumes that have already been issued by the Society are of first class description; this, I think, is a sufficient guarantee that the forthcoming work will be the best of the sort ever offered to the entomological world; it is expected to be completed in four yearly volumes. I must, however, remind your readers that they will not be able to purchase the work through their booksellers; in order to obtain it, it will be necessary to join the Ray Society, which can be done by communicating with the Secretary, the Rev. T. Wiltshire, 25, Granville Park, Lewisham, S.E. The annual contribution is a guinea; P.O.O. or cheque for that amount should be sent with full name and address; and while the annual subscription is continued every subscriber will get the full benefit of the works published by the Society *for the year*. Only a limited number will be published, and those who do not subscribe for the year of publication will stand a very great chance of being disappointed should they join afterwards for the purpose of obtaining this invaluable work. My advice to all who may read this and wish to avail themselves of this prize, and there is not the slightest doubt it will be a prize for any entomologist in the next generation, is to join the Ray Society without delay, and continue an annual subscriber to this very useful Society; and I am quite sure they will never have cause to regret it. In the works already issued no pains or expense have been spared to make them perfect; only first class artists and printers are employed, and to possess a volume issued by this Society is "to possess a thing of beauty which is a joy for ever." — G. C. BIGNELL; Stonehouse, Plymouth, April 14, 1884.

STUDY OF BRITISH DIPTERA. — I am about to begin the study of the Diptera, and should be much obliged if any of the

readers of the 'Entomologist' could tell me what books would be useful, or would give any assistance in naming the insects.—  
Address: Miss PRESCOTT DECIE, Bockleton Court, Tenbury.

[See Entom., xvi. 24.—E. A. F.]

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### REVIEWS.

*List of Yorkshire Lepidoptera.* By GEORGE T. PORRITT, F.L.S.  
Leeds. 1883.

THIS work is vol. 2 of the Entomological Transactions of the Yorkshire Naturalists' Union; and Mr. Porritt is to be congratulated upon the very successful manner in which the lepidopterous fauna of Yorkshire has been recorded. The work may be safely taken as a model for future local lists, its arrangement and general production being so excellent. The information as regards localities for each species, although most copious, is evidently carefully chosen, in every instance bearing the initials of the authority for the record. The type used is such that no confusion can occur, and the particulars sought can be seen at a glance.

It appears from Mr. Porritt's labours that there have been observed 1341 species of Lepidoptera out of a possible 2032 in the county; but we do not quite agree with the author when he says in his introduction that "I have no hope that many more additions will be made to the number of species of Macrolepidoptera." So comparatively little has been done in the more mountainous portions of North Yorkshire that it is highly probable there are other prizes in store for the collectors who work those districts. The following table will be found interesting, as showing how the groups are divided:—

	Yorkshire.	British.		Yorkshire.	British.
Diurni . . .	48 out of	64	Aventiæ . . .	1 out of	1
Nocturni . . .	80	112	Pyralides . . .	47	75
Geometræ. . .	207	278	Crambites . . .	39	80
Drepanulæ . . .	3	6	Tortrices . . .	203	334
Pseudo-Bombyces	19	27	Tineina . . .	443	700
Noctuæ . . .	224	309	Pterophorina	18	31
Deltoides . . .	8	14	Alucitina . . .	1	1

This list ought to prove a great incentive to the entomologists of the Union to try to make additions, which must be still possible, especially among the Micro-lepidoptera.

If all the work of the Yorkshire Naturalists' Union is as satisfactorily tabulated as Mr. Porritt's portion, recently issued, it can no longer be said that local societies produce no results.

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*Transactions of the Huddersfield Naturalists' Society.* Part 1.

THIS little pamphlet contains the Annual Report for 1883, and a Catalogue of the Lepidoptera of the Huddersfield District; the Macro-lepidoptera by Mr. S. L. Mosley, and the Micro-lepidoptera by Mr. Porritt. All this is of course incorporated in the York County List above referred to, so needs no further notice. By the Report we find there are 109 members; but, if we are to judge by the library-circulation, not half are too actively engaged in any branch of Natural History; for there appear to have been but 31 readers, who had out 190 volumes. The botanists appear to have been the most active section, but are closely followed by the entomologists as exhibitors at the meetings.

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*Seventh Annual Report of the Lancashire and Cheshire Entomological Society.*

THIS is the Report for the past year,—1883,—and contains also the President's Address to the Society. In the latter it is suggested that the Club should follow the example of the Yorkshire Union of Societies, and publish a similar list of the Lepidoptera of the Liverpool district. As the Society bears the name of two counties, it seems to us most desirable that the work should be extended to Lancashire and Cheshire. If some competent person could be found to edit such a compilation, it would be most useful to present and future lepidopterists. Assistance would be most willingly given by those who at present collect in those counties, as well as by many who have in past times explored their insect fauna. Cannot the President undertake the work, if it has not already been commenced?

J. T. C.

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OBITUARY.

SIR SIDNEY SMITH SAUNDERS, Knt., C.M.G., died at his residence, Gatestone, Central Hill, Upper Norwood, S.E., on the 15th April, aged seventy-four. It is with great regret we make this announcement; only at the April meeting of the Entomological

Society of London, Sir Sidney was present, and read a somewhat lengthy paper (his second this year) on the *Pediculus melittæ* of Kirby, which insect was described in 1802, and "whose natural affinities still remain debatable ground," in the hopes that a *résumé* of what is already known about this curious creature might induce "some of our younger members to direct their attention to the habits of this remarkable group." The proof-sheets of this characteristic paper were corrected and some additions made thereto the day previous to his death—characteristic, because probably nobody possessed the faculty of telling others what to look for and how to do it more clearly than he; his success in this direction was great—various parasites, locust-egg parasites, the anomalous fig-insects, and almost any aculeate Hymenoptera were forthcoming from intelligent correspondents in almost all parts of the world, where their presence surprised nobody more than the educated observers themselves. The recurrence of a severe attack of bronchitis, not improbably brought on by the late stay at the Entomological Society's meeting, was the immediate cause of death. Sir Sidney Saunders was the son of William Saunders, Esq., of Wandsworth, where he was born in 1810; he entered the Consular Department of the Foreign Office in 1826, and was appointed Consul to Albania in 1835, was transferred to Alexandria in 1859, and was Consul-General in the Ionian Islands from 1864 to 1870. His entomological studies were necessarily somewhat guided by his place of residence, in consequence of his diplomatic appointments, and many new facts and unrecorded habits were speedily discovered. He received the companionship of the Order of St. Michael and St. George in 1860, and was knighted in 1873. Sir S. S. Saunders faithfully carried out in the Hymenoptera those large views which he enunciated in the first paragraph, headed "Habits and instincts," in his Entomological Society's Presidential Address for the year 1875, in no way "limiting his investigations to mere distinguishing characteristics." He had a large knowledge of the Hymenoptera generally, especially of the *Aculeata* and their wonderful and diversified life-histories. His contributions also on the many messmates and parasites attending various species exhibit most minute researches and observations. He was especially interested in the habits of the South European briar insects and their parasites, of the coleopterous *Meloidæ* and

*Stylopidæ*, of the dipterous *Conopidæ* and *Bombyliidæ*, of the interesting parasitic hymenopterous genus *Scleroderma*, of many of the parasitic *Chalcididæ*, and especially in the history and affinities of the wonderful fig-insects to which he and Prof. Westwood have lately given so much careful attention. Sir Sidney was an original member (1833), a past President (1874-5), a present Vice-President, and always a strong supporter of and constant attendant (as far as circumstances would permit) at the meetings of the Entomological Society. His published papers—far too few to in any way represent his extensive knowledge—were mostly contributed to their Transactions; his first paper being read on May 4th, 1835, "Account of the attacks of various insects upon wine-corks," and his last on April 2nd, 1884, "On the *Pediculus Melittæ* of Kirby and its affinities, with reference to the larvæ of *Meloë*"—a long period embracing a time of great entomological progress, to which the subject of our notice was constantly contributing and carefully watching. He was often a fellow-worker with his friend Westwood, the only two original members of the Entomological Society who have continued to attend the meetings—the last representatives of an entomologically eventful era. His genial and sympathetic presence will be greatly missed by many of the younger members whom he so greatly loved to encourage. The death of this veteran Entomologist, who was a member of the French (since 1835), Belgian, Vienna, Italian, and other Societies, and whose enthusiasm and activity seemed to increase with his years, will be deeply regretted by many Entomologists both in Britain and abroad. His foreign correspondence was large, and he was a worthy representative of British Entomologists. The gracious manner in which his knowledge was brought into conflict with those of others is well exemplified in his recent controversies with M. Edmond André and Dr. Paul Mayer. He was always a most careful and scrupulously painstaking writer, corrections and additions being frequent to matter intended for publication or otherwise. This has been said to be a sure mark of genius, and with our lamented author it assuredly was so.—E. A. F.

WILLIAM PREST, of Holgate-road, York, died April 7th, 1884, aged fifty-nine years. Mr. Prest has been so long before the entomological public as a contributor to this Magazine, and one who had an exceptionally large circle of correspondents, that

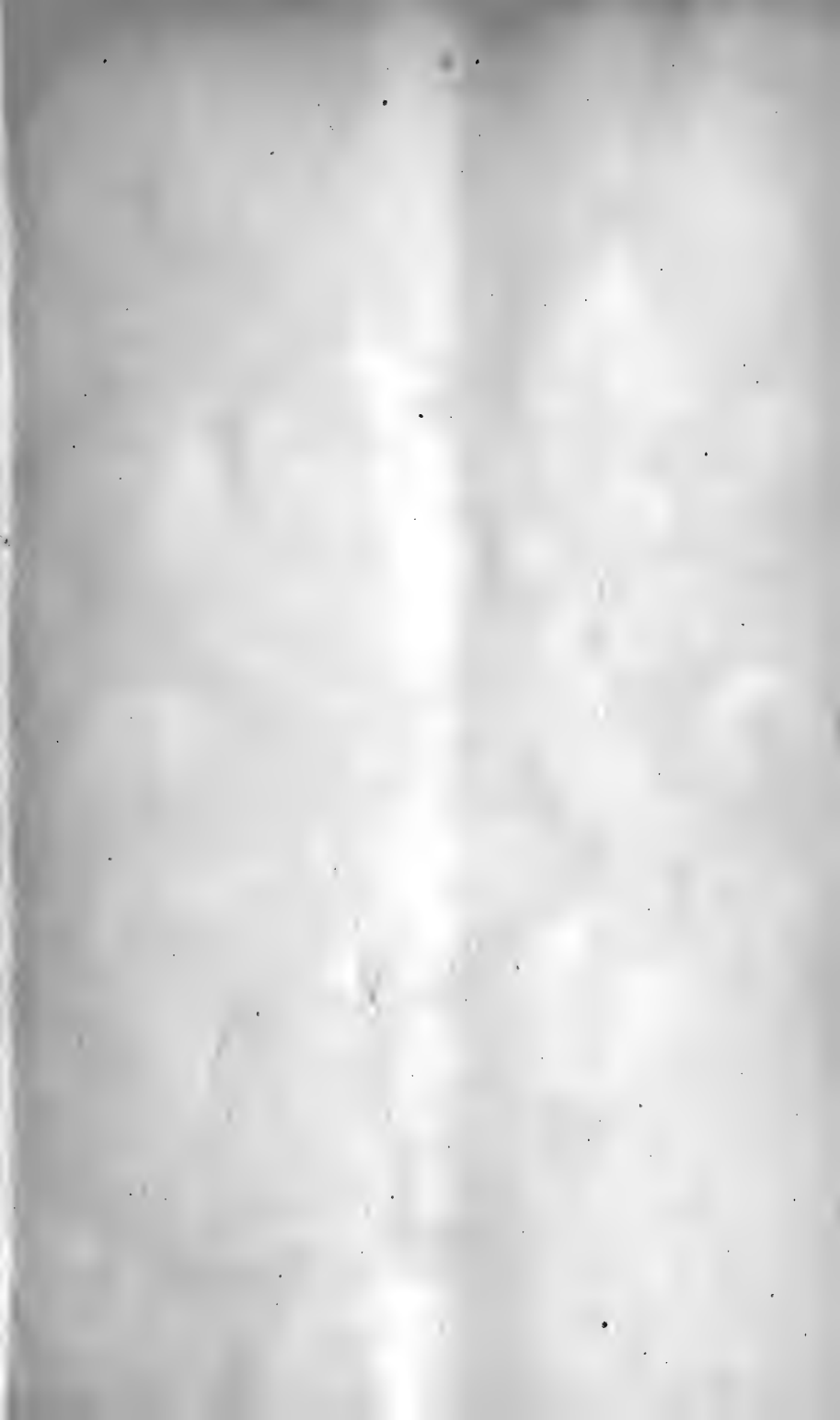
his death will be felt as a personal loss to most of our readers. His taste for Lepidoptera, which branch of Entomology received his chief attention, was fully developed in the spring of 1857, since which he has been an assiduous observer and collector of both Macro- and Micro-Lepidoptera. Besides moths and butterflies, his attention was given, though not so completely, to other orders, including bees, beetles, and the Trichoptera of the York district. To his example may be traced the beginnings of several well-known entomologists of the North of England, and through him was established the present York and District Field Naturalists Society, of which he was the delegate to the Yorkshire Naturalists' Union. Mr. Prest at all times had no greater pleasure than showing his collection to those who could appreciate it, and his house was for a long period thrown open as a monthly meeting place for those interested in Natural History. These meetings were held, with the exception of a few intervals from time to time, from about 1859 up to a recent period. Our late correspondent contributed notes frequently to the various periodicals devoted to Natural History, his name first appearing in the 'Entomologist's Weekly Intelligencer,' as long ago as 1857. He added several Lepidoptera to the Yorkshire list, and one of his chief captures was a specimen of *Eubolia maniata*. Mr. Prest suffered from chronic gout, which gave him much suffering for many years, and eventually caused his death.—J. T. C.

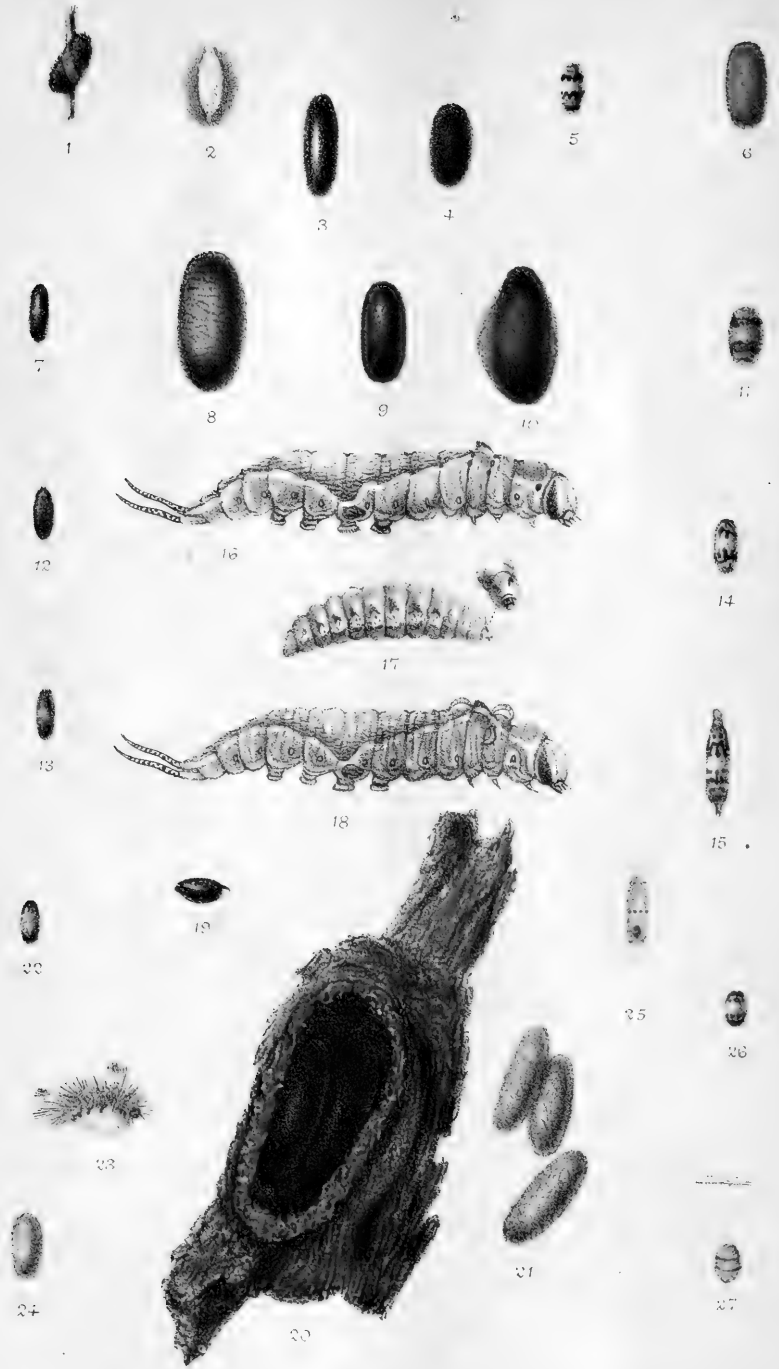
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ERRATUM.—Vol. xvii., No. 251, page 92, 3rd line from top of page, for "Bournemouth," read "Barmouth."—H. H. CORBETT; Ravenoak, Cheadle Hulme, Stockport.

ERRATUM.—In my communication to the 'Entomologist' for the present year, page 51, line 34, I have omitted the name "*Fasciata*, Brit. Cat., p. 92," after the word "remark"; the sentence should run thus: "with the remark *Fasciata*, Brit. Cat., p. 92 (an spec. diversa?)" Mr. R. C. R. Jordan, who has kindly drawn my attention to the omission, informs me that *E. discoidalis* and *E. fasciata* are very distinct, and that he has sent figures of both to Dr. Staudinger; so that in his next Catalogue he will probably place them apart.—J. JENNER WEIR; Chirbury, Copers Cope Road, Beckenham.







COCOONS & PUPAE OF OPHIONIDAE.

West, Norman & Co. } ad. nat.  
Horace Knight } del. lith.

# THE ENTOMOLOGIST.

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[No. 253.

## INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

(WITH PLATE.)

No. IV.—AGRIOTYPIDÆ.

THIS family comprises but one genus, which contains but one species, of which Curtis wrote in 1832:—"This curious insect is considerably like *Helorus* and some of the Proctotrupidæ at first sight, and not unlike some of the Formicidæ; and the habit as well as the sculpture of the thorax remind us, at a casual glance, of the genus *Chlorion*; on examining the mouth, however, and wings, it will be found to be entirely different. It is undoubtedly one of the Ichneumonidæ, and bears considerable resemblance to *Hemiteles*; but it has no areolet in the superior wings" (Brit. Ent. 389). In a footnote he adds Latreille's opinion:—"In a word, it seems to unite the Ichneumonidæ with the Oxyuri." This aberrant species, which cannot be confounded with any other Ichneumon, is probably most nearly related to the Cryptidæ; it reminds one greatly of the aculeate *Agenia bifasciatus* or *A. variegatus*; Dr. Jordan likened it to *Pompilus plumbeus*, another Fossor (Ent. Mo. Mag. i. 186).

### AGRIOTYPUS, *Walk.*

Black; wings of male obscurely clouded with pale brown; of female, yellowish, with four broad rich brown fasciæ. 1. *armatus*, 3—4 lines.

This remarkable species is rare. It was first taken by Mr. Henry Walker on the banks of the Clyde, at New Lanark, the males skimming over the surface of the water in the sunshine, and alighting on stones; later he found the females reposing on the

same stones, "apparently in a dormant state" (Brit. Ent. 389). In the same locality he observed, in June, "the female descend the sides of rocks to a considerable depth under the surface of the water, remain immersed for ten minutes, and then reappear without any apparent injury; this singular operation it repeated several times" (Ent. Mag. iii. 412). Francis Walker then (1835) conjectured "Can the object of these subaqueous wanderings be for the purpose of depositing its eggs in the aquatic larva of some neuropterous insect?" Twenty years later Vincent Kollar, Dr. Kriechbaumer, and Prof. v. Siebold bred this species from the larva-cases of the trichopterous *Silo pallipes*, Fabr. (*Trichostoma picicorne*, Pict.), in Bavaria and Bohemia. For interesting notes on its peculiar economy see Verh. z.-b. Gesell. Wien, vii. 189, 190 (1857); Stett. Ent. Zeit. xxii. 59-61 (1861); and Dr. Hagen's note in E. W. I. x. 148. Prof. Westwood exhibited larva-cases of *S. pallipes*, from Mentone, at the meeting of the Entomological Society of London, October 5th, 1863, from which specimens of this species had been extracted. He says:—"The cases had a long tail or appendage, which looked like a piece of grass or straw attached to the end." It has been suggested that this long foot-stalk, which Siebold so fully describes, is to enable the pupa of the Ichneumon to raise the case to the surface, it wanting the natatory powers of the phryganideous pupa (Ent. Ann., 1862, p. 23). Curtis tells us this species varies much in size, some species being only half as large as others; hence it is not improbable that the larger parasites of *Odontocerum* (*Molanna*) *albicorne*, Scop., were the same insect. It is beautifully figured in Curtis's plate; and Westwood gives its profile in outline (Intro. ii. 75, 14).

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No. V.—OPHIONIDÆ.

This is an easily-recognised family, containing those Ichneumons which have their abdomens compressed and mostly petiolate; the areolet is small and mostly triangular, or wanting. It contains a numerous and varied collection of species, but the family characters are generally well marked.

Gravenhorst (Ichn. Europ., vol. iii.; 1829) included the genera *Campoplex*, *Paniscus*, *Anomalon*, *Ophion*, *Macrus*, *Trachy-*

*notus*, *Pachymerus*, *Cremastus*, *Porizon*, and *Atractodes*, in this family. Of these *Campoplex* has been subdivided into the genera *Campoplex*, *Charops*, *Cymodusa*, *Sagaritis*, *Casinaria*, *Limneria*, *Meloboris*, *Pyracmon*, *Canidia*, *Nemeritis*, and *Angitia*, by Holmgren in his 'Monographia Ophionidum Sueciæ' (Sv. Ak. Handl. ii. (8), pp. 1-158). *Anomalon* was subdivided into the genera *Schizoloma*, *Heteropelma*, *Exochilum*, *Anomalon*, and *Trichomma*, by Wesmael in his "Revue des Anomalons de Belgique" (Bull. Ac. Brux. xvi. (2), pp. 115-139). *Macrus* contains the males of *Coleocentrus*, belonging to the Pimplidæ. *Pachymerus* includes Schiödte's *Collyria* and Curtis's *Pristomerus*. *Exetastes*, *Arotes*, and *Banchus* were separated as a distinct family (Banchidæ) by Gravenhorst. *Mesochorus* was placed by him in the Cryptidæ, and *Scolobates* in the Tryphonidæ. *Neurateles*, Ratz., is omitted; Marshall included it in his catalogues on the authority of Haliday, who told him he had discovered it in Britain. We do not know that anybody has described the genus since Ratzeburg, who curiously in his 'Die Ichneumonien' has mentioned no *Orthocentrus*; following his description, and taking this latter fact into consideration, we believe that *Neurateles papyracea* is only an *Orthocentrus*, and the description is not complete enough to identify it. Förster has defined it as a genus of his family Orthocentroidæ, slightly altering the name; but Förster's changes are so great and require so much confirmation that we cannot generally adopt them. Holmgren's 'Monographia,' the best handbook to this family, includes thirty-three named divisions in its Conspectus Generum: of these all but *Angitia*, Holmgr., and *Seleucus*, Holmgr., occur in Britain; and to the other thirty-one genera are added *Henicospilus*, Steph., *Agrypon*, Först. (very doubtfully, and only because included by Marshall), *Collyria*, Schiödte, and *Arotes*, Gr., besides Förster's divisions of *Plectiscus*. Wesmael's subgenera of *Anomalon* are only included as subgenera by Taschenberg; and Vollenhoven says "in our opinion Wesmael's subgenera . . . have no claim to be retained as genera;" the same with Holmgren's subgenera of *Paniscus*.

With but very few exceptions the Ophionidæ are parasitic on Lepidoptera, and most of them are remarkable for the cocoons which their larvæ spin after leaving their host. These vary much, those of many species being distinctly banded, and are

often very beautiful. Most of the types are represented on Plate II.; but the more detailed notes on their life-history can be better referred to under the respective genera. The *Anomalons* spin no cocoon, the Ichneumon emerging from the pupa of its host. The species of *Mesochorus* are all hyperparasitic, mostly on other Ophionidæ, especially on species of *Limneria*; also on various Braconidæ. As a familiar example the life-history of *Paniscus virgatus*, as worked out by Newport, may be taken:—The parent Ichneumon deposits her black, shining, pedunculate eggs on the caterpillar, when this is nearly full grown and ready to pupate. The fated larva, exhausted by the parasites, has but sufficient strength to complete and tapestry its cocoon or earthen chamber, as the case may be, before it dies, leaving its newly-formed abode to the occupation of its enemies, which grow rapidly, casting their skins three times; but as the body of the larva is still connected with the egg-shell they are not entirely got rid of until the larva is mature and becomes detached, before forming its own black cylindrical leather-like cocoon. The larva is mature on the fifteenth day: it is more than half an inch long, of a curved form, being smallest at each extremity, and with lateral fleshy tubercles (Linn. Trans. xxi. 71-77, pl. viii., figs. 13-19). See also Westwood's 'Introduction' (ii. 145-7, figs. 76, 7-15). Newport thus traced *P. virgatus* from the bursting of its egg to its assumption of the imago state, and having watched its growth and the formation of its tissues expresses the opinion that "in the earlier stages of growth they more resemble cotyledonous vegetables in general appearance than animal organisms, which are destined to become some of the most perfect and most active of their class" (*l. c.*, p. 71). They live by the direct abstraction of fluid from another living body into its own; and he regards these larvæ as the representatives among insects of the prematurely liberated fœtus of the kangaroo. The similar economy of the common *Paniscus cephalotes*, externally parasitic on *Dicranura vinula* larva, is known to most lepidopterists (Entom. xv. 163, and *cf.* Entom. xvi. 69); also the successful remedy of removing the shining black Ichneumon eggs from the anterior segments of the stung larva by means of forceps or with a fine needle, as recommended by Erichson and Treitschke. Apparently these eggs have recently been taken for pupa-cases (Ent. Mo. Mag. xx. 227) and for small beetles! (Entom. xi. 251).

It is hoped that the figures on the accompanying plate will lead to their better identification. Plate ii., fig. 19, represents the egg; fig. 16, a larva of *D. vinula*, with the eggs *in situ* on the third and fourth segments, the attenuated foot-stalk being inserted into the larva-skin; fig. 18 shows the parasitic larva feeding externally; fig. 17 represents the full-grown *Paniscus* larva, also the head enlarged; fig. 20 shows the cylindrical black *Paniscus* cocoons inside the *Dicranura* cocoons,—these are frequently spun so closely together that their sides become angulated, like the cells in a wasp's nest; these are mostly four to six in number; fig. 20 shows other cocoons of a lighter colour and more silky texture,—they vary much in both these respects. The cocoon of *Limneria rufa*, referred to by Mr. Bignell at Entom. xvi. 69, is figured on plate ii., fig. 1, but the encircling skin of the young *B. quercus* larva is not shown. Mr. Bignell has described the jumping cocoons of *Limneria krieckbaumeri* (Entom. xv. 215); also the double-banded cocoons of *Casinarina vidua*, which is a frequent parasite of *Abraxas grossulariata*, at Entom. xiii. 246, now figured on Plate ii., fig. 11. A beautiful pendulous cocoon of a *Limneria*, bred from a young larva of *T. stabilis* by Mrs. Henry Jenkyns, is figured on Plate ii., fig. 27. At the meeting of the Entomological Society of London, on January 7th, 1839, a similar cocoon was exhibited, together with the *Campoplex*? bred, and which had remained in the cocoon for eighteen months. The curious cocooned larva-skins of *Gonepteryx rhamni* by *Limneria vulgaris* (see Plate ii., fig. 15) and of *Nola albulalis* by *Limneria fitchii* (see Plate ii., fig. 25), with the other references to the Plate, must be noticed later. Réaumur's observations on the pendulous and saltatory *Campoplex* cocoons surrounding the nests of *Cnethocampa processionea* is thus amply verified, although the parasitic species is not yet identified: see the interesting discussion at the Entomological Society (Proc. Ent. Soc. Lond., n. s., iii., pp. 27, 34, 35). The species exhibited by Mr. Curtis, "allied to *C. majalis*, Grav.," was not unlikely *L. krieckbaumeri*.

The Ophionidæ contain many of our commonest Ichneumons. The species of *Paniscus* are commonly seen throughout the summer, careering along a ditch with its heavy and somewhat lazy flight, resting on some leaf for a few seconds every few yards. The two common species of *Ophion* are not infrequent visitors at light, and their loud and incessant buzzing is sure to

attract immediate attention; they have also occurred at sugar. The puzzling species of *Campoplex* and *Limneria* occur almost everywhere. *Mesochorus* and *Exetastes* are garden insects; the species of the latter genus being commonly parasitic on low-feeding Noctuæ. *Scolobates* is very rare, being regarded by Marshall as doubtfully British. The rare *Arotas*, and commoner *Collyria* and *Pristomerus*, are doubtfully located here. Besides the beautiful figures in Curtis and Stephens, Ratzeburg figures many species in his 'Die Ichneumon;' and Vollenhoven gives useful outline figures of the genera in his 'Schetsen;' and Plates 28, 39, 3, 43 and 17 of his 'Pinacographia' relate to the Ophionidæ. There are a few other scattered figures in Donovan, Latreille, and Jurine.

The British genera may be thus tabulated:—

SECTION I.—First cubital cell receiving both the recurrent nervures.

- A. Back of mesothorax rather smooth.  
 a. Discoidal cell with one or two yellow corneous spots. *Henicospilus*.  
 b. Discoidal cell without spots. - - - - *Ophion*.  
 B. Back of mesothorax scabrous, rugulose. - - - *Nototrachys*.

SECTION II.—First cubital cell receiving only one recurrent nervure.

DIVISION I.—Abdomen petiolated.

A. Radial cell most frequently lanceolate.

SUBDIVISION 1.—Hind femora simple, without a spine in the middle beneath.

- A. Metathoracic spiracles oval or oblong (in *Absyrtus* subrotund).  
 a. Claws of tarsi simple, not pectinated.  
 \* Spiracles of 1st segment placed before the middle of the 1st segment. *Collyria*.  
 \*\* Spiracles of 1st segment placed far behind the middle.  
 † Abdomen black, margins of segments yellow. - *Gravenhorstia*.  
 †† Greater part of the abdomen testaceous.  
 ‡ Recurrent discoidal nervure of upper wing received in the middle of the 1st cubital cell.  
 § First joint of hind tarsi about twice as long as the second.  
 × Apical margin of clypeus widely reflexed and bilobed. *Schizoloma*.  
 ×× Apical margin of clypeus truncated. - - - *Ezoichilum*.  
 §§ First joint of hind tarsi four times longer than the second. *Heteropelma*.  
 †† Recurrent discoidal nervure received before the middle of the first cubital cell.  
 o Eyes nude.  
 → Transverse anal nervure of lower wing divided. *Anomalon*.



- +-+ Transverse anal nervure not divided. - - - *Agrypon.*  
 oo Eyes hairy. - - - - - *Trichomma.*  
 b. Claws of tarsi pectinated.  
 \* Scutellum rather convex; areolet of wing present.  
 † Spiracles of 1st abdominal segment placed before the middle.  
 † Spiracles of metathorax elongate or oblong.  
 § Supero-medial area of metathorax distinct. - - - *Opheltes.*  
 §§ Supero-medial area obsolete. - - - *Panicus.*  
 †† Spiracles of metathorax subrotund. - - - *Absyrtus.*  
 †† Spiracles of 1st abdominal segment placed behind the middle.  
*Campoplex.*  
 \*\* Scutellum depressed, subquadrate; areolet of wings wanting.  
*Charops.*  
 B. Spiracles of metathorax circular, rarely subovate.  
 a. Areolet of wings minute, subtriangular, subpentagonal, or none.  
 \* Clypeus not, or imperfectly, separated from the face.  
 † Eyes hairy. - - - - - *Cymodusa.*  
 †† Eyes not hairy.  
 † Apex of clypeus produced into a distinct tooth. - *Sagaritis.*  
 †† Apex of clypeus not toothed.  
 § Eyes against the antennæ distinctly emarginate; area of metathorax most frequently none, or next to none. - - *Casinaria.*  
 §§ Eyes against the antennæ not, or only slightly, emarginate.  
 × Head moderately large.  
 o 2nd segment of abdomen transverse. - - - *Canidia.*  
 oo 2nd segment of abdomen not transverse.  
 +- Head very much buccated; 1st segment of abdomen very short and rather stout. - - - - - *Pyracmon.*  
 +-+ Head transverse or subbuccated.  
 ++ Petiole of 1st segment of abdomen slender, not thickened, longer than the post-petiole. - - - - - *Limmeria.*  
 +++ 1st segment of abdomen short and rather stout; post-petiole a little shorter than the petiole. - - - - - *Meloboris.*  
 ×× Head much wider than the thorax; abdomen narrow; aculeus long. *Nemeritis.*  
 \*\* Clypeus separated from the face; stigma of wing large.  
 ∞ Abdomen in both sexes compressed; aculeus long; wings without an areolet. - - - - - *Cremastus.*  
 ∞∞ Abdomen in female most frequently compressed; depressed in the male; rarely depressed in both sexes; aculeus of female very short; areolet of wings subpentagonal, triangular, or very incomplete.  
 Δ Abdomen of male depressed; 1st segment of abdomen shorter than the coxæ and trochanters of hind legs. - - *Atractodes.*  
 ΔΔ Abdomen of both sexes depressed; 1st segment longer than the hind coxæ and trochanters. - - - - - *Exolytus.*  
 b. Areolet of wings large and rhomboidal; anal styles of male and aculeus of female exerted. - - - - - *Mesochorus.*  
 B. Radial cell of front wings rather short, subtrapezoid; radial and discoidal cells almost touching in the middle.  
 \* Antennæ with a moderate space between them; metathorax scarcely shorter than high. - - - - - *Porizon.*

- \*\* The space between the antennæ most frequently very wide; metathorax much shorter than high. - - - *Thersilochus*.  
 Head small; wings sometimes without an areolet, transverse cubital nervure sometimes wanting; areolet when present a transverse rhomboid. - - - *Plectiscus*.

[This genus, originally formed by Gravenhorst, contained several small Ichneumons, which varied somewhat in important particulars. Haliday made the genus *Helictes* from some of these insects; and about the same time (1839) Schiödte described the genus *Megastylus*, containing Haliday's group of insects; but as Schiödte's paper was published a short time before the other it obtained priority. Holmgren has placed this genus amongst the Tryphonidæ. Förster (Verh. Nat. ver. preus. Rheinl. xxviii., 1871, p. 71) has published an elaborate monograph of *Plectiscus*, elevating the genus of Gravenhorst into a family, and dividing it into over 20 genera; and, as several of these have occurred in Britain, we have added a short table of them as subgenera:—

- A. Wings with an areolet. - - - *Plectiscus*.  
 B. Wings without an areolet.  
 a. First joint of flagellum shorter than the second.  
 Second joint of flagellum in the male notched. - *Miomerus*.  
 b. First joint of flagellum as long as, or longer than, the second.  
 \* Fifth to seventh joints of flagellum of male deeply notched.

*Idioxenus*.

- \*\* Fifth to seventh joints of flagellum of male not notched.  
 † Metanotum divided into two parts by a deep transverse depression. - - - *Dicolus*.  
 †† Metanotum not so divided; back part of head with a transverse ridge; stigma not narrow.  
 ‡ Metathorax at the base not distinctly and regularly divided into areæ; antennæ more than thirty joints; abdomen depressed. - - - *Megastylus*.  
 †† Metathorax without distinct areæ at the base.

The apical joint of tarsi not thickened; transverse anal nervure distinctly interrupted; the first division of the radius interrupted, and with the second does not form a sharp angle; hind femora and tibiæ not thickened.

*Proclitus*.]

SUBDIVISION 2.—Hind femora armed with a spine in the middle beneath.

*Pristomerus*.

DIVISION II.—Abdomen sessile or subsessile.

- A. All the tarsi slender.  
 a. Claws of tarsi not pectinated.  
 \* Aculeus short. - - - *Exetastes*.  
 \*\* Aculeus as long as the body. - - - *Arotus*.  
 b. Claws of tarsi pectinated; abdomen sessile. - - *Banchus*.  
 B. Hind tarsi thickened; claws pectinated. - - - *Scolobates*.

THE STORY OF *VALERIA OLEAGINA*.

BY THE REV JOSEPH GREENE.

IN the year 1856 I sent to 'The Zoologist' (vol. xiv., p. 5073) a short article entitled "Adaptation of the Colouring of Moths to Autumnal Tints." At the close of it I asked whether any one could inform me in whose collection were to be found authentic specimens of the above insect. My object in doing so was to obtain some particulars as to when, where, and by whom it was discovered. From that day to this my question has remained unanswered. A few months ago I obtained some curious "fragments" of the 'Entomological Transactions.\* One of the papers is headed thus: "Review of the Rise and Progress of the Science of Entomology in Great Britain; chronologically digested. By A. H. Haworth, Esq., F.L.S., F.H.S., & P.E.S." It commences with the following words:—"It is the intention of the following paper to lay before the Society, in chronological order, an outline of the rise and progress of our favourite science in Great Britain, from its earliest dawnings to the present time." . . . . "The first entomological publication extant in these kingdoms, is an extensive one in folio, written in the Latin language, and published at London in the year of our Lord 1634 by Thomas Mouffet, entitled 'Insectorum sive minimorum Animalium Theatrum,' &c." He then gives a list in chronological order—accompanied by longer or shorter biographical notices—of the various writers down to his own time. Most of these are probably unknown to the present generation, but there are nevertheless some familiar names, as Petiver, Ray, Albin, Drury, Harris, Donovan, Martyn, &c. At page 56 he writes thus:—"James Sowerby, F.L.S., published, on the 1st of December, 1804, in octavo, at London, the first number of the 'British Miscellany, or coloured figures of new, rare, or little-known animal subjects, not before ascertained to be inhabitants of the British Isles; and chiefly in the possession of the author.' This number was followed by eleven others, at irregular periods,

\* The work quoted is the "Transactions of the [old] Entomological Society of London, vol. i., part i.," which bears the date 1807 on its title page. In my copy, with original wrappers, parts i. and ii. were issued together on May 1st, 1809; but part i. (extending to page 112) was probably published separately, as the Rev. John Burrell corrects an error occurring on p. 61,—“in the former pages of our Transactions” (*l. c.*, p. 225).—E. A. F.

the last appearing on the 1st of August in the present year. The first five contained four plates each, and corresponding letter-press; and the remainder eight plates each, with similar descriptions. As the entomological articles of the 'British Miscellany' are not numerous, and the subjects in general very interesting, a slight enumeration of them is here subjoined; with, occasionally, such short remarks as the limited nature of this paper will consistently allow. On table (*i. e.*, Plate) the second, a *Papilio*, new to Britain, is figured, under the name of *P. blandina*, Fab., E. S. 736 nec 397, but which is, most probably, the *P. ligea* of Linnæus. It was caught in the island of Arran in Scotland. . . . Table 37 finely represents, as a new species, the rare *Bombyx oleagina* of Fab. and of Lep. Brit., and *Noctua oleagina* of Hüb. Schmet., cum icone. I have seen Mr. Plastead's specimen, here mentioned, several years since; which that gentleman dug the pupa of in Battersea fields, along with *Noctua persicariæ*; and have also seen another which was caught in Scotland twenty years ago; and my friend Mr. Donovan, F.L.S., found one in Wales."\* And so here at last, after so many years, I find an answer to my question! Can any of your readers inform me whether the three specimens above referred to are still in existence?† There can be no reasonable doubt, I should imagine, as to their being genuine British specimens. It seems very strange, considering the number and indefatigable zeal of collectors since that period, that no other example, so far as I am aware, has since been taken. It is the more remarkable, when we consider the widely-separated localities in which the above were taken, *viz.*, Battersea, Scotland, and Wales! One more quotation may, I think, be interesting:—"In the same year (1770) we arrive at the time of the publication of a beautiful work on Entomology, that of my late and regretted friend D. Drury, F.L.S., in one vol. 4to. . . . Mr. Drury's cabinet was one of the most extensive ever made; and is said to have contained in species and varieties the surprising number of 11,000 insects. He spared no pains or cost in getting them together; and, like Petiver of old, sent printed instructions, in

\* Donovan ('British Insects,' vol. xiii., pl. 439) states that he took his specimens on the wing, by a low hedge, near Fishguard, Pembrokeshire, in July, 1800.

† Newman ('British Moths,' p. 401) mentions that the specimen in the Entomological Club collection is from the late Mr. Haworth's cabinet. The collection is under the care of Mr. B. T. Lowne, and still contains the insect in question.

various languages, all over the world for that purpose, by means of captains and others. Soon after his decease, at an advanced age, his valuable collection was disposed of in London by public auction. The sale occupied three days, and was by much the most considerable one of its kind ever known, producing about £650; one single insect in it selling for no less a sum than twelve guineas."\* We entomologists have been subjected to a good deal of light banter from the 'Times' and other papers in reference to the prices fetched at the recent sale of Mr. Harper's collection. It may be a consolation to us to learn that our great-grandfathers exhibited a similar amiable weakness in this department. It seems to me far more rational, or at any rate far more excusable, to give thirteen guineas for a rare or beautiful insect than ten or twenty times that sum for a bit of old ugly china!

Clifton, Bristol, May 8, 1884.

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## ON SETTING LEPIDOPTERA UNPINNED.

BY GEORGE COVERDALE.

SOME time ago it occurred to me that if we could prepare our insects for the cabinet without pinning them through the thorax several important advantages would be secured, especially in reference to the smaller genera of the Micro-Lepidoptera, where the difficulties of setting become so formidable that many are deterred from entering upon the study of those most interesting and beautiful creatures.

The anticipated advantages were threefold. In the first place the process of setting the insects would be much facilitated, a large proportion of the difficulties encountered being due to the action of the pin in displacing or destroying the muscles of the thorax, and the wings thereby frequently thrown into awkward and obstinate positions. Indeed, to pin a *Nepticula* at all is not of the easiest accomplishment, and quite impossible to some. Secondly, there being no pin through the insect, all chance of verdigris would be removed. This danger, it is true, is sufficiently met by the use of black pins, but these are often soft and bending, occasionally pointless, and comparatively

\* The elder MacLeay bought lot 95—a male *Goliathus drurii*—for £12 1s. 6d., at the King Street auction rooms, on May 23rd, 1805.—E. A. F.

thick. Again, in moving insects about, the chance of such a mishap as a body flying off, or the pin giving way, would be reduced to a minimum. Thirdly, under the present system characteristic markings and structures of the thorax are frequently obliterated or destroyed, and it is not uncommon to find one or more of the legs carried away by the pin. With insects unpinned this could not be the case.

These considerations induced me to devote some time to the subject, and, after numerous experiments and almost as numerous failures, a simple method has been devised, the results of which are in every respect encouraging and satisfactory.

To ensure success in the process adopted a careful attention to matters of detail is imperative. Supports for the insects are prepared by cutting blocks of corks (about a sixteenth of an inch long), and a small pin passed through each one. At right angles to this another and longer pin is pushed about half its length through the cork, so that when the large pin is stuck upright in the setting-board the small one is parallel with its surface. Numbers of these supports can be made in a very few minutes, and when once made will last for a long time. The insect, after being killed, is placed upon its back on a glass plate, a 3 in. by 1 in. microscopic slide answering the purpose admirably. A drop of "coaguline" is now put on to the small pin, which is then gently pressed against the under side of the thorax, causing it to adhere to the pin. If this has been neatly and quickly done the insect is firmly fixed along the pin by the under side of the body, with its head towards the cork block. The wings and antennæ may now be blown out, the support fixed into the groove of the setting-board by the large pin, and the insect set in the usual way. After drying and the removal of the braces the slightest jerk given to the pin, or the gentle heat from a hot needle, will detach the insect from its support. Finally it is mounted with gum tragacanth on little blocks of elder-pith, through which a pin has been passed. The head should be made to project a little beyond the pith-block, so as to enable the palpi, &c., to be examined from beneath. The glass plate is used to avoid a rough surface, which might remove some of the scales from the wings. Kay's Coaguline is found to be the best for fixing the insect to the pin, on account of its rapid coagulating properties. Gum tragacanth is preferable for the

final mounting, as it is more transparent than "coaguline," although it does not dry so quickly.

Tedious as this process may appear in description, it is in practice simple and expeditious. By means of it this spring I have set *Nepticula microtheriella*, *N. septembrella*, *N. viscerella*, *N. marginicolella*, *N. catharticella*, &c., *Cemiosstoma laburnella*, many species of *Lithocolletis*, *Micropteryx*, *Argyresthia*, &c., all of which will bear comparison with the best of those set in the usual manner. During the season a more extended use will be made of the system; in the meantime I shall be happy to render any assistance to those who may consider the process worth a trial.

24, Fleming Road, Lorrimore Square, S.E., May 8, 1884.

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#### A FORTNIGHT'S COLLECTING IN SICILY.

BY J. H. LEECH.

It may interest some of the collectors of European insects to hear the results of my short sojourn in Sicily. I arrived at the end of March under rather unfavourable circumstances, the weather being extremely windy and by no means as warm as I had been led to expect. The landlord of the "Hotel des Palmes," M. Envier Ragusa, is an enthusiastic entomologist, and showed me with just pride his excellent Sicilian collection. In his natural love for his native fauna he pointed out Sicilian specimens of *Vanessa io* with as much pride as an Englishman would a British *Vanessa antiopa*.

The Sicilian fauna corresponds in many ways to our British on account of its insular character, many species which are quite common in Italy being either entirely absent or extremely rare, and insects also occurring there found nowhere else, for instance, *Melanargia pherusa*, and many others both among the Lepidoptera, the Coleoptera, and Hymenoptera.

The island has also many species in common with Sardinia and Corsica, as the curious *Apochima flabellaria*, and, like those islands, does not contain a single species of *Erebia*, although having high mountains and an extensive alpine fauna. However, it is extremely rich in new forms, and, if well worked, would be certain to produce abundance of novelties, especially among the Micro-Lepidoptera and the Hymenoptera. The latter, by the way, are being energetically sought out by a Mr. de Steffanie,

who has devoted much time to them and found many new species, the most beautiful of which I was fortunate enough to take a specimen, viz., *Chrysis trinacria*; although not a collector of Hymenoptera, it was such a lovely insect that I took it, and was glad to have done so when I found out what it was.

I was disappointed to find myself fully a month too soon for the Lepidoptera, so devoted most of my time to Coleoptera, in the acquisition of which I was very successful, bringing in daily from 200 to 300 specimens, mostly different, and many very minute. Collecting in Sicily is indeed a pleasure, and well worth the four days' journey from England; the country, in sheltered spots, seemed literally alive with insect-life, and, if it had not been for the wind, would have been perfect. It seemed almost sacreligious, strolling among the remains of some grand Greek temple left untouched for generations, and in quest of beetles, overturning fragments of columns which had rested undisturbed since the day they fell, yet such spots were often the most productive of good species, notably the temples at Girgente. Sand-hills on the coast produced many good things, so did the banks of streams, especially the stream at Bella Strade. *Cicindela littoralis* and var. *nemoralis*, and *C. flexuosa* and var. *circumflexa*, were to be seen running all over the mud-banks, and the curious little *Omophron limbatus*. I found the best way to procure the smaller species was to throw water on to the mud or sand, and so drive them out; but the best all-round collecting-ground is the Favorita, at Palermo; there are some open water-courses for the purpose of irrigation, generally nearly dry, which produce swarms of species. Sweeping was fairly productive, but searching flowers more so.

Mimicry among various orders of insects was very noticeable, especially between the Arachnidæ and Coleoptera, and I often watched the spider, half-hidden in the centre of a flower, seize the unfortunate beetle, who had evidently mistaken it for one of its own species. The plant-bugs also resembled Coleoptera, especially small Longicorns, though for what purpose I was not able to find out; probably for their own protection, or possibly for the protection of the species they imitated. Although interesting, yet one gets tired of being imposed on by insects one cares nothing about, and, from a collecting point, mimicry is a nuisance when it occurs to the extent it does in Sicily.



There is not the least fear to be apprehended from the natives, brigandage being quite a thing of the past. I found the peasantry most obliging; whenever I met any I used to explain, in broken Italian, my occupation, and they generally assisted me, often becoming an intolerable bore. I used to carry a box on purpose to put their unwelcome gifts into, so as to avoid offending them; snails, grasshoppers, small frogs, &c., were common offerings, and of course were disposed of as soon as the donor's back was turned; but one was sometimes rewarded by a good species. They never minded how much one trampled through their corn or orange groves, and seemed pleased to see a stranger, unlike our noble countrymen.

The best time to go to Sicily would be from the middle of May to the end of June, and the weather would be delightful in the mountains. I unfortunately had to leave when the good time was just beginning. I conclude by giving a list of some of the most interesting insects I took. The small beetles and the Micro-Lepidoptera I have not yet had time to identify.

## LEPIDOPTERA.

- |   |   |
|---|---|
| Papilio machaon, <i>var.</i> sphyrus.—P.  | And many butterflies common in            |
| podalirius.                               | England.                                  |
| Thais polyxena.                           | Arctia caja.                              |
| Pieris daplidice.                         | Spilosoma fuliginosa.                     |
| Anthocharis belia.—A. cardamines,         | Metoptria monogramma.                     |
| <i>var.</i> turrilis.                     | Heliothis dipsaceus.—H. peltigera.        |
| Colias edusa.                             | Acontia lucida, <i>ab.</i> albicollis.—A. |
| Rhodocera cleopatra.                      | luctuosa.                                 |
| Polyommatus phlæas, <i>var.</i> eleus.    | Thalpochares ostrina.                     |
| Lycæna baton.                             | Botys polygonalis.—B. amata.—B.           |
| Cœnonympha pamphilus, <i>var.</i> lyllus. | sanguinalis.—B. ferrugalis.               |

## COLEOPTERA.

- |   |                                   |
|---|-----------------------------------|
| Cicindela campestris, <i>var.</i> nigrita.— | Calathus circumscripta.           |
| C. littoralis, <i>var.</i> nemoralis.—      | Harpalus cupreus.                 |
| C. flexuosa, <i>var.</i> circumflexa.       | Ditomus flavipes.                 |
| Omophron limbatus.                          | Acinopus ambiguus.                |
| Notiophilus palustris.—N. rufipes.          | Feronia splendens.                |
| Carabus morbillosus, <i>var.</i> servillei. | Aristus capito.—A. clypeatus.—A.  |
| Masoreus ægyptiacus.                        | sphærocephalus.                   |
| Chlænienus auricollis.—C. spoliatus.—       | Brachinus sclopeta.—B. crepitans. |
| C. chrysocephalus.—C. velu-                 | Polistichus fasciolatus.          |
| tinus.—C. circumscriptus.                   | Silpha sinuata.—S. granulata.     |
| Lionychus brevicollis, <i>var.</i> sicula.  | Sunius longicornis.               |
| Broscus politus.                            | Hister major.—H. 12-striatus.     |
| Scarites biparius.—S. arenarius.            | Oxythyrea stictica.               |

- Cetonia squalida*. — *C. hirta*. — *C. floralis*.  
*Trachys pygmæus*.  
*Capnodis cariosa*. — *C. tenebrionis*.  
*Anthaxia viminalis*.  
*Acnæodera discoidea*.  
*Dasytes algineus*.  
*Dolichosoma nobile*.  
*Drilus flavescens*.  
*Melachius parilis*.  
*Erodium*, *var. siculus*, *var. vicinus*.  
*Pachychila dejeani*. — *P. cossyrensis*.  
— *P. frioli*.  
*Teuturgia grosse*.  
*Stenosis sardia*, *var. major*.  
*Acis spinosa*. — *A. atrata*.  
*Blaps mucronata*. — *B. gages*.  
*Pimelia rugosa*. — *P. sardia*. — *P. inflata*.  
*Sepidium siculum*.  
*Pedium punctatostriatus*.  
*Opatus validum*.  
*Trichodes alvearius*, *var. dahlii*.  
*Meloe zuccius*, *var. carossa*. — *M. erythrocnemus*. — *M. murinus*.  
*Hybalus dorcas*.  
*Geotrupes lævigatus*.
- Ateuchus pius*. — *A. semipunctatus*.  
— *A. variolosus*.  
*Gymnopleurus mopsus*.  
*Copris hispanus*.  
*Bubas bison*. — *B. bubalis*.  
*Onthophagus taurus*.  
*Cartallum ebulinum*.  
*Phytœcia rufimana*. — *P. virescens*.  
*Cryptocephalus rugicollis*, *var. 6-notatus*, *var. verrucosa*.  
*Timarcha pimilioides*.  
*Chrysomela atra*. — *C. banksii*. — *C. sparshalli*. — *C. palustris*. — *C. grosse*.  
*Malacosoma lusitanica*.  
*Cassida depressa*.  
*Lytta segetum*.  
*Brachycerus mauritanicus*. — *B. undatus*. — *B. albidentatus*. — *B. cirrosus*. — *B. oculatus*.  
*Agryphus hæmarensis*.  
*Anisorynchus monochus*.  
*Cleonus cinereus*.  
*Lixus paraplectus*.  
*Agapanthia asphodeli*. — *A. acutipennis*. — *A. cardui*.

This list mentions only the more conspicuous insects, the greater part of those collected being not yet identified. I was fortunate enough during my short stay to discover several insects new to the island, so a collector, choosing a better season and spending more time, ought to do great things.

15, Rose Crescent, Cambridge, April 22, 1884.

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## CONTRIBUTIONS TO A LIST OF THE LEPIDOPTERA OF THE SOUTH-EAST COAST.

BY A. H. SHEPHERD.

THE under-mentioned list of species, taken during August only, between Sandwich and St. Margaret's Bay, Kent, may be of interest to those collectors who may not yet have paid a visit to that locality:—

- Pieris brassica* and *P. rapæ*, common everywhere.  
*Colias edusa*, occasionally all round the coast.
- Vanessa urtica*, *V. io*, *V. atalanta*, and *V. cardui*, all round the coast; the last species occasionally swarms.

- Arge galathea*, common on grassy banks, most plentiful between Walmer and St. Margaret's Bay.
- Satyrus janira*, very common all round the coast.
- Chortobius pamphilus*, very common.
- Polyommatus phlæas*, common everywhere.
- Lycæna agestis*, common all round the coast.
- L. alexis*, very common; varieties are occasionally met with.
- L. corydon*, plentiful, but local, between Walmer and St. Margaret's Bay; some nice varieties of this species are sometimes met with.
- L. alba*, rather local, Walmer to Kingsdown.
- Hesperia sylvanus*, plentiful.
- H. comma*, rather local, Kingsdown to St. Margaret's Bay.
- H. linea*, plentiful.
- Acherontia atropos*, the larvæ and pupæ are not uncommon, the imago I have not met with.
- Macroglossa stellatarum*, very common; the larva is of frequent occurrence also.
- Hepialus lupulinus*, very common at dusk.
- Zygæna filipendulæ*, plentiful, but rather local; varieties are sometimes to be taken.
- Lithosia lurideola*, occasionally near Kingsdown.
- Callimorpha dominula*, plentiful, but local, Walmer to St. Margaret's Bay; this seems to be a very sluggish insect, may be found during the daytime at rest among herbage, brambles, &c.
- Liparis chrysoorrhæa*, very plentiful, but local; may be taken on the wing at dusk flying round hedges.
- L. auriflua*, very common, hedges in lanes at dusk.
- L. salicis*, not uncommon, lanes near Sandwich and Deal.
- Bombyx neustria*, not uncommon in lanes.
- B. quercus*, occasionally near Walmer.
- Odonestis potatoria*, not uncommon near Sandwich.
- Rumia cratægata*, very common.
- Selenia illunaria*, occasionally in lanes.
- Odontopera bidentata*, lanes near Kingsdown.
- Crocallis elinguaris*, lanes near Kingsdown.
- Boarmia rhomboidaria*, not uncommon in lanes.
- Gnophos obscurator*, occasionally common, but local, Kingsdown to St. Margaret's Bay; nice varieties are occasionally met with.
- Asthenes candidata*, common.
- Acidalia scutulata* and *A. bisetata*, common.
- A. ornata*, not uncommon, but rather local, Walmer to St. Margaret's Bay.
- A. incanaria*, occasionally taken.
- A. promutata*, occasionally near Kingsdown.
- Acidalia straminata*, not common.
- A. aversata*, rather common.
- Timandra amataria*, occasionally taken in lanes, but not common.
- Strenia clathrata*, a few specimens have been taken.
- Fidonia atomaria*, of local occurrence, plentiful.
- Aspilates citraria*, very local, between Sandwich and Deal, most plentiful in that part known as "the sandhills," but sometimes met with near Walmer.
- A. gilvaria*, also a local species, but much more distributed than the last-named species, Walmer to St. Margaret's Bay, "plentiful."
- Emmelesia unifasciata*, once only near Walmer.
- Eupithecia centaureata*, of general occurrence.
- E. absynthiata*, occasionally; also the larvæ.
- E. minutata*, occasionally, Kingsdown to St. Margaret's Bay.
- Melanthia ocellata*, not uncommon near hedges.
- Melanippe unangulata*, of general occurrence.

- M. subtristata*, not uncommon.  
*M. galiata*, not uncommon, but local, Kingsdown to St. Margaret's Bay.  
*M. fluctuata*, general occurrence.  
*Coremia ferrugata* and *C. unidentaria*, rather common.  
*Campptogramma bilineata*, common in lanes.  
*Eubolia mensuraria*, not uncommon.  
*E. bipunctaria*, very plentiful, although local.  
*E. lineolata*, very local, Sandwich to Deal; the larva occurs on the sandhills.  
*Bryophila perla*, of general occurrence on walls.  
*Acronycta aceris*, larvæ taken occasionally near Kingsdown.  
*Leucania conigera*, occasionally taken, Walmer to Kingsdown.  
*L. lithargyria*, a few specimens have been taken.  
*Leucania obsoleta*, of occasional occurrence.  
*L. phragmitidis*, occasionally, Sandwich to Deal.  
*Hydræcia nictitans*, a few specimens near Sandwich.  
*Xylophasia polyodon*, common, lanes near Deal.  
*Miana strigilis*, not uncommon.  
*M. furuncula*, plentiful, Walmer to St. Margaret's Bay.  
*Caradrina cubicularis*, not uncommon.  
*Agrotis tritici*, occasionally taken near Kingsdown.  
*Triphæna pronuba*, common everywhere.  
*Noctua xanthographa*, occasionally near Walmer.  
*Eremobia ochroleuca*, of general distribution.  
*Dianthæcia carpophaga*, the larvæ are not uncommon near Walmer on bladder-campion (*Silene inflata*).  
*D. capsincola*, the larvæ occur in the lanes near Deal.  
*Phlogophora meticulosa*, very common.
- Plusia gamma*, very common everywhere.  
*Amphipyra tragopogonis*, once only near Sandwich.  
*Phytometra ænea*, of general occurrence; strongly marked specimens are sometimes met with.  
*Hypena proboscidalis*, not uncommon near Walmer.  
*Rivula sericealis*, occasionally, Kingsdown to St. Margaret's Bay.  
*Herminia barbalis*, occasionally.  
*Pyralis glaucinalis*, not uncommon, but rather local.  
*Pyrausta punicealis*, *P. purpuralis*, and *P. ostrinalis*, of general occurrence.  
*Herbula cespitalis*, occasionally.  
*Ennychia anguinalis*, occasionally, Walmer to St. Margaret's Bay; rather active on the wing.  
*Cataclysta lemnalis*, plentiful, but local, Walmer and Sandwich.  
*Botys pandalis*, not common, Walmer to Kingsdown.  
*B. verticalis*, common.  
*B. urticalis*, occasionally very common.  
*Pionea forficalis*, rather common.  
*Spilodes palealis*, not uncommon, but rather local.  
*Scopula prunalis*, of common occurrence.  
*S. ferrugalis*, of general occurrence.  
*Stenopteryx hybridalis*, this species is sometimes very plentiful.  
*Scoparia ambigualis*, occasionally with *S. basistrigalis* and *S. cembralis* near Walmer.  
*Crambus pratellus*, very common.  
*C. perlellus*, occasionally.  
*C. tristellus*, generally common.  
*C. inguinatellus*, occasionally taken.  
*C. geniculellus*, plentiful, but local, near Sandwich, and sparingly near Walmer.  
*C. culmellus*, not uncommon.  
*Onocera ahenella*, once only near Walmer.  
*Melia sociella*, occasionally taken.  
*Peronea variegana*, *P. hastiana*, and

*P. aspersana*, a few specimens have been taken.

*Aspis udmanniana*, occasionally.

*Orthotania striana*, a few specimens near Walmer.

*Sciaphila perterana*, *S. subjectana*, and *S. virgaureana*, specimens are occasionally taken.

*Grapholitha nigromaculana*, not common.

*G. campoliliana*, occasionally.

*Hypermezia angustana*, occasionally, Kingsdown to St. Margaret's Bay.

*Catoptria hohenwarthiana*, not uncommon.

*Cochylis stramineana* and *C. giganteana*, rather common, Kingsdown to St. Margaret's Bay.

*Aphelia pratana*, occasionally.

*Tineæ* were not looked after, and only a few species were noticed, viz.:—*Tinea pallescentella*, *Plu-*

*tella xylostella*, *Depressaria litarella*, *D. nanatella*, *D. atomella*, *D. heraciella* (larvæ), *Gelechia malvella*, *G. mulinella*, *Nothris durdhamella*.

*Pterophori*:—*Pterophorus acanthodactylus*, not uncommon.

*P. plagiodactylus*, occasionally, Deal to Sandwich.

*P. fuscodactylus*, rather common, Walmer to Kingsdown.

*P. lithodactylus*, not uncommon.

*P. pterodactylus*, occasionally, Deal to Sandwich.

*P. microdactylus*, rather plentiful, but somewhat local.

*P. baliodactylus*, occasionally, Kingsdown to St. Margaret's Bay.

*P. tetradactylus*, once only, Walmer to Kingsdown.

*P. pentadactylus*, common, Kingsdown to St. Margaret's Bay.

This list of nearly one hundred and fifty species was taken, with a very few exceptions, during the daytime only, my health not permitting night work; otherwise no doubt the list would have been a much longer one. At the same time I may remark that the few occasions on which I have tried sugar produced little or nothing worth taking. If lists somewhat like the above for other months were contributed it would, I think, be interesting to many collectors.

4, Cathcart Street, Kentish Town, London, March, 1884.

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## ENTOMOLOGICAL NOTES, CAPTURES, &c.

LEPIDOPTERA NEAR LONDON.—I should like to bear out the experience of Mr. T. W. Hall as regards the fairly plentiful occurrence of Lepidoptera in South London last year. In a small district I worked I found enough to afford consolation, after spending several nights in other quarters with no success whatever. I am unable to state anything about the Diurni, as I had no opportunity for observing them; but these are not likely to have been many; nor have I much to say of the Geometers, as it was amongst the Noctuæ I did most work. The only

species of the former group noticed last year were *Selenia illunaria*, *Metrocampa margaritaria*, *Acidalia aversata*, *Rumia cratægata*, *Cabera pusaria*, *C. exanthemaria*, *Anticlea derivata*, *Melanippe subtristata*, *Panagra petraria*, *Ypsipetes elutata*, and *Aspilates strigillaria*. As regards the Noctuæ, however, I think my list is a fairly good one for the season. In the spring time, at shallows, were to be found *Tæniocampa stabilis*, *T. instabilis*, *T. cruda*, and *T. gothica*. At sugar, during the summer and early autumn, were taken the following:—*Acronycta psi*, \**A. leporina*, *Leucania lithargyria*, \**L. pudorina*, *L. comma*, *L. impura*, *L. pallens*, *Hydræcia nictitans*, *Xylophasia lithoxylea*, *X. polyodon*, *X. hepatica*, *Dipterygia pinastris* (in fair abundance), *Apamea gemina*, *A. oculea*, *Miana strigilis*, *M. furuncula*, *Grammesia trilinea*, *Rusina tenebrosa* (very common), *Agrotis suffusa*, *A. segetum*, *A. exclamationis*, *A. corticea*, *Triphæna janthina*, *T. orbona*, *T. pronuba*, *Noctua glareosa*, *N. augur* (plentiful), *N. plecta*, *N. c-nigrum*, *N. triangulum*, *N. festiva*, *N. rubi*, *N. baja*, *N. xanthographa*, *Orthosia lota*, *Anchocelis pistacina*, *A. lunosa*, *A. litura*, *Xanthia cerago* (very common), *X. silago*, *X. ferruginea*, *Cosmia trapezina*, *Hecatera serena*, *Phologophora meticulosa*, *Euplexia lucipara*, *Aplecta nebulosa*, *Hadena proteus*, *H. chenopodii*, *H. oleracea*, *H. pisi*, *Plusia gamma*, *Amphipyra tragopogonis*, and *Catocala nupta*. In addition to these I took on the wing *Chortodes arcuosa* (very plentifully), *Tapinostola fulva*, and *Euclidia mi*; at lamps, \**Luperina cespitis*, *Gortyna flavago* (several); and at rest, three *Acronycta aceris*. Of those marked with an asterisk only single specimens were taken. Another collector took, in addition, in the same locality, *Euthemonia russula* (in fair numbers), one *Geometra papilionaria*, one *Notodonta dictæa*, and several *Agrotis porphyrea*. Of course I am aware that there are no really good things in the above list of sixty-one species of Noctuæ; but it is, I think, sufficiently comprehensive to show that in some few localities there were exceptions to the almost universal dearth of even common insects.—J. E. TARBAT; Cambridge, April 21, 1884.

PAPILIO MACHAON IN SURREY.—It may interest the readers of the 'Entomologist' to know that I have just found a pupa of *Papilio machaon* in a field abounding with wild carrot plants, and near a marshy piece of ground. It was found suspended to a dead twig. There is a mention, in Newman's 'British Butter-

flies,' of *Papilio machaon* having been caught at Battersea, but there is no recorded capture anywhere else in Surrey.—BRUCE G. SETON; Derwent House, Anerley, Surrey, May 13, 1884.

PIERIS BRASSICÆ, VAR.—Out of 160 larvæ of *Pieris brassicæ* taken in October three have up till now safely reached the imago stage. One of these is a curious variety, the extreme expanse of wings being  $1\frac{2}{3}$  in., and the specimen having none of the usual markings, this being a male, except the tips of the fore wings, which are very faintly marked with black. The other two are ordinary male and female specimens.—G. F. G. WILDES; Kirtling, Newmarket, May 7, 1884.

REPORTED CAPTURE OF PYRAMEIS HUNTERA.—It may interest some of your readers to know that I took a variety of *Pyrameis cardui*, var. *Pyrameis huntera*, about four years ago in a lavender field at Hitchin.—F. H. BARCLAY; Leyton, Essex.

[*Pyrameis huntera*, Fab., is a synonym of *P. virginiensis*, Dru., a North American species. It was formerly a reputed British species, but no one holds that view now. It is possible that Mr. Barclay has taken a variety of *P. cardui*, but we imagine not *P. huntera*, which is not a variety, but a good species.—ED.]

LYCÆNA ARGIOLUS AND THECLA RUBI IN N. WARWICKSHIRE.—These two species were extremely plentiful this year in Sutton Park (N. Warwickshire). The males of the former, as usual, average about twelve to one to the females. They were rather late in making their appearance this year, perhaps owing to the recent rough weather, and many of the nights in April were frosty. In 1882 *L. argiolus* was seen on April 7th; this year it was a month later.—W. HARCOURT BATH; 2, Edmund Street, Birmingham, May 16, 1884.

DEIOPEIA PULCHELLA AND ACRONYCTA ALNI.—When I began collecting Lepidoptera some few years ago I formed the nucleus of my collection with a few species my elder brother had taken at Repton, in Derbyshire; amongst them was the rare *Deiopeia pulchella*. When he returned from abroad this year, where he has been for some time, I asked him about it. He took it, he said, on a brick wall in the autumn of 1874 at Repton. I am not aware that it has been captured in that neighbourhood before. On June 9th, 1883, I took a finely-marked, but small, specimen of

*Acronycta alni* at Wimbledon.—LYONELL FANSHAWE; 2, Halkin Street West, Belgrave Square, S.W., April 27, 1884.

PUPATION OF *ERIOGASTER LANESTRIS*. — The following remarkable case of pupæ standing over for several seasons may not be without interest to some of your readers. In the autumn of 1880 I had half a dozen pupæ of *Eriogaster lanestris* sent me. One emerged in the spring of 1881, the remainder standing over until 1882. In the spring of that year another emerged. In 1883, no other emergence having taken place, I opened two pupæ, when I found that both contained fully-formed and living imagines, which crawled about for some days, but, as might be expected, their wings were not developed. During the present month (March, 1884), thinking the two remaining pupæ must certainly be dead, I opened them, and found the first one contained a dead imago; but on opening the second, to my surprise, a living imago was liberated, which immediately crawled upon a dead leaf, and its wings were soon developed to the normal size. I have never had pupæ stand over so long before, although delay for two seasons seems to be a common occurrence. — J. W. TUTT; 45, Beaconsfield Terrace, East Greenwich, S.E., March 15, 1884.

HYBERNIA PROGEMMARIA, VAR. FUSCATA.—In answer to your correspondent in the last number of the 'Entomologist,' he may be interested to know that I took this variety at light in March, 1883, in Sutton Park. I frequently come across very dark varieties also of *H. defoliaria* in the autumn in the woods near here.—W. HARCOURT BATH; Birmingham, May 16, 1884.

PETASIA NUBECULOSA, RETARDED EMERGENCE. — In 1881 I reared some twenty larvæ of *Petasia nubeculosa* from Rannoch eggs; they were full-fed about the end of June, and duly went to earth. In the following spring I vainly searched the breeding-cage for imagines, and the early months of 1883 having passed with a no more favourable result, I concluded that the larvæ had died instead of pupating. To my surprise and pleasure, on looking into the cage on March 22nd of the present year, I discovered a moth just emerged from pupa; this was followed by others on the 23rd, 24th, 29th, and 31st, in all five, which (with the exception of the first, which was very slightly crippled) are fine well-developed specimens. — ROBERT ADKIN; Lewisham, May, 1884.



EPUNDA LUTULENTA AND VARS.—The varieties *luneburgensis* and *sedii* both occur in this district. By *luneburgensis* I mean the dark form almost as black as *Epunda nigra*, but with the central bar clearly visible in certain lights; and by *sedii* the ashy-gray form with very distinct darker central bar. Neither of them have any superficial resemblance to what I believe to be the ordinary English *Epunda lutulenta*, which I take to be a dull smoky brown, nearly unicolorous, insect, by no means so handsome as either of the varieties named. This form, so far as my experience goes, does not occur here. In one of my specimens of *luneburgensis*, a male, there is a distinct wavy dark central line across the upper side of the under wings; and in another, a female *sedii*, the same wavy line occurs, but is pale on the dark ground, or exactly reversed. If possible, it is my intention this autumn to obtain eggs from both varieties, and see if they are constant. I should also be glad to obtain, in exchange for some of mine, eggs of the English *Epunda lutulenta* to compare the larvæ.—PERCY H. RUSS; CULLEENAMORE, SLIGO, MAY 13, 1884.

CUCULLIA SCROPHULARIÆ (*Hübner*) TWO YEARS IN PUPA.—On July 8th, 1882, I found seven larvæ of this moth on *Scrophularia nodosa*; they all went into pupa in about a fortnight, but none appeared in the perfect state during 1883. One, however, came out, a fine and perfect specimen, on April 26th in the present year (1884). I am not aware that this species has before been known to remain two years in the chrysalis state.—O. P. CAMBRIDGE; BLOXWORTH RECTORY, MAY 1, 1884.

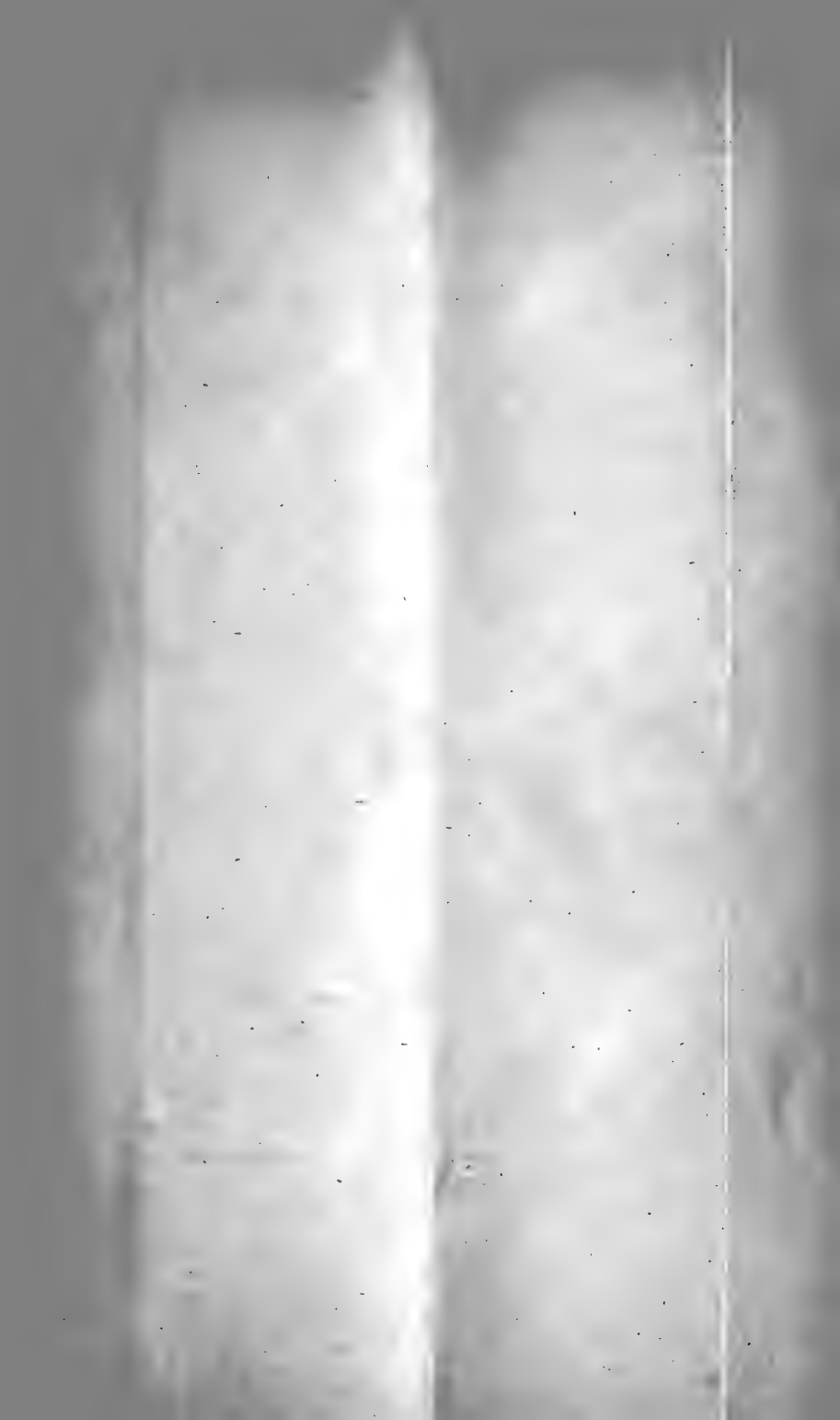
DESCRIPTION OF THE LARVA OF HOMŒOSOMA NEBULELLA.—On August 18th, 1882, I received a supply of withered flower-heads of thistle (*Carduus*), containing larvæ of this species, from the Rev. H. Williams, of Croxton, Thetford:—Length five-eighths of an inch and stout, cylindrical, tapering a little at both extremities. Head small, narrower than the 2nd, and still narrower than the 3rd, segment; segmental divisions deeply cut, and there is also a transverse depression, but not so deep, on each segment. Ground colour dingy greenish yellow; head brown, with darker sienna-brown mandibles, and a few prickles of the same colour above the mandibles; frontal plate sea-green, edged behind with smoke-colour. Dorsal stripe broad, dingy purple; subdorsal stripes of the same colour, but still broader; and there is an equally broad stripe of the same colour along the

spiracular region, but this stripe is interrupted at the segmental divisions, and has also running through it a waved line of the ground colour. The purple stripes form the prevailing colour of the dorsal area, and might almost be taken as the ground colour; spiracles black; ventral surface dingy greenish yellow, variegated with purple marks, the legs barred with black. I bred no imagos the following year, but specimens of a pretty chalcid, *Monodontomerus areus*, two species of Diptera, *Trypeta serratula* and *T. solstitialis*, and about a dozen specimens of a small hemipteron emerged from the thistle-heads.—G. T. PORRITT; Huddersfield, May 12, 1884.

THE DEATH WATCH.—Are there not two insects, producing very different sounds, commonly known by superstitious people under the above name? I have very frequently heard the watch-like “tick, tick” of one of them, but a few days ago my attention was called to another “death watch,” which made a quick succession of raps, reminding one of the woodpeckers. In this part of the country the natives are pretty unanimous in attributing all these sounds to a spider. Of course this is only folk-lore.—W. MACMILLAN; Castle Cary.

THE BIRMINGHAM NATURALISTS' FIELD CLUB.—This Club, which was formed in 1882, is composed chiefly of entomologists. It has been arranged to read the following papers relating to Entomology during the summer session:—April 23rd, “British Butterflies,” by W. Whitehouse, Soho Branch; June 11th, “The Geometræ,” by A. R. Pimm, Central Branch; July 16th, “Ants,” by F. Spearman, Soho Branch; July 23rd, “The Motions of Insects,” by A. R. Pimm, Central Branch; August 13th, “Some Species of Lepidoptera injurious to Agriculture,” by W. Harcourt Bath, Central Branch. The General Secretary is Mr. A. R. Pimm, 60 Lionel Street, Birmingham.

LOCAL LIST OF LEPIDOPTERA.—It is pleasing to find that Mr. John W. Ellis, the Hon. Sec. of the Lancashire and Cheshire Entomological Society, has undertaken, at the request of that Society, the compilation of a list of the Lepidoptera known to occur in those counties. He has appealed for the assistance of those who have collected over the locality, and will furnish them with printed lists to fill in. His address is 101 Everton Road, Liverpool.—JOHN T. CARRINGTON; Savage Club, Savoy, London, May, 1884.





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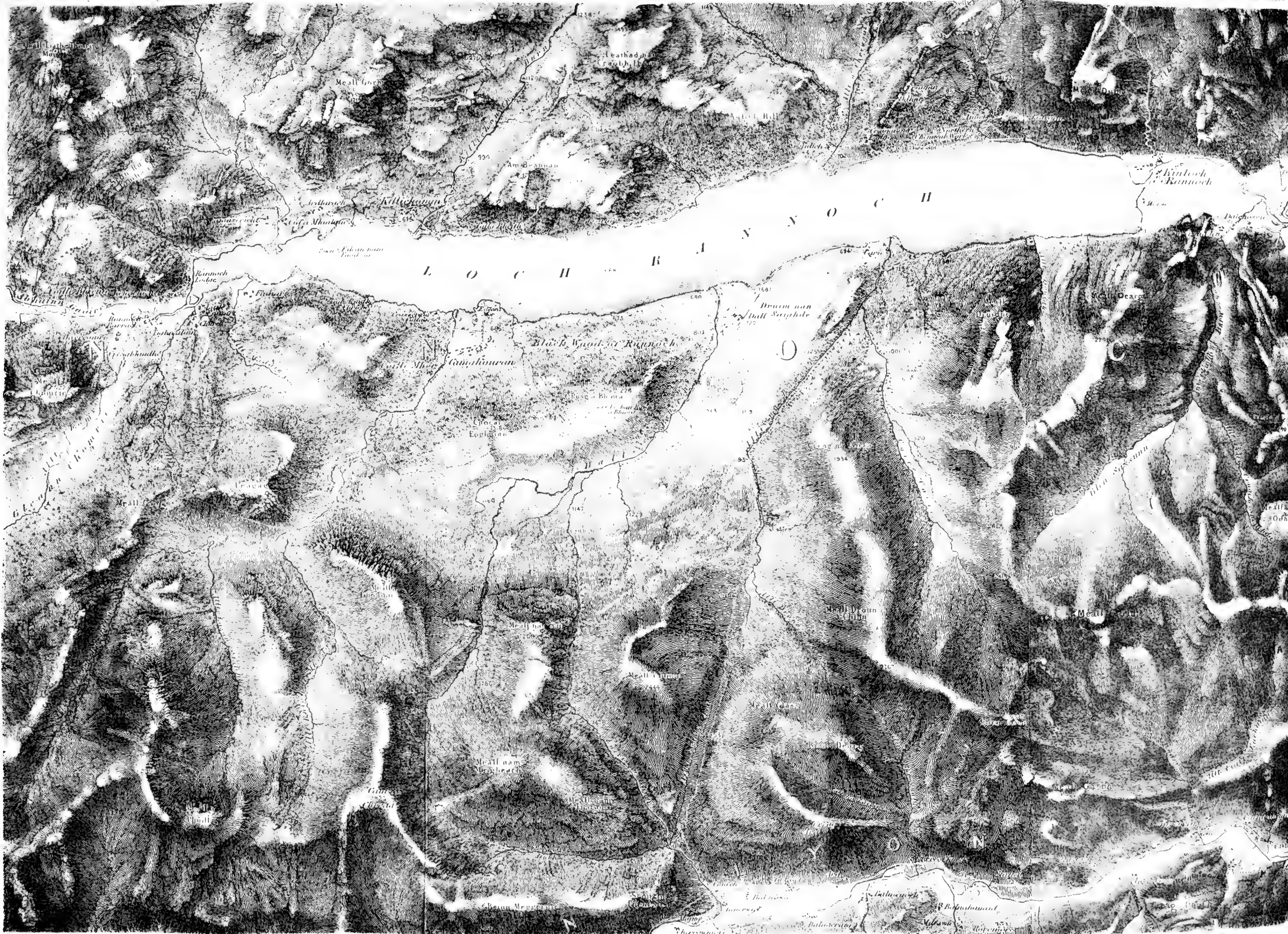
## RANNOCH.

By JOHN T. CARRINGTON, F.L.S.

(WITH MAP.)

DURING the last few weeks I have had no less than a dozen enquiries from lepidopterists—some young and some old hands—as to the best way to get to Rannoch, and what to do on arriving there. As the demands upon my time are only too numerous, I have promised to answer them—and possibly at the same time interest others of our readers—by giving a description in these pages of that most charming entomological locality. I must, however, apologise for any shortcomings, as it is now nearly ten years since I visited Rannoch; but with the help of the accompanying map, and of my notes taken at the time, I have no doubt I can give intending collectors sufficient information to form a basis for good work on their part.

It will be found of the first importance by visitors from the south to travel by the right train to Scotland, so as to arrive at Struan Station by the mail train from Perth. Struan is on the Highland Railway, is some forty miles north of Perth, and is the station for Kinloch Rannoch, which is about twelve miles distant by road. The importance of reaching Struan by the mail train, which should get there at 10 o'clock in the forenoon, lies in the fact that it is met by a post-car, on which seats for Kinloch may be secured for two or three shillings; whereas if one arrives at any other time of the day one must hire specially at post-horse rates, or remain the whole day and night, which would be comparatively wasted at Struan. The visitor should not



Reduced from the Ordnance Survey



be too sure that such seat will be at his disposal, and he had better write a few days previously to the post-master of Struan, on whose kind offices he may rely, to secure for him a place.

We Londoners will imagine that we have left Euston Square Station at 8.50 in the evening, and slept most of the way to Perth, as every entomologist should, if he only leaves behind him the cares of his every-day business, which all who intend having a real holiday would do naturally. Then there is a short time for a little breakfast, and a change on to the Highland line. For the first few miles after leaving Perth the scenery will fully occupy his attention, especially between Pitlochrie and Blair Athol, when the train passes through the celebrated Pass of Killiecrankie; and, by the way, I may mention that the left-hand corner of the carriage, when facing the engine, will be found the best place for observing the scenery.

At last, seated on the post-car for Kinloch, we pass through a wild and not too inviting country. Wild, however, as it appears to the newly-imported "Sassenach," it is nothing when compared with the scenery a few miles further north, in the tract of country north-west of the head of Glen Glarry. However, as we descend into the vale of Rannoch, we come upon one of those beautiful Highland views which repays us for the fatigue of our long journey from town.

There are now two hotels in Kinloch,—one is the "M'Donald Arms," and the other the "Burn Rannoch Hotel." The latter, which is the most conveniently situated for entomologists, is kept by Mrs. M'Donald, who has lived for years in Kinloch as proprietress of the former hotel, and for whom the latter was built. This good lady has long ago learned the eccentricities of the "Flycatchers," and can make them most comfortable. If we travel in a party of two or more it will be well to arrange to let her conveyance meet us at Struan, and perhaps she may board us "en pension"; but these are details which may be settled by letter. Private lodgings are most difficult to obtain in the district, and are not always quite such as the uninitiated would care for; although comfort, but of very plain character, may be found.

As it is long past noon when we have unpacked our "impedimenta," and as we have travelled something like five hundred miles since dinner last evening, we shall not care to enter very



seriously on our entomological work the first day; so we can take our nets, and a few boxes, and have a short walk, with the object of obtaining the bearings of the locality. This may be best effected by ascending the hill on the north side of the "town." If we return a little way down the road by which we entered the town we shall see to our left the village school-house, and just before reaching it is a path, which on our map is denoted by a zigzag line. This path is very steep, but for the view will be found worth the climb. It takes us to the top of "Beinn a Chuallaich," a hill of 2925 feet elevation. This, however, we must not attempt, but can bear over towards the westward, when we can at no great altitude see nearly the whole length of the great vale of Rannoch, including its Loch towards the west, and the windings of the River Tummel to the east. South-east, and immediately before us, is *the* mountain of the district, with its curiously volcanic-looking cone. This is Schiehallion, and is to be a great landmark in many future wanderings. It is given as 3547 feet high, and ranks among the higher mountains of Great Britain. It is also celebrated for certain physical observations carried out upon its summit some years ago, no less than the "weighing" of the world.

Before us, in panorama, lie the mountain's sides south of Rannoch, and on these all that most interests entomological visitors is to be found. Somewhat west of the foot of Schiehallion is the Innerhadden Burn, long one of the celebrated collecting-grounds. In this article Innerhadden will be our eastern limit, and we will carry our investigations westward as far as the head of Loch Rannoch, in all some eighteen miles of country. All the best entomological work in Rannoch has been done on the south side of the lake; and if we cast our eyes over towards the westward one of the first things we note is a white cottage near the lake-side, about a couple of miles along its shore. This used to be Duncan Campbell's; and there stayed Weaver and some of the early collectors who visited this locality. Weaver had no luxuries in those days, not even such as those of a train and post-car; for it is said that he wheeled his luggage in a barrow from Perth to Rannoch, and settled in that cottage on his first visit, when nearly everything which he caught was new. Again, to the west, we see large birch woods; these are those of Carie, where the next important burn runs into the loch,

Further on is Dall; and then the great Black Wood of Rannoch, some three miles through. There is a burn also at Dall. Past the Black Wood is Camachgouran, the chief village of the south side of the loch, and much celebrated as a good entomological locality. Here also is a burn; and near it is Cross Craig Cottage, the residence of Mrs. Robertson, of Struan, the proprietress of half the land south of the loch. Years ago this estate is said to have extended from near Glencoe to Struan, but it is now much divided. Having got all this into our mind's-eye, we may be content for the time with the promise that to-morrow we can walk the whole distance, and I can mention as we go some of the insects which we may expect to meet with, from time to time, in the various localities. In a general article of this character it is impossible to give anything like a detailed account of the riches of the various little bits of collecting-ground we shall pass on our walk from Innerhadden to the head of the loch. I will, however, try to give such particulars as may lead collectors to revisit any particular place according to the different species of insects required.

Arrived at the bridge which crosses the Innerhadden Burn we see to the left a house which used to be the residence of Duncan Stewart, who, when professionally engaged, represented the sheriff of the county, and served such legal instruments as were necessary on the surrounding inhabitants. As these duties were few and far between, he had much time on his hands, and was always willing to take in a lodger or show the visitor over the neighbouring country. As Duncan's (if he still lives there) accommodation is limited, it will be better viewed before engaged. A long day may be spent up this burn, and many mountain species observed. It bears to the west a little, through Glen Sassun, where, says a legend, there was once a great slaughter of English invaders by the highland natives. Perhaps even greater slaughter has occurred in this wild glen, for several entomologists have from time to time lodged with Duncan at its foot, notably Mr. Thos. Eedle. I never found any rare Macro-Lepidoptera in this locality which I have not taken elsewhere in the district; but among the stunted bilberry high on the mountain, at the end towards Fortingal, *Scoparia alpina* and *Penthina staintoniana* used to occur (June 16), while on the hill-top just west of Duncan Stewart's was good for *Euchromia arbutana* and *E. flammeana*

(same date). On the tops of higher mountains south of this, and all the way west to head of the loch, if above 2000 feet, may be found *Erebia cassiope* (July 12) and *Psodos trepidaria* (July 1). I need hardly say sunshine is absolutely necessary for these to take wing, as also for *Anarta melanopa* (June 3) in same localities. This species is later than *A. cordigera*, which prefers a little lower down the hill-sides; these latter may be found at rest, when there is no sunshine, upon large stones, with an occasional *Acronycta myricæ*, and, if well looked for, a couple or three dozen a day may be taken about May 8th to 16th. Still lower on the mountain's side amongst heather we shall find in the early days of May the lovely little *Fidonia carbonaria* flitting in gleams of sunshine, frequently over the fresh fallen snow of early spring. Under the crowberry a little later are to be found the pupæ of *Pachnobia hyperborea*, once the great prize of the locality. I took my specimen on the 10th of July, but that is perhaps rather late for the imago state of this species. On the lower slope of the hills west of Innerhadden, and just above the loch, *Crymodes exulis* has been taken at sugar in July, but only odd specimens. This species also frequents certain flowers, orchids among them. It has been taken close by the road-side near the lake between Kinloch and Carie, and amongst the birch trees nearer the latter.

Keeping along the road at the foot of the hills to the westward we come to the first burn of importance, which runs into the loch from the south. This is Allt Druithe, and it is by the side of this that stands Duncan Campbell's cottage. Although small, it is a most picturesque burn, and full of interest for both entomologist and botanist; many rare and characteristic plants occur by its sides a little way up to a fine waterfall, just before reaching which is the only locality where I have taken *Larentia ruficinctata* (August 10). At the same time *Cidaria immanata* in endless variety, with other Geometers, may be disturbed from the rocks overhanging the burn; all are worth looking at, as variation seems peculiar to this locality, especially in the case of *Ypsipetes elutata*. There is a rare fern, which grows right under the fall just spoken of, viz., *Hymenophyllum wilsoni*, and *Asplenium viride* also occurs there. In passing I may mention that I have found some eighteen species of ferns in Rannoch, and many of them are rare. I have taken *E.*

*cassiope* just above these falls, and on up to the top of the hills above.

Continuing our walk, the road now enters a large birch wood, and this was a favourite sugaring-ground for collectors who made Kinloch their head-quarters. Most of the Noctuæ which have been recorded from Rannoch have been taken here, or further along by the loch-side. Sugar appears to be of little use before the middle of June; but July is the month best suited to it, and August is better than June. In these woods in the early spring the great prize is *Petasia nubeculosa*, which is to be found at rest. To make a good catch of this species a man needs a quick eye and great patience, for it is dreary work, frequently walking in deep snow, with a cutting wind. A little later *Endromis versicolora* is to be seen, though by no means commonly, at rest during the afternoons on the leafless twigs of the birch trees in the same locality. We now come to the Carie (pronounced Caurie) Burn, passing which the road turns somewhat past a few small houses. If lodgings could be obtained here it would save much walking, but I doubt if such could be arranged. The road now rejoins the lake-side, and continues through heathy banks on to Dall. It was on a post just as we enter the two fields before reaching the Dall Burn that Warrington found the unique *Nyssia lapponaria*; and in the field near the lake the late Mr. Blackburn found three specimens of *Sterrha sacrararia*, an odd find for Perthshire when we consider that South of Spain and North Africa may be considered its more natural home. Here also Weaver said he once saw a *Vanessa antiopa*. To our left is Dall House, the highland residence of Mr. Wentworth, to whom all the land belongs from Duncan Campbell's at Allt Druithe to the cottage at the west end of the Black Wood, and it is proper to obtain his leave to collect thereon.

Passing over the Dall Burn we enter the great Black Wood of Rannoch. This is probably the most important locality in Britain for students of our Lepidoptera and Coleoptera. It perhaps cannot be called virgin forest, but it is nevertheless as nearly approaching it as anything we have remaining in these islands. It is therefore probable that many of the plants and insects which occur there are direct descendants for countless ages, without suffering from the disturbance of cultivation of the land, or even forest fires. It is highly desirable that a

series of each species, no matter how common, found in such a place should be carefully preserved for comparison with those from other localities.

With the limited space at my command it would be inconvenient to give a list of all the Lepidoptera to be found in the Black Wood; but suffice it to say that, no matter what be the season of the year between April, when the sallows are well worth working, and November, when certain rare *Peronias* and other hibernating species still linger, there is always something to be discovered in this rich locality. The immense fir trees give shelter when too windy to work in more exposed places, and the rich undergrowth of heather and bilberry protect hibernating larvæ and pupæ from the very severe frosts of winter. In the height of the entomological season, on a suitable day, insects occur in such profusion that it is at times difficult to select on a first visit, what one would care most to take. Against this charm, however, we have as a set-off the bloodthirsty Diptera, which are generally left masters of the position. I have had some experience of mosquitos, but none I have met with could be more severe in their punishment than can be these large gnats of Rannoch. Among the Lepidoptera peculiar to the Black Wood are *Fidonia brunneata* (July 1), at times common enough to be a nuisance to the collector. *Mixodia palustrana* (July) also is to be found chiefly among the bilberry beds. *Sesia scoliæformis* has been found (by Mr. Cooke) on the large birches, but, although I long sought for them, I never came nearer than an empty pupa-case.

As we leave the Black Wood we enter upon Mrs. Robertson's property, and the cottage to the right by the lake-side is her keeper's house. If she will give the visitor permission to wander over her moors, as she most kindly gave to me, he will be a happy man, for on her estate occurs nearly every species which has been taken in the Rannoch district. The crofters' cottages and their "bothies" to the left form the village of Camachgouran as spelled by the natives, or Camghouran of the Ordnance maps. The moor above the village is full of entomological riches, and the higher one gets in the various ranges of hills the more varied the fauna and flora. In the meadows below the little graveyard and by the lake-side I used to take the pretty *Emmelesia blandiata* among the eyebright, and at rest on the birch

leaves in July. This species also occurs at Kinloch in similar situations. Continuing our walk, we pass the bridge over the burn which is the largest running into the lake on the south. There is much bold scenery up this burn, and good collecting. The pretty house to the right is Cross Craig Cottage, the residence of Mrs. Robertson. In the birch wood to the left, among long grass, *Erebia blandina* is often common at the end of July. The large birch trees on either side of the road which runs through the wood, although near the lake, will doubtless even now bear the marks of the entomologists' sugar, for this is the best sugaring-ground of all in Rannoch, and where one may get *Noctua sobrina*, *Aplecta occulta*, and other rarities. We must, however, pass on, and as we look over to the other side of the loch we can see the village of Killichonan facing south. Although the hills on that side look tempting enough, I never found anything to repay the time spent upon them.

We will now hurry on, for we have four miles further before reaching the loch-head. There is little new to be found on the way, for such insects as we find after passing the last birch wood are to be obtained elsewhere, and nearer our hotel. *Chortobius davus* is common on the moors here (July), and many are very fine examples; but these occur also up the Innerhadden Burn. After passing the little kirk of Finnart we see the large house at the head of the loch. This is Rannoch Lodge, the residence of Sir Robert Menzies, to whom belongs the whole north side of the lake.

We have now walked some eighteen or twenty miles, and I need hardly say feel thoroughly tired. We have not met with a single public-house of refreshment on the journey; nor are we any better off now, for there is no inn here. We may, however, persuade one of the "guid folk" in the little village to give us some tea and scones, and allow us to wait for the driver of the post-car, who will give us a lift if we have previously arranged with him, and take us back to Kinloch by the north side of the lake.

Having given intending visitors a general idea of Rannoch, I have little more now to add as regards the collecting-ground. The best, as I have said, is on the south of the loch, and extends anywhere from the lake-shore right over the mountains to Glen Lyon, as is most convenient to the collector; and, if this be his first visit to Scotland, let him take a series of every species he

meets with, for nearly all bear traces of local variation. The younger visitors must not expect to fill all their boxes every time they go out, for everything depends on weather in Rannoch. Given warm sunshine and fair wind it is not possible to set all the insects one may take, so prolific is the locality; but, on the other hand, if cold and wet, which is more frequently the case, matters are precisely the reverse. As a matter of experience I may mention that I have seen in Rannoch five weeks of continuous wet and cold, and during those weeks I have not seen as many dozen specimens of any kind of Lepidoptera. The year 1875 was a dreadful year; the whole of May, June, and part of July being more or less wet; and August almost continuously so. Should, however, the weather be propitious, no entomologist will regret a visit to Rannoch.

Savage Club, Savoy, London, June 24, 1884.

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NOTES ON *BOLETOBIA FULIGINARIA*; WITH A  
DESCRIPTION OF ITS LARVA.

BY W. H. TUGWELL.

A FEW weeks since my friend Mr. J. Trimmer Williams, of Foots Cray, kindly brought for my inspection six very fine specimens of *Boletobia fuliginaria*, which he was interesting himself to sell for Mr. Edward Upton, of Park Road, Bermondsey. Mr. Williams told me that he knew the history of the specimens, and that they could be depended on as genuine native London examples of this rarity. The simple fact of Mr. Williams offering them to his friends as genuine was in itself a good guarantee, and was sufficient to tempt me to obtain a pair. These I placed in my cabinet with every confidence, which opinion has since been confirmed beyond suspicion.

Mr. Williams gave me at the time a short history of them, which I will here detail. I cannot do better than quote from one of his letters to me, in which he says:—"Some few years since I was looking over some insects taken by Mr. Upton, when he called my attention to what he supposed was a variety of the common *Fidonia atomaria*, and which he kindly offered to give me; but I declined to accept it, telling him it might be of some

value, although at that time I did not know the name of the insect. I, however, exhibited the specimen (which was a very large one, and not quite perfect) at a meeting of the South London Entomological Society, when Mr. Farn at once recognised it as *Boletobia fuliginaria*. Mr. Upton was told of the rarity of his capture, and advised to keep a good look out for more."

This he has evidently done, and each year since Mr. Upton has taken an odd specimen, and in some years two or three, but generally wasted, sometimes only portions of wings found floating on water. All these specimens were taken near the River Thames. Last year Mr. Upton, after many failures, succeeded in discovering the larva feeding on fungus on rotten wood, and by dint of close search secured full-fed larvæ, and also pupæ, from which he bred some twenty specimens; and it was some of these bred examples that Mr. Williams offered to his friends.

A few weeks later I arranged with Mr. Williams to be introduced to Mr. Upton, who called upon me with him. The object of this visit was to ask me to meet them in Bermondsey, and see for myself the genuineness of Upton's discovery; the reason assigned being that doubts had been expressed in some quarters as to the specimens being truly British moths. This was a very natural doubt, without some proof, and one which I should most certainly have held, but from the fact of my relying on my friend's good faith, and that to me was above suspicion. However I agreed to meet him and Mr. Upton to be conducted to the locality, which was on May the 24th. It will readily be understood that I am not free to give the exact spot, as that would tend to deprive Mr. Upton of the fruits of his discovery.

We were conducted to an old wooden building in Bermondsey, near the river, to a spot most difficult of approach, in an obscure light, consequent on its position; and there, after a short search, Mr. Upton showed us the larva apparently feeding. In all he found four specimens. The food appeared to be a black, sooty-looking fungus or mould. The position of the larvæ, the surroundings, and the locality were such as would convince anyone, as it did me, that I had seen *B. fuliginaria* really and truly at home. But, to remove any possible doubt, if this queer-looking fungoid mass was the food of the larva, I suggested that



it would be more absolutely conclusive if I could feed the larva on this pabulum at my leisure. At once Mr. Upton broke off a portion of this fungus-covered rotten wood, and, removing one of the larvæ, gave it to me to bring home; and I have had the great satisfaction of seeing it not only eat, but thrive upon, the fungus for the past three weeks, and of showing it to several entomological friends. This, I think, establishes the genuineness of Mr. Upton's *Boletobia fuliginaria* beyond doubt.

The larvæ we saw on the 24th of May varied from about three-eighths to five-eighths of an inch long. The colour and markings, then, were very much of the same character as the now (June 14th) full-fed larva, which is about seven-eighths of an inch long, moderately stout for a Geometer larva, cylindrical in form, attenuating slightly at the anterior and posterior segments. The ground colour is of a sooty-black, the dorsal line marked by ten pairs of orange-coloured raised tubercles, two on each segment. The four central segments have also a second pair of smaller and less distinct tubercles, from the region of which spring longish and curiously recurved hairs. The spiracular line is also indicated by a row of raised orange-coloured tubercles. When full fed it spins up in the crevices of the rotten wood, and forms a fairly compact cocoon of greyish silk, the outside being coated with particles of fragments of wood and dried fungus. Three old cocoons, from which Mr. Upton had bred some of his insects last year, were handed to me, and these show most markedly the character of the wood on which grew the fungus where I saw the larva feeding in a state of nature.

I forwarded a portion of this fungus-covered wood to Dr. M. C. Cooke, who is one of our ablest authorities on British fungi, and he most kindly determined it for me as an effused Muscedine,—order Hypomycetes, family Muscedines (see 'Handbook of British Fungi,' p. 587). Dr. Cooke could not determine the genus, as it was not then in the stage of development necessary for identification.

6, Lewisham Road, Greenwich, June 14, 1884.

PS.—The larva was full fed, and duly spun up its characteristic cocoon, on June 25th.

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THE GENERA *HYDROCHUS*, *OCTHEBIUS*, AND *HYDRÆNA*.

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

THESE genera of the Hydrophilidæ are, as a rule, almost entirely neglected by beginners; and even advanced students of Coleoptera seem often to have very little knowledge about them. They are best obtained by using a net shaped like a prawning-net, with a straight iron edge, with which the damp, mossy, and grassy sides of ponds and watercourses may be thoroughly scraped, and so many things obtained that are lost by using the ordinary ring-net. Many of the species, in fact most of the *Hydrænæ*, frequent running brooks and narrow watercourses. These may be captured by placing some thick frayed string across the stream, so that it rests on the surface of the water, and then stirring the stones at the bottom, and tapping and scraping the sides some little way up the stream: the insects will rise to the surface, and, as they invariably cling to the first object they meet with, will almost all be found collected on the string. In swift-running shallow streams, where there are stones and boulders projecting above the surface, or approaching near to the surface, it will be found a very good plan to place the net in the stream, just below a convenient stone, and then gently rub the sides under the water with the fingers. The beetles will then become detached, and be carried down into the net. By employing these methods Dr. Power has captured large quantities of *Hydrænæ*, &c., and has added several new species to the British list. On warm days in summer some species of *Octhebi* may be found by hundreds floating on the top of the water in stagnant pools, or basking on the mud. The insects belonging to all three genera are excessively sluggish; and, as some are very minute, it requires great patience to discover them in the net, for they will often remain perfectly motionless until the net is almost dry.

Of the genus *Hydrochus* we possess four species, which may easily be distinguished from one another:—

*H. brevis*, Herbst, is a short stumpy-looking insect, with the body almost ovate, and in consequence the elytra much broader than the thorax; it is of a shining black colour, and has very deeply punctured elytra. It is a very marked species, and is probably generally distributed, but is very scarce. Stephens

gives Whittlesea Mere and Norfolk as localities. Of late years it has occurred at Horning, Gumley (near Market Harborough), Perth, Dumfries, and in the North of England.

*H. carinatus*, Germ.—This species may best be described as a diminutive *H. elongatus*, which it very closely resembles, except that it is half the size of that insect. It was first taken in Britain in 1859, by Mr. Dossetor, at Holme Fen, Huntingdonshire; and has since been found in Wicken Fen, and other fen localities.

*H. elongatus*, Schall.—From the preceding insect this may be distinguished by its duller appearance and much larger size. From *H. angustatus* this and the two preceding species may be at once separated by having several of the interstices of the elytra raised into a carina or keel. Deal, Wicken and Burwell Fens, Askham Bog, and many other localities.

*H. angustatus*, Germ.—The interstices of the elytra of this species are not raised, so that they present a flat evenly punctured surface; the depressions on the thorax are less strong; and the whole insect has a more shining iridescent appearance. Generally distributed, but local; commoner in the South of England than in the North; London district, New Forest, &c.

Of the *Octhebi* we possess nearly half the European species. They are usually considered a difficult group, and it is certainly hard to distinguish many of them without types, as the chief distinctions lie in the impressions and furrows of the thorax; and it is hard to describe these, so that they may easily be recognised.

Some writers divide the *Octhebi* into three groups:—1st, the species that have the elytra with strong punctured striæ, comprising the first eight species of our catalogues; 2ndly, those that have the elytra with feeble punctured striæ, containing *O. æneus* and *O. æratus*; 3rdly, those that have the elytra confusedly punctured, comprising the single species *O. punctatus*. The punctuation of the first eight species, however, differs so much *inter se*, that I have found from experience that this distinction is of little practical value: *O. marinus*, for instance, is very feebly striated when compared with *O. exsculptus*, although strongly striated when compared with *O. æratus*. A better division for practical purposes might, perhaps, be made by separating off *O. exsculptus*, which used to

stand as a separate genus,—*Enicocerus*, Curtis,—and then dividing the rest according to their size, which is very constant, as a rule, in this genus. With the help of the sculpture of the thorax, the membranous border or posterior angles of the thorax, and the striation, the species may then be very easily separated.

Before, however, proceeding to deal with the species in detail, it may be convenient to point out that the sculpture of the thorax (leaving out the lateral impressions, which are comparatively unimportant) are chiefly of two kinds: first, a central furrow, with a transverse impression above it and below it, like an H laid on one side, the under line being more or less curved ( $\text{H}$ ); and secondly, a central furrow, with two depressions on each side, giving the appearance of a straight line with a semicolon, more or less distinct, on each side of it ( $\text{;}$ ).

I. Second joint of the antennæ almost quadrate, but slightly narrowed at the base; membranous border hardly, if at all, visible; sculpture of thorax different in the sexes; elytra much dilated, very strongly striated.

*O. exsculptus*, Germ.—This species is very variable in colour, some specimens being of a dull black, others shining bronze; while occasionally specimens are met with in which either the thorax or elytra, or the base of both, are of a bright metallic blue colour. The male has the thorax very strongly convex, with a central furrow, and two impressions springing from its base, like a government broad arrow, and is comparatively smooth. The thorax of the female has a central furrow, with a semicolon on each side, and is very strongly punctured. In both sexes the thorax is strongly constricted at the base, and so heart-shaped. Specimens, however, occur in which this character is not so marked as in others. Taking these variations into consideration it is hardly to be wondered that confusion has arisen regarding this insect. The male is the *O. tristis* of Curtis, and the var.  $\alpha$ . *viridiæneus* of Stephens; the female is the var.  $\beta$ . *Gibsoni* of Curtis. It appears to be found chiefly in the North of England in running streams, and is very local.

II. Second joint of the antennæ narrowed from the centre to the apex, ending in a fine point at its junction with the third joint; thorax with membranous border, or with posterior angles excised and filled with membrane, or both; elytra with sides usually more or less parallel, never very widely dilated, as in the preceding division.

A. Length  $\frac{1}{2}$  a line, or thereabouts.

*O. margipallens*, Latr.—Thorax with very feeble central furrow, and transverse impressions above and below, which are not continued to the sides; membranous border distinct, more so at the posterior angles; elytra not very strongly, although distinctly, punctured. Legs red. A generally distributed species; found chiefly in brackish ditches; commoner in the South of England than in the North. Hanwell, Whitstable, Sheerness, Gravesend, Hunstanton, &c.

*O. exaratus*, Muls.—At once distinguished by its very shining appearance, deep punctuation of elytra, and by the deep sculpture of the thorax, which is very transverse, and has a feeble central furrow and two deep transverse furrows, which are continued to the lateral margins; this latter character is found in no other British species. Posterior angles of thorax excised, and filled with membrane. Legs pitchy. Usually a very rare species; but has been found in abundance by Dr. Power (who introduced it as British), and also by Mr. Champion. Rainham, Lewes, Southend, Gravesend, Whitstable. It occurs in brackish ditches, as a rule.

*O. Poweri*, Rye.—Thorax with central furrow and four depressions, and with posterior angles excised and filled with membrane; legs and palpi dark. Distinguished from both the preceding species by the sculpture of the thorax; and from *O. exaratus* more particularly by its duller appearance, closer punctuation, posteriorly more contracted thorax, &c. The first specimen taken by Dr. Power at Seaton, Devonshire; and several near the Chesil Bank, Weymouth, by Dr. Sharp and Mr. Crotch.

B. Length usually 1 line; never less than  $\frac{3}{4}$  line.

a. Thorax with very feeble central furrow, sometimes marked by a depression, and two strong transverse impressions not continued to the sides; membranous border distinct.

*O. marinus*, Payk.—Thorax very finely punctured, almost smooth, often iridescent; elytra finely punctured, usually more or less castaneous; membranous border of thorax very indistinct. In general sculpture it approaches most nearly to *O. margipallens*, but may at once be distinguished by its size, colour, and wider thorax. A very common and generally distributed species in brackish ditches or stagnant pools near the sea. I have found it in great abundance at Hunstanton, Norfolk, in company with *O. bicolon* and *O. æratus*.

b. Thorax with well-marked central furrow, but no impression on the disc; membranous border distinct at posterior angles.

*O. pygmæus*, Fab.—Distinguished from the next species by the much stronger punctuation of its elytra, which are less dilated, and by its duller appearance; the thorax also is much more strongly punctured, and the central furrow is more marked. The commonest species of the genus. Found in fresh water (stagnant ponds and ditches) throughout the kingdom.

*O. æneus*, Steph.—Brassy testaceous, very shining, with elytra considerably dilated. Distinguished from the preceding by its weak striation and larger, though feebler, punctuation; and from all other species by the sculpture of its thorax. A very rare species; but has been taken by Dr. Power at Birdbrook (Essex), at Cowley (near Uxbridge), at Hanwell, and at Horsell.

c. Thorax with central furrow and two well-marked impressions (forming a semicolon) on each side; posterior angles deeply excised, and filled with white membrane.

*O. bicolon*, Germ.—Thorax transverse; elytra with strongly punctured striæ. Insect of an entirely dull brassy colour. Generally distributed, and common in stagnant brackish water.

*O. rufimarginatus*, Steph.—Allied to the preceding species, of which it is considered a variety in De Marseul and Gemminger and Von Harold's catalogues. Its short thick form and more ovate elytra, and the broadly rufous margins of its thorax, are, however, abundantly sufficient to give it specific value. My specimens are smaller than *O. bicolon*. Scarce, but generally distributed; and found both in fresh and brackish water. Repton, Birdbrook, Lee (Kent), Sheerness, Tottenham, Scarborough, &c.

*O. æratus*, Steph.—Distinguished from the preceding species by its dull, almost black, colour, and by its smooth elytra, which are very finely punctured, with scarcely visible striæ. It is just possible that small specimens of this species might be at first sight confounded with the largest *O. margipallens*, but the sculpture of the thorax will at once separate them. Local, and not very common; found in brackish ditches and ponds. Whitstable, Sheerness, Southend, Deal, Gravesend, Hunstanton.

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

*O. punctatus*, Steph.—This species comes in naturally after the three preceding, which it resembles in the sculpture of the

thorax, and in having the posterior angles of the thorax excised, and filled with membrane. It is, however, abundantly distinguished from all our other species by its size, long white pubescence, and by the fact that it is the only species of the genus that has the elytra confusedly punctured. Very local. I have found it at Lymington Salterns, where Mr. Champion has also taken it; Dr. Power has found it at Worthing and Sheerness. It appears to be a southern insect.

Although the difference in size, as given, may appear to be in some cases inconsiderable, yet it will be found that in almost every case it will be possible to separate the insects out into their divisions, even without the aid of a lens. So far as my experience goes it would be almost impossible to confound them, except in the case, mentioned above, of a large *O. margipallens* and a small *O. ævatus*; the former being the largest species of the first group, and the latter the smallest species of the second group. In case any difficulty should arise with abnormal specimens, a glance at the sculpture of the thorax will at once settle the matter.

The genus *Hydræna* is represented in the British list by nine species (out of twenty-two given in the European catalogues). They are chiefly distinguished by their general shape and size, and to some extent by their colour; and also by the number of rows of punctures between the suture of the elytra and the humeral angle, and by the shape of these punctures, which in some species are round, in others more or less square. The genus is distinguished from all the other Hydrophilidæ by the great length of the maxillary palpi, which are three times as long as the antennæ.

I. Each elytron with more than six rows of punctures between the suture and the humeral angle.

A. Thorax testaceous, with disc at most darker.

*H. testacea*, Curt.—Head black, thorax and elytra testaceous; metasternum with three raised lines, which are wanting in all the other species; thorax quite as long as broad; each elytron with eight rows of very strong punctures between the suture and the humeral angle. Length, 1 line. Local; found in both stagnant and running water. Notting Hill, Holm Bush, Epping, New Forest, Lee, Wicken Fen, Loughton, &c.

B. Thorax dark, with extreme margins only yellow.

*H. palustris*, Er.—Head black; thorax, except extreme margins, and elytra dark. Distinguished from the preceding by its colour, smaller size, less elongate thorax, and by the fact that each elytron has nine or ten rows of distinct, but less deep, punctures, which give the insect a smoother appearance. Length,  $\frac{2}{3}$  line. Very local and rare. Askham Bog, York, and Cowley; it may always be found sparingly in the former locality.

C. Thorax entirely dark.

The three species that form this group, although very distinct from all the other species of the genus, are with difficulty separated one from another by descriptions, although their differences may easily be seen on a comparison of types.

*H. riparia*, Kug.—Distinguished by its size, and by having nine or ten rows of almost square punctures on each elytron; elytra broader than thorax, with sides rounded, but still somewhat parallel-sided. Length, 1 line. The commonest and most generally distributed species of the genus.

*H. angustata*, Sturm.—Distinguished by its parallel elytra, which are hardly at all rounded, and by having two strong longitudinal impressions on the disc of the thorax, and, above all, by the fact that each elytron has eight rows only of strong, almost square, punctures, which give the insect a more coarsely punctured general appearance. Length,  $\frac{3}{4}$  line. Local and rare. The Wansbeck (Wallington, Northumberland), Falkirk, Polmont (Glasgow), &c. A north country insect.

*H. nigrita*, Germ.—Often confounded with *H. riparia*, which it very closely resembles, but may be separated by its smaller size, oval elytra (which are much more rounded than in either of the preceding species, and are dilated behind), and by the fact that each elytron has nine rows of almost round punctures. Length,  $\frac{2}{3}$  line. Local. North of England, Scotland (Glasgow), Holm Bush, Birdbrook (Essex), &c.

II. Each elytron with at most six rows of punctures between the suture and the apical angle.

A. Punctuation of elytra very strong and regular, and plain at the apex.

a. Length, 1 line. Elytra with parallel sides, rounded at the apex only; thorax unicolorous.

*H. gracilis*, Germ.—A very distinct species, which may be at once known by its large size, shining pitchy appearance, and very



parallel elytra, each of which has six rows of large punctures between the suture and the shoulder. Common, and generally distributed in England and Scotland.

b. Length,  $\frac{2}{3}$  line. Elytra with sides rounded and dilated behind middle, sharply truncate at apex; thorax with light margins.

*H. atricapilla*, Wat.—The truncate elytra are alone sufficient to separate this species at once from all others; the regular punctuation of the elytra (each of which has six rows of punctures) is also a distinguishing mark. The palpi of the male are very much thickened; at first sight it bears a superficial resemblance to *H. pygmæa*. Local. Scarborough, the Wansbeck (Northumberland), Ochil Hills (Scotland). It appears to be a northern insect.

B. Punctuation of elytra more or less feeble and irregular, especially behind the middle; thorax with light margins.

*H. pygmæa*, Wat.—Thorax strongly punctured; elytra with six rows of punctures on each, between the suture and the shoulder, fairly strong and regular at the base, but hard to distinguish behind the middle; thorax strongly contracted at base; elytra rounded at sides and apex. Male with femora thickened, and tibiæ dilated at base, but narrowed towards apex. Length,  $\frac{2}{3}$  line. Rare. Scarborough, the Wansbeck (Northumberland).

*H. pulchella*, Germ.—Distinguished from the preceding by its usually smaller size, more parallel shape, lighter colour, duller appearance, and less strong punctuation of the thorax and base of elytra, each of which has six rows of rather feeble punctures between the suture and the shoulder, the outer ones being rather confused; the margins of the thorax are also more broadly testaceous, and of lighter colour than in the preceding species. Length,  $\frac{5}{8}$  line. Rare. Scarborough, Derbyshire, the Wansbeck.

The *Hydrænæ* are usually found in running water. *H. palustris*, *H. riparia*, and *H. testacea*, however, and probably other species, also occur in stagnant water.

I am much indebted to Dr. Power and Mr. Champion for hints as to localities, &c., for the species.

## ENTOMOLOGICAL NOTES, CAPTURES, &amp;c.

INFLUENCE OF MILD WINTER ON LEPIDOPTERA.—The unwonted mildness of the winter and spring of 1884 has brought Lepidoptera out very early:—*Gonepteryx rhamni* was flying about before January was very far advanced; I saw *Vanessa io* the third week in February; and *Vanessa urticæ* and *Pieris rapæ* in the first and fourth weeks of March respectively; whilst *Tæniocampa instabilis* was out in the second week in February. Larvæ of *Chelonia caxa* left their hiding-places in February; and I found the caterpillars of *Liparis auriflua* in the latter half of March. Mines of *Nepticula aurella* with living larvæ in were plentiful on bramble leaves throughout the winter. I found them especially abundant at Kirtling, near Newmarket, in the second week in January. I have also obtained several other species of Micro-lepidoptera, of which I will send you notes later on. The larvæ of *Grammesia trilinea*, *Cerigo cytherea*, *Leucania lithargyria*, *L. pudorina*, and the spring-feeding larvæ of the Noctuidæ generally, are more abundant than has been usual of late years; and this, I think, promises well for the coming season. I have found the above-mentioned larvæ and several others by searching among grass and low plants early in the morning. *Hybernia rupicapria*, *H. leucophearica*, and *H. progemma* have, as far as I have noticed, been in less abundance this winter and spring than they usually are; while, on the other hand, the early flying and hibernated Tineina have been very numerous.—A. H. WATERS; Willoughby House, Mill Road, Cambridge, April 8, 1884.

POSTPONED EMERGENCE OF LEPIDOPTERA.—Somewhere in our early periodical literature I remember to have read the statement that one of the Chelsea "aurelians," in rearing a batch of the larvæ of *Eriogaster lanestris*, was astonished to find that a third emerged the next February, another third the second February, and the remainder the February after that; and Rennie declares that this species has been known to remain in pupæ five years, which would exceed by a year the time noticed by Mr. Tutt. Apropos of another instance, given by the Rev. O. P. Cambridge, I have observed such a delay to occur in the appearance of *Cucullia verbasci*; possibly it is not infrequent throughout that very natural genus. I think it would be interesting to many entomo-

logists if Mr. Cambridge were to inform us how he distinguishes the nearly-allied *C. scrophulariæ* and *C. verbasci* in larva and imago states.—J. R. S. CLIFFORD; Gravesend, Kent, June 2, 1884.

CUCULLIA SCROPHULARIÆ.—I notice that the Rev. O. P. Cambridge, in speaking of *Cucullia scrophulariæ*, says that it had not, to his knowledge, been known to remain two years in pupa. In Merrin's invaluable 'Lepidopterist's Calendar,' p. 189, we read that the species in question, as well as *C. asteris* and *C. lychnitis*, sometimes remain two years in the pupa state. As regards the latter species I can speak from actual knowledge; but I have never possessed *C. scrophulariæ* in any stage. It seems to be either an excessively rare species, or, from its great similarity to *Cucullia verbasci* and *C. lychnitis*, it may sometimes be overlooked.—ALFRED THURNALL; 120, Major Road, Stratford New Town, E., June 9, 1884.

[Cf. Entom. vi. 175.—E. A. F.]

FURTHER NOTES FROM WITHERSLACK.—On the 30th of May, although the weather was very cold and windy, I went to Witherslack; more to accompany a friend than with the intention of doing much collecting. Since I unfortunately injured one of my legs so severely I have had to go very carefully to work, and had in consequence to forbear all collecting on the mosses. I had, therefore, to content myself with less risky ground, and commenced by looking for the larvæ of *Rodophæa marmorella*, and studying its habits. I found by beating the sloe bushes a number of *Ephippiphora signatana* larvæ, but none of *R. marmorella*, until I was resting in another field, when I observed some stunted sloe bushes with locks of sheep's wool attached. I transferred my resting-place to these bushes, and having lain down beneath them soon found some tube-like galleries made—not of wool, but fine silken thread—beneath the joints of the branches. In vain I searched for eaten leaves, but could not find any trace of the scanty foliage being attacked by any insect larva. Whatever it is they do eat seems to agree with them, for they were very fat and plump. While in a warm and sheltered corner, collecting pupæ of *Crambus falsellus*, I saw *Gelechia affinella* running amongst the low herbage; also *Euclidia mi* and *Thanaos tages* flitting about. Of these latter my friend, though not an entomologist, was good enough to catch me three specimens, one

of which had a clean light brown band across the anterior wings. June 1st was windy, but in a sheltered spot behind a hedge I noticed *Pyrodes rhediana* flying briskly in the sunshine about half-past one o'clock. My friend catching them kept me hard at work boxing,—I should think quite a big hundred; with an occasional *Lycæna argiolus* and *L. alsus*. We transferred our quarters on Monday, June 2nd, to Grange, and walked leisurely over my favourite collecting-ground there, and picked up *Catoptria aspidiscana*, but worn in condition; *Æcophora flavifrontella*, *Ennychia octomaculalis*, and *Pterophorus pterodactylus* were flitting about. *Ephippiphora cirsiana* was seen amongst knapweed; *Lithocolletis dunningella* among nut-bushes. The only Geometers were *Asthena candidata*, *Acidalia remutata*, and *Iodis lactearia*. *Cemistoma laburnella* was to be seen rising and falling like a number of charming little snow-flakes; and, as a contrast, we noted some *Micropteryx thunbergella* under a shady yew tree.—J. B. HODGKINSON; 15, Spring Bank, Preston.

NEPTICULA CENTIFOLIELLA.—Last October, whilst visiting a friend at Leyland, about six miles from here, after strolling through the orchard to see if *Nepticula minusculella* could be found, I came across a few fine large rose trees, and lost no time in finding some empty mines of a *Nepticula*. I hoped against hope for some time to find one with a living tenant; and at last one turned up. I knew the other rose-mining *Nepticula* larvæ, and therefore concluded this to be new to me; so I worked on until I found some eight or nine mines with full-fed larvæ in them, all of the same colour,—a dark brick-red. I made sure they must be *N. centifoliella*, and kept them separate. In confirmation of my opinion three specimens came out early in May. What a distinct and lovely specimen it is; the female is a really brilliant insect. I think it has only been bred before by Mr. Boyd, of Cheshunt.—J. B. HODGKINSON.

PSYCHE RETICELLA.—Two fine specimens of this local insect were captured, one on the 1st and another on the 2nd of June, on the sea-wall below Gravesend.—WM. MACHIN; 29, Carlton Road, Carlton Square, E., June 16, 1884.

PTILIUM AFFINE, *Er.*—Among some Trichopterygidæ I took in moss last winter, and which have been lately named for me by the Rev. A. Matthews, were two specimens of this rare beetle.—C. H. MORRIS; School Hill, Lewes.

BASSUS LÆTATORIUS BRED FROM A SYRPHUS COCOON.—On the 3rd June I bred this ichneumon from a *Syrphus* larva, obtained last October in Oreston quarry, feeding on *Aphis jacobææ*. By the end of the month it changed to pupa, and remained in that state until the above date.—G. C. BIGNELL; Stonehouse.

THE DEATH-WATCH AND ITS SOUND.—Possibly, as Mr. Macmillan suggests, what is popularly styled the “death-watch,” or tick, is produced by more than one species of beetle or larva. Some years ago I lived in a house where this sound was heard repeatedly, as coming from the panelling of one of the sitting-rooms. It was noticed by myself and others that there were variations: thus at times the taps (if taps they were) came with such regularity that they might easily have been mistaken for the actual ticking of a watch; then there were also occasional taps, with pauses,—these seemed somewhat louder, but listeners did not agree on this point. No insect was seen, in any stage of life, nor were any apertures discovered in such portions of the woodwork as were open to examination. The theory—for it can be nothing more—has been propounded these recent years that the noise is not made by the beetles as a call or signal to each other, which was the opinion of the older entomologists, but produced by the larva, in order to ascertain how near it is to the external air when it is forming mines or galleries. May it prove ultimately to be the fact that both are vocal, but in a different manner? I have never quite been able to accept another theory,—that it is by striking its head against the wood that the sound is produced by the beetle. The species credited with this ominous appellation is *Anobium striatum* or *tessellatum*; presumably a similar sound may be emitted by other species of *Anobium* under certain circumstances.—J. R. S. CLIFFORD; Gravesend, Kent, June 2, 1884.

INSECTS AFFECTING STORED RICE.—Mr. Riley, in the ‘American Naturalist,’ says:—“In a lot of damaged rice from the Chinese Centennial Exhibit, recently submitted to us by the the director of the National Museum, we found the following insects:—Numerous larvæ of *Tenebrio molitor*; larvæ of *Tenebrio obscurus*, somewhat less numerous than the former; also a few imagines of the same species; numerous larvæ, pupæ and imagines of *Murmidius ovalis*; several larvæ and imagines of *Trogosita mauritanica*; numerous dead specimens of *Calandra oryzae*; a few specimens of *Silvanus surinamensis*; a few larvæ of

*Attagenus megatoma*; numerous larvæ of what appears to be *Ephestia zææ*; a few specimens of *Lepisma saccharina*. The larvæ of *Trogosita mauritanica* are known to prey upon other soft-bodied insects, while those of *Attagenus megatoma* live also chiefly upon dried animal matter. The remaining species found in the rice are known to feed upon stored produce, and are of no special interest, except the *Murmidius ovalis*, which is not often found in large numbers, and whose earlier states have hitherto remained unknown."

COLEOPTERA.—Having lately commenced the study of our native Coleoptera, I would be much obliged if I could communicate with some of your numerous correspondents with a view to obtaining information upon that department of Entomology, and especially in regard to good works published upon that subject.—A. HARBOTTLE; 6, Gibson Terrace, Sunderland, June 9, 1884.

[No doubt some of our friends studying the Coleoptera will be glad to obtain a correspondent in a new locality.—ED.]

SOUTH LONDON ENTOMOLOGICAL SOCIETY.—An exhibition meeting was held on June 5th, in the new rooms of the above Society, 60 Blackman Street, Borough, at which many exhibits of considerable interest were made. The most extensive was that of Mr. T. R. Billups, comprising ten cases of Coleoptera; besides others of Hymenoptera, Hemiptera, Arachnidæ, and Orthoptera. The exhibit of Mr. Robert Adkin contained many well-set species of British Lepidoptera of considerable value, besides some full-fed larvæ of *Endromis versicolor*. Twenty-four life-histories of British species of Lepidoptera were shown by Mr. West; and a collection of leaves infested by *Coleophora*, with a collection of pupæ, by Mr. West, of Greenwich. A case of Lycænidæ, by Mr. J. T. Hall, and five cases of exotic Lepidoptera, by Mr. Bliss, formed very effective exhibits. A case of Neuroptera and Trichoptera was shown by Mr. Vincent; and another case was on view showing the manner of setting Lepidoptera without pins through the thorax, as advocated by Mr. G. Coverdale. The life-history of the celery fly was also shown; and that indefatigable collector Mr. G. Elisha showed some cases of Tineæ. A large number of microscopes, showing various wonders of insect-life, with extensive mural decorations, composed chiefly of drawings of botanical specimens, helped to form a very interesting exhibition of work done by the members.—WALTER A. PEARCE, Hon. Sec.

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## NOTES ON A NEW ZEALAND APHIS.

BY GEORGE VERNON HUDSON.

IN the following paper I have endeavoured to give a brief account of a colony of Aphides, and their dependents direct and indirect. The investigation of these communities of insects has afforded much pleasure, showing as it does the wonderful means Nature employs to keep the numbers of individuals of various species in proper check.

I have been at present unable to discover the name of the Aphis here, owing to the want of both catalogues and collections of this order; but, as no doubt such a common species has been described, it must suffice at present to state that it is the common Aphis of the country, and is found almost everywhere.

The females, as in the British species, being apterous, are about a line in length, and covered with a kind of waxy secretion. The male is considerably smaller, and has ample wings; but its chief peculiarity consists in the great length of its hind legs, which are nearly three times as long as the body. Colour dull grass-green in both sexes. These insects are very destructive, multiplying with great rapidity viviparously. They first appear about the end of November, and increase till the middle of January, when they continue in great numbers for about ten weeks, the colder weather, which generally sets in at the beginning of April, rapidly causing them to disappear.

The injuries produced by Aphides on many cultivated plants is well known, and holds good with increased force here, as they

seem to have almost forsaken the native vegetation in favour of cabbages, broccoli, and many other garden productions.

Fortunately, there are several insects which accompany the Aphis in its migrations, and destroy it in immense numbers, a small brown ichneumon (probably an *Aphidius*) being the most serviceable in this respect. These little insects may be found abundantly wherever Aphides occur; and it is not infrequent to see them on window-panes indoors. The female deposits an egg in the Aphis by means of a long ovipositor with which she is furnished. From this a minute grub proceeds, which devours the internal portions of the Aphis, reducing it at last to an oval shell, fixed firmly to a leaf, by its edges. When in this condition the Aphis is of course quite dead, and the ichneumon is probably in the pupa state, as the emergence of the perfect insect takes place in a few days. Numbers of these exuviae may be found in most of the communities, and I have frequently seen large ones nearly exterminated by this insect alone.

The larvæ of the genus *Syrphus*, among the Diptera, are well known to be great Aphis consumers; and as these insects are here very abundant it is not surprising to find the larvæ plentiful in the Aphis colonies. The species which I have noticed most commonly is *Syrphus ortas*, but I expect the others have a very similar economy. The larva of this insect when full grown measures about 5 lines in length; its surface is so much wrinkled that the divisions of the various segments are not distinguishable; the abdomen and sides are dark green, the back being of a yellowish brown colour, which is caused by the presence of a large quantity of fatty substance situated just beneath the thin skin of the insect. In the middle of this yellowish portion is a broad dark green line, extending from within a short distance of each end of the larva. This is the dorsal vessel, and by careful examination its pulsations may be distinctly detected. Near the anal extremity, on the dorsal surface of the larva, is a short thick tube, which has at its apex what appear to be four lunate spiracular holes. I could not detect the opening and closing of these, although I watched carefully, so cannot be quite certain as to their function. The anal aperture lays exactly opposite this tube on the ventral surface of the body. These larvæ grow very slowly, probably occupying several weeks to attain full growth. They eat large quantities of Aphides, which they have a very peculiar method of procuring,



briefly as follows:—The larva, by lying in the midst of Aphides, necessarily causes some of them to crawl over it, and on feeling them touch its back it immediately darts out its long pointed head and strikes an Aphis with the end, which is enveloped in a quantity of very sticky mucous, constantly ejected from the mouth. On the Aphis being thus captured the larva withdraws its head into the hinder segments, and devours all the juicy portions of the Aphis, the dry skin being afterwards thrown aside. In its method of progression this larva resembles a small slug, possessing no legs of any description. When full grown it slowly shrinks up and changes into a curious-shaped coarctate pupa, somewhat resembling a pear, with the stalk proceeding out sideways some little distance from the thinner end. This appendage is the air-tube, bearing spiracles at its extremity. The pupa is not protected by any kind of cocoon, but simply lays amongst the refuse near the stem of the plant which the Aphides had affected. In a fortnight or three weeks the fly emerges. It is very common everywhere, and is fond of hovering over and sucking honey from the flowers. Occasionally specimens may be seen running about plants, probably in search of a suitable place to oviposit.

One other species will complete our Aphis dependents, and that is a small hymenopterous insect of a black colour; the abdomen red in the middle; and the legs striped with black, white, and orange. Length,  $2\frac{1}{2}$  lines. This insect has been described by Smith in the 'Transactions of the Entomological Society,' 1878, p. 3, under the name of *Scolobates varipes*. It is parasitic in the *Syrphus* larva; and being very common in some places must destroy a considerable number of them. It entirely eats the soft portion of the insect, being found in the pupa state lying snugly within the hard old shell of the *Syrphus* pupa, which forms a good protective cocoon for it. The ichneumon emerges in a few days, and may be found in the vicinity of Aphis colonies, evidently searching for victims.

The larva of *Coccinella tasmanii* no doubt feeds on Aphides, but it is far from being common; and as I have as yet only found the pupa, this insect must at present terminate our list.

Karori, Wellington, New Zealand, April 26, 1884.

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## CAPTURES OF COLEOPTERA.

BY G. A. LEWCOCK.

NOTICING your correspondent's request, in the last number of the 'Entomologist,' for information concerning our native Coleoptera, it occurred to me that a few observations on this subject might be acceptable, and perhaps have the effect of awakening some of our slumbering coleopterists, and stimulate them to record their captures from time to time in this magazine. I have pursued the study of this branch of Entomology for some years, and have often found great difficulty in obtaining precise information as to the habits, time of appearance, &c., of the various species; for want of which information my researches have been conducted in a somewhat haphazard fashion, though, by continual observation and making extensive notes, I have succeeded tolerably well.

When first I resolved to take up Coleoptera, I obtained a copy of Rye's 'Beetles,' from the library of the Haggerston Entomological Society; this gave me several useful hints as to localities, &c., and proved to be a valuable book indeed. I next turned my attention to Cox's 'Handbook of British Coleoptera,' a work which is indispensable to the coleopterist, as giving descriptions of the British species. I was unable for some little time to make much headway in naming, but in this matter I obtained much valuable assistance from others similarly occupied. With the more difficult species, however, the Rev. W. W. Fowler most readily aided me; and moreover, in returning the named specimens, he very kindly filled up my box with a quantity of types of other beetles, many of them uncommon and some rare, which I found of great service. This gentleman frequently contributes articles to the 'Entomologist' (see vol. xvi., also July number, 1884), and from them I have derived considerable information. However much one reads on this subject, there is nothing like personal experience, which can only be acquired by diligence and perseverance. At the same time, should the practice of recording become general, it would materially assist us to obtain a better knowledge of the habits of our British Coleoptera than is at present available for the young aspirants in the study of this

order of insects. I will now proceed to narrate some of my experiences in search of Coleoptera this season, premising however, that I have generally been accompanied by a friend, Mr. J. Cripps, who also is interested in this branch of Entomology.

April 5th. Having determined to work up the Silphidæ, Mr. Cripps took a preliminary trip to Esher for the purpose of putting down the baits—some bottles containing pieces of liver; and he also carried a dead rat with him.

April 14th. Departed from Waterloo Station in the early morning, a cold easterly wind prevailing. Arrived on the ground in due course, we commenced sweeping, with but little result, so tried beating the furze-blossom, and obtained *Apion ulicis* and *A. striatum* in profusion; also several *Sitones linearis* and other common beetles. *Helops striatus* abounded at the foot of fir trees. Also took one specimen of each of the following:—*Dromius meridionalis*, *Coccinella 18-guttata* and *C. hieroglyphica*. *Strophosomus limbatus*, *S. coryli*, and *Adimonia suturalis* were obtained by sweeping heath. Swept a few *Plectroscelis subcærulea*. Visited the baits, finding three *Necrophorus humator*, several *Choleva chrysomeloides* and other *Cholevina*.

May 10th. Weather much improved, insects consequently abundant; *Cicindela campestris* and *C. sylvatica*, flying briskly in the hot sunshine or darting at lightning speed along the heath, were oftener seen than caught; in fact I took but one *C. sylvatica*. Netted a *Silpha thoracica*, flying at full speed in same place. By general sweeping obtained *Apion genistæ*, *A. ulicis*, and *A. striatum*; also *Cytilus varius*, *Phyllobius pyri*, &c. *Aphodius depressus*, *A. prodromus*, and *A. hæmorrhoidalis* I procured from their usual habitats. *Timarcha coriaria*, *Byrrhus fasciatus*, and many common species from sandpits; and several common *Cissidæ* on the wing late in the evening. The baits were not forgotten, and on examination yielded eight *Silpha thoracica*, one *S. rugosa*, several *Necrophorus humator*, *N. mortuorum*, *N. vespillo*, *Hister cadaverinus*, and several *Cholevina*. Result of day's work very gratifying.

May 16th. By way of change went to Loughton. Sweeping was rather difficult, the herbage being sparse and scanty; nevertheless bagged several *Apion genistæ* from the yellow-flowering plant *Genista anglica*. Also several *Crepidodera rufipes*. Beating

was a more successful affair ; obtained *Adimonia sanguinea*, *Rhynchites nanus*, *Orchestes fagi* (commonly), *Telephorus pallidus*, *T. limbatus*, *Phyllotreta nemorum*, *Coccinella variabilis*, *Dolopius marginatus*, *Phyllobius argentatus*, *P. uniformis*, and *Polydrosus cervinus* (the latter three were very common). It may be as well to mention that the foregoing were all beaten from hornbeam, the hawthorn being scarcely advanced enough to prove sufficiently attractive to insects.

Respecting the locality of Loughton I cannot say that I hold a very high opinion of its merits, either for Lepidoptera or Coleoptera. Of course there are specialities to be obtained there, but these are few and far between. On various occasions I have received from Messrs. Boden, J. A. Clarke, T. Hockett, W. Harper, and other members of the Haggerston Entomological Society, specimens of *Liopus nebulosus*, *Clytus mysticus*, *Melan-drya caraboides*, *Toxotus meridianus*, *Bembidium quadrimaculatum*, &c. I have also obtained several species of *Aphodii*, but taken as a whole the Forest does not yield enough to repay one for the trouble of working it.

May 24th. Resumed at favourite locality—Esher. Weather scorching. Having taken a specimen or two of *Donacia bidens* here last year, resolved to lose no opportunity of working at the *Donaciæ* generally this season. Commenced sweeping the low rushes and herbage in marshy places near ponds, and succeeded in getting *D. linearis* and *D. sericea*, commonly ; also specimens of *D. typhæ* and *D. dentipes*. *Erirrhinus nereis* occurred commonly ; also took *Micraspis 12-punctata*, *Coccidula rufa*, *Phyllobius pyri*, *Telephorus pallidus* (very common), *Phra-tora vitellinæ* (common). Captured one specimen of *Myceto-phagus atomarius*, which settled on my coat. Bagged *Ips ferru-gineus*, flying lazily across the new line at Cleygate. Was much puzzled by an insect I obtained by sweeping, taking it for a dried *Coccinella hieroglyphica*. Referred it to a friend, of the South London Entomological Society, who informed me that it was *Hyperaspis reppensis*, a rare beetle, occurring in moss on chalky hillsides, under stones, and decaying seaweed on the coast, &c., found also by sweeping under fir trees ; it had been taken at Sheerness, Box Hill, Chobham, Esher, Mickleham and Shirley.

June 2nd. Went to Farnham alone. Weather fine and very

hot. Hawthorn blossom magnificent; commenced operations on it early in the morning; soon obtained *Grammoptera ruficornis*, *Attagenus pellio* (very unusual to find this on hawthorn!), *Adimonia sanguinea*, *Rhynchites æquatus*, *Helodes lividus* (2), *H. minutus* (common), &c. Later on I swept the rushes at Cannon pond; obtained *Donacia linearis* and *D. semicuprea*. By the courtesy of Mr. J. R. Nash I explored some hop-gardens, and obtained several specimens of *Pachyta collaris*. This insect, which I am told bores in the hop-poles, I have hunted for unsuccessfully for several years; it flies very rapidly in the hot sunshine, but most of those I captured were beaten from the hawthorn, and swept from the nettles growing in a ditch in centre of the ground. I also took a couple from hawthorn in Darvill's meadows, but the water being over my shoe-tops I was reluctantly compelled to desist. Tried an osier-bed, and obtained a specimen of *Cryptorhynchus lapathi*; also *Nitidula bipustulata* and *Epuræa obsoleta*. Beat six *Luperus rufipes* from oak at Crooksbury Hill; also *Rhynchites nanus*, *Telephorus hæmorrhoidalis*, &c. From broom I obtained several *Gonioctena litura*, *Bruchus cisti*, *Sitones regensteinensis*, &c. The locality of Farnham well repays the trouble of working.

June 21st. Locality Esher. *Luperus betulinus* very common by beating almost any foliage. This species, as well as others of same genus, should be carded as soon as possible, otherwise they go to pieces in the laurel. Obtained *Clytus arietis* and *Dorytomus pectoralis* from willow; *Coccinella oblongo-guttata* and *C. ocellata* from fir; and *C. 16-guttata* and *C. 14-guttata* by general sweeping; as also a few *Scirtes hemisphæricus*. Took several *Donacia linearis*, *D. sericea*, also *D. menyanthidis*. The latter beetle, which Mr. Cripps first found on June 2nd this year, requires looking for in the curled blades of previous year's growth, of dried reeds standing in quagmires. Those who want it must not be afraid of the water or quagmire either. I can only say that Mr. Cripps and myself tucked up our trousers, waded in, and got a series each from the reeds. Found *Anchomenus gracilis* running quickly in and out of the rushes growing by waterside; also one *Elaphrus cupreus*. Baits again produced *Necrophori* and *Cholevina*.

July 5th. Went alone to Surbiton by 8.5 a.m. train. Took a tour round Hook, Cleygate, Claremont and Esher, finally

walking into Kingstons at 9.45 p.m. I did a hard day's work and was quite tired out. At the commencement I swept *Coccinella 11-punctata* and *C. 22-punctata*; obtained a couple of *Mantura rustica* from clover; *Cassida viridis* from thistles; *Lagria hirta*, generally common in hedges; *Anthrenus claviger* from cow-parsley. Took twenty *Malachius ruficollis* in a space of about ten yards. This insect seems very local; it occurs at Farnham on the banks of the Wey, and also at Guildford, where Dr. Capron has taken it. *Anthocomus fasciatus*, of which I captured two specimens, is generally distributed at Esher, but is not common; it occurs on the small herbage growing by ditch sides; also in buttercup flowers, and prefers the shady side of the hedge. Of *Pyrochroa serraticornis* I generally take one a year; captured the one for this season to-day. *Gastrophysa polygoni* occurred sparingly, also *Phædon cochleariæ*. *Gymnetron pascuorum* common in a recently-mown meadow; took one *Cryptohypnus quadripustulatus* at same place. Beat *Agrilus angustulus* from hazel; tried for more, but rain descended and interrupted my proceedings. These I continued again afterwards, but I got only *Chrysomela didymata* and a few *Donacia sericea*. Removed some *Necrophori* and *Cholevina* from baits, and this finished my labour for the day.

July 7th. Had a couple of hours at Coombe, taking *Attelabus curculionoides*, *Dolopius marginatus*, and three species of *Orchestes* from oak; *Rhynchites betulæ*, *Athous niger*, *Cryptcephalus labiatus*, *Lema melanopa*, &c., from miscellaneous foliage; also *Bembidium quadrimaculatum* and *B. quadriguttatum* from a dried-up pond:

This concludes the account of my captures up to present date. I hope some other coleopterist will shortly give his experience.

40, Oxford Road, Islington, N., July 12.

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## INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. V.—OPHIONIDÆ (*continued*).

### HENICOSPILUS, *Steph.*

Almost entirely testaceous (male and female).

A. Fore wing with two horny spots in first cubital cell.

a. Thorax almost entirely black; apex of abdomen black.

3. *combustus*, 9 lines.

b. Thorax testaceous.

- \* Apex of abdomen infuscated at sides. - 1. *merdarius*, 6—10 lines.  
 \*\* Apex of abdomen black. - - - 2. *ramidulus*, 6—10 lines.  
 B. Fore wing with one horny spot. - - 4. *repentinus*, about 6 lines.

Stephens' genus *Henicospilus* is only distinct from *Ophion* in having one or two chitinous spots in the fore wings. This is a very unstable character, and not of generic value, although included as only a convenient division of the species of *Ophion* by Holmgren, Taschenberg, and other continental authors. In *Ophion inflexus*, Ratz., the spot is almost absent, and asymmetrical (see Die Ichn., i. 102, iii. 80; and Vollenhoven's 'Pinacographia,' pl. 39, fig. 4). There is a good coloured figure of *O. combustus*, and details of wing-spots, in Stephens' Illustrations (vol. vii., pl. xl., fig. 4); Taschenberg did not know this species (Zeits. Ges. Nat. xvi. 436), but it is not rare in Britain. Ratzeburg figures *O. merdarius* (Die. Ichn., vol. i., pl. vi., fig. 8), and Donovan figures *O. ramidulus* (pl. 42, i.). Details of *O. merdarius*, *O. ramidulus*, and *O. repentinus* are beautifully figured in 'Pinacographia' (pl. 28, figs. 5, 5 a, 6, 6 a; pl. 39, fig. 6, 6 a). With the exception of *O. repentinus*, Holmgr., the British species are not rare. Ratzeburg describes the cocoon of *O. merdarius* as resembling a large *Lophyrus* cocoon, dark brown in colour, with the central third paler. The cocoon of *O. ramidulus* is figured on Plate ii., fig. 9: it is a hard cylindrical dark brown cocoon, with a thin covering of loose black silk; 6 lines long by  $2\frac{1}{4}$ . One of Ratzeburg's pupils probably mistook the cocoon of *O. merdarius* for that of *Lophyrus pini*, from which he bred the *Ophion* in April, 1843 (Die Ichn., i. 102).

Two species have been bred from the following hosts:—

1. *merdarius*, Gr., from *Trachea piniperda*; Ratzeburg. *Dianthœcia irregularis* (echii); Brischke. *Hecatera dysodea*; (Perris) Giraud. *Cucullia argentea*\*; Brischke. *Grammodes algira*\*, *Pseudophia tirrhœa*\*; Kriechbaumer. ?*Samia cecropia*\*; Taschenberg.
2. *ramidulus*, L., from *Pœcilocampa populi*; Rondani. *Eriogaster lanestris*; Scopoli. *Dipterygia pinastri*; Drewsen. *Trachea piniperda*; Hartig, Giraud, Brischke, Norgate. *Dianthœcia capsicola*; Giraud. *Hadena pisi*; Gravenhorst, Giraud, Bignell.

OPHION, *Fabr.*

Almost entirely testaceous.

A. Thorax black-marked (male and female).

a. Base and apex of abdomen black; sutures of thorax black.

5. *marginatum*, 7—10 lines.

b. Extreme base of abdomen not black; back and apex of abdomen more or less black.

\* Antennæ red. - - - - 4. *ventricosus*,  $4\frac{1}{2}$ — $7\frac{1}{2}$  lines.

\*\* Antennæ black at the base. - - - 6. *bombycivorus*, 9—10 lines.

B. Thorax not black-marked (male and female).

a. Radial nervure of front wing wavy. - 3. *undulatus*, 9—14 lines.

b. Radial nervure straight.

\* Lines on thorax and scutellum yellow.

† External and internal nervures of prædiscoïdal cell (pl. i., figs. 2, 10) of equal length. - - - - *minutus*,  $4\frac{1}{2}$ — $5\frac{1}{2}$  lines.

†† External nervure of prædiscoïdal cell one-third shorter than internal nervure. - - - - 1. *obscurus*, 4—10 lines.

\*\* Marks on thorax sometimes pale, not yellow. - 2. *luteus*, 4—9 lines.

This well-marked genus is the type of the family, and contains two or three of our best-known Ichneumons, which are generally common from early spring to late autumn. Their habit of coming to light has already been noticed. The neuration is remarkable, but it is very inconstant in its minor details in the same species: the upwards of 60-jointed antennæ is noteworthy (in *O. undulatus* the male has 66, the female 63; *O. merdarius*, male, has 68; and *O. ramidulus*, male, 70); and Curtis remarks on the difficulty of separating the sexes, and notes that frequently only one sex of *Ophion* (as in many other genera) "is bred from an infested larva, although a considerable number may be hatched." *O. minutus*, Kriechb., is added to the six species included as British in Marshall's catalogue (see Entom. xiii. 54, and Trans. Ent. Soc. Lond., 1881, p. 157). It is not uncommon, and doubtless was formerly overlooked as a small variety of the common *O. obscurus*. Vollenhoven gives beautifully coloured figures of *O. obscurus*, *minutus*, *luteus*, *undulatus*, and *ventricosus* on plates 28 and 39 of 'Pinacographia;' and Jurine gives a fair coloured figure of *O. marginatus* in his 'Nouvelle Méthode,' pl. 8, fig. 4. *O. ventricosus* is figured on Curtis's plate, 600. In addition to Gravenhorst and Holmgren, reference should be made to Taschenberg's "Zur Kenntniss der Gattung Ophion Fab." (Zeits. Ges. Nat., vol. xlvi., pp. 421—438). The species are all parasitic on Macro-Lepidoptera, and



the parasitic larva leaves its host when full-fed and spins its own cocoon, either within the cocoon of its victim—when this is a cocoon-making species—or by the side of the dead larva skin, or pupa, as is more frequent. *O. luteus* occasionally spins its cocoon within the pupa of its host. Mr. Bignell has confirmed Gravenhorst's observation in the case of *Agrotis præcox* pupa (cf. Ichn. Europ., iii. 693). Réaumur figured (ii. p. 435; pl. 35 and 37) the banded gold-beater's-skin-like cocoons, and minutely describes the process of formation. The similar cocoon of *O. pteridis*, Kriechb., ex the European Noctua—*Eriopus pteridis*, Fabr., is figured in 'Pinacographia,' pl. 39, fig. 5 b. The more common form of cocoon of *O. obscurum* is figured on Plate ii., fig. 8: it is smooth, hard, cylindrical, 9 lines by 4, dark testaceous, with a few threads of black silk running over the surface. The irregularly cylindrical, shining chestnut-brown cocoon of *O. bombycivorus* ex *Stauropus fagi*, from the New Forest, is figured at Plate ii., fig. 10: the outer envelope appears to project out of the cylindrical shape of the inner one; it measures 8 lines by 5; there are but a very few silky hairs on the cocoon. Vollenhoven describes the cocoon of *O. minutus* as obscure brown with a gray band, but not metallic in colouring. The following species have been bred; the common *O. luteus* and *O. obscurus* from many varied hosts; while the fine and rare *O. undulatus* and others appear to be almost confined to the larger Bombyces:—

1. *obscurus*, Fabr., from *Arge galathea*; Raynor. *Sesia formicæformis*; Brischke. *Bombyx pini*\*; (Reissig) Ratzeburg. *Dicranura vinula*; Eedle. *Pseudopterpna cytisaria*; Brischke. Geometrid; (Reissig) Ratz. *Acronycta leporina*; Drewsen and Boie. *Pachetra leucophæa*; (Graff) Ratz. *Agrotis porphyrea*; Brischke. *Hadena protea*, *Epunda lichenea*; Bignell.
2. *luteus*, L., from *Sesia formicæformis*; Brischke. *Chelonia villica*; DeGeer. *Bombyx pini*\*; (Reissig) Ratz. *B. quercus*; Marshall Coll. *Demas coryli*; Brischke. *Dicranura bifida*; Brischke. *D. vinula*; DeGeer, Grav., Curtis, &c. *Cymatophora flavicornis*, *Acronycta aceris*; Brischke. *A. leporina*; Bignell. *Leucania lithargyria*; Butler. *Dipterygia pinastri*; Drewsen and Boie. *Agrotis præcox*; Grav., Bignell. *Trachea piniperda*; (Graff, Schmidt) Ratz. *Tæniocampa populeti*; Bignell. '1.

- munda; (Goossens) Gir. *Dianthœcia capsicola*; Marshall. *D. cucubali*; Drewsen and Boie, Marshall. *Miselia oxyacanthæ*; Bignell. *Hadena pisi*; Marsh. *Cucullia verbasci*; Gir. *C. scrophulariæ*; Brischke. *C. absynthii*; Müller, Brischke. *C. chamomillæ*, *C. artemisiæ\**; Gir., Brischke. *C. argentea\**, *C. thapsiphaga\**, *C. mixta\**; Brischke.
3. *undulatus*, *Gr.*, from *Bombyx trifolii*; (Hartlieb) Grav., Curtis, Holmgren, Gir. *B. rubi*, *B. quercus*, *B. catax\**; (Perris) Gir. *B. quercus* var. *Spartii*; Bellier de la Chavignerie. *Samia cecropia\**, (Brinckmann) Taschenberg, large *Bombyx*; Rudow. ? ? [Two from one pupa of *Tæniocampa gothica*; Harrach.]
4. *ventricosus*, *Gr.*, from *Callimorpha dominula*; Gir. *Bombyx quercus*; Marshall.
6. *bombycivorus*, *Gr.*, from *Stauropus fagi*; Grav., (Standish) Desvignes, Brischke, Norgate.
- minutus*, *Kriechb.*, from *Tæniocampa cruda*, *Pionea forficalis*; Vollenhoven.

#### NOTOTRACHYS, *Marshall*.

Head and thorax black, variegated with red; legs black, variegated with red and straw-colour (male and female). - 1. *foliator*, 3—5½ lines.

This interesting species, which connects the *Ophions* with the *Anomalons*, being nearer to the latter, is included by Marshall as doubtfully British. There are three females from Desvignes' collection in the British Museum, but we know of no recent capture. It should occur with us, as the species is generally distributed; see Gravenhorst's localities; and Holmgren says it is not rare in Sweden. It is recorded from Halle by Fabricius and Taschenberg, from Holland by Vollenhoven, from Piedmont by Giraud, from France by Dours, from near Vienna by Kirchner, from Parma by Rondani, and from St. Petersburg by Woldstedt; we have German specimens from Kaltenbach's collection, Corsican specimens captured by the Rev. T. A. Marshall, and Albanian ones by Sir Sidney Saunders. *N. foliator* is figured in Vollenhoven's 'Schetsen,' pt. i., pl. ii., fig. 23; and has been bred from *Hymenorus doublieri*, one of the *Cistelidæ*, by Perris, according to Giraud.

#### SCHIZOLOMA, *Wesm.*

The general colour of this and the following genera to *Trichomma* (except *Gravenhorstia*, which is black variegated with yellow) is much alike.

Head and thorax black, more or less marked with red or yellow; legs and abdomen reddish yellow, more or less marked with black.  
 Scutellum black (male and female). - - - 1. *amicta*, 8—13 lines.

Wesmael, in his "Revue des Anomalons de Belgique" (Bull. Ac. Brux., vol. xvi., pt. 2, pp. 115—139), subdivided Gravenhorst's very natural genus *Anomalon* into five subgenera:—*Schizoloma*, *Heteropelma*, *Exochilum*, *Anomalon*, and *Trichomma*. These are adopted in Holmgren's classical 'Monographia Ophionidum Sueciæ,' and in Marshall's Catalogue; but Vollenhoven has lately written, "in our opinion Wesmael's subgenera... have no claim to be retained as genera" (Pinacog., p. 6). Taschenberg merely adopts them as subgenera (Hym. Deutschl., p. 71). The single species of the genus is not uncommon in Britain. The male is well figured by Curtis (Brit. Ent., pl. 736); and a small female, with details, by Vollenhoven (Pinacog., pl. 3, figs. 5—5 c). Several of Ratzeburg's species, bred from *Sphinx pinastri*, and Desvignes' *A. capitatum*, probably belong to this genus, if they are distinct from *S. amicta*. The larva of this species makes a very thin cocoon, and emerges direct from the pupa of its host. It is solitary in its parasitism, and has been bred as follows:—

Callimorpha dominula; Buchecker Coll. *Orgyia pudibunda*; Brischke. *Demas coryli*?; Marshall Coll. *Bombyx rubi*; (Speyer) Ratzeburg. *Cnethocampa processionea*; (Richter) Gravenhorst, (Baer) Ratz. *Pygæra bucephala*; (Reissig) Ratz. *Eupithecia linariata*; Bignell. *Xylina rhizolitha*; (Perris) Giraud. *Cucullia* sp.?; (Bond) B. M. Coll. *Halias prasinana*; Brischke.

#### EXOCHILUM, *Wesm.*

Scutellum yellow, rarely black (male and female).

1. *circumflexum*, 8—10 lines.

This genus also contains but one species, the fine and not uncommon *E. circumflexum*. Its female is figured by Holmgren in the Swedish "Öfversigt" (vol. xiv., pl. ii., fig. 2); and characteristic details are given in 'Pinacographia,' pl. 3, figs. 6, 6 a. See also Ratzeburg's figures, 'Die Ichn.,' vol. i., pl. vi., fig. 2; and 'Die Waldverderber,' pl. i., fig. 6; and Donovan, pl. 93, 2. Ratzeburg traces and figures the details of this species from the egg in his 'Die Ichneumonien,' vol. i., pp. 80—87; pl. ix., figs. 11—22; and 'Die Waldverderber,' pl. i., fig. 6 L, pl. iii., fig. S''. This should be consulted as a typical life-history of the

*Anomalons*, or the abstract in the Ray Society's Report on Zoology for 1844, p. 363; the curious tailed young larva and the absence of tracheæ, the probability of a double brood, the departure from the normal solitary parasitism in two instances out of over fifty, and many other points raised, are of great interest. The parasite emerges direct from the pupa of its host, constructing a very delicate cocoon within. Ratzeburg, Brischke, and Harrach bred it from *Lasiocampa pini*\*, Brischke from *Euplexia lucipara*; and Hartlieb (teste Gravenhorst) and Ratzeburg bred the var. *giganteum* from *Bombyx trifolii*.

#### HETEROPELMA, *Wesm.*

Scutellum black (male and female). - - - 1. *calcator*, 5—7 lines.

Wesmael's rare *H. calcator*, again the only species in the genus, was confounded by Gravenhorst with *A. xanthopus*. Kawall bred it from *Fidonia piniaria* and Brischke from *Trachea piniperda* and *Halias prasinana*.

#### ENTOMOLOGICAL NOTES, CAPTURES, &c.

ARGYNNIS LATHONIA NEAR SALISBURY. — While strolling through a clover-field near here, last August, I captured a pair of *Argynnis lathonia*.—G. H. PENRUDDOCKE; South Newton Vicarage, near Salisbury, June, 1884.

APATURA IRIS NEAR SALISBURY.—My brother caught a female specimen of *Apatura iris* on the lawn of this vicarage last season. This is the fourth specimen I have heard of being captured in this neighbourhood.—G. H. PENRUDDOCKE.

MELITEA ARTEMIS IN SHROPSHIRE.—I have much pleasure in recording the occurrence of this very local species in this district. While taking an evening stroll at Church Stretton on June 12th last, and not in the least expecting to see any butterflies so late in the day,—5.45 p.m.,—I was all the more surprised to meet with *M. artemis*, never having before found it in this county. I easily caught one with my fingers, having no net with me, and found it in fair condition. Several others were noticed during the next half-hour flying in company with *Argynnis euphrosyne*, which was quite freshly emerged and on the wing in some numbers up till

6.35, an unusually late hour, but accounted for by the very bright evening and great heat of the sun.—MARTIN J. HARDING; Cottisbrooke, Shrewsbury, July 4, 1884.

VANESSIDÆ IN SUMMER.—On June 28th I noticed, at Weston-super-Mare, a perfect specimen in fine condition of *Vanessa atalanta*, and also, here, single perfect specimens on July 4th and 5th. Each season for the last two years I have noticed single specimens in June, which I think cannot have been hibernated ones. On the 5th I saw several specimens of *Vanessa cardui* in perfect condition amongst other worn and tattered ones. Hibernated specimens of *V. cardui* were extremely abundant in May, in Dorsetshire. Perhaps other lepidopterists have made similar observations in other localities this season. When in Kansas, U.S., some few years since, I noticed that *Vanessa atalanta* was most abundant in the spring: I rarely saw them in the autumn.—T. B. JEFFERYS; Tynningfield, Clevedon, July 7, 1884.

DEIOPEIA PULCHELLA.—About three years ago I was fortunate enough to obtain a specimen of the above. I took it (fluttering upon a heap of sand) at Westbourne, Bournemouth, Hants.—EDWARD LEWER GUTCH; Christchurch, June 18, 1884.

REARING OF BOLETOBIA FULIGINARIA.—I was much gratified by finding, on July 14th, that an imago had emerged from the pupa mentioned in the 'Entomologist' (vol. xvii., p. 153) last month. The insect is a perfect female, and is a trifle smaller than those bred by Mr. Upton from pupæ collected in their native habitat. This was doubtless caused by the difficulty I experienced in retaining a uniform balance of moisture in growing the fungus upon which the larva fed for three weeks after I obtained it. The life-history of *Boletobia fuliginaria* appears to be summed up as follows:—Ova deposited end of July or beginning of August; larvæ hatch in August, and after hibernation continue feeding until the end of June of following year, when the pupa state lasts about three weeks, and the perfect insects appear about the middle of July.—W. H. TUGWELL; Greenwich, July 20, 1884.

CUCULLIA SCROPHULARIÆ AND VERBASCI LARVÆ.—In reply to Mr. Clifford's note in the last month's 'Entomologist,' some time since I visited our lamented friend, Mr. Buckler, and saw his drawings of the above-mentioned larvæ; they are certainly at the

first glance very much alike, but my friend impressed upon my memory the difference between the two in these words:—"The commonest (*verbasci*) has a saddle and stirrups, the other is without stirrups," alluding to the yellow markings on the larvæ. It is well known that *verbasci* feeds upon *Scrophularia*; in fact, in this locality, where I find one on *Verbascum* I find twenty on the former plant; *verbasci* larva has a patch of yellow on the back and sides, and *Scrophulariæ* on the back only; the moths are very different.—G. C. BIGNELL; Stonehouse, July 2, 1884.

MACROGASTER ARUNDINIS AT SUTTON, SURREY.—As the only localities for this insect mentioned in Newman's 'British Moths' are Holme Fen and Whittlesea Mere, it may interest some of your readers to know that I captured, on June 23rd, a male specimen of *M. arundinis* on a fence in Cheam Road. There were no reeds or marshy places near. — S. WORMALD; Glenthorne, Cheam Road, Sutton, Surrey, June 25, 1884.

PERONEA COMARIANA. — At page 20 of this volume of the 'Entomologist' some remarks appear upon *Peronea comparana*. These really refer to *Peronea comariana*, which is the strawberry-feeding species, while *P. comparana* feeds upon hawthorn. I do not know how the error occurred, but it should be corrected as early as possible.—J. B. HODGKINSON; 15, Spring Bank, Preston, Lancashire.

GRAPHOLITHA CÆCANA, &C., ON THE S.E. COAST. — A short stay on this coast has again enabled me to take *Grapholitha cæcana* in the same locality as last year. I have also found it in two other spots in the neighbourhood, and it is not unlikely that, when well worked for, its range may be considerably increased. Unfortunately the state of my health at the time prevented any very extended search on my own part, but probably some of the local collectors will meet with it next season. My other best captures were *Sesia chrysidiformis* and *S. ichneumoniformis*, *Heliothis peltigera*, *Homœosoma nimbella*; and *Stenia punctalis* was not uncommon. The best Tortrices were *Orthotania antiquana*, *Catoptria microgrammana*, *Stigmonota leplastriana*, *Penthina gentianana*, *Eupæcilia implicitana*, *Argyrolepis zephyrana*, and *Conchylis alternana*. *Gracillaria ononiella* was represented by a solitary specimen. — GEO. COVERDALE; 24, Fleming Road, Lorrimore Square, S.E., July 17, 1884.

COLEOPHORA MARITIMELLA. — It was my good fortune to meet with the cases of this species, from which the insects are just emerging, rather freely along the Essex coast, in May, on *Artemisia maritima*. I hope soon to have duplicates.—GEO. COVERDALE; 24, Fleming Road, Lorrimore Square, S.E., July 17, 1884.

ELACHISTA DENSICORNELLA AND OTHER CAPTURES.—*Incurvaria canariella* was much more rare this year than formerly. One day recently I worked seven hours and only took three specimens, while another day produced fifteen examples, but nothing else worth boxing; so I left Arnside and journeyed to Grange; there I took two specimens of *Elachista densicornella*. This capture induced me to revisit the locality, when I took *Lampronia luzella*, eight *E. densicornella*, one *Tinea semifulvella* which deposited ova, one *T. albipunctella*, *Cleodora cytisella*, some *Pterophorus osteodactylus*, *P. tephradactylus*, *Dicrorampha herbosana*, *D. plumbana*, *D. plumbagana*, *D. consortana*, which were very large specimens, and evidently identical with the *distinctana* which I saw at the late Mr. Harper's sale. While lying down searching for the larvæ of *Depressaria capreolella*, I thought I would try to find ova of *Leucophasia sinapis* on the *Lotus corniculatus*, which was growing in profusion. I was, however, saved the trouble, for a male and female of that butterfly came flitting up and I secured them. Having placed the latter with some of the food-plant on my return, I now see a large number of eggs, which appear to be fertile and healthy. I may remark upon the very late appearance of the variety *salmacis* of *Lycæna agestis*, which was in fine condition and plenty in the last week in June. — J. B. HODGKINSON; 15, Spring Bank, Preston, July 3, 1884.

LATENESS OF THE SEASON.—After every promise of a remarkably early spring, and the expectation of insects appearing at least somewhere near their usual dates, the whole aspect of affairs has been changed by a six weeks' spell of bitter east wind during April and May, whereby the appearance of many species has been greatly retarded. For instance, *Anthocharis cardamines* was not seen here until June 3rd, a full month behind time; and the larvæ of *Vanessa urticæ* were also very late, none being found until June 12th, when I took several broods only just hatched, whereas on the same date last year this species had gone to pupa. — MARTIN J. HARDING; Cottisbrooke, Shrewsbury, July 3, 1884.

LEPIDOPTERA OF LONDON SUBURBS. — There is much truth in Mr. J. R. S. Clifford's remarks (*Entom.* xvii. 108) regarding the unvarying abundance of many lepidopterous insects in our suburban gardens. Not only are the common ones, especially among the Noctuæ, to be found year after year in the same gardens, but occasionally much esteemed visitors are chronicled, especially those rare species of the Sphingidæ which come over from the Continent. Many of our gardens are the remains of those park-like grounds which surrounded the villas of city merchants, and are now, owing to the great demand for building-sites, fast becoming things of the past. In these grounds a wealth of botanical life was usually encouraged; not only were the trees of every description that will flourish in this country to be found, but the cultivation of exotic plants afforded food for innumerable species. I was never more surprised than in the summer of 1882, when collecting in Epping Forest was far from good, to find that in some old grounds of the above description, and partly built upon, the Noctuæ were far more numerous than I could have imagined possible. It is true they were only such as Mr. T. W. Hall mentions (*Entom.* xvii. 89), yet they came in such numbers to "sugar" as to gladden the eyes of the most desponding collector. These cultivated grounds doubtless account for the halcyon days enjoyed by the older collectors in London, whose accounts of what they used to do within five miles of Charing Cross often appear incredible to the younger entomologists of this period. That these gardens still produce a large number of species is not astonishing when it is taken into consideration that many of the plants cultivated for show are very attractive both in appearance and odour, and, when here, the moths have little difficulty in finding among the great variety of vegetation, even in a small pleasure garden, something suitable for the food of their future progeny. One point which seems to have been overlooked by Mr. Clifford, and which to my mind appears one of the most potent reasons for the abundance of larvæ in our gardens, is the absence of birds of an insectivorous turn of mind. Such birds as the finches are of too timid a nature to remain long near the abodes of man, and nobody, I am sure, will accuse the London sparrow of an intense liking for caterpillars. Many good useful species for the cabinet are still to be obtained in the suburbs of London, and I am sure that we often go further than is necessary



for many of our common ones; but at the same time I should be among the last to discourage collectors of an exploring disposition. — W. H. WRIGHT; Secretary's Department, Inland Revenue, Somerset House, May 5, 1884.

INFLUENCE OF CIVILISATION UPON INSECTS.—The number of species of insects is prodigious, and the number of individuals to us infinite. Their fertility is proverbial, but the world is not destroyed by them, as the enemies which prey upon insects are innumerable. One of the most interesting branches of Entomology is the study of the relations existing between insects and their foes; and of all the great agencies man is the most potent. Man, from the earliest times, has fought against the advances of insect tribes. The nearer perfection man becomes, the more civilised, the greater is his power; and civilisation tends to produce less variety and more uniformity in Nature. I purpose enumerating a few facts in support of the last sentence. When the facts relating to the decrease of Mammalia are examined, man's influence is appreciated, and with Aves to a less degree; but with the Insecta his power is frequently overlooked. Comparing the British Isles of to-day with those of the early Britons, the first thing which strikes us is the large area occupied by villages, towns, and cities. What an area of forest, wood, and undergrowth must they have supplanted. Were a census possible of insects, taken as to numbers and species in A.D. 84 and A.D. 1884, would it not present a singular contrast? The increase of buildings, railroads, and canals has certainly lessened considerably the numbers of insects. The growth of towns is a necessity, and cannot be prevented. By cultivation of the land man destroys many species of indigenous plants, and consequently the insects which feed upon them. Land being drained causes plants which flourished previously to languish and die. Insects depending upon these given plants become extinct, e.g., *Polyommatus hippothöe*; the area of distribution of *Papilio machaon* is much diminished by drainage. Forests and woods being cut down alter the amount of moisture in the atmosphere, making the climate colder and drier, and so affecting insects. Man causes changes by his laws. The Bird Protection Act is already making a different result in the numbers of insects. Man is the only creature who collects and preserves insects. This makes a slight,

but hardly appreciable, different total, even if we remember the large numbers which are annually captured and preserved. Uniformity in Nature is also increased by the large areas growing the same kind of cultivated plants, instead of a various wild growth. Pasture lands and meadows have little variety of flora. Corn-fields, and all arable land and sheep-feeding districts, have a certain sameness, and orchards in the southern counties provide only a few kinds of fruit trees. The custom of having hedges of hawthorn gives encouragement only to those species which feed upon it. If we look into the future we must own that civilisation will still lessen the area for entomological research. Waste places will be enclosed; and even now there are only a few localities in this country which are in their primitive wildness. Residents in towns know it is difficult to find a spot where Nature is left undisturbed. Some who love Nature devoutly regret this; but everything must give way before the great strides of the giant progress. These remarks are only a few illustrations written *currente calamo* to call attention to the subject, as it is extremely interesting to note the effects produced by the wonderful assertion of the vast human race.—HERBERT E. NORRIS; St. Ives.

THE "DEATH WATCH" AND ITS SOUND.—As there seems to be a great deal of misapprehension with regard to the "Death Watch" and its sound, perhaps a few words on the subject may not be out of place, especially as one or two remarks in last month's 'Entomologist' are calculated to be misleading. The insects that produce this sound belong to the family Anobiina of the Ptinidæ; the species that are credited with producing the sound are *Anobium domesticum*, Fourc. (*striatum*, Ol.), and *Xestobium tessellatum*, Fab., which are quite different species, and not the same, as implied in the note in Entom., vol. xvii., p. 167; the former is a small insect, and is abundant in all old houses, its larvæ producing the small holes found in old furniture, and being commonly known to furniture-dealers as "the worm"; the perfect insects also have the power of boring: another species which is sometimes very destructive to furniture is *Ptilinus pectinicornis*; the much larger *Xestobium* is found in old houses and churches, but is also abundant in old oaks; *Anobium domesticum* itself is by no means confined to houses, but is sometimes common in old trees, old ivy, &c. Some of the species, as Professor Westwood observes, notably *A. paniceum*, feed on almost every substance,

devouring ginger, rhubarb, cayenne pepper, &c., even perforating tin-foil, in the larva state. They are very fond of biscuits; I have found them in profusion in an old tin that had been put by and forgotten. The wood-feeders alone produce the sound, not because of their structure, but because of the medium by which they are surrounded, and it is probable that the power is by no means confined to the two species, *A. domesticum* and *X. tessellatum*; the others live in the open country, and will naturally not be observed to produce the sound. The sound of the Death Watch is certainly not vocal, as is suggested by Mr. Clifford (Entom. xvii. 167); no insect produces a vocal sound, at any rate one that is appreciable to human ears. Sir John Lubbock, noticing the wonderful way in which ants communicated with each other, made very delicate experiments with the sensitive flame and microphone in order to ascertain if they communicated by sound, but although with the latter instrument he could distinctly hear the tread of their feet, the results were entirely negative. The hum of bees, &c., is produced by the vibration of the wings; the chirp of the cricket and Cicada and other insects by stridulation, or the rubbing of one rough surface against another on some part of the body; the so-called "squeak" of the Death's-head moth is produced by the same cause; several butterflies are provided with a stridulating apparatus, and produce a very distinct sound. The "tick" of the *Anobium*, then, is evidently caused by some hard portion of the insect coming in contact with the wood, either by the mandibles gnawing the wood or by the head being rapped against it. If we adopt the former theory, there is no need for further explanation. Professor Westwood, from a series of observations made by him, is inclined to think that the sound is produced by the larva as well as the perfect insect, as they gnaw the wood while boring their burrows. If, however, the sound is produced by the head being rapped against the wood, this must be apparently done for one of two reasons: either as a call from the insect to its mate, or in order to ascertain the thickness of the wood which still remains unbored. The sound is not one that would be produced by mandibles in gnawing, but is a distinct sharp rapping sound, and would rather lead us to adopt one of the latter explanations: the question, however, of the real cause still remains to be decided. The reason why the beetle has got its ominous appellation of the "Death Watch" is

obvious; the sound is too low to be heard except when there is perfect stillness, as at night; people seldom sit up alone at night, except to nurse sick people, and as a rule people who are very ill, and in such a case their nerves are often strung to the highest tension; the sound then appears to them doubly hard and exaggerated, and, when the patient has died, the sound and the death have naturally become connected together in the minds of superstitious people.—W. W. FOWLER; Lincoln, July 16, 1884.

CÆLIOXYS ELONGATA, *Lep.*, EMERGING FROM A COCOON. — It may be interesting to note a very curious departure from the supposed ordinary course of this bee, which I bred on July 7th from a cocoon found on a thistle on June 26th last. A young friend, who has been doing a little in Entomology for the past seven years, took unto himself a wife, and during his wedding trip saw a *Vanessa cardui* larva on a thistle; it then struck him that he may as well collect a few larvæ of *V. cardui*, and in searching the thistles he found the cocoon in question, and at once came to the conclusion it was an ichneumon cocoon. Knowing my weakness for the Ichneumonidæ, he boxed it, brought it home, and gave it to me, with another supposed ichneumon, which is without doubt a species of Syrphidæ. The cocoon is very compact and hard, and it has resisted my efforts to soften a portion of it in spirits of wine and afterwards in boiling water; I was desirous of doing this to ascertain if possible of what the outside covering consisted; I very strongly suspect it is portions of the florets of a thistle: it has every appearance of it, and in examining it with a strong lens I can see the silken cords or web which formed the foundation of the cocoon; my young friend thinks the web was made by the larva of *V. cardui*, the web being the cause of attracting his attention to the thistle, thinking it contained a *V. cardui* larva.—G. C. BIGNELL; Stonehouse, July 14, 1884.

WASP CAPTURING SESIA MYOPÆFORMIS.—When walking round my garden this afternoon, after the storm, I struck at something flying quickly, which I thought might be one of the larger ichneumons, and to my surprise found a wasp and a male *Sesia myopæformis* in my net; the former was doubtless carrying the moth in its mouth. The clearwing was quite lively and is apparently perfect, being none the worse for its temporary captivity.—EDWARD A. FITCH; Maldon, July 26, 1884.

DESCRIPTION OF A NEW SPECIES OF *CHARAXES*  
FROM THE MALAY PENINSULA.

BY W. L. DISTANT.

*CHARAXES DURNFORDI*, n. sp.

♂ Wings above dark brownish-ochraceous; anterior wings with the apical half blackish, containing two transverse series of greyish-white angulated spots placed between the nervules, and with a somewhat obscure series of small greyish-white marginal spots, those at the outer angle largest and most distinct; two small obscure greyish-white spots at end of cell, separated by the upper discoidal nervule; posterior wings with a very broad marginal greyish-white fascia, inwardly lunulated and margined with blackish, containing a central series of blackish spots with whitish centres, placed between the nervules—that at anal angle duplex—and with a narrow submarginal blackish line. Wings beneath brownish grey; anterior wings with the cell containing a small black basal spot, and centrally crossed by a darker spot margined with blackish, an irregular darker fascia margined with blackish crossing wing at end of cell, where it is widest; beyond the fascia the ground colour is paler, the whitish spots above are more or less distinctly visible beneath, a waved dark line separating the two discal series; posterior wings with two irregular darker fasciæ margined with blackish, one at base, the other crossing disk and terminating on abdominal margin; the outer white fascia and spots above faintly visible beneath, its margin denoted by two waved or lunulated lines, the innermost bluish, the outer fuscous with the intervening ground colour ochraceous. Body above and beneath and legs more or less concolorous with wings.

Exp. wings ♂ 93 millm.

Hab.—Malay Peninsula; Sungei Ujong (Durnford).

This beautiful and exceedingly distinct species seems to find its nearest ally in the Amboinese *C. curyalus*, Cram., and belongs to that division of the genus in which the caudate prolongation to the posterior wings, at the apex of the third median nervule,

is obsolete, whilst that at the apex of the first median nervule is short but distinct.

This species will be figured in the Appendix to my 'Rhopalocera Malayana.'

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#### REVIEW.

*Report on the Tea-mite and the Tea-bug of Assam.* By J. WOOD-MASON. London: 1884. 20 pp. Royal 8vo, with three coloured plates.

IN his introduction the author says, "Of the numerous animals which prey upon the Tea-plant, two only are at present known to do such injury to it as materially diminish the profits of owners of tea-estates; these are the Tea-bug or 'Mosquito-blight,' and the Tea-mite or 'Red Spider' of planters. The former of these two formidable pests damages the young and tender shoots required for manufacture into tea . . . while the latter of them confines its ravages to the full-grown leaves, and by so injuring these organs as to unfit them for the performance of their important functions, checks the growth of green shoots, and prevents the bushes from flushing."

The Tea-mite, which has not hitherto been described, Mr. Wood-Mason proposes to name *Tetranychus bioculatus*, in allusion to its double (really two pairs of) eyes. This is a very minute animal, and to the naked eye appears only as a dull-red speck, but its ravages seem to be very widely spread and serious to the planters, old gardens suffering to a greater extent. No satisfactory remedy appears to have as yet been discovered.

The Tea-bug is a member of a genus of Capsidæ, which is characteristic of the Indo-Malayan Fauna, and has been named by Mr. F. Moore *Helopeltis theiovora*. The author gives an interesting account of this animal also. It appears that a variety of the tea-plant imported from China is alone attacked, while the indigenous species is free from the pest. The latter shrub produces a liquor "much more pungent and rasping" than the imported variety, so that some chemical difference in the plants may cause the "bugs" to avoid the native plants.

Altogether Mr. Wood-Mason has given us an interesting contribution to Economic Entomology.—J. T. C.

# THE ENTOMOLOGIST.

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## LYCÆNA ARGIOLUS COMPARED WITH THE AMERICAN LYCÆNA PSEUDARGIOLUS.

BY J. JENNER WEIR, F.L.S., F.Z.S., &c.

IN part xii., second series, of W. H. Edwards' 'Butterflies of North America,' there is a most valuable contribution on that singularly polymorphic species *Lycæna pseudargiolus* of Boisduval and Leconte. This insect is found as far north as 54°, and as far south as Mexico. In response to its environment it has varied exceedingly, and the different races have been regarded as distinct species; but Mr. Edwards has now arrived at the conclusion that they "constitute one polymorphic species."

I must refer the readers of this magazine to the work above quoted for a complete account, but will shortly state some of the main facts of the general history of the insect.

*Lycæna pseudargiolus* varies according to the latitude and longitude in which it is found, or in other words is topomorphic; according to the season of the emergence of the imago, horeomorphic; and besides is dimorphic and trimorphic. A melanic variety has also been developed; two hermaphrodites are figured, and two heteromorphic forms.

1. In the high boreal regions the species is one-brooded and dimorphic,—*L. lucia*, Kirby, and *L. violacea*, Edw.

2. At about lat. 45° it becomes double-brooded, the second emergence being *L. neglecta*, Edw.; and the spring emergence has become trimorphic by the development of an intermediate form, *L. marginata*, Edw., between *L. lucia* and *L. violacea*.

These four forms inhabit the country, at least as far south as Long Island.

3. At about lat. 39°, on the Atlantic side, two forms of the first generation, viz. *L. lucia* and *L. marginata*, are found to have been suppressed; and the third, *L. violacea*, remains to represent that generation. The blue colour has, however, become darker, and a melanic male has been developed; but no melanic female has yet been discovered.

4. In lat. 40°, at the west, *L. lucia* and *L. violacea* are found. The second emergence is *L. neglecta*; and it is also remarkable that in Colorado a melanic male of the spring emergence is also found.

5. In Arizona, at or about lat. 33°, *L. violacea* alone appears, but in a modified form var. *cinerea*, Edw. The second generation apparently is *L. pseudargiolus*, Bois. and Lec., no black male and no *L. lucia* having been taken.

6. From lat. 40° or 39° southward, in the Atlantic district, the summer generation is *L. neglecta*; but there is an intermediate or interpolated generation flying in May, viz. *L. pseudargiolus*.

7. In California and Arizona the species is represented in part by what is very near to *L. neglecta*, or else a small *L. pseudargiolus*, viz. *L. echo*, Edw., but mainly by a modified form, *L. pius*, Bois., which has two generations not differing from each other.

Such is a very brief outline of the changes which *L. pseudargiolus* undergoes in the Nearctic Zoogeographical Region.

I do not find in any of the works of British authors the least allusion to the horeomorphic and dimorphic condition of *Lycæna argiolus*, Linn., as it exists in these islands. Stainton, Newman, and Lang are silent on the subject; nor am I aware whether in the more northern districts in which the insect is found, e.g., Cumberland, Westmoreland, and Yorkshire, it differs in any respect from those found in the most southern counties, nor whether in the former districts it is one-brooded, a point I should be very glad to know.

In my late garden at Blackheath the holly and ivy thrive. I had numerous varieties of each, and had therefore opportunities for more than quarter of a century of seeing *L. argiolus* at the periods of the spring and summer emergences of the imago. I



cannot detect any differences in the males which appear at these two periods; but with regard to the females the case is widely different.

The spring form only of the female is figured by Stainton in his 'Manual,' by Newman in his 'British Butterflies,' and by Lang in the 'Butterflies of Europe'; the description of the female given by the latter author agrees more with that of the autumn emergence.

The female of the spring emergence has been accurately described by Newman, 'British Butterflies,' p. 135, thus:—"In the female there is a broad hind-marginal black band on the fore wings, and a narrow black hind-marginal border on the hind wings, and just within this is a series of six transversely oblong black spots." It is clear to my mind that my late dear friend had a female of the spring emergence only before him when he wrote this excellent description.

The females of the spring emergence closely resemble the figure of *L. marginata*, given by Edwards in 'Butterflies of North America,' vol. ii.,—*Lycæna*, ii., fig. 4,—but are lighter on the under sides of the wings than fig. 3 of the same plate, which shows the under side of the same variety.

The females of the autumn emergence are very much more suffused with black. It may be said that those of the first generation are blue on the upper side of the fore wings, with a black hind margin; but the females of the second generation are black on the upper side of the fore wings, with the centre of the wings suffused with blue.

Although, as I remarked before, Dr. Lang in the 'Butterflies of Europe,' plate xxxi., fig. 1, has figured the female of the spring emergence, his description is apparently taken from a female of the autumn emergence, as known in England. His words are:—"The female has the outer half of the costa and all the hind margins of the fore wings broadly brownish black; the hind wings are similarly brownish black on the costa; sometimes the hind margin is also dark brown, and always a row of black dots." The specimen from which this description was taken must, I think, have been one of the second generation. I may add that generally the females of this emergence have a more or less well-defined black discoidal spot on the upper side of the fore wings, and agree very closely with *L. pseudargiolus*, figured

by Edwards in the work above referred to,—*Lycæna*, ii., fig. 19, vol. ii.

It thus appears that the female of the spring emergence of *L. argiolus* in England resembles that of one of the varieties of *L. pseudargiolus*, which appears at that time of the year in America; and in a similar manner the second-generation female is exceedingly like one of the varieties of the American species, which appears later in the year as a second generation.

The parallel between the two species does not end in these resemblances only. In Edwards' 'Butterflies of North America,' second series, a form of the female of *L. pseudargiolus* is figured,—*Lycæna*, plate ii., fig. 9. In this beautiful insect the blue gives place on the upper side of the wings to a lovely silvery colour, somewhat like that of *L. corydon*; the black edging on the costa and hind margin of the fore wings is very broad, and the discoidal spot is much more marked than in the blue form. This variety was also figured, but without the discoidal spot, in the first volume of the 'Butterflies of North America,'—*Lycæna*, plate ii., fig. 3,—as *L. pseudargiolus*, and a similarly coloured insect as *L. neglecta*, fig. 6, unaccompanied by any figure of the blue form. I have taken an insect, coloured exactly in every respect like that figured by Edwards in the second series, at Brenchley in Kent, in summer, and was struck with the strong resemblance it bore to the butterflies figured in the first volume, above adverted to; the only difference being the presence of the discoidal spot in the Kentish specimen. I may remark that Edwards does not figure a male of this silvery colour, so that it is probable the insect is dimorphic in the female sex only.

I have received specimens of the American insect from Mr. Walter Haydon, who captured them at Moose, lat. 51°. It is there double-brooded; the females exhibit the homeomorphic variation, and are apparently *L. lucia*, Kirby. Mr. Haydon found the species on the wing from June to September.

Specimens of the Russian female *L. argiolus*, received from the late Mr. Field, of St. Petersburg, are exceedingly dark both on the fore and hind wings on the upper side; the discoidal spot, absent in the American *L. lucia*, is well defined in these northern specimens; the fore wings have but little blue, and the hind wings are merely shot with that colour. They most nearly resemble the American *L. cinerea* of Edwards, 'North American

Butterflies,' vol. ii.,—*Lycæna*, plate ii., fig. 17. I am ignorant as to the time of the year they were taken.

Mr. Kane, who takes such an intelligent interest in the variation of insects, has just sent me two specimens of *L. argiolus* taken by himself. The first, at Vichy, in May, is on the upper side almost identical with that figured by Edwards, vol. ii.,—*Lycæna*, plate ii., fig. 4,—as *L. marginata*; the fringes of the secondary wings are in the European specimen spotless, and in the American slightly spotted. The other specimen, so kindly sent, is a most remarkable butterfly. It was taken either late in March or early in April; and should have a narrow black border to agree with the North European spring form; but the insect has nearly as broad borders to the fore and hind wings as the Russian specimens above described, and I should have deemed it a typical specimen of the summer emergence. Mr. Kane writes that the Provençal specimens he has seen are all remarkable for the breadth of the apical and marginal borders.

I venture to think that this Southern European form is the result of the warmth of the climate at Hyeres, where it was captured. In so sunny a district the caterpillars may feed almost all the year round, and never remain long in the pupa state. An insect much resembling this specimen is figured by Edwards, vol. ii.,—*Lycæna*, ii., fig. 21,—as *L. pius*. This subspecies, as I remarked before, has, according to Edwards, two generations *not differing from each other*.

If I be right in this conjecture the parallel between the American and European species is completed in the southern varieties in each continent. The conclusion is forced upon me that, if *L. pseudargiolus* varies from *L. lucia* to *L. pius*, then all the forms of *L. pseudargiolus* are but races of *L. argiolus*, Linn.

Chirbury, Beckenham, Kent, August 17, 1884.

## A WEEK'S COLLECTING IN UNST.

BY CHARLES A. BRIGGS.

LEAVING London from Euston Station by the limited mail on the 6th July, the next day found Mr. E. G. Meek and myself at Aberdeen, somewhat the worse for wear. Here a few hours

involuntary stoppage occurred, pending the arrival from Leith of the mail boat, 'St. Magnus.'

We left Aberdeen at midnight on the 7th, and on the next day took advantage of the 'St. Magnus' stopping for an hour at Scapa Pier (which is at the back of Kirkwall, on the mainland of the Orkneys) to go on shore. There we found males of *Lycæna alexis* flying vigorously; but as our nets were unfortunately packed up, and were only armed with pill-boxes, we reluctantly left them to continue their flight. We also noticed a *Pieris*, either *P. brassicæ* or large *P. rapæ*, but apparently the former; one nearly fell a victim to the seductive finger and thumb, but just escaped.

The *Lycæna alexis* recorded in the 'Entomologist,' vol. xv., p. 2, were from the Island of Hoy, which is some distance to the south, and near the coast of Scotland. Our observation, therefore, is the most northerly modern record of the species, although no doubt it is found all through the Orkneys.

We arrived at Lerwick, on the mainland of Shetland, towards what ought to be nightfall on the 8th; and finding that the local steamer was luckily starting for the North at 4 o'clock next morning we arranged to go by her, which we did, arriving at our destination, Balta Sound, Unst, on the afternoon of the 9th. Here an entomological friend, Mr. Roper-Curzon, had secured us lodgings under Mrs. Hunter's hospitable roof; and lucky it was that he had been able to do so, as there are no other lodgings to be got at Balta Sound; and one fellow-traveller had to convey his belongings back to the steamer, and return South sorrowing. Nothing daunted by our three days' travelling, the indefatigable Mr. Meek, scarcely allowing us time to swallow a hasty tea, rushed us off, under Mr. Curzon's guidance, in quest of *Hepialus humuli* var. *hethlandica*, which we soon got amongst, but found much worn. *H. velleda* was decidedly rare, but probably had been more common. In the same place *Emmelesia albulata* in every shade of variety, from the type to var. *thules*, was to be found, but worn to rags, only a very few being worth boxing.

*Coremia munitata*, abandoning the habits of its Scottish brethren, was only to be found in marshes flying gently by night. *Melanippe montanata* was on the wing in some quantity, but nearly all were males. The females we got were chiefly taken by searching the heather, on the top of which they were to be

found fluttering. The males flew freely throughout the night, and even in broad sunshine in the early morning, a fact which I wish we had discovered one day earlier than we did. *M. fluctuata* was nearly over; but the few specimens we saw were very large and dusky. The strange form *Eupithecia nanata* (?) still lingered on amongst the heather, but were very worn.

Sugaring was fairly successful, although, from the flight of the Noctuæ being limited to a couple of hours, one was at first induced by the broad twilight to put off visiting the sugar until too late. *Hadena adusta* in grand variety was common; as also were *Agrotis suffusa*, *A. porphyrea*, and *Noctua conflua*. Of *Mamestra brassicæ* and *M. furva* one specimen of each was taken at sugar; a second specimen of the latter, with one *Dianthæcia conspersa* and one *Stenopteryx hybridalis*, being the sole results of a night wasted at *Silene* flowers. *Triphæna pronuba* was common, and, as usual, pugnacious, driving off the better species. Although they varied greatly, yet there was little by which to distinguish them from southern specimens. A most unexpected species was *T. subsequa*, two specimens of which were taken. Of *Mamestra oleracea* and *Apamea oculea* a few specimens were captured, including a nice variety of the latter. *Plusia gamma* was common on the wing at ragged-robin and other flowers. Neither *Crymodes exulis* nor *Pachnobia hyperborea* were out, which was a great disappointment to us.

The Pyralidæ were but scantily represented. *Herbula cespitalis* was common, but worn; *S. hybridalis* was to be found occasionally; while of the Scopariæ, *S. atomalis* was common on a hill-side, *S. coarctalis* occurred at the door-step of our lodgings, and *S. pallidulalis* turned up at a bog.

Of the Crambidæ, *Crambus pratellus* was common; *C. hortuellus*, *C. pascuellus*, and *C. perllellus* more rare; while *C. culmellus* was most abundant. Of the latter species a fine dark variety occurred that almost raised hopes of a novelty.

Of the Tortrices, *Mixodia schulziana* was common among heath; *Sericoris lacunana* and *Clepsis rusticana* on hill-sides; and *Bactra lanceolana* in marshes. We also noticed a few *Phoxopteryx unguicana* and *Eupæcilia ruficiliana*; one *Orthotænia antiquana* was disturbed from a turf-wall; while a few large and dark *Xylopada fabriciana* and *Sericoris littorana*, which was just coming out, completed the list. In searching among thrift for

the latter a large mine in the roots of one plant seemed to point to the presence of *Sesia philanthiformis*; but this certainly requires confirmation.

In the Tineæ, *Æcophora pseudospretella*, *Endoris fenestrella*, and *P. cruciferarum* were abundant; the latter, no doubt by its numbers, serving to conceal the presence of several other species. *Glyphipteryx cladiella* was in tolerable numbers; while one or two species still await identification.

A truly magnificent humble-bee was not rare.\*

A collector of Diptera and caddis-flies would reap a rare harvest.

Midges were most malevolent, choosing for their worst attacks the time when one was boxing *M. montanata* from a sopping wet and heavy net.

From the above notes it will be seen that of Macro-Lepidoptera five species—namely, *Mamestra brassicæ*, *Agrotis suffusa*, *Triphæna snbsequa*, *Apamea oculea*, and *Hadena oleracea*—are new to the Shetland Islands. How many more are new to Unst itself cannot at present be ascertained, as Mr. Jenner Weir, in his notes in the January number of the 'Entomologist' for the present year, has unfortunately treated the islands as a whole, and has not given a complete list of the species taken in Unst by Mr. McArthur last year. It would appear from Mr. Jenner Weir's notes that twelve species occurring in the mainland were not observed in Unst, but which these twelve were we are not told. No notes of Mr. McArthur's Micro-Lepidoptera from Unst, or of his second visit to the mainland, have as yet been published.

I cannot say that we were favoured by the weather. For the first week we had, with one exception, either high winds or sea fogs so dense that we constantly had to wring our nets out; while on the 16th the weather completely broke up, and gales and incessant rain stopped both day and night work, until our departure on the 19th terminated one of the most enjoyable trips I have ever had.

The midsummer sunset and sunrise—and it is difficult to say

\* Mr. Briggs having submitted a specimen of this bee for identification, it proves to be *Bombus smithianus*, White (see Smith's Catalogue, 2nd edition, p. 202). E. Saunders says of it in his Synopsis,—“This beautiful species has at present only been found in the extreme north, and is recorded from Shetland and the Hebrides.”—E. A. F.

where the one ends and the other begins—seen from Hermes Ness, the most northerly point of the kingdom, is a sight to be remembered; while throughout the night hours, during the whole of which there is light enough to read by, the melancholy wail of Richardson's skua and the harsh grunt of the great skua, enraged at the unwonted disturbance of their sanctuary (for the latter bird is now preserved on this point, which, with the neighbouring Island of Foula, is their sole home in the British Isles), go to make up an experience never to be forgotten.

55, Lincoln's Inn Fields, August 13, 1884.

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## NOTES ON SOME MICRO-LEPIDOPTERA REARED IN CAPTIVITY.

BY GEORGE ELISHA.

THE following species have emerged in my cages this season, up to the end of July:—*Sericoris euphorbiana*.—Some fine specimens from larvæ taken in the Warren, Folkestone, feeding on the shoots of the sea spurge (*Euphorbia paralis*), eating out the heart of the shoot. They were collected, when nearly full fed, in the beginning of last August. *Phtheocroa rugosana*.—Seven lovely specimens from larvæ, found near Wrotham, Kent, feeding on the shoots of *Bryonia dioica*. *Retinia turionana*.—Larva found at Box Hill, feeding in the shoots of young firs (*Pinus sylvestris*). This species, which is usually more or less infested with ichneumons, sometimes so badly that not more than three or four moths emerge out of every dozen larvæ collected, has this year been entirely free from them; not a single ichneumon has been bred, out of about three dozen larvæ collected; indeed I may mention that ichneumons generally have been very scarce in my cages this year. From the roots of tansy (*Tanacetum vulgare*) I have bred *D. tanacetana* plentifully, and a fine series of *Dicrorampha alpinana*; also from the same roots *D. sequana* and *D. petiverana*. The roots were dug at Deal, during a three weeks' stay in December last year, the weather at the time not being at all propitious for digging up roots, as the snow and frozen leaves and sticks had to be scraped away before reaching the earth. During the same visit to Deal, I also found the larvæ of *Argyrolepis badiana*, and many other

species of stem and root-feeding larvæ; but I have been amply repaid for all the unpleasantness of collecting under such circumstances, by the number and splendid condition of the species and specimens bred. *Eupæcilia ciliana*.—Some nice specimens from larvæ collected at Box Hill in the beginning of July, feeding on the seeds of cowslip. The larvæ require rotten wood or sticks to pupate in. *Grapholitha nigromaculana*.—A few specimens from larvæ found feeding in the seed-heads of ragwort, on the salt marshes near Thames Haven. The plants that are infected are readily seen by their discoloured appearance, and by pulling off some of the pappus the larva is seen snugly ensconced beneath. *Eupæcilia udana*.—A fine long series emerged, a few each day, for at least ten or twelve weeks. The larvæ were found feeding in the stems of water plantain (*Alisma plantago*) in Hackney Marshes. I also found the larva at Deal, where the food-plant occurs abundantly in the ditches to the left of Sandy Lane. *Catoptria tripoliana*.—A long and variable series from larvæ feeding on heads of *Aster tripolium* from Canvey Island. This species is at least ten months in the larval state. *Ypsolopha alpella*.—A few from cocoons found on oaks at Wanstead. *Y. horridella*.—A fine series from larvæ on blackthorn at Loughton. This, I think, is one of the most lively larvæ I ever saw, jumping and shuffling about in all directions; it must be possessed of wonderful muscular power. In shape it is the usual Cerostoma-shaped larva, tapering at each end, bright green, with a distinct white dorsal line. *Depressaria angelicella* freely emerged from larvæ collected near Sandwich in June. They are to be found, twisting and crumpling up the leaves of *Angelica sylvestris*. *D. cnicella*.—Some very fine specimens from larvæ found at Deal and Southend, eating out the shoots of sea holly (*Eryngium maritimum*). This species is not at all pleasant to collect, owing to the hard and prickly nature of the food-plant. *D. subpropinquella*.—A long series from larvæ found commonly at Sheerness, on the banks of a disused canal, under thistle leaves, mining galleries covered with a slight web, along the leaf-ribs. *D. alstrœmeriella* and *D. weirella* both bred rather freely from larvæ in folded leaves of hemlock (*Conium maculatum*). I was much surprised to breed the latter species, not having the least idea at the time there were two species among the larvæ feeding. I collected them thinking they were all *D. alstrœmeriella*; and although I changed their food four or five times, I



never noticed any particular difference in the larvæ. It was therefore rather an agreeable surprise to see *D. weirella* emerge, for I much wanted them, having only four or five very poor specimens in my collection; so light and faded were they, that I could not identify my bred ones with them, nor could one or two of my friends. Mr. C. G. Barrett, with his large experience, very soon recognised them and kindly named them for me.

*D. arenella*.—Some nice specimens from larvæ in the shoots of burdock at Bexley; also *P. lappella*, from the seeds.

*Gracilaria semifasciella*.—A few specimens from Box Hill. This species, as regards ichneumons, was the exception to what has been the rule this year with my larvæ; nearly all those of this species collected were destroyed by these little pests, which spun their white cocoons, fastened at each end by a single thread to the leaf, close to the remains of their victims.

*Coleophora inflatella*.—A fine long series from larvæ found in the lanes about Croydon, feeding on the seeds of *Silene inflata*. They seem to prefer the dry seed-heads to the unripe pods, for most of those I found were on the dried-up seed capsules, which would scarcely bear touching without breaking off.

*C. artemisicolella*.—A fine long series from larvæ found feeding on *Artemisia maritimum* at Southend. This species is generally very difficult to rear, but this year, from some cause, they emerged very freely.

*C. wilkinsonella* and *C. ibipennella*.—A nice series of each, from larvæ found rather sparingly on birch at Wanstead.

*Laverna raschkiella*.—A few from larvæ mining the leaves of *Epilobium* at Box Hill.

*Pterophorus galactodactylus*.—Some nice specimens from larvæ under leaves of burdock. I was rather late for this species, but the riddled state of the leaves was a proof of the numbers that had been feeding, most of which had disappeared.

*P. lienigianus*.—A very long and fine series from larvæ found at Deal in June, on *Artemisia vulgaris*. By careful searching I managed to secure a good supply; they were no trouble to rear, and I think every larva I found emerged a perfect specimen of this insect.

From the above few notes it will be seen that I have no reason to be dissatisfied with the season so far, but rather the reverse; for I had species emerge, in some cases very freely, the larvæ of which have hitherto given me the greatest trouble to get through the winter at all.

THE ACTION OF AMMONIA UPON SOME LEPIDOPTEROUS  
PIGMENTS.

BY GEORGE COVERDALE.

Two or three years back, some entomological friends induced me to kill all my insects with ammonia, instead of employing potassium cyanide, and I have never regretted the change I then made. Nearly the first species so treated was *Melanargia galathea*, and on opening the pill-boxes I was much surprised to find every one of them of a beautiful primrose-yellow colour. In a few moments the primrose-yellow had vanished and the insects were of their normal white again. Evidently this phenomenon was due to the volatile ammonia, so I held a specimen over the bottle and instantly the primrose colour returned, only to disappear again with the departure of the pungent ammoniacal fumes. The reagent employed was a saturated aqueous solution of ammonia, and the black pigment of the wings remained unchanged throughout.

Now here was something of great interest and well worth investigation, so I determined to follow it up, and since that time have never lost an opportunity for experiment or study. Many of my friends are now familiar with the results obtained, but as they appeared to be previously unknown to all those with whom I have communicated on the subject, I have thought it best to place them on record. They may be well known and authenticated, but to ascertain this a careful search through the vast mass of the chemical and microscopical literature, both of this country and the Continent, would be required, and for this my spare time is quite inadequate. I must therefore crave the indulgence of those who may be familiar with the facts herein recorded. Naturally, the first species selected for experiment was *Melanargia galathea*. As before, ammonia gave the primrose coloration. The next reagent employed was a solution of potassium hydrate, in which pieces of the wing were placed, and they immediately turned yellow. Other alkalies, such as solutions of sodium hydrate and barium hydrate, were tried, and gave similar results, the only difference being that with the fixed alkalies the primrose coloration was permanent, whereas with ammonia it was necessarily fleeting.

As alkali turned the pigment yellow, acids I thought might prevent this, or even produce another colour. Accordingly the wings were treated with a great many acids, the chief being sulphuric, nitric, sulphurous, hydrochloric, phosphoric, and acetic. With all these, when used in excess of the alkali, the pigment was restored to its natural white colour. I also found, that whenever the liquid employed was exactly neutral to both red and blue litmus, the pigment remained unchanged, whilst the slightest addition of alkali produced the primrose-yellow, and when acid predominated the normal colour prevailed. Thus, we see, this pigment is a good test for alkalinity.

To enumerate all the species experimented upon would occupy too much space, so I will only give the most important. As some Continental species are mentioned, I have followed Staudinger's arrangement. *Papilio machaon* and other *Papilios* were unchanged, and the same may be said of the genus *Thais*. *Parnassius apollo*, *P. delius*, and *P. mnemosyne* turned a pale yellow. With such semitransparent species a deeper coloration could not be expected, from the small amount of pigment present.

None of the species of *Aporia*, *Pieris*, or *Anthocharis* showed any alteration with ammonia, but *Leucophasia sinapis* and its vars. *lathyri*, &c., exhibited a delicate primrose colour. Not a single species in *Colias*, *Rhodocera*, *Thecla*, or *Polyommatus* was changed; but the behaviour of the species of *Lycæna* was extremely curious and somewhat unexpected. *L. argiades*, *argiolus*, *alsus*, *acis*, *alcon*, *arion*, and *euphemus* remained unaltered. *L. bætica*, *ægon*, *argus*, *optilete*, *orbitulus*, *eros*, *alexis*, *eumedon*, *amanda*, *adonis*, *meleager*, *jolas*, and especially *agestis*, *corydon*, and *damon* were beautifully suffused with primrose on the under side and cilia, wherever the white pigment occurs. It is difficult to say why some of the species in this genera are unaffected, whilst others exhibit the most gorgeous colouring; but in the case of *argiolus* at least this may be accounted for. The pale bluish white of the under side is not the result of white pigment at all, but is due to reflected light from the almost pigmentless scales, in which a change could not be looked for. All the species which were examined in *Nemeobius*, *Charaxes*, *Apatura*, *Limenitis*, *Vanessa*, *Melitæa*, and *Argynnis* exhibited no change. In the Satyridæ, besides *Melanargia*, *Ceneis ællo* is clearly suffused with primrose

beneath. In *Satyrus*, *S. circe* and *S. briseis* have the white bands changed, but *S. alcyone* and *S. semele* are not affected. *Erebia* and *Pararge* are alike unchanged. *Cænonympha hero*, *C. arcania* (and vars.), *C. pamphilus*, and *C. davus* have the cilia and under side deeply suffused with yellow. Of the Hesperidæ, *Spilothyrsus alceæ*, *Syrichthus alveolus*, *S. serratulæ*, and *S. alveolus*, all have the whites changed to primrose, but *Nisoniades*, *Hesperia*, and *Carterocephalus* are not affected.

With the Heterocera I have obtained but negative results, although the number of species operated upon are to be counted by hundreds. It would be unsafe to generalise with such scanty data to go upon, but a few remarks may be ventured. The white pigmentary deposits of *Pieris* and *Melanargia*, although to the eye the same, must have a very different chemical constitution, and at one time I thought the negative ammonia results would be a good character of the Pieridæ, in contradistinction to *Melanargia*, &c.; but facts would not support this speculation, for *Leucophasia* proved refractory, and the Satyridæ gave results by no means uniform. Many more experiments must be performed, Nature must be thoughtfully questioned again and again before we can possess a firm basis for speculation.

Hitherto changes of colour only have been dealt with, and few reagents employed, but by recent experiments on the solubility of the various pigments in different media, most interesting facts have been brought to light, which in the future I hope to communicate. What a wonderful and lovely sight is the under side of *Vanessa atalanta*! It has at least a dozen shades of colour, most exquisitely mingled. Some day these colours will be analysed and their constitution made known. The results herein recorded may then be of service.

24, Fleming Road, Lorrimore Square, S.E., Aug. 16, 1884.

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#### DESCRIPTION OF A NEW SPECIES OF *JUNONIA*.

BY H. C. LANG, M.D., F.L.S.

A FEW days since I noticed some specimens in the British Museum Collection included in the series named *Junonia orithya*, Linn., bearing the locality label "Turkey," and at once proceeded

to examine them, as coming within the range of the European fauna, a position which this species has not hitherto held, the only *Junonia* included in Staudinger's Catalogue being *J. œnone*, L., which occurs in Syria. On examination I at once saw that these specimens, coming from Bagdad, differed very materially from the oriental type of *J. orithya*, L., which inhabits the Indian region. Mr. Butler then showed me a specimen in a collection, made recently by Major Yerbury at Aden, which exactly corresponded to the Turkish specimens collected by Loftus in 1850. From its geographical distribution and its appearance it seems perfectly entitled to rank as a new species. I therefore describe it.

JUNONIA HERE, n. sp.

Expansio alar. 40-43 mm.

Differt ab *orithya*, L., staturâ paginaque alarum.

♂. Alis, supra nigris; serie marginali macularum albicantium; maculâ apicali albâ; intus fasciâ brevi albâ, cujus inferiore parte extendit fascia latior cœrulea, margine interiore recto, maculam nigram obscure ocellatam continens; ocello apicali cœruleo obscure rubro-annulato; duabus aut tribus maculis subcostalibus cœruleis. Alis posticis cœruleis; parte basali nigra; maculis ocellatis duabus (ut in *Orithya*), sed superiore earum ocello fere obsoleto; margine externâ cœrulea (raro albidâ), lineis nigris duabus. Subtus, alis anticis, colore pallidiore quam in *Orithya*, L.; angulo anali nigrescente; macula anali sine annulo rubro. Posticis ochraceo-gricescentibus, parte externa fusco-umbrata; ocellis nullis, sed in ♂ et ♀ puncto cœruleo juxta angulo anali.

♀. Alis supra posticis fusco-cœrulescentibus; ocellis majoribus et bene notatis, cœtera ut in mare.

Habitat, Turciâ Asiatica et Arabia.

Differs from *Junonia orithya*, L., in being smaller, and in the pattern of the wings. The fore wings have the blue submarginal fascia straighter on its inner border, and there are no red subcostal spots, but only two or three indistinct blue ones. The hind wings (in the male) have the upper of the two ocellated spots, found in *J. orithya*, reduced to a black patch, or with a very indistinct ocellus. The hind margin is generally blue with black lines, sometimes whitish, but never as distinctly white as in *J. orithya*. The under side differs remarkably from *J. orithya* in the

general paleness of the ground colour. The fore wings are shaded with black towards the anal angle, and the spot at that point is without any orange ring. The hind wings, instead of having a reddish tinge, are light stone-colour, the hind marginal portion slightly darker than the rest, separated from the basal half by a brown line passing from the costa to the anal angle; there are no ocellated spots, but only a small blue dot near the anal angle. The female has the hind wings slate-colour above, and the ocellated spots are prominent and well defined.

Bagdad; Loftus, 1850. Aden; Yerbury, 1883.

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#### ENTOMOLOGICAL NOTES, CAPTURES, &c.

*PIERIS DAPLIDICE* AT DOVER.—On the 11th inst. I had the pleasure of receiving from a correspondent at Dover a pair of *Pieris daplidice*, taken there the previous week.—C. A. BRIGGS; 55, Lincoln's Inn Fields, August 13, 1884.

*ARGYNNIS LATHONIA* NEAR CANTERBURY.—We have received an interesting communication from Miss Minnie G. S. Jellie (aged nine years), who is the proud captor of a specimen of *Argynnis lathonia*, which she took in a clover field near Canterbury on August 6th of this year. The capture is verified by her father, Mr. W. Harvey Jellie.—JOHN T. CARRINGTON; August, 1884.

*LYCÆNA ARION*.—I feel quite certain that the haunts of *Lycæna arion* at Bolthead must be looked upon as a thing of the past. I visited the old familiar spots twice this year, 28th June and 5th July, without seeing a single specimen. It is now more than twenty years since I first became acquainted with *L. arion*. My first record in the 'Entomologist' of my capture of thirty-six in one afternoon is in vol. ii., p. 295; and when I look back and remember the spot then, and what it is now, it is no wonder that they have disappeared. When I first visited the place the fern, furze, and thyme held full possession of the slopes towards the sea; all, comparatively, have gone. The farmer who rents the ground has annually burnt the furze, &c.; first one spot and then another. This no doubt is the principal cause; but we must also take into consideration the great assistance the elements have

given to their extermination during the past seven years. On the 17th June, 1865, when I captured the above-named species, the wild thyme was in full bloom; the fragrance of the flowers, and the aromatic odour arising from running over the plants, made a lasting impression on me. Many females I watched that day, and since, flitting about depositing their eggs on the flowers of the thyme. But now all is changed; for on the 5th inst. I could have carried all the flowers of the thyme I saw at Bolthead in my waistcoat pockets, and found no inconvenience from the quantity. Although the eggs are laid on the flowers of the thyme, and the larvæ feed upon them until the first moult, it is quite certain that it is not their food-plant; but what the food-plant is I am not prepared to state, but I strongly suspect it is one of the small trefoils or a vetch. I know *L. arion* has been on the wing this year, for I have had the pleasure of seeing nine specimens, taken during the first week in July by a gentleman who had visited Bolthead, but gave it up in disgust. He will not give the locality, for he says the place is so small that one greedy collector would clear off the lot in a couple of seasons; but if they should spread over the place in a year or two he may be induced to name the locality, but not until then.—G. C. BIGNELL; Stonehouse, July 25, 1884.

SECOND BROOD OF *SMERINTHUS POPULI*.—Having procured some larvæ of *Smerinthus populi*, I fed them on poplar till about the second week in June, when they should have pupated. Only one, however, reached the chrysalis state; the others, being stung by ichneumons, died. Looking in my pupa-cage on July 2nd I was surprised to see a perfect specimen had emerged, being only a chrysalis six weeks. Would some of your readers tell me if this, with the Sphingidæ, is of common occurrence, or only exceptional? I should be much obliged.—A. E. HALL; Norbury, Sheffield.

[It is by no means uncommon to have second broods of *Smerinthus populi*. By feeding larvæ liberally in a warm greenhouse some time ago I reared three broods in one year.—J. T. C.]

ACRONYCTA ALNI.—I have had three larvæ of this insect given me in the last few days: one was sent by post from Grantham, and two were picked up here in this village; one on a gravel path, the other at the entrance of a rabbit-hole. The first

mentioned I am sorry to say died the day after its journey. My getting three specimens in the same season may be merely a piece of good luck, or it may be that the insect is more plentiful than usual this year.—ARTHUR MARSHALL; Egginton, Burton-on-Trent, August 9, 1884.

CRYMODES EXULIS IN UNST.—I have to record the capture of a dozen fine specimens of *Crymodes exulis* at sugar, between July 22nd and August 5th; all males, and very varied. I will send a notice of other captures later in the season.—EDWIN R. CURZON; Baltasound, Shetland, August 7, 1884.

LEPIDOPTERA IN THE FENS.—I have again taken in the fens some lovely specimens of *Senta ulvæ*, though only two of the variety *wismariensis*, which seems very scarce compared with the other forms of this species. *Nonagria brevilinea*, *N. neurica*, *Leucania obsoleta*, *Meliana flammea*, *Macrogaster arundinis* (larvæ and pupæ), *Sericoris doubledayana*, *S. micana*, *Argyrolepia schreibersiana*, *Schœnobius mucronellus*, *Crambus paludellus*, *Gelechia morosa*, *Chauliodus illigerellus*, *Adela sulzella*, and *Gelechia palustrella* were all more or less abundant; and from larvæ which I took of *Plusia orichalcea* I reared some fine specimens. The nights were usually perfect for collecting: I have hardly ever seen more moths about. The hot weather lately has been bringing out second broods of species which are seldom seen twice, except in such a summer.—GEO. W. BIRD; Hurley Lodge, Honor Oak Park, S.E., August 19, 1884.

COLLECTING NEAR CHARMOUTH.—With a view of working fresh ground, I went last July to Charmouth, Dorsetshire; and although the country is pretty enough, and promised to yield good species, my success was but very moderate. It is true that there were only two fine days in the three weeks I stayed there, but want of success must not be solely attributed to the indifferent weather. The winding lanes extend in every direction, bordered by hedges, in which there is a profusion of vegetation, and the Lepidoptera are thus spread over a large area, and are not sufficiently localised to admit of a large number of any one species to be readily collected. Among the Geometræ, *Melanippe rivata* was common enough, but *triangulata* and *galiata* occurred but sparingly. *Anticlea rubidata*, *Emmelesia affinitata*, *E. alchemillata*, and *E. decolorata*, *Lobophora sexalata*, *Larentia olivata*,



and *Cidarias prunata*, *C. picata*, and *C. immanata* were also taken; besides one or two of the variety *conversaria*, *Boarmia repandata*, and other common species. It was among the smaller species of Lepidoptera that I had hoped to be successful. *Ephippiphora signatana* occurred pretty freely among blackthorn, but was difficult to get quite perfect; by dint of careful working I managed to get a nice series. The larvæ of *Eupæcilia atricapitana* were feeding in the terminal shoots of a species of ragwort, which I have not yet identified; and from these I bred some very richly coloured specimens, having the ground colour of the fore wings deep peach-colour. *E. hybridellana* was common. Other species of Tortrices which occurred were *Ditula semifasciana*, *Penthina gentiana*, *P. marginana*, *Euchromia purpurana*, *Sciaphila perterana*, *Olindia ulmana*, *Semasia rufilana*, *Catoptria cæcimaculana*, *Trycheris mediana*, *Argyrolepis zephyrana*, *Conchylis inopiana*, &c. Among the Tineæ I took *Psychoides verhuella*, *Gelechia inopella*, *Æcophora flavifrontella*, *Acrolepis granitella*, *Gracilaria stigmatella*, *Coleophora fabriciella*, *C. alcyonipennella*, *C. lizella*, *C. discordella*, *C. therinella*, *C. troglodytella*, *C. hemerobiella*, and *C. frischella*. This last was fairly common on a large bed of *Melilotis officinalis*, but I quite failed to find cases. Doubtless the larvæ leave the food-plant when about to pupate. Altogether I noted some 119 species of Macro-lepidoptera, and 113 species of the Micros. I did not sugar, so the number of Noctuæ was small. *Tapinostola bondii* occurred, but not in quantity. I boxed, yet lost, a perfect variety of *C. inopiana*. It was an entirely black female. She appeared sluggish in the extreme; permitted me to thoroughly inspect her at my leisure, as she sat on a grass stem, and to box her. In this latter operation I unfortunately included a piece of the grass. Upon opening the box, the veriest trifle to remove this, heigh, presto! out went the black *inopiana*. A friend who was with me made a futile effort to net it, but we both marked it down in some long grass within a yard of us. I searched, I smoked into the grass till I emulated the moth as regards the colour of my face, I tried various other expedients, but I never again saw the melanic beauty. My friend was visibly affected, and I returned a sadder man. This would have made the fourth decent variety I have taken this season. In my garden I took the darkest *Melanippa fluctuata* I have seen; and near home a pretty variety of *Antithesia*

*pruniana*, particularly silky in appearance, with white fore wings delicately mottled with pale grey; also a *Scoparia* having white fore wings, with a dark brown central fascia on each. In Kent I have also taken a fair series of *E. curvistrigana* and some fine *Catoptria æmulana* from golden rod.—A. B. FARN.

ABUNDANCE OF MICRO-LEPIDOPTERA.—The present dry and warm season has been very favourable to the development of the Micro-Lepidoptera, and some species have been more numerous than for many years past. I have reared a rather large series of both *Coleophora maritimella* and *C. artemisiella* from larvæ obtained on the Essex coast, and a few *C. therinella*; also a large series of *C. argentulella* and about a score of *C. inflatella* from larvæ collected in Surrey; and *C. genistæcolella* from larvæ on *Genista anglica* in Epping Forest. The cases of *C. lutipennella* on the oak were in greater numbers than I ever saw them before.—WILLIAM MACHIN; 29, Carlton Road, Carlton Square, E., August 13, 1884.

THE BLUE BEETLE IN ESSEX.—This destructive beetle—the true *Phædon cochlearia*, Fabr.—has made its appearance, I believe for the first time, on the mustard crops in our Essex marshes. It has completely cleared part of a crop on Mr. John Page's Nazewick farm on Foulness Island, and is very destructive on a twenty-seven acre marsh of Mr. J. T. Gale's, on Hollywell, on the other side of the Crouch. Mr. Page's seed came from Cambridgeshire and he blames this for the introduction of the pest; its destructive habits there and elsewhere have lately been referred to (Entom. xiv. 44, 187, 236, 294; xv. 23, 213).—EDWARD A. FITCH; Maldon, August 23, 1884.

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#### REVIEW.

'The Entomologist' *Synonymic List of British Lepidoptera*.  
Compiled in conformity with the law of priority. By  
RICHARD SOUTH. 1884.

I HAVE to thank the publishers of the 'Entomologist' for sending me a copy of this list, and I beg to congratulate the compiler upon the successful completion of his work.

Doubleday's list has long been out of print, and Staudinger and Wocke's 'Catalog' had rendered it obsolete. For the

present generation of British lepidopterists South's list will worthily fill the place occupied by Doubleday's in the past.

Omitting accidental visitors, Mr. South enumerates 1982 indigenous species, distributed as follows:—

	Species.		Species.
Rhopalocera . . .	65	Pterophori . . .	37
Sphinges . . .	39	Crambi . . .	83
Bombyces . . .	111	Tortrices . . .	245
Noctuæ . . .	324	Tineæ . . .	720
Geometræ . . .	280		—
Pyralides . . .	78		1982

The Nycteolidæ (*Sarothripus*, *Earias*, and *Hylophila*), are placed at the head of the Bombyces; in the same group are included the Drepanulidæ, the Pseudo-bombyces of Guénée and Doubleday's List, and the Noctuo-bombycidæ or Cymatophoridæ (*Thyatira*, *Cymatophora*, and *Asphalia*). *Diloba* and *Asteroscopus* are relegated to the Noctuæ; the former to the Bombycoidæ, the latter to the Xylinidæ. The Aventiidæ, Boletobiidæ, Herminiidæ, and Hypenidæ are classed as Noctuæ, at the end of the group. The Pterophori are placed between the Pyralides and the Crambi, the erstwhile Elachistid, *Chrysocorys festaliella*, being put at the head of them. *Choreutes* and *Symæthis* are ranged as Tortrices, between the Grapholithidæ and Conchylidæ. The Psychidæ are retained amongst the Tineæ.

Thus, the separation of the Dicranuridæ, Pygæridæ and Notodontidæ from the Bombyces, and the promotion of the Geometræ above the Noctuæ, are both abandoned, and the arrangement again becomes very much what it used to be, *Consule Planco*, with the solitary exception that, instead of forming the rear-guard of the order, the Pterophori are interposed between the Pyralides (ending with *Acentropus*) and the Crambi (beginning with *Chilo*). This location of the Plume-moths is the striking feature of Mr. South's classification; it was, I believe, first suggested by Dr. Knaggs, and others have noticed the affinity between *Acentropus* and *Agdistis*, to which *Chrysocorys* has manifest relationship: as Curtis said, "this moth is closely allied to the Pterophori."

On the whole, the sequence in Mr. South's List appears to me more natural than that in Doubleday's.

Of course the entomological aspect of the Catalogue is the principal thing. But I am glad that the author has not allowed

himself to think that attention to accessories can be dispensed with. There is abundant evidence that Mr. South has viewed his subject with an entomological and orthographic eye. And I therefore make no apology for asking him to take note of the following trifles, as doubtless a second edition of his list will at no long interval be called for.

There are very few generic synonyms given, only about three dozen in all; and such as there are might very well be omitted. It would be a great improvement if an external margin were allowed for the generic names, instead of printing them on the same level with the specific names; the latter have a margin, as well as distinctive type, to separate them from the synonyms; the generic names should commence as much to the left of the specific names as the latter do to the left of the synonyms.

As a rule, the names are followed by an abbreviation of the name of the author supposed to be responsible for them, but without any reference to the work in which the family or genus is founded or the species described. It strikes me that, for the familiar and generic names, the original nomenclator is not always the one whose abbreviation follows the name; but having no books at hand I cannot now verify this. A good many of the family-names are without any author's name at all; it would have been no detriment if all of them had been left without. In a few instances the name of the author has been omitted in the case of a generic or specific name, as *e. g.* the genus *Hedya* (p. 23; should it not be *Hedia?*), and *Pædisca ratzeburghiana* (p. 25; is the *h* required?).

The family-names are for the most part formed on a uniform principle. But *Brephides* (p. 11) is an exception, and it may be doubted whether *Amphidasydæ* (p. 12) and *Botydæ* (p. 18) are right; *Pieridæ* (p. 1) and *Phycidæ* (p. 20) should be *Pierididæ* and *Phycididæ*; but, on the other hand, *Chrysocorididæ* (p. 18) seems to me to be a mistake (even if *Chrysocoris* were right). *Steniidæ* (p. 18) and *Galleridæ* (p. 21) are probably nothing more than misprints for *Steniidæ* and *Galleriidæ*. If *Ennomos*, *Ephyra*, and *Zerene* sink as synonyms, the families should no longer be called *Ennomidæ* (p. 11), *Ephyridæ* (p. 13), or *Zerenidæ* (p. 14).

The generic name *Aporophyla* occurs twice: once in the *Apameidæ* (p. 6), and again in the *Hadenidæ* (p. 9). And can it be that Heinemann's *Doryphora* (p. 33) has priority over the

Coleopterous genus of that name? Has an insignificant Gelechiid rendered the Colorado-beetle nameless? I do not know the date at which that part of 'Die Schmetterlinge Deutschlands und der Schweiz' was published, but it cannot be more than about fifteen years since, whereas Illiger's 'Doryphora' dates from 1807.

Mr. South has been careful to make the adjectival specific name agree, for the most part, in gender with the specific name. A few cases, however, have escaped his attention. Thus, we ought to have *Trochilium apiforme* and *crabroniforme*, *Sciopteron tabaniforme* (p. 2), *Notodonta trilopha* (p. 5), *Asteroscopus nubesculosus*, *Heliothis dipsaceus*, *scutosus*, *peltiger* and *armiger* (p. 10), *Biston hirtarius*, *Amphidasys stratarius* and *betularius* (p. 12), *Bupalus piniarius* (p. 14), *Platyptilia isodactyla*, *Amblyptilia tæniodactyla*, *Mimeseoptilus bipunctidactylus* (p. 19), *Semioscopus avellanellus* (p. 28), and *Hyponomeuta 20-punctata*, &c. (p. 30).

If Mr. South had been right in his spelling of *Chrysocoris* (p. 18), that name would have been masculine. But the proper name is *Chrysocorys*, and it is so spelt by Curtis, both in Ent. Mag., i. 191, and Brit. Ent., pl. 663.

In forming a Latin word from a Greek root, the Greek  $\epsilon$  is represented by the Latin *i* (not *ei*); but this rule has not been uniformly adhered to. To be consistent, we ought to read *Deiopia* (p. 3), *Chimatobia* (p. 14), *Lioptilus* (p. 19), *Idophasia* (p. 31), and *T'elia* (p. 33).

In forming a compound of two Latin words, the letter *i* is the euphonious and proper connective. Thus, we ought to write *costistrigalis* (p. 11), *rosicolana* (p. 23), *fasciipennella* (p. 35), *binotipennella*, *ardeipennella* (p. 36), and *emberizipennella* (p. 39). Where the compound is formed of two Greek words, the letter *o* is the proper conjunctive. Thus, we ought to write *Phiba-lopteryx* (p. 16) and *tæniodactyla* (p. 19).

Mr. South is not averse to the correction of misspelt names, and I am glad to welcome him as one of those who think that misprints should not be perpetuated. Even the law of priority has however failed to induce him to adopt *Zenzera* for *Zeuzera* (p. 4); and Banks, Francillon, Yeates and Geoffroy have still to be content with the truncate honour of *bankia*, (p. 10), *francillana* (p. 28), *yeatiana* (p. 32), and *geoffrella* (p. 34). But surely *Epione paralellaria* (p. 11) should be *parallellaria*; *Cnemidophorus*

and *Mimeseoptilus* should take the place of Wallengren's *Cnæmidophorus* and *Mimæseoptilus* (p. 19); *ophthalmicana* (p. 25) should be *ophthalmicana*; *Dicrorampha* (p. 27) should be *Dicrorrhampa*; *vaculella*, *cochylidella*, *tapetzella*, and *lapella* (p. 29), should be *vaculella*, *conchylidella*, *tapetiella*, and *lappella*.

Again, *chrysonuchellus* (p. 20) should be *chrysonychellus*, and *betuletana* (p. 23) should be *betuletana*. Whilst *lafauriana* (p. 21) and *demaryella* (p. 39) would look more like Latin if they were spelt *lafauriana* and *demariella*.

In addition to the Corrigenda mentioned at the end of the List, I take the following to be unintentional misprints:—*pinistri* (p. 6) for *pinastri*; *siterata* (p. 16) for *siderata*; *rubortibiella* (p. 21) for *rubrotibiella*; *flavicillana* (p. 28) for *flaviciliana*; *heegeriella* (p. 38) for *heegeeriella*; *saliciella* (p. 39) for *salaciella*; and *nacilia* (p. 40) for *naclia*.

But these minute blemishes detract little or nothing from the credit that is justly due for the preparation of "the new Doubleday"; and British Lepidopterists owe much to Mr. South for the pains he has taken in performing a somewhat thankless task.

There was a time when the Entomological Society of London contemplated the production of a co-operative 'Catalogue of British Insects,' and though a beginning was made, for ten years nothing has been done. Is it too much to hope that the appearance of Mr. South's List will stimulate the Society, and induce it to proceed with the Lepidopterous portion of its larger Catalogue, the need of which is by no means superseded by the publication that I have now the pleasure of commending to all to whom these presents come.

J. W. DUNNING.

August 18, 1884.

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NOTICE.—THE 'ENTOMOLOGIST' LIST OF BRITISH LEPIDOPTERA.—Until the completion of the present volume of the 'Entomologist,' the nomenclature used in the 'Doubleday List' will be continued. In and after January next, with the commencement of Volume xviii., the nomenclature and arrangement of the new 'Entomologist' List will be followed, with reference to the British Lepidoptera, both in the Magazine and Exchange Column.—JOHN T. CARRINGTON (Editor).

# THE ENTOMOLOGIST.

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## RANDOM NOTES ON NEW ZEALAND LEPIDOPTERA.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

DURING the past summer H.M.S. 'Espègle' was employed for nearly four months cruising on the coasts of New Zealand, when she visited many of the principal ports and harbours of the colony; this enabled me to make several excursions into different parts of the country, a brief description of which may perhaps be of interest to the readers of the 'Entomologist.' I may, however, at once remark that, on account of the short stay at most of the places visited, and the prevailing wet and boisterous weather experienced, my observations were necessarily of a limited nature, and my captures not very numerous.

We first called at the little township of Russell, situated at the head of the Bay of Islands. The approach to the anchorage is very fine. For several miles we passed up a bay studded with small islands clothed with a rich verdure of scrub, with a few scattered trees on their highest points. The mainland on each side and beyond is hilly, rugged, and wooded, and at this time of the year (December 9th) was beautifully green.

Russell, although a small place, is one of the oldest "townships" in the colony; but it is likely to become of more importance, as coal-mines, which have recently been discovered and placed in good working order, are already attracting the attention of various steam-ship companies.

Soon after we anchored I went on shore with two of my mess-mates for a walk, and, as is the custom with most Englishmen when landing for the first time in a strange country, we made for

the top of the nearest hill, about a mile off, and some four or five hundred feet high. Our path took us through thick "Ti-tree" scrub (*Leptospermum scoparium*), which grew everywhere, and was only varied in the gullies, where other trees and shrubs, and magnificent tree-ferns, flourished luxuriantly. Near the town, where the land had been cleared some years ago, there was a quantity of furze, sweet-briar and thistles, which in many places have quite overrun the country and become almost as great a nuisance as the introduced sparrows and sky larks, which have increased and spread with such marvellous rapidity. It was a windy cloudy afternoon but with occasional gleams of sunshine. The only butterflies noticed were *Chrysophanus salustius*, which were disporting themselves in a sheltered nook where sorrel (*Rumex*) was growing plentifully. This species is usually found in stony waste situations where a dwarfed form of *Rumex* abounds, and upon which I believe its larvæ are nourished. A few small Geometræ and Tortrices were dislodged from the bush, but the undergrowth was so reeking with moisture from the recent rains that it was difficult to do much collecting.

The next morning we got under way and steamed for a few miles up an arm of the bay, and anchored off a place called Opuā, where there is a wharf to which coal is brought down by rail from the Kawakawa mines. It was a dull day, with strong wind and frequent showers; but at one time it cleared up and looked more promising, so I landed on the beach and made my way to a likely-looking gully about half a mile off. Here a little stream ran into the harbour, and on each side of it there were some cattle-tracks leading into the bush. I selected one which ran parallel to the stream, but after walking for about a quarter of a mile the path came to an end and I found it impossible to advance beyond, as a number of old trees which had fallen across the gully effectually prevented further progress, and the bush on each side was far too thick to penetrate. Rain also began to fall again in torrents, and my net soon became perfectly soaked and useless, so I had to retrace my steps and return to the ship. Geometræ and Pyrales were fairly numerous, and had the weather been dry I might have taken a good number. Most of my captures were quite new to me, and for the names of those given I am indebted to my friend Mr. R. W. Fereday, who very kindly presented me with a liberal collection of named types of New



Zealand Lepidoptera when I met him at Christchurch a few weeks later. The most abundant species was the pretty little *Acidalia mullata*, which occurred freely among the "Ti" bush, and which subsequently turned up at every other place we visited. It varies so much that in a series of twelve there are scarcely two alike. I have also taken it in Tasmania and New South Wales, so it appears to be widely distributed. Upon the trunks of old trees three species of *Scoparia* were common—*Scoparia feredayi*, a very distinct species, and two others which are at present unknown to me. Among sedge and rushes by the side of the stream *Botys flavidalis*, *B. notata*, and two plumes, *Platyptilus repletalis* and *Aciptilus monospilalis*, were not uncommon, and besides these I boxed about two dozen other species, amongst which were some pretty and interesting Crambites.

From Russell we proceeded to Auckland, where we remained for nearly three weeks; as it rained more or less the whole time we were there I was able to do next to nothing in the way of collecting. From thence, after stopping a day or two at Tauranga, we went on to Port Chalmers, the port of Dunedin, where we arrived on January 12th, and left again on 24th; and the weather here was much the same as at Auckland, and nothing could be done. On January 25th we reached Lyttelton, the port of Christchurch, and where, I am glad to say, we were favoured with finer weather. Lyttelton is snugly and prettily situated at the foot of a lofty range of hills in a little bay within an almost land-locked harbour. The hills slope up immediately from the back of the town, and are divided by deep gullies, in which there is a mixed growth of trees and shrubs; and the spurs and higher parts are overgrown with tufts of the native tussock grass. Little streams course down the gullies, and after heavy rains become much swollen and form waterfalls in many places; and their margins are fringed with a variety of ferns—*Asplenium*, *Todea*, *Lomaria*, &c.; and many beautiful parasitical species, such as *Asplenium flaccidum*, *Hymenophyllum*, *Polypodium*, &c., clothed the trunks of the dead and fallen trees.

One of my first expeditions was a scramble up one of these gullies to the top of the highest hill, and a more enjoyable afternoon I have seldom spent. Under the shadows of the trees, in the deepest recesses, masses of shrub-like nettles three to four feet high grew in large patches; and one of the first insects

I noticed was a battered female *Pyrameis gonerilla* depositing her eggs upon the young shoots; and a little search disclosed an abundance of larvæ of all sizes, from tiny individuals just hatched to those full grown and ready to pupate, besides a plentiful supply of chrysalids. I was of course delighted to make the acquaintance of this fine species in all its stages, and to be able to note its habits, which are almost identical with those of *Pyrameis atalanta*. The first thing the young larva does as soon as it is hatched is to fasten the edges of a tender leaf together so as to form a little tent, from which it issues forth from time to time to feed. As it grows older it increases the size of its tent by appropriating larger leaves, and when full-grown it spins a pad of silk to the midrib of the leaf which forms the roof of its tent, and from this suspends itself and changes to a chrysalis, when it hangs snugly protected from every change of weather. Some of the nettles were so devoured that the larvæ had literally been eaten out of house and home, and were wandering disconsolately about the plants. Where there was plenty of food they only appeared to move a short distance from their tents to feed, and as soon as the leaves near them were consumed they changed their quarters and constructed a new domicile. The chrysalids were so easy to find that I only boxed a small number of larvæ for the purpose of description.

I was much interested in reading Mr. Hudson's life-history of this species in the 'Entomologist' (xvi. 217), and am surprised that he should have been unable to find the chrysalis; but this I think may be accounted for by the fact that in the locality where Mr. Hudson took his larvæ they were, comparatively speaking, scarce, and were feeding upon a stunted form of nettle, so that the chrysalids could not be so easily seen; whereas in the gullies near Lyttelton the larvæ occurred in such numbers upon plants—or rather shrubs—from three to four feet high, and the tents in which the chrysalids were hanging were generally on the highest part of a stem and so conspicuous, that they could often be detected without any difficulty directly one glanced towards the spot.\* These butterflies, as Mr. Hudson remarks, are very

\* As my description of the larva differs slightly from that of Mr. Hudson (whose acquaintance I subsequently had much pleasure in making at Wellington), I will give it briefly here:—Length 1·6 to 1·8 in. Cylindrical, tapering towards each extremity, and with the median segments much thickened. Head slightly notched

strong and rapid flyers, and may frequently be seen careering at a headlong pace miles from any place where their food was likely to occur; and indeed they have often flown on board ship when we have been a great distance from land. Although so strong on the wing, they are bold and fearless in their habits, and when struck at and missed often return and fly backwards and forwards until captured; and I have even taken them between my finger and thumb as they sat on a leaf.

The nettles they live on near Lyttelton, as before mentioned, are tall bushy shrubs with tough woody stems, and leaves with highly developed urticating powers, being furnished with strong stinging spines arranged upon their upper surface along the ribs; and the stems also are thickly armed with the same, so that it was painful work collecting the larvæ, &c., with naked hands, for upon this occasion I did not happen to have a pair of gloves with me.

(To be continued.)

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## COLEOPTERA AT SHIERE.

BY EDWARD CAPRON, M.D.

A SHORT account of some of the less common Coleoptera taken in this neighbourhood during the present year, may perhaps interest a few of your readers. On the whole beetles have been anything but plentiful, and I never knew a season

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on the crown, deep greenish black, blotched and speckled with black and white dots, and sparsely covered with short fine black hairs. Dorsal area hoary black, irrorated with yellowish white dots; subdorsal stripe somewhat interrupted, pale greenish yellow, bordered below by a blackish stripe, which is thickly irrorated with minute yellow dots; spiracles black, in a greenish yellow ring, and bordered above by a somewhat oblique yellow stripe and below by a wavy stripe of the same colour; ventral surface and claspers much wrinkled, pale green, tinged with yellow, with indistinct yellowish white dots, and emitting a few fine light-coloured hairs; ventral claspers tipped with a reddish fringe; short dorsal spines on 4th to 11th segments; a row of subdorsal spines, and a spine above and below each spiracle, those below seated upon a pale peach-coloured blotch; all the spines pale green, and finely branched, the subdorsal row being the longest. These larvæ vary slightly, some having the yellow-green stripes more or less suffused with golden green; others the dorsal area greenish yellow, with reddish brown blotches; and some with the spiracular region beautifully tinged with pink and pinkish yellow. I bred more than 130 splendid butterflies from the larvæ and chrysalids taken near Lyttelton, and in no case were any of them ichneumoned.

before when beating the herbage has produced so little. This has been particularly the case with the Curculionidæ and Elateridæ, even the commonest species being in many cases entirely absent. Towards the end of February I took a fine specimen of *Euryporus picipes*, out of some moss growing on a bare chalk hill, near a plantation; and in tufts of a coarse grass near the same place *Evæsthetus scaber* occurred in plenty. I soon after captured a pair (the sexes) of *Stilicus fragilis* in some rotten fern covering roots stored for the winter, but diligent searching failed to procure more. I should not have perceived these had not the red thorax betrayed their presence, as they tightly rolled themselves up and feigned death on being disturbed. All the other species of *Stilicus*, except *S. geniculatus*, are more or less common here. Amongst some hedge rubbish *Lithocharis obsoleta* and *L. ochracea*, and one example of *L. fuscula*, taken flying. In haystack refuse *Heterothops dissimilis* and *H. binotatus*, *Quedius scintillans*, *Oxypoda hæmorrhœa*, and *O. umbrata*. At the end of March I found *Mycetoporus lucidus* tolerably abundant by shaking moss in a fir plantation, and by sweeping a hedge *Balaninus villosus* and *Bledius subterraneus* were procured. In May a nice example of *Ocypus fuscatus* obligingly walked across the high road, and in June I beat a pair of *Magdalinus barbicornis* out of a hawthorn hedge. A small pool in a wood furnished me with both sexes of *Liopterus ruficollis*, and out of moss half submerged on the banks I captured several specimens of *Tachys bistriatus*, as well as *Myllæna brevicornis* and *M. elongata*. A sand-pit during the season has afforded several examples of *Tachinus elongatus*, also sparingly *Gnathoncus rotundatus*, *Lathridius testaceus*, *Colon brunneum*, *Oxypoda mutata*, *Ocalea castanea*, and a dozen *Calodera umbrosa*. Among insects taken casually I may mention *Atomaria ferruginea*, *Colon zebei*, and *Corticaria cylindrica*; also *Ips. quadripunctatus* in decaying mangold roots, *Falagria thoracica* in sand, and *F. sulcatula* in wet moss.

I have managed to take as well as see the beautiful *Cicindela sylvatica*, but found it no easy matter.

Up to the present time I have come across very few of the Phytophaga, the only ones worth recording being *Luperus flavipes* and *L. circumfusus*, *Lema puncticollis*, and *Lamprosoma concolor*.

A short visit to the Isle of Wight, the second week in June,

was rendered unproductive by the severe cold which occurred at that time, scarcely an insect being seen. I however obtained *Anisodactylus pæciloides* at Bembridge, and *Aëpus marinus* and *Philonthus sericeus* near Ryde; also a few maritime *Homalotas*, *Tachyusa uvula* and *sulcata*.

When the intense heat set in, beetles entirely disappeared, and for the last month I have taken nothing except one *Ilyobates nigricollis* in a sand-pit.

Among other insects the following may also perhaps be worth notice as having occurred in this neighbourhood:—*Badister sodalis*, not very uncommonly; *Bledius opacus*, in plenty; one or two *Prionus coriarius*, *Agrius angustulus* and *laticornis*, *Corymbites bipustulatus* and its variety with entirely rufous elytra; *Myrmedonia humeralis* and *limbata*; *Hydrobius strigosus*, by sweeping in the evening; *Coccinella oblitterata*, in fir plantation; *Homalium pygmæum* and *iopterum*, *Læmophlæus ferrugineus*, *Salpingus castaneus* and *Lissodema 4-pustulata*, *Mordellistena lateralis* was very plentiful during the summer, and varieties occurred almost entirely ochraceous. I have once taken here, also, a single example of *Agathidium confusum*, Bris.

Shiere, Guildford, August 19, 1884.

## INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. V.—OPHIONIDÆ (*continued*).

ANOMALON, *Jur.* (including *Agrypon*, Först.)

- A. Antennæ from half to three-fourths the length of the abdomen (male and female).
- a. Posterior discoidal recurrent nervure (fore wing, fig. 2, *g. r.*) interrupted by anal nervure (*r. t.*) in or a little below the middle.
- \* Forehead with a horn just above the antennæ.
- † Scape of antennæ entirely yellow. - 5. *bellicosum*, 5—6 lines.
- †† Scape of antennæ yellow beneath.
- ‡ Abdomen red; apex and back of 2nd segment black; hind coxæ black. - - - - - 1. *xanthopus*, 5—6 lines.
- †† First segment and back of 5th to 7th black; hind coxæ red, extreme base black. - - - - - 4. *ruficornis*, 5—6 lines.
- \*\* Forehead without a horn; joints of hind trochanters of equal length below.
- § Scutellum convex, or slightly depressed.

- × Forehead with a vertical ridge above the antennæ.  
*perspicuum*, 5—6 lines.
- ×× Forehead without a vertical ridge, or with a very slight one.
  - o Exterior discoidal recurrent nervure interstitial.
- + Antennæ black, scape with whitish spot beneath.  
Base, apex, and back of 2nd segment of abdomen black.  
8. *fibulator*, 7—8 lines.
- + + Antennæ rufo-fulvous; abdomen red, with a black line on 2nd segment. - - - - - 3. *mirabile*, 14 lines.
- oo Exterior discoidal recurrent nervure not interstitial.
- + + Face yellow; hind femora black, or base and apex red.  
6. *cerinops*, 5—9 lines.
- + + + + Face of male yellow, female sometimes yellow-marked; base of hind femora black. - - - - - 13. *latro*, 6—9 lines.
- §§ Scutellum depressed, margins very much raised.  
*Agryp. canaliculatum*, 4—5 lines.
- b. Posterior discoidal recurrent nervure interrupted by anal nervure above the middle.
  - \* Transverse anal nervure divided by a more or less distinct emitting nervure.
  - † Hind tarsi not thickened; thorax black.
  - ‡ Exterior discoidal recurrent nervure interstitial.
  - § Antennæ about half the length of the insect. 9. *perspicillator*, 5 lines.
  - §§ Antennæ three-fourths the length of the insect.  
*cylindricum*, 7—8 lines.
  - †† Exterior discoidal recurrent nervure not interstitial.  
10. *tenuitarsum*, 5 lines.
  - †† Hind tarsi thickened.
- × Exterior discoidal recurrent nervure interstitial.  
7. *melanobatum*, 6—6½ lines.
- ×× Exterior discoidal recurrent nervure not interstitial.  
12. *clandestinum*, 3—4½ lines.
- \*\* Transverse anal nervure not divided.
  - o Hind coxæ red.
- + Vertex black.
- + + Breast yellow, or yellow-marked; 1st to 3rd segments of abdomen reddish chestnut, with bases black. - 11. *interruptum*, 6¾ lines.
- + + + + Breast not yellow-marked; back and sides of apex of abdomen black.  
*anxium*, 4½—5½ lines.
- + + Vertex with yellow spots; thorax of female greater part red; apex of abdomen slightly fuscous.  
*arquatum*, 3½—5½ lines.
- oo Hind coxæ black.
- ∞ Aculeus about as long as the 1st segment of abdomen.  
*minutum*, about 2¼ lines.
- ∞∞ Aculeus about half the length of the 1st segment.
  - ! Exterior discoidal recurrent nervure almost interstitial.  
*septentrionale*, 3 lines.
  - !! Exterior discoidal recurrent nervure not interstitial.
- \* Hind tibiæ red, apex dark. - *Agryp. flavcolatum*, 3½—6 lines.
- \*\* Hind tibiæ black, towards the base red. - *anomelas*, 4—5 lines.
- c. Posterior discoidal recurrent nervure not interrupted.  
*geniculatum*, 3 lines.

- B. Antennæ as long as, or a little longer than, the insect; hind tarsi not thickened (male and female).
- a. Base of 1st segment, sometimes back of 2nd and 3rd, generally 6th and 7th, black; back of 4th and 5th piceous.
- Agryp. tenuicorne*, 3—6½ lines.
- b. A line on back of 2nd segment and three apical segments of abdomen black. - - - - - 14. *gracilipes*, 5½ lines.

This very characteristic genus is rich in species; and from their great similarity of coloration, together with the variability of many species in size and colour, they require careful discrimination. Besides Gravenhorst, Wesmæl's "Revue des Anomalons de Belgique" (Bul. Ac. Brux., xvi., ii., 115-139), and Holmgren's "Ophionidslägtet *Anomalon*" (Öfversigt, &c., xiv., 157-186, pl. ii.) and "Monographia Ophionidum Sueciæ" are the authorities to consult; but there are also many scattered descriptions. Foerster's genus *Agrypion* is acknowledged in Marshall's catalogue, but is here included with *Anomalon*, as the distinctive characteristics are not only trivial, but frequently inconstant, the principal difference being the absence of the horizontal nervure from the transverse anal nervure. Wesmæl rightly describes this as subobsolete in *A. clandestinum*. *Atrometus*, Foerst., also appears to be a superficial genus. Of the fourteen *Anomalons* and three *Agrypions* included in Marshall's catalogue, *A. capitatum*, Desv., is omitted, as being hardly a true *Anomalon*; and we know nothing further than Curtis's very short and mostly colour description of his *A. gracilipes*; it is probably only a pale variety of the common *A. tenuicorne*, Gr. To these are added *A. arquatum*, Gr., *A. anomelas*, Gr., *A. perspicuum*, Wesm., *A. anxium*, Wesm., *A. septentrionale*, Holmgr., *A. geniculatum*, Holmgr., *A. cylindricum*, Bridgm., and *A. minutum*, Bridgm. (see Trans. Ent. Soc. Lond., 1881, p. 157; 1883, p. 164; 1884, pt. iii.). *A. xanthopus*, *bellicosum*, *cerinops*, *melanobatum*, *fibulator*, *tenuicorne*, *perspicuum*, and *canaliculatum* are well figured on plates 3 and 43 of Vollenhoven's 'Pinacographia.' The species of *Anomalon* are solitary in their parasitism, and emerge direct from the pupa of their host, not spinning a separate cocoon like most of the Ophionidæ. They are exclusively parasitic on Lepidoptera, being mostly attached to species whose larvæ do not spin a cocoon, as the Noctuæ, Geometræ, and Tortrices.

The following British species have been bred:—

1. xanthopus, *Schr.*, from *Pieris daplidice*; Bignell. *Fidonia piniaria*; (Bernuth) Ratzburg. *Trachea piniperda*; Ratz., (Graff) Ratz., (Muss) Ratz., Boie, Brischke, Bridgman. *Miselia oxyacanthæ*; Brischke (*armatum*). *Cucullia lychnitis*; Giraud. *Halias quercana*; (Reissig), Ratz.
4. ruficorne, *Gr.*, from *Callimorpha dominula*; Gir. *Demas coryli*; Boie.
5. bellicosum, *Wesm.*, from *Sphinx pinastri*\*, *Demas coryli*; Brischke.
6. cerinops, *Gr.*, from *Eupithecia* sp.; Brischke. *Diloba cæruleocephala*; (Graff.) Ratz. *Agrotis segetum*; Brischke. *Tæniocampa gracilis*; (Perris) Gir. *Calocampa vetusta*; Brischke.
8. fibulator, *Gr.*, from *Bombyx castrensis*; (Goossens) Gir. *Diloba cæruleocephala*; Gir.
9. perspicillator, *Gr.*, from *Cnethocampa pityocampa*\*; (Perris) Gir. *Simyra nervosa*\*; Brischke.
10. tenuitarsum, *Gr.*, from *Zygæna filipendulæ*, *Z. loniceræ*; Weston. ? *Diloba cæruleocephala*; (Dale) Curtis.
12. clandestinum, *Gr.*, from *Hemithea thymiaria*; Bignell. *Emmelesia alchemillata*, *Eupithecia lariciata*, *E. actæata*\*; Brischke. *E. veratraria*\*; (Goossens) Gir. *E. castigata*; Bignell. *E. linariata*; Barrett. *E. pumilata*, *E. absynthiata*, *Ypsipetes impluviata*; Raynor. *Cœnectra pilleriana*, *Hyponomeuta evonymella*, *Cerostoma radiatella*; Brischke. *C. costella*; Bignell.
13. latro, *Schr.*, from *Diloba cæruleocephala*; Brischke.  
*perspicuum*, *Wesm.*, from *Cleora lichenaria*; Atmore. *Noctua*; Gir.
1. flaveolatum, *Gr.*, from *Thecla betulæ*; Bignell. *Hybernia defoliaria*, *Eupithecia actæata*\*; Brischke. *Notodonta dromedarius*; Marshall coll. *Thyatira batis*; Gir., not Drewsen and Boie, teste Ratz. *Acrobasis consociella*; (Goureau) Dours. *Halias prasinana*, *Earias clorana*; Brischke. *Tortrix heparana*; Ratz. *Hyponomeuta evonymella*; Brischke, Gir.
2. tenuicorne, *Gr.*, from *Thais polyxena*; Bignell, ? Ruthe coll. *T. rumina* var. *medesicaste*, *Doritis apollinus*; Gir. *Euchelia jacobææ*; (Fallou) Gir. *Selenia lunaria*; Elisha. *Anisopteryx æscularia*; Bignell. *Dicranura bifida*; (Richter) Grav. *Cymatophora or*; Brischke. *Dianthœcia capsicola*; Bignell. *Anarta myrtilli*; Brischke. *Hyponomeuta padella*, *H. malinella*\*, *H. evonymella*; (Goureau) Dours.
3. canaliculatum, *Ratz.*, from *Fidonia piniaria*; (Graff) Ratz. *Halias prasinana*; Brischke. *Pœdisca sordidana*; Sang. *Steganoptycha rufimitrana*; Walsingham. *Hyponomeuta evonymella*; Ratz., Brischke.



- arquatam, *Gr.*, from *Tæniocampa gothica*; Bignell.  
 anxium, *Wesm.*, from *Teras hastiana*; (De Graaf) Voll. *Eupœcilia*  
*udana*; Elisha.  
 septentrionale, *Holmgr.*, from *Pœcilocampa populi*; Raynor.  
 geniculatum, *Holmgr.*, from *Cynips kollari* galls (probably ex *Ephippi-*  
*phora obscurana*); Weston. *Halias clorana*;  
 Vollenhoven.  
 cylindricum, *Bridgm.*, from *Euchelia jacobææ*; Fitch coll.  
 minutum, *Bridgm.*, from *Chrysocorys festaliella*; Fletcher.

TRICHOMMA, *Wesm.*

- A. Scutellum yellow-marked, or black; aculeus one-third of abdomen.  
 1. *eneicator*, 4—5 lines.  
 B. Scutellum red; aculeus one-fourth of abdomen.  
 2. *fulvidens*, 7—7½ lines.

*T. fulvidens* appears to be very rare; there is one female in the British Museum from Desvignes' collection. *T. eneicator* is not uncommon, and is apparently exclusively parasitic on Tortricidæ; we have bred it from Tortrix pupæ received from Lord Walsingham, whose larvæ had fed on *Myrica gale*. Vollenhoven records that Heylaerts bred it from a Tortrix; and in Ruthe's collection there is a specimen bred from a willow-feeding Tortrix. Brischke records it from *Earias clorana*; it emerges direct from the Tortrix pupa without spinning any cocoon. Details of both species are well figured in Vollenhoven's 'Pinacographia' (pl. 43, figs. 8, 9).

GRAVENHORSTIA, *Boie.*

Black; head and thorax yellow-marked: scutellum yellow; apex of abdominal segments yellow-banded; legs yellow, varied with black and red; head cornuted; exterior discoidal recurrent nerve interstitial; transverse anal nerve divided; aculeus slightly exerted (male and female). - - - - - *picta*, 8—11 lines.

This oft described, but distinct and beautiful, species is not mentioned in Marshall's catalogue. In the Proc. Ent. Soc. Lond., 1872, p. xlv., we read:—"Mr. Bond exhibited a new British species of Ichneumonidæ (*Anomalon fasciatum*), bred by Mr. Mitford from the cocoons of the supposed variety of *Lasio-campa trifolii*, obtained from larvæ found at Romney, Hants" (this should be Romney Marsh, Kent). The species was first described by Drewsen and Boie as *Gravenhorstia picta* (Wieg. Archiv., ii., 43; 1836. Krøy. Nat. Tids., i., 311; 1837), from specimens bred from *Bombyx trifolii* on May 26th. Dr. Giraud

described it under Schæffer's MS. name, *Anomalon fasciatum* (Verh. z.-b. Gesell. Wien, vii., 170; 1857), from specimens in the Vienna Museum, bred from the south-east European variety *Spartii* of *Bombyx quercus*. Mr. Marshall described the specimens bred by Mr. R. Mitford under Smith's same MS. name (*A. fasciatum*, Ent. Mo. Mag., ix., 240; 1873); there are two males and one female in the National Collection. Taschenberg described a Spanish female as *Ophion septemfasciatus* (Zeits. Ges. Nat., xlvi., 428; 1875), but considered it the type of a new genus. Dr. F. Rudow has described it as *Anomalon pictum* (Ent. Nach., viii., 35; 1882). We have a female and the large egg cocoon from which it was bred by Sir Sidney Saunders in Corfu, it has emerged direct from the *Bombyx* pupa. Both sexes are well figured in Vollenhoven's 'Pinacographia' (pl. 3, figs. 1-2 b); the male from Drewsen's original specimen and the female from one caught in Holland; the *Banchus*-like coloration is very striking.

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## RANNOCH IN JUNE.

BY A. H. JONES.

To the entomologist resident in the South of England I cannot imagine a more delightful excursion than one to Rannoch, for, in addition to the novelties in the way of species, nearly all the specimens he meets with differ to some extent from the forms with which he is so familiar. For the collector of Tortrices I cannot recommend a better time than the last half of June, as I think the following account will testify.

As accommodation elsewhere was difficult to obtain, I stopped at Kinloch, and found it in some respects better than Camachgouran (where I have usually taken up my quarters), and nearer some of the best collecting ground for mountain species; moreover, Rannoch Moor, on the edge of which Camachgouran is situated, is now closed to entomologists. The first day's collecting, June 15th, was devoted to the Black Wood. How it is changed! Large fir trees lay in every direction, in some places two or three together. This dreadful devastation was the result of the storm which destroyed the Tay Bridge. On this one night, I was told, 2000 trees were blown down, a number it could ill afford to lose.

On the occasion of this visit to the Black Wood I only met with *Phoxopteryx myrtillana*, which was, however, common among

*Vaccinium*. From June 15th to 20th I worked chiefly in a plantation of young Scotch fir, paying occasional visits to the hills about 500 feet above it. Among the firs I met with *Coccyx cosmophorana*, not uncommonly flying throughout the day. I also took on the wing in the afternoon sunshine a fine series of *Mixodia rubiginosana*, *Retinia pinivorana*, and five *R. duplana* (northern form of *turionana*?); also one *Stigmonota coniferana*. In the swampy places between the fir trees *Penthina dimidiana* and *Phoxopteryx uncana* were not uncommon, and *Clepsia rusticana* occurred occasionally. *Eupæcilia ciliella* was in great abundance in certain localities. On the hills, flying in the afternoon sunshine among *Arctostaphylos uva-ursi*, I took a fine series of *Euchromia arbutana*, *E. mygindana*, and *Coccyx nemorivagana*. The last-named species occurred equally among heather, and I should not be surprised to find this to be also its food-plant. Among heather *Mixodia schulziana* and *Phoxopteryx unguicana* were both common. *Penthina prælongana*, an abundant Rannoch species, still lingered a little way up the hill-sides among birch. *Phlæodes tetraquetra* also occurred among birch, and *Grapholitha campoliliana* among sallow. The last visit I paid to the Black Wood was on June 24th, and on this occasion I took flying round the branches of the fir trees a series of *Coccyx coniferana*; also one *C. cosmophorana*, the only specimen I noticed in the Black Wood. Among *Vaccinium*, *Mixodia palustrana*, *Coccyx ustomaculana*, *Sericoris lacunana*, *S. irriguana*, and *S. daleana* were all more or less common. *Irriguana* is now, I believe, considered only a small form of *daleana*, and it has been suggested to me by a good authority that *daleana* is also only another form of *lacunana*, an opinion I am inclined to share.\*

On June 25th, at about 2500 feet, I took a few *Penthina staintoniana* among its supposed food-plant, *Vaccinium myrtillus*; and on the same ground a few *Amphysa gerningana*. A little higher up

\* Is our correspondent quite sure that he captured the true *Sericoris irriguana* in the Black Wood of Rannoch? There is a form of *S. daleana* which occurs in the Black Wood closely resembling *S. irriguana*. The latter in my experience is a truly mountain species, never being found under 1500 ft., and more frequently at 3000 ft., having quite different habits and time for flight. *S. daleana* flies in the afternoon, after the manner of many other Tortrices; while *S. irriguana* flies high, say, six or eight feet above the ground, just before and after sunrise, and not freely in the afternoon. Will Mr. Nicholas Cooke give us his opinion? I have taken *S. lacunana* in the meadows below the graveyard at Camachgouran, and within a few hundred yards of *S. daleana*, which is apparently a bilberry-feeder.—J. T. C.

the hill, among "grey moss," *Scoparia alpina* was common. I had but little time to devote to the Macro-Lepidoptera. I noticed several *Argynnis euphrosyne* and two *Thecla rubi* in the Black Wood, and an occasional *Chortobius davus* on the moor. *Larentia salicata* occurred a little way up the hill-sides, and *Emmelesia blandiata* in the meadows near the loch. *Botys fuscalis* was in the greatest profusion in many localities. I did not sugar (which I was told was not productive), and the only Noctuæ I met with were *Cymatophora or* and *Hadena rectilinea* at rest on palings.

Shrublands, Eltham, Kent, September 13, 1884.

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## DESCRIPTION OF AN *EUPITHECIA* NEW TO SCIENCE.

BY C. S. GREGSON.

### *EUPITHECIA CURZONI*, *mihii*.

Imago.—Expands over three-quarters of an inch, wings broad. Colour of the whole insect silvery steel-gray, tinged with ochreous on parts of the wings in fine specimens. The striæ are numerous; sometimes they are obscure, at other times they are distinctly divided by sharp silvery markings, often with a broad transverse central band, composed of about three dark unequal striæ: this band is darkest at the outer edge and turns outwards to the costa; on its outer edge are a series of dark cuneiform nerve-marks pointing inwards. The discoidal spot and nerve below are well defined. The outer striæ are confused, but are edged with a well-defined wavy or arched line; the bases of the arches are outwards. Ciliary line distinct, ciliæ broad, nerval-marks well defined. Under wings small, dark, striate; ciliary line distinctly pronounced.

Larva.—Eggs deposited in June soon hatch, and the young larvæ are of various colours, from light ashy-green and gray to bright grass-green. Form cylindrical, long and slender; when older, form long, slightly broader at the middle segments and somewhat appressed. Colour: bright grass-green predominates; yellowish and whitish greens appear; one before me is dark green, and one chocolate-brown. Size, three-quarters to seven-eighths of an inch long; head lobed, hairy, light horn-colour; corslet, none; on its space may be seen three darkish markings, the dorsal line passing through the central one; dorsal streak well defined to fourth segment, when it broadens out into six spearhead-like

dark markings, pointing forwards, followed by a less well-defined roundish marking to the anal segment. Sometimes these spear-head-like markings appear almost lozenges. Under each of the spearheads is a dark streaky mark, placed diagonally, the wrinkled edging to which is light and well-defined; anal segment without a plate.

Pupa.—Rather obese. Face, thorax, and wing-cases bright grass-green. Anterior segments bright red-ochre colour. Spins a slight web of white silk at the base of its food-plant amongst the débris lying about, and pupates therein.

Remarks.—General appearance of full-grown larva: form long, slender, central segments broadest, slightly appressed. Colours various, from bright green to rich chocolate-brown, and with six well pronounced spear-head or lozenge-shaped dorsal markings, edged diagonally with light green. It is a rather slender, wrinkled, "pug" larva, and belongs to the *absynthiata*, *satyrata* and *knautiata* group of *Eupithecia*, but has a much more elegant appearance than these in both the larval and imago state. It is the most lineolate *Eupithecia* I know. The moth appears in plenty at Balta Sound, in Shetland, on heathy places, its larva eating *Calluna vulgaris*; it was taken there during June, 1884, by Mr. E. Roper-Curzon, from whom I have received a most liberal supply of perfect insects and the larvæ from which this description is written.

This is probably the insect figured in the 'Entomologist' (vol. xiv., plate i., figs. 2 and 3), and there supposed to be *E. satyrata* or *E. nanata* (page 303), and which was to receive future consideration. In the absence of that consideration, up to the present time, I have thought it best to wait no longer, and therefore have described the species from the long series of specimens captured and given to me by my friend Mr. Curzon. I have named it in his honour *Eupithecia curzoni*. In the arrangement of the genus *Eupithecia*, in British collections, this species should precede *E. satyrata*; but it has nothing common in appearance with that genus, except perhaps its shape; the arrangement by the larvæ as followed in France alone places it there. Following Newman's plan in 'British Moths,' of giving English names to all species before the scientific name, this will be called "Curzon's Pug."

## ENTOMOLOGICAL NOTES, CAPTURES, &amp;c.

**PIERIS DAPLIDICE AND ARGYNNIS LATHONIA NEAR ASHFORD.**—Driving from hence to Sandgate on the 20th of last month, I distinctly saw a *Pieris daplidice* flitting along the road-side, and settling on the flowers of marjoram. It kept pace with the carriage for some little way, and then disappeared over the hedges. Having often seen the species in the South of France, and well knowing its look whilst flying, I do not think it possible that I could have been mistaken. On the downs above this place (Wye) *Argynnis lathonia* has been taken more than once; it seems to delight in the thistle-blossoms.—(Rev.) HENRY BURNEY; Wye, near Ashford, Kent, September 3, 1884.

**COLIAS EDUSA IN SUSSEX.**—Having stayed at Slindon, which is a small village near Arundel, during August and until yesterday, I should like to record that I captured a fine male specimen of this butterfly on August 8th, and during the four hot days we had last week, *viz.*, 17th, 18th, 19th, and 20th, I saw altogether twenty-four specimens, seven of which I captured; all were flying across stubble fields.—W. H. BLABER; Beckworth, Lindfield, Sussex, September 21, 1884.

**COLIAS EDUSA AT HASLEMERE.**—On September 11th I observed one specimen of *C. edusa* flying very fast, in Polecat Lane, on the slope of Hindhead; it was in fine condition, and appeared to be freshly out. This is only the fourth specimen I have seen during the last four years; two at Winchester in 1881, and one here in 1882.—R. J. HUTCHINSON; Inval, Haslemere.

**LYCÆNA ARGIOLUS.**—Referring to Mr. Jenner Weir's interesting paper on *Lycæna argiolus* (Entom. p. 193) in which he has done me the honour to quote my description of that species from the 'Butterflies of Europe,' I may say that I have for some time past been struck by the variation in the width of the black border on the fore wings of the female. I must, however, confess that the fact of this difference being due to seasonal variations has hitherto escaped my notice, though I now call to mind that all the broadly-marked females I have taken in England have been summer captures. At the same time I recollect having twice taken the narrow-bordered form in August, once in England and once in Switzerland, so I suppose it occurs as an aberrant form of the second generation.—HENRY C. LANG; Maidenhead, Berks, September 18, 1884.

CHEROCAMPA NERII AT EASTBOURNE.—My brother, a friend, and myself were walking along the sea front at Eastbourne, at about half-past nine on the night of the 24th September, when my attention was attracted by a large moth, which was flying round one of the electric lights. It alighted on the post, and I saw it was a magnificent specimen of *C. nerii*. I promptly placed my hat over it, and sent my brother to the house where we were staying, which was fortunately near at hand, for a net, in which we enclosed the hat, and safely captured the moth.—B. ALFORD; 7, Pembridge Villas, Bayswater, London, W., September, 25, 1884.

CHEROCAMPA NERII AT TOTTENHAM.—Mr. South states in the 'Entomologist' Synonymic List, that the appearance of *Charocampa nerii* in this country is phenominal. It may interest your readers to know that the phenomenon has turned up at Tottenham. A fine but somewhat travel-worn specimen was brought to me in a tumbler, on the 12th of September, by some boys, who had found it settled on some scarlet-runners in a garden near the India Rubber Factory in this place; the specimen is now in my cabinet. — W. B. POOL; L.R.C.P., Tottenham, September, 21, 1884.

CALLIMORPHA HERA IN DEVONSHIRE.—This charming insect appears to have fairly taken up its abode in Devonshire; the exact locality I would rather not name, for fear of its speedy expulsion. In August, 1882, whilst returning from my morning's collecting, in company with Mr. Willie Waring, a son of the late S. L. Waring, Esq., whose collection was well known to all old collectors, in a rather secluded part of a narrow lane, I observed *Callimorpha hera* flying between our heads, then dashing into the fence, much to our disappointment; but patience and perseverance soon made our new insect a prisoner. Six days afterwards, while beating in a new locality, one was started and secured, to our great sorrow a worn specimen. The following year two were taken, one on a low myrtle bush, and the other flying in the sun in the garden where the myrtle grew, a distance of half a mile from where the first two were taken in 1882. A third was found just over the garden fence, on the road, evidently having been run over by some passing vehicle, being a mutilated specimen; this was not kept. This August, we were beating

hedges, a distance of fully three miles from where the specimens of *C. hera* were taken in the previous years, and on the fifth day of our search my young friend, Mr. Waring, beat out a good specimen, and being rather a sluggish flyer was soon safely netted and bottled. While I was in the act of pinning our first capture, my friend was busy securing a second, which he kindly gave to me; a third was taken by myself, making three good specimens in the short space of about ten minutes. The next day, being Sunday, we were leisurely walking down a lane, when by an accidental touch of the hedge one bolted across our path and was soon secured by my friend. The following evening, myself, Waring, and two lads in our rear, were returning just as it was getting dark, through a narrow lane overhung with hazel, holly, oak, ivy, and long grass, when one of the lads in our rear called out that a large insect had just flown over the hedge. In an instant it returned, was secured, and proved to be one of our finest specimens, making five altogether last August, three of which I fortunately possess. I may add that the specimens, as compared with foreign ones, are extremely large. Sugaring proved to be quite a failure.—W. BROOKS; The Lodge, The Oaks, Lower Norwood, S.E., September 11, 1884.

LEPIDOPTERA NEAR PORTSMOUTH.—I found a specimen of *Hepialus sylvinus* at rest on a tree-trunk in Stake Wood, on June 10th, 1883. In the evening, July 18th, 1884, Mr. T. Larcom, of Gosport, took a splendid specimen of *Deilephila lineata* from the jessamine in his garden. From a willow tree at Char Common, near Gosport, on August 10th, I procured a single larva of *Cymatophora ridens*, but was unsuccessful in rearing it.—W. T. PEARCE; 42, St. John Street, Buckland, Portsmouth, August 27, 1884.

LAPHYGMA EXIGUA NEAR GREENWICH.—It may be interesting to some of our metropolitan collectors to know that I took a specimen of *Laphygma exigua* at Greenwich on the evening of July 8th last. The specimen was flying at dusk about a hawthorn bush, with a short, jerky flight, and I thought at first it was a specimen of *Miana furuncula*; but was soon convinced it was something different, as it kept near the bush. Having netted and boxed it, I put it away with my other captures, but it was not until the following morning that I recognised what a rarity I had taken.—J. W. TUTT; 45, Beaconsfield Terrace, East Greenwich, September 8, 1884.



LAPHYGMA EXIGUA.—Whilst sitting at supper last evening a moth flew in at the open window to the gaslight, which I captured, and to my great surprise it proved to be a particularly fine and fresh example of *Laphygma exigua*. One would hardly have expected this rarity in one's upper room, an uninvited but very welcome guest.—W. H. TUGWELL; Greenwich, September 22, 1884.

LARVA OF GEOMETRA SMARAGDARIA.—While collecting micro-larvæ on the Essex salt-marshes last week, I took one larva of the above rarity, on a plant on which I should never have thought of looking for the species; and although I had never seen the larva of *G. smaragdaria* before, and was not even thinking of it at the time, I knew in a moment what it was, from its being covered all over with small pieces of leaves and scaly portions of its food-plant; it reminded me very forcibly of the larva of *Phorodesma bajularia*. I certainly should not have seen it, had it not stretched itself out and waved its head to and fro with a tremulous motion; for its mimicry of dead portions of its food-plant is so perfect that it took me some little time to find it after I got home, although there were only a few small pieces of the plant in the box. It is now three years since I first went after this larva, and many long and fruitless journeys I have had since that time, extending over miles of ground in every direction on the salterns. Year after year I was searching the wrong plants; for although I worked up the subject as well as possible, by all the books that contained any information at all about the species, the knowledge I gained was quite useless as regards its food, so that my journeys always ended in disappointment. They were not, however, altogether unprofitable, for I have added a great number of very local species to my collection, from larvæ taken in the district, which I certainly should never have found had it not been *Geometra smaragdaria* which first induced me to collect over such a very uninviting and desolate-looking locality. Mr. Machin, who discovered the larva in Essex some few years ago, has seen my larva, and pronounced it to be that of *G. smaragdaria*, as I thought. Now I know its food I am in hope of filling up my series, although I am inclined to think that will be no easy matter, for I had quite two hours' collecting after I had taken this larva, but failed to take another. The exact locality and the food-plant I must for obvious reasons at present decline to state, but will leave that

to be given by my friend who first found it in this country at his own time and convenience.—GEO. ELISHA; 122, Shepherdess Walk, City Road, September 18, 1884.

EPUNDA NIGRA IN PERTHSHIRE.—During my stay in Rannoch I captured a fine specimen (female) of *E. nigra* in the Black Wood. I got a male in the same locality some seasons ago. I am told that they are of infrequent occurrence in that district, so that I should like to record them in the 'Entomologist.' We have had a tolerable season in Rannoch for some insects, but not nearly as good as many summers I have spent there. Larvæ seem very scarce indeed; even many of the common kinds were hardly to be found.—ELIZABETH CROSS; Edinburgh, September 18, 1884.

THE DEATH-WATCH AND ITS SOUND. — I feel somewhat surprised by the remarks of three correspondents, seeing that within the last fifty or sixty years several reliable articles on this subject have appeared in various works. When a young lad I had in my bedroom a slight box or case made of paper (not pasteboard), in form similar to the tins generally used for packing cream, &c.; this case contained only a desiccated seed-vessel of the Stramonium. One night for the first time I heard a ticking sound much like a watch; there being no watch in the place, I thought it came from an adjoining room, but no watch was there; and having heard of "death-watches," I concluded this must be one, therefore commenced a search for it, and soon discovered the sound proceeded from the Stramonium-case. Nothing could be seen on merely looking into the box, which was then removed into another room, but, wherever placed, the ticking continued to come from the Stramonium-case; still nothing could be seen. My father suggested holding it to the fire to see if any living thing would make an appearance when the place became "too hot" for it; in a few seconds a fine female *Atropos pulsatorius* rushed out from the Stramonium in an excited state; no other creature could be found, and the ticking in the box was heard no more. I am fully convinced that the *A. pulsatorius* causes the watch-ticking sound, though at present I have not been able actually to see it perform. This insect is the *Termes pulsatorium*, Linn. = *Psocus pulsatorius*, Latr. I read that the Termites or white ants produce a sound by tapping with their mandibles. The Death-watch beetle (*Ptinus fatidicus*, Linn. = *Anobium tessellatum*, Fabr.) is a very different insect. I had read accounts of this beetle and

its sound, the descriptions being so correct that when I first heard the little rapping noise I was sure it must be the true death-watch; the sound is very distinct, and may be heard in a room where people are moving and talking; it consists of about six or eight raps in quick succession, then an interval of perhaps ten minutes, more or less, before another set of raps is repeated. The Death-watch, like most other insects, is more vigorous in warm than in cool weather; it appears about the end of May, and continues, I think, until the end of July. About forty years ago I had the opportunity to capture several of these little beetles, which I kept in small cardboard boxes, where they soon proved themselves *bonâ fide* death-watches by rapping against the inside of the box; they are very manageable and interesting insects; when allowed to come out of the box they moved about quietly, rapping at intervals under my eye; to produce the sound the insect first raises itself on its legs in a peculiar manner, and then strikes vigorously (on whatever substance it stands) with the front of the head. My *Anobiums* laid eggs from which young larvæ were hatched. It is stated that the Death-watch will respond to an imitation of their call made by tapping with the finger-nail; I am not sure that this is the case, but I really think it is a fact (from my own experience). Some time ago I heard a tapping which I presume must be made by another species of this tribe of insects, the sound not quite so loud, and the number of beats more extended—I should say double the number made by the present *Anobium*, with intervals similar. I am sorry to add that circumstances prevented my searching for the insects.—G. R. WEBSDALE; August 11, 1884.

THE DEATH-WATCH.—For the last two or three years I have spent some weeks every summer at an old farm-house at Felixstowe, generally going down in June. The house was erected, I should say, about the year 1550, and is one of those massively built old timber structures which were plentifully erected about that period. I had always been very anxious to discover the "death-watch," and consequently was delighted to hear it for the first time upon my visit to the old house in the summer of 1882. Carefully noting the direction from which the sounds came I searched for the beetles, and almost immediately found one upon a ledge of the timber. I should state the beetles generally commenced rapping at dusk, and did not keep up the sound long, as

we were seldom disturbed by them at night. Without a doubt the noise is made as a call to each other; and I proved this to be the fact by tapping with my finger-nail on the back of my watch, when I was almost certain to be immediately answered by one of the beetles. I also constantly heard two of them tapping to each other. In this manner I discovered the whereabouts, and captured several of the insects. As to the method by which the sound is produced I am able positively to set the point at rest, as I have not only watched the beetles and seen them produce it, but I have by tapping induced captured beetles to make the noise in the presence of friends, who also witnessed the performance. Upon my making the tapping the beetle would gather himself up, and appear to be intently listening. As soon as I had finished he would elevate himself on his legs, and quickly rap with his head seven or eight times upon the wood or other substance upon which he might be. The species I captured was *Xestobium tessellatum*. The sound could be distinctly heard fourteen or sixteen feet away from the insect. I kept specimens of the beetles in pill-boxes for some time, and amused my friends with sights of the performance.—E. F. BISSHOPP; 32, Museum Street, Ipswich, August 11, 1884.

PTEROSTICHUS MELANARIUS A FRUCTIVOROUS INSECT. — An intelligent gardener (Mr. Graves) of this town told me that his strawberries were devoured by a beetle, and that he had caught dozens, if not hundreds, of them by making little holes in the ground to act as pitfalls. I offered to show him some beetles, to see if he could recognise the species. After two or three bad shots amongst the *Rhyncophora* and *Sternoxi*, I showed him a box containing *Pterostichi*, &c. He pointed out *Pterostichus melanarius*, Ill., as the culprit, and declared that he was his "worst enemy" in the strawberry-bed. I disbelieved his story and said they were probably his best friends, and eat vermin in the strawberries. Next morning before breakfast he brought me a box containing a *Pterostichus melanarius*, Ill., and a strawberry with a hole in it. I was still incredulous, but could find no signs of insect-vermin inside the hole. I therefore cut off a sound piece of the strawberry, and put that and *Pterostichus* into a gallipot. During the day and evening I suddenly uncovered the pot several times, and generally found the beetle at work with his jaws, leaving decided traces on the surface of the strawberry. I

am therefore perfectly satisfied that this carnivorous insect is a fruit-eater at times. I have not yet been able to satisfy myself that *Amara spinipes*, L., feeds on the flower- and seed-heads of *Centaurea nigra*, but I have so frequently found their heads embedded in them that I shall be glad to have the observations of others. A near ally, *Zabrus gibbus*, has been seen eating wheat by Mr. Chas. Waterhouse, and perhaps by others. — A. C. HORNER; Tonbridge, Kent, July 10, 1884.

THE WILLOW BEETLE AT LYMM.—For some weeks past the willow growers in Lymm, Statham, Thelwall, and other places in Cheshire have been troubled by the appearance among their willow beds, some of which are extensive and very valuable, of numbers of beetles, which threaten to destroy all the willows in the neighbourhood, unless the means that are now being adopted, prove effectual. This beetle is a little larger than the size of a pinhead, but its powers of destruction are enormous, and the anxiety of the willow-growers can be easily imagined. A meeting was held on Monday night, in the Plough Hotel, Lymm, and was attended by several gentlemen, who conferred together as to the best means of exterminating the pest. Among those present were Messrs. H. Cameron, T. Davies, G. Leigh, G. Warburton, J. Marsh, and T. Hutchinson (who acted as secretary). A resolution which pledged all the growers to continue the use of paraffin oil, with the object of catching the beetles, was carried. By this means one grower has caught some millions in one day, and it is believed if this course is followed up the crops will be saved. Some of the beetles are now on view in the Warrington market.—‘Liverpool Weekly Courier,’ May 31, 1884.

[Mr. Thomas Hutchinson, of Warrington, has kindly forwarded specimens, which prove to be the well-known *Phratora vulgatissima*, L., as was expected. He also writes, under date 18th August, that the beetles are again very numerous and again doing great damage.—E. A. F.]

THE ‘ENTOMOLOGIST’ SYNONYMIC LIST OF BRITISH LEPIDOPTERA AND THE HAGGERSTON ENTOMOLOGICAL SOCIETY.—At a meeting of the above Society, held this evening, a discussion was held on Mr. South’s new list of British Lepidoptera, and the universal opinion was “That many of the alterations were uncalled for, and that a re-issue of the Doubleday List, with the addition of the new species discovered since the date of its

publication, would have been far more acceptable to the great body of British entomologists. It was further resolved that the above opinion be entered in the minutes, and a copy forwarded to you for insertion in the 'Entomologist,' if convenient." — E. ANDERSON, Sec. ; 10, Brownlow Street, Dalston, London, E., Aug. 21, 1884.

[It would have been much more satisfactory if the members of the Haggerston Society had given their reasons for the objections they have raised in the above resolution, which might then have been answered in detail. The following remarks, however, may perhaps be worth their consideration :—It certainly is to be regretted that in the new 'Entomologist' List it was found necessary to supersede some of the names to which many of us had become accustomed, but the law of priority is inexorable, and it is only by the acceptance and adoption of the earliest names that we can insure a fixed and unchanged nomenclature. Had a reprint of the Doubleday List, with all the recent additions, been published, it could not have stood long, and would soon have been rendered obsolete by general consent. Many British entomologists have never accepted the Doubleday List; others who at first adopted it have long ceased to use it in favour of that of Staudinger. There are others who, though they have up to a recent period used Doubleday's List, are aware that many of the names given therein are not the earliest, and therefore by the law of priority legitimate, names. These have only continued to use Doubleday because, previous to the publication of the 'Entomologist' List, no attempt had been made to introduce a more uniform and at the same time stable nomenclature. It was further found that the growing desire on the part of many British entomologists to cast off their insular prejudices, and to extend their studies to the whole European insect fauna, necessitated the production of a list of Lepidoptera in which the names would be equally understood on each side of the English Channel. We have great pleasure in stating that we have received most complimentary testimony as to the value and necessity of Mr. South's really very excellent work, from many of the leading lepidopterists of this country. We therefore trust that the members of the Haggerston Entomological Society will further discuss this matter. We are sure that the exertion of learning the "new" names in this list will be far outweighed by the scientific results of such labour.—ED.]

# THE ENTOMOLOGIST.

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## COLLECTING AT LYNMOUTH, NORTH DEVON.

BY RICHARD SOUTH.

THIS year I spent some weeks at the pretty little village of Lynmouth. This place is about six miles from Headon's Mouth, where I had stayed on former visits to North Devon. The village is said to be twenty miles from any railway station, and the usual route from London is per G. W. R. or S. W. R. to Barnstaple, and thence by coach through some splendid scenery to Lynton, a somewhat larger village, standing on the hill 500 feet directly above Lynmouth. During the summer months there are other means of approach, and the tourist has the choice of travelling from Paddington (G. W. R.) *viâ* Bristol and Minehead, and then by coach through Porlock and Countisbury; or he may book from Waterloo (S. W. R.) *viâ* Barnstaple to Ilfracombe, from which place he can next day continue his journey to Lynmouth by coach through Coombemartin and Paracombe, or by steamboat up the Bristol Channel. There is still another route open to those who enjoy a sea trip, that is from Paddington *viâ* Bristol to Portishead by train, and thence by the fine steamboat 'Lynn' to Lynmouth. The voyage is performed in from four hours and a half to six hours, according to wind and tide. This last route is most enjoyable, especially on a fine day. The varied scenery of the Somerset and Devon coasts on the south side and that of South Wales on the north side of the Bristol Channel cannot fail to afford delight to the lover of the picturesque.

Lynmouth is often, aptly, styled the English Switzerland. I must not, however, attempt to describe the beauty or grandeur of its scenery, because, apart from the fact that to do so would be foreign to the general purport of these notes, I fear that my pen would fail to draw a sufficiently vivid word-picture of such charming valleys as that of the East Lynn, or do justice to the rugged magnificence of its lofty hills.

A rough idea of the more prominent botanical characteristics of the locality is pertinent to the subject in hand. The beautiful woods, which fringe the bed of the East Lynn and cover the lower slopes of the hills on either side, are composed mainly of young oaks, with here and there a band of larch or spruce. Clumps of alder bushes and alder trees of large size grow by the margins of the stream. An occasional ash, beech, or birch, and some fine old hornbeam trees, together with an undergrowth of hazel (*Corylus*), dogwood (*Cornus*), buckthorn (*Rhamnus catharticus*), willow (*Salix*), rose (*Rosa*), bramble (*Rubus*), honeysuckle (*Lonicera*), bilberry (*Vaccinium myrtillus*), ling (*Calluna*), and other plants, such as golden-rod (*Solidago virgaurea*), yellow cow-wheat (*Melampyrum pratense*), wood-sage (*Teucrium scorodonia*), &c., offer food for the larvæ and refuge for the imagines of many species of Lepidoptera.

The rocky hill-sides are chiefly covered with a short springy turf, not unlike that of the downs in the South of England. Many plants, such as wild-thyme, milkwort (*Polygala*), scabious, &c., grow in great luxuriance thereon. Large clumps of furze are scattered about, many of which must have existed undisturbed by man for numbers of years, judging from the height—eight or nine feet—to which some of the bushes have attained. The rocks are clothed with various mosses and lichens, and on some of them are patches of stonecrop (*Sedum*). Where the ground is very stony or much broken the foxglove abounds, and in some of these places wormwood (*Artemisia absinthium*) is plentiful; dog-violet and strawberry are both abundant; so also is the wild-madder (*Rubia peregrina*) in particular spots.

Although many species of Lepidoptera were abundant in the larval stage at Lynmouth during the first fortnight of June, but few imagines of any species were to be met with until the 15th of the month. This state of things was without doubt due to the retarding influence of dry cold easterly winds, which had prevailed in the district for some considerable time previous to my arrival



there. During the latter part of June and the first ten days of July, however, the weather was all that could be desired from an entomological point of view, albeit agriculturists hardly entertained the same opinion. Farmers were anxious for rain; the ground was parched, and all kinds of vegetation was seriously affected with Aphides. The sea-fogs that from time to time rolled over the land were of little benefit to the crops. There was no heavy rain until the 28th of June; then the following two days were showery, and there was a slight fall of rain with distant thunder on the 3rd of July, and a few showers again on the 11th, the day I left Lynmouth.

During the time I was at Lynmouth I saw or captured some two hundred species of Lepidoptera; of this number about twenty-seven species were in the larval stage.

*Anthocharis cardamines* was not seen until the 10th of June. I have noticed before that this species appears scarce on the North Devon coast, but it was even scarcer this year. On the same date *Argynnis euphrosyne* was still out and in fine condition; also a few *A. selene* were met with. The last-named species was not well out until the 15th of June.

Several larvæ of both *Argynnis aglaia* and *A. paphia* were found hiding among the herbage on the banks by the road-side on the 12th of June. These were fed up on dog-violet, and disclosed imagines after my return to London.

A specimen of *Eurymene dolobraria* was found at rest on the trunk of a large oak tree near Waters-meet. I had not hitherto seen this species in North Devonshire.

*Boarmia repandata* var. *conversaria* occurred frequently, and one or two of those secured were very beautiful.

*Corycia temerata* and *Abraxas ulmata*.—I had not met with either of these species in North Devon before. The last-named was abundant in places along the East Lynn valley. I did not meet with a variety; and with the exception of being a little larger in size and perhaps a trifle brighter they were otherwise much the same as specimens I have from other parts of England.

*Ypsipetes elutata*.—Of this very variable species I obtained a remarkable series from larvæ found feeding on bilberry and heather. I also bred a series from larvæ found and fed up on willow. As has been before noticed in these pages, the uniform lesser size of the specimens obtained from bilberry and heather

is a noticeable feature, but the greater extent of variation of both colour and pattern of marking of such specimens is even more striking. I cannot think that food has much to do with the matter. This question of food as a factor in the coloration of Lepidoptera and its influence—if any—in causing variation is one that I cannot well enter into here. I hope shortly to return to this subject in a paper on protective coloration of Lepidoptera.

*Melanippe tristata*.—New to me in North Devon. Several specimens, together with *M. montanata* and *M. galiata*, disturbed from the bushes, &c., growing on stone walls. In a former paper (Entom. xiv. 155) I have referred to the North Devonshire walls. They are the only kind of boundary used for fields, &c.; and the bountiful and varied vegetation which adorns their sloping sides and crowns their summits affords excellent harbour and sustenance for many species of Lepidoptera. I captured and examined a large number of *M. montanata*, with the result of obtaining a nice series of interesting forms.

*Anticlea badiata*.—One specimen in good condition on June 11th. This is the latest date I have ever observed this species on the wing.

*Cidaria russata*.—Some examples of this species were captured as late as June 20th. Many of them were not, however, in the best possible condition; at the same time they were not by any means worn out. From four females taken between June 16th and 20th I obtained batches of eggs, from thirty-eight to fifty-two in a batch, or an average of forty-two deposited by each female. These all duly hatched, and the larvæ were fed on rose and strawberry at first; but on my return to London I added young leaves of sallow to their bill of fare. The boxes containing these batches of eggs were each marked with one or other of the first four letters of the alphabet in the order of capture. Considering the batches A, B, C, D were deposited and also hatched within a day or so of each other, the broods of larvæ, although supplied with the same food and subjected to exactly identical circumstances in every respect, evinced great disparity in the rate of feeding up, both in the broods collectively and in individuals of the same brood. Brood A from the first was much further in advance of B, C, D than the slightly earlier date of birth would seem to warrant. Again, the specimens bred from A larvæ are larger than any yet bred from either of the other broods. On the

other hand, the D brood were the slowest growers, and so far have produced only imagines much smaller than either A, B, or C; whilst at this present date (September 17th) seven larvæ are still feeding. It will be seen from the following table that twenty-nine imagines from the A larvæ emerged from August 17th to 23rd, thus completing their metamorphoses in about sixty-two or sixty-three days. I should mention that at the later date (August 23rd) two larvæ of brood A were still feeding.

Table showing the rate of emergence of the imagines of four broods of *Cidaria russata*, reared from eggs deposited between June 16th and 20th.

## AUGUST.

	17th.	18th.	19th.	20th.	21st.	22nd.	23rd.	24th.	25th.	26th.	27th.	28th.	29th.	30th.	31st.
A	3	4	4	5	3	6	4		1	1					1
B				1			1	4	2	2	2	2			1
C							2	3	1	2	1		1		3
D							1								

## SEPTEMBER.

	1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	11th.	12th.	13th.	14th.	15th.	16th.	17th.	Remaining.
A	1	1			1						1							Nil
B	1	1				1	2	1			1	2	2	2	1		3	Some pupæ & 6 larvæ
C	1	4	1		1	1		2			1	2		1		1	1	Eight pupæ
D	1	1		1	1	2	1	1			1			1			1	Some pupæ & 7 larvæ

*Cidaria suffumata*.—I took several specimens of this species during the latter half of June; but the capture of a fine and perfect specimen on July 4th was a great surprise.

I did not try the attractive power of sugar, so my captures in Noctuæ were only of such species as I could net at dusk or meet with at rest, and certain others of which I found larvæ. The only species in this group worthy of note is *Toxocampa craccæ*, of which I obtained a few larvæ from the locality where I took it in 1881 and 1882. *Vicia sylvatica*, the food-plant of this species, occurs sparingly on the rocky cliffs close to Lynmouth on the west side of the river. I also noticed some large patches of the vetch among the brambles in the "Tors," near the Lyndale Hotel, Lynmouth. No signs of larvæ having fed on the plant were observed in the latter place, but plants on the cliffs showed evident traces of larval attentions; and the way in which the leaflets were cleared from the stems was very suggestive of the neat kind of work performed by larvæ of *T. craccæ*.

I understand that "sugaring" is nightly practised in the Tors woods by sundry entomological visitors during the months of August and September, but I have not yet seen any account of work done in that locality during those months. If any reader of these random notes has tried autumnal "sugaring" in any of the woods about Lynmouth, perhaps he will kindly give us the benefit of his experience.

Larvæ of *Botys asinalis* were beaten from madder (*Rubia peregrina*). These were nearly full-fed when found (June 19th), and soon spun up in the angle formed by the top and rim of lid of the tin box in which they were confined.

*Phycis adornatella* was very abundant on the sides and the top of the Tors, also in the Valley of Rocks, Lynton, at the end of June. I found some larvæ of a *Phycis* feeding on thyme, or rather they were in a long silken mine on the ground among the twigs of thyme, at Headon's Mouth, in 1881. These produced *P. subornatella*, Zell.

Some forty species of Tortrices were captured, among which were *Dichelia grotiana*, taken very sparingly under oak trees in the "Tors" and in the valley of East Lynn. *Spilonota rosæcolana*.—A few. *Orthotania striana*.—Very common in a rough field called Westlands; this species gets on the wing about 7.30 p.m. *Pædisca occultana*.—A few beaten out of larch. *P. sordidana*.—Found larvæ of this species feeding in folded leaves of alder during June; the perfect insects are now emerging. *Ephippiphora turbidana*.—I got very few of this species this year; the food-plant was abundant in one or two fields a little beyond Lynn Vale, and distant from Lynmouth about one mile and a half; curiously enough, though, I did not get a single example of the insect where its food was plentiful; but by the side of the Barnstaple highroad, where there were a few dust-covered plants, I got all the *E. turbidana* brought back with me this year. *E. signatana* was scarce among blackthorn; so also was *Olindia ulmana* among bilberry, &c., under larch trees. *Stigmonota redimitana* was represented by two specimens only; I have taken as many dozens in about an hour at a place called Trentishoe Bottom, near Headon's Mouth. *Eupæcilia rupicolana* was fairly common among *Eupatorium* near the sea, and very fine and bright specimens most of them were. *Argyrolepis enicana* was not uncommon; but only one specimen of *Conchylis smeathmaniana* was met with.

I was fortunate enough to capture eight beautiful specimens of *Æcophora lambdella*, six of which were taken in one evening between 7 and 8 o'clock.

12, Abbey Gardens, St. John's Wood, London, N.W.  
September 17, 1884.

## RANDOM NOTES ON NEW ZEALAND LEPIDOPTERA.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

(Continued from p. 221.)

In the gullies, in addition to the numerous beds of nettles, there was a thick undergrowth of mixed rank vegetation, and as one walked through it was astonishing to note the vast quantities of Pyrales of different species that were disturbed. The most abundant was *Botys flavidalis*, an insect much resembling *Scopula ferrugalis*, only a trifle larger, and given to variation; whereas *S. ferrugalis* is usually constant in its markings and coloration. Two others—*Botys notata*, also much like *S. ferrugalis*, but with a conspicuous yellowish white discoidal spot on the fore wings, and an unnamed species—were almost as numerous; while *Deana xanthialis*, *Botys deprivalis*, *Deraba cordalis*, &c., occurred commonly. Beating the lower branches of trees produced *Larentia megaspilata*, *L. invexata*, and one specimen of the beautiful *Cidaria purpurifera*; besides *Helastia indicataria*, *Acidalia undosata*, and many others at present unknown to me. Proceeding further up the gully the trees became less numerous, and gave way to tussock grasses and patches of *Iris* sp. ?; and here *Cidaria inclarata*, one of the most abundant of New Zealand Geometers, was a perfect pest. It varies a great deal, and several very pretty varieties were secured. The tussock grass was also the home of many Crambites,—*Crambus flexuosellus*, *C. vitellus*, and *Chilo leucanialis* being the most frequent; *Camptogramma subochraria*, *Acidalia rubraria*, *Larentia semisignata*, and *Cidaria clarata* were taken in the same situation.

On reaching the summit of the range of hills, which is divided into several peaks, of which Mount Pleasant, 1642 feet, is the highest, a magnificent view of the surrounding country was

obtained. Below on one side was Lyttelton, just like a chess-board, with its streets laid out at right angles to each other; and H.M.S. 'Espiegle' and other ships in harbour so reduced by distance that they looked mere pigmies; while on the other side the celebrated Canterbury plains could be seen stretching away for miles and miles, until the eye rested on the New Zealand alps in the far distance; and Christchurch, which was seven or eight miles off, seemed close beneath. The ground here was extremely rough, being covered with huge blocks of stone, between which tussock grass grew in dense tufts. In some places, where it had to a certain extent been cleared, there were numerous beds of thistles, which were in profuse bloom, and upon which many *Pyrameis gonerilla* were feasting, while others flew about and sported with each other in the fresh breeze. After resting for a short time and enjoying the fine view I descended the hill by another route, and went on board much pleased with my afternoon's work.

On January 30th I left Lyttelton by an early train for a place called Whitecliffs, a little hamlet about forty miles beyond Christchurch, where I stopped for a couple of days for the purpose of fishing the River Selwyn. After leaving Christchurch the railway crossed the Canterbury plains and passed through an immense tract of country, which at this time of the year was chiefly under wheat. Some of the fields are more than a hundred acres in extent, and the various crops appeared to be in a very flourishing condition. Where not under cultivation the country was overgrown with the usual tussock grass, and there was not a single tree or bush to be seen, except near farmhouses, where Australian gum trees had been planted to form a shelter from the prevailing winds, and were a pleasing break to the otherwise monotonous landscape.

On reaching Whitecliffs I found the river very high and discoloured by the recent rains and melting snow from the neighbouring mountains, so that fishing was quite out of the question. Luckily the weather was delightfully bright and warm, so I devoted myself almost entirely to Entomology.

The first butterfly I saw was the curious *Argyrophenga antipodum*, which was just coming out and was in splendid condition. The males appear to be the first to emerge, for during the day, although several hundred butterflies were seen,

only one female was taken. It was a great pleasure to make the acquaintance of this strange species,—one I had often read and heard of, and longed to see. Its flight and general appearance are quite unlike that of any other species with which I am acquainted. The males fly in a weak, sailing, flapping manner a few feet above the tussock grass, and go away in a perfectly straight line for a considerable distance before they alight. The moment the sun becomes obscured they all disappear, settling on the tussock grass and crawling down the stems towards the base of the plant, when they turn head upwards and sit on a stem until the sun shines again. They cease flying altogether after four o'clock; and after that hour, or earlier in the day when the sun is obscured, they were frequently to be seen at rest on the grass. The newly-emerged butterflies seem to take longer flights than those which have been out for some time. Occasionally they settled on flowers to feed; but flowers were scarce, and there were not many varieties to choose from, a small dandelion and a starved kind of white clover being all I noticed. It was a pretty sight to see a number of them on the wing together, for as they slowly flapped or sailed along, the silver streaks upon their under wings glittered in the bright sunshine, and made them look very interesting and attractive.

The next day the river was still high and discoloured; so after three or four hours fishing, with but poor success, I gave it up, and again turned my attention to Entomology. It was another glorious bright day with a cloudless sky, and deliciously fresh invigorating breeze which came direct from the snow-clad alps in the distance, but was not too cold or too strong to prevent butterflies from appearing. *A. antipodum* was far more numerous to-day, and a few females had emerged, but they were in the proportion of one to twenty of the males. Nor were they so active on the wing, for upon being disturbed, as one passed through the grass, they simply flew for a little distance, settled on a tussock, and tried to creep into the middle of it. *Chrysophanus salustius* was fairly common and in fine condition; and by the river's side, sitting sunning themselves upon the warm shingle, the pretty little *C. boldenarum* was plentiful, but not easy to catch, for directly it took wing it was difficult to see on account of its small size and rapid flight. Geometræ were conspicuous by their absence, the only species noticed being *Campto-*

*gramma subochraria*, which, on the wing, reminds one of *Aspilates citraria*; and *Hyperythra panagrata* (coming near *Fidonia*), a little moth common throughout New Zealand. However, several species of Crambites were numerous, and were to be kicked out of every tussock.

This ends my trip to Whitecliffs, for I returned to Lyttelton by the last train.

(To be continued.)

#### ENTOMOLOGICAL NOTES, CAPTURES, &c.

VANESSA ANTIOPA AT NEW MALDEN.—I have much pleasure in recording the capture of this lepidopteron at New Malden, upon the 20th of September. It was seen by my neighbour, Mr. C. Andrews, sporting about some drain-pipes in his garden; he caught it with his hat and kindly presented it to me alive. It is a female, and in fair condition.—H. T. DOBSON, Jun.; New Malden, Surrey, September, 1884.

VANESSA ANTIOPA NEAR KING'S LYNN.—Early in September a fine specimen of this butterfly was captured by Sir William Ffolkes, Bart., M.P., in his own garden at Hillington. So far as I know, this is the only specimen which has been noticed this season in this neighbourhood; but it is noteworthy that whenever this species has of late years made its reappearance in this country, Norfolk especially has been favoured with its presence.—EDWARD ATMORE; Lynn, Oct. 9, 1884.

VANESSA ANTIOPA.—On September 28th I saw, but unfortunately failed to catch, a fine specimen of *Vanessa antiopa* on the Backwater Bridge, at Weymouth. After trying several times to catch it in my hat, not having a butterfly-net with me, I gave up the chase.—A. W. P. CAMBRIDGE; Weymouth College, Oct. 4.

COLIAS EDUSA AT CHRISTCHURCH.—On October 5th I took a fine male specimen of this butterfly in a garden here. It is the third I have seen there this autumn, and about half a dozen specimens were seen, but not taken, in the country near by my brothers on the 4th.—A. DRUITT; Christchurch, Hants, October, 1884.

COLIAS EDUSA IN HACKNEY.—On the 11th inst. my friend Mr. Chillingworth captured a fine female specimen of *Colias*



*edusa* in Lansdown Road, London Fields. It is a large specimen, measuring in the expanse of the fore wings 2 inches 5 lines. It was brought to me immediately after it was taken, and is now in the collection of the Hackney Microscopical and Natural History Society.—J. A. CLARK; The Broadway, London Fields, Sept. 11.

COLIAS EDUSA IN KENT AND ESSEX.—It may interest some of the readers of the 'Entomologist' to hear of the appearance of *Colias edusa* this year. I captured a female in The Warren, at Folkestone, the last week in August; and during the present month have seen two male specimens flying over Wanstead Flats in front of my house. I believe that in the year previous to the last "*Edusa* year" they appeared sparingly in the autumn.—J. A. COOPER; 1, Sussex Villas, Harrow Road, Leytonstone, Sept. 24.

COLIAS EDUSA AT DOVER.—While staying at Dover last August I saw a specimen of the above species, but it flew away, and I could not capture it. The next day I went to the same place, and saw another specimen, which I captured; but, being a very battered male, I did not keep it. A few days after I saw another in the same spot, but could not net it, as it flew too fast, and the ground was so rough that I stumbled once or twice.—B. B. HUNT; The Grove, Woodford, Essex, October 2, 1884.

COLIAS EDUSA NEAR MALDON.—The two species of *Colias* so frequently appear in England in hot seasons that I kept a sharp look-out for them all through August, but without even viewing a single specimen. To-day I hear from my brother, Mr. A. G. S. Raynor, that he captured a single specimen of *C. edusa* at Hazeleigh on September 9th. I fear that so late in the season we are not likely to see them in any numbers, but it will be interesting to hear if the species has been observed elsewhere in England this autumn. Since writing the above I saw two specimens of *C. edusa*, on September 16th, a very bright and warm day, winging their way leisurely along the banks of the Great Eastern Railway line between Maldon and Witham. *Vanessa cardui* has appeared in considerable numbers in Essex this season, but I have not noticed any other species of butterfly in unusual quantities.—(Rev.) GILBERT H. RAYNOR; Shenfield, Brentwood, September 16, 1884.

COLIAS EDUSA AT THE LAND'S END.—On October 4th I took two specimens of this insect, and saw numbers of them flying over

the grassy slopes, in very good condition. This insect is usually plentiful here during the months of August and September, the season of 1882 alone proving an exception, in which I did not take one. The cliffs having a southern aspect are most favoured; but on account of their steepness a close pursuit is not always practicable.—R. J. ANDERSON; Porthauxno, Penzance, October 8.

POLYOMMATUS PHLÆAS BRED.—I have succeeded in breeding some very fine specimens of *Polyommatus phlæas* from ova deposited by females captured on August 2nd. They emerged from September 19th to the 22nd. The larvæ were fed on a growing plant of sorrel; and from the same batch of ova I have now some very small larvæ feeding, and others nearly full grown.—J. A. COOPER; 1, Sussex Villas, Harrow Road, E., September 24, 1884.

ACHERONTIA ATROPOS IN THE CENTRE OF LIVERPOOL.—On the 2nd inst. a boy brought to me an *Acherontia atropos*, which he had taken in a bacon shop in Elliot Street, where no vegetables or potatoes are sold, in the centre of Liverpool. — B. COOKE, jun.; 21, Renshaw Street, Liverpool, October 4, 1884.

CHÆROCAMPA CELERIO IN BERKSHIRE.—I yesterday received from a lady residing at West Hannay, near Wantage, Berks, a living specimen of *Chærocampa celerio*, which she found in her greenhouse. It reached me alive and in fine condition. Hannay is so entirely an inland place that it is evident the moth must have been bred in England. — W. SLADE; 131, Elizabeth Street, Cheetham, Manchester, October 2, 1884.

DEILEPHILA LINEATA AT BRIGHTON.—I had the pleasure last autumn of receiving from a correspondent, Mr. Parsons, of Cavendish Street, Brighton, a fine specimen of *Deilephila lineata*. It was taken at Bevingdean by Master Rake, of Brighton College, on July 10th, 1883. — J. A. CLARK; The Broadway, London Fields, September 11, 1884.

ACRONYCTA ALNI.—On August 31st I found a full-fed larva of *Acronycta alni* crawling on a fence at Wildernes Park, near Sevenoaks. It has since eaten its way into the cork at the top of a zinc collecting box, and changed to a pupa.—LEWIS F. HILL; 3, Edwardes Terrace, Kensington, W.

CURIOUS HABIT IN LARVA OF ACRONYCTA PSI. — A few days since I placed in a breeding-cage a full-fed larva of *Acronycta psi*.

At the back of the cage was some virgin cork, in which was the cocoon of *Mania typica*, from which the moth emerged in June last. The *Acronycta* larva entered this cocoon, and in about two minutes returned to the opening with some of the skin of the old pupa in its mouth and threw it out; this it repeated once or twice, then attaching a web to the valve or trapdoor of the cocoon hauled it up as one would a drawbridge, and so closed itself in.—ROBT. M. WATTSON; Narford Rd., Upper Clapton, Sept. 9, 1884.

NOTODONTA TRITOPHUS AT SOUTHWOLD.—In looking over a small collection of Lepidoptera, taken early this season at Southwold, I saw a male specimen of *Notodonta tritophus*. I am told it was taken flying to the light of a shop window.—E. G. MEEK; 56, Brompton Road, S.W., October 6, 1884.

LAPHYGMA EXIGUA IN NORTH DEVON.—Whilst rambling over one of the hills at Lynmouth, North Devon, on September 3rd, I was fortunate enough to disturb from the heather a small Noctua, which after flying a few yards settled again, and enabled me to capture it with a small box, as I had no net with me. Upon bringing it home and submitting it to my friend Mr. Wellman he at once pronounced it to be *Laphygma exigua*, and in very fair condition. I searched for more, but was not successful in finding any.—W. WEST; Cyprus Villa, Lewin Road, Streatham Common, S.W., October 6, 1884.

LAPHYGMA EXIGUA AT CROSBY.—On September 16th I took, at a lamp in Crosby, a Noctua which was unknown to me. I subsequently identified it as *L. exigua*. Mr. Gregson verified it, and says that it is a very well-marked specimen and an addition to the Lepidoptera of the district.—GEO. A. HARKER; 28, Brook Road, Blundellsands, Liverpool, Oct. 15, 1864.

NONAGRIA SPARGANII, *Esp.*—Amongst some moths captured for me at Deal by my mother, at the beginning of September, there was a species of *Nonagria* unknown to me at the time, and I find on reference to the European Collection of the British Museum that it turns out to be the above-mentioned insect. The specimen was taken flying at dusk in a garden in Park Street. It is the insect recently discovered in this country by Mr. Sydney Webb.—R. MELDOLA; October 18, 1884.

CHAREAS GRAMINIS. — Yesterday morning, whilst crossing Kersal Moor, I noticed an unusual fluttering in the centre of a

large tuft of hair-grass (*Deschampia flexuosa*), which grows abundantly on the moor, mingled with the common heather, now in full flower. I soon found that an unusually fine female *Charæas graminis* was reposing, whilst several males flew in uncertain gyrations round her; others were scurrying post haste to the spot, attracted by the same cause, and the whole scene resembled exactly what so often occurs amongst the Bombyces; but I was unaware till now that the female *C. graminis* possessed similar powers of attraction. This moth has not been observed by me in this locality before. It is, however, abundant this year, not only here, but also in my field and grounds at Prestwich, not far distant, and no doubt generally so in the neighbourhood; but it is, I believe, a moth extremely capricious and uncertain in its appearance, and may not be seen at all next year.—J. COSMO MELVILL; Prestwich, August 23, 1884.

ABNORMAL ABUNDANCE OF AGROTIS SEGETUM.—Throughout the season I have noticed the unusual plenty of imagines of *Agrotis segetum* in this district, and especially has this been noticeable from the middle of August to the present time, when it has invariably put in its appearance at sugar in considerable force. Moreover, during the last month or so agriculturists have been complaining of the injury done to the turnip crop by the “grub.” Having asked one of them for a few of these “grubs,” I very soon received a number of larvæ of this species in various stages of development; also pupæ. In some localities the crow, with unerring instinct, has been making short work of this “undesirable tenant of the soil.” The condition of imagines observed at sugar within the last few days would indicate their recent emergence; and, judging of the number of full-grown larvæ and pupæ now met with, there will probably be no lack of the moths so long as moderately warm weather continues.—EDWARD A. ATMORE; King’s Lynn, September 22, 1884.

ENTOMOLOGICAL JOTTINGS FROM CHICHESTER.—Almost the first emergence in my breeding-cages this season was a fine male *Endromis versicolor*, bred from a batch of Scotch eggs, obtained from Mr. McArthur in May of last year. This specimen made its appearance on February 14th, and was the only one that came out. The remaining cocoons still feel heavy, so that I hope they will give me some moths next year. On the same day a *Notodonta dictæa* was in the cage, and a few days later, and

during March, *Platypteryx unguicula* furnished me with a good series. On March 22nd I bred a melanic variety of *Stauropus fagi*—a male; on April 4th, a dark female; and on the 8th and 15th, two more fine dark females emerged in perfect condition. The male insect was unfortunately rubbed in coming out of the pupa; this misfortune I obviated with the others by damping the moss in which the cocoons were placed. Perhaps I may be allowed here to express my somewhat tardy thanks to Mr. Jobson, for his kind instructions relative to the “breeding *Stauropus fagi*,” contributed in answer to a query of my own, to the ‘Entomologist,’ vol. xvi., p. 211. Having so few cocoons I was afraid (no doubt foolishly) to trust them out of doors as he directed; had I done so I might not have failed with one even. I may observe that the moths were not forced, being kept in a cool room. The first week in May, *Dianthæcia capsophila* came out, and on the last day of the month the first *Smerinthus ocellatus*, a male, showed himself. On June 14th, a specimen of *Acherontia atropos* was captured in the park. Towards the close of the month *Sesia tipuliformis* was observed, flitting over the currant bushes in the garden. About this time the formidable-looking stag-beetle (*Lucanus cervus*) was to be seen in some numbers. In July the handsome larvæ of a sawfly, bright blue-green, with the first and last segments orange, with rows of black spots, were in great profusion on willows (*Salix alba*), stripping the trees almost bare of leaves, the leaves also being much disfigured with a rosy gall. During this month the pretty Geometer, *Anticlea rubidata* (with *Iodis vernaria*, *Melanippe procellata* and *Cidaria pyraliata*) was to be beaten out of hedges, or taken “in the gloaming” fairly common. On the 21st July a fine *Acherontia atropos* emerged, the larvæ being found in September of 1883. Sugaring has not produced much; but amongst swarms of *Apamea oculea* I may mention *Plusia chrysitis* (over nettles), *Orthosia ypsilon*, *Mania maura*, *Tryphæna janthina* and *interjecta*, *Catocala nupta*, *Pyralis glaucinalis*, *fimbrialis*, &c. On July 14th I took a female *Zeuzera æsculi* in the garden. She has deposited a number of eggs. Should there be anyone desirous of breeding this insect, I shall be very happy to forward them. Early in August *Ennomos fuscantaria*, bred from ova, began to appear. All the specimens are remarkably light in colour. In this month larvæ of *Smerinthus ocellatus* were taken from apple trees; and on the

15th two larvæ of *Acherontia atropos*, found feeding upon potato leaves, were brought me, nearly full-fed. The caterpillars of the gooseberry sawfly (*Nematus ribesii*) have been very troublesome this year, and we have been greatly annoyed by the attacks of the leaf-cutter bee, or bees, for both species (*Megachile centuncularis* and *Anthocopa papaveris*) may have been the guilty depredators. Not alone were the rose-leaves selected, but fuchsias were cut up almost into ribbons; and geranium-flowers (those of a salmon-colour being preferred) had large circular patches taken out of almost every petal, causing them to present a sorry figure. The first week in August another pest came to the fore, the truly disgusting larvæ of the pear-tree slug (*Selandria cerasi*). These were busy on pear trees and cherry trees, doing their best to skeletonize the leaves, or at least the upper surface, for I could detect none on the lower. Are there two species of sawfly, or are both larvæ, those of the pear and those of the cherry trees, identical? Of butterflies, the common *Pieridæ* have been excessively abundant, settling in patches on the watered roads, and sipping up the moisture thus afforded. Beyond these, and the *Vanessas*, *io*, *atalanta* and *cardui*, and such-like species, always to be met with, there have been very few again this year. — JOSEPH ANDERSON, jun.

ON THE URTICATING PROPERTIES OF THE HAIRS OF *LIPARIS CHRYSORRHŒA*.—Merrin in his 'Calendar' (apparently quoting some other author), says that the larva of *Liparis chrysoorrhœa* is "painfully undesirable to handle," and Dr. Knaggs uses exactly the same expression. For some time I was entirely at a loss to understand what was meant; and, even now, I cannot say that I fully comprehend the phrase as applied to the larva, although I have found from experience—a very "painful" experience too—that the breeding of *Liparis chrysoorrhœa* is anything but a pleasant operation. But is it the larva which is so "painfully undesirable to handle," or has the phrase been copied from one authority to another, as is so frequently the case? Certainly, after a rather extensive acquaintance with this species during the last two years, I have felt no ill effects from the larva. I cannot say the same of the cocoon, for, within a minute or two of touching one, my face and neck have been covered with eruptions, very much resembling "nettle-rash," accompanied by an intolerable itching. For some time I could not bring myself to

believe that the cocoons were the cause of my discomfiture. On one occasion, when I had been clearing a few empty ones out of a breeding-cage, my agony was so intense that I rushed off, almost in a state of temporary insanity, to a surgeon, and he assured me that it was nothing but "pure nettle-rash," and put me through a course of medicine accordingly! Since then, I have been convinced, without the shadow of a doubt, what was the real cause of the "pure nettle-rash." Quite recently I took up a small tin box, in which was the remains of a cocoon, and, knowing what would be the result if I carelessly emptied it, I took what I thought ample precautions—I held the box at arm's length and cleared it out with my penknife, but, nevertheless, in a few minutes the old symptoms appeared, though not in quite so virulent a form. I forthwith had some boiling water poured into the box, and mentally resolved to have nothing more to do with *Liparis chrysorrhæa* in the pupa state. Being now so well acquainted with the effects, I feel what I hope is a pardonable curiosity to know a little more of the cause, and should feel extremely grateful to any one for enlightenment.—GEO. BALDING; Ruby Street, Wisbech, September 3, 1884.

[Perhaps one of our medical correspondents will throw light on this subject. Do minute hairs stick into the ducts of the skin-gland, or are they sharp enough to go right through the epithelium?—ED.]

PECULIARITIES OF THE PRESENT SEASON.—Several divergences from the usual order in the changes of Lepidoptera have this year come under my notice. They may prove interesting to other entomologists, who may be able to account for some of them. Last year I had some ova of *Endromis versicolor*, which hatched June 1st. The larvæ made their first change on June 8th; their second on June 19th, 20th; their third on June 29th; their fourth on July 9th, 10th, 11th. One died, but the remainder spun up from July 22nd to August 5th. One fine male emerged, March 16th; and another on the 22nd of the same month. The others have refused to do likewise, and remain still healthy pupæ, purposing, I trust, to come forth next spring. Is this mode of procedure not common to *E. versicolor*? Last year I also bred some *Dicranura vinula* from eggs, three of which spun up in due time. Two of them

emerged in June, on the 13th and 16th respectively, but the third lives on still in a happy state of pupation. This year I had some larvæ of *Callimorpha dominula* sent to me, which have all turned out successfully, but two of the larvæ spun up in the same cocoon. The pupæ evidently found it close quarters, judging from their constant wriggles; still, they both produced perfect imagos in the proper time. Again, last February I received from a friend in North Wilts upwards of 600 larvæ of *Melitæa artemis*, which I fed up on *Lonicera periclymenum*. They thrived well on it, although, I suppose, owing to the cold winds of April, they far exceeded the usual time before coming to full growth. Then they began, during the latter half of May and the first half of June, to die off, fully grown, in considerable numbers. I managed, however, to get about 250 pupæ, but to my sorrow these soon began to shrivel up most unaccountably, in the end producing but sixteen perfect insects and a dozen or so deformities, between June 20th and July 8th. Some pupæ of *M. cinxia* dried up in a similar way. I have never heard of *Hepialus lupulinus* being double-brooded. On August 14th I was dining late at Ryde, when a perfect specimen flew through the open window on to the dinner-table, and was duly secured. On the 22nd of the same month another flew into my room after dark, at Bembridge, Isle of Wight (where I was staying); and a third, on the 26th, did likewise at Hambridge, Somerset. The three specimens differ in colour from a number I caught here early in June, the second of them having a distinct rosy tint pervading all the wings. Late in July one of my servants found a nearly full-grown larva of *Notodonta dictæa*, which went under ground the first week in August. To my surprise a lovely imago came forth the 5th of this month. I think it could not have been due till next year.—(Rev.) J. SEYMOUR ST. JOHN; Crowcombe Rectory, Taunton, Sept. 10, 1884.

*SERICORIS IRRIGUANA*.—The note on p. 229 of the 'Entomologist' had escaped by attention till my cousin, J. W. Harris, of this place, called my attention to it last night. I never had the good fortune to take *Sericoris daleana*, but, as far as my experience goes, it is a much larger insect than *S. irriguana*, which I have taken freely on Craig Maigie, Invernesshire, at an elevation of about 3000 ft., and I never saw it lower. It flies there very low, and where the bearberry grows (*Arctostaphilos uva-ursi*), but is



not confined to it; and I cannot say that that is its food-plant. I cannot give any other reason why it should not fly at a lower elevation, but I never met with it lower. I have taken *Mixodia schulziana*, which is abundant on our Cheshire bogs, on the summit of the same mountain, at least 700 ft. higher than *S. irriguana*; so, unless the food-plant is never found below 1500 ft. above the sea, I think it is possible it might be found in the Black Wood of Rannoch; but if it is, why not find it low down on Craig Maigie?—N. COOKE; Derwent Bank, Broughton, *viâ* Carlisle, Oct. 9, 1884.

[If *Arctostaphilos uva-ursi* is the food-plant of *Sericoris irriguana*, that will account for its absence from the Black Wood of Rannoch, for I am not aware that that plant ever reaches so low an altitude as even the higher ground of the Black Wood by several hundreds of feet.—J. T. C.]

LEIOPTILUS MICRODACTYLUS.—Mr. South, when he mentions the food-plant of *L. microdactylus*—*Eupatorium cannabinum*—says of the larva, “Feeds on the flowers” (Entom. xv. 103). I suppose he takes it for granted that it is so; now I am not going to say it does not, but what I wish to do is to record a few facts, so that others may draw their conclusions. From the few observations I have been able to make on this insect, I should say the larva fed in the stem. By searching a number of plants I have been able to discover many larvæ by the appearance of the flowering-stem—*i. e.*, when the larva has entered the stem rather high up I find that the main flowering-stem has been dwarfed, and that the two flowering stems springing from the joint below have grown above the main stem; whereas if the stem had not been injured the main flowering-stem would be above or on the same plane. This, I think, is very good proof that the larva is an internal feeder; but another thing, supposing the larva fed on the bloom and only entered the stem to turn to a pupa, I have an idea that the plant having flowered would not make any more growth; but we find where the larva is located there is always a slight swelling of the stem.—G. C. BIGNELL; 7, Clarence Place, Stonehouse, August 25, 1884.

HABITS OF LEIOPTILUS MICRODACTYLUS LARVÆ.—On the 25th of August last Mr. Bignell, of Stonehouse, was good enough to send me larvæ of *Leioptilus microdactylus*, together with portions

of the food-plant, *Eupatorium*. Mr. Bignell also at the same time favoured me with a copy of his note to this Journal, in which he records his observations of the habits of the larva of this plume-moth. In my description of *L. microdactylus* (Entom. xv. p. 103) I stated that the larva fed on the flowers of hemp agrimony. Now, however, after having had an opportunity of seeing larvæ in the fresh green stems, before they had formed their cocoons in which to pass the winter and ultimately pupate, I can quite agree with Mr. Bignell that they do feed in the stems. But I cannot form so positive an opinion as to whether they do so or not from the moment of leaving the egg. In only one instance could I find anything that looked like a point of entry; this was situated on the opposite side, and a little above a larger hole just below a joint. By carefully paring the stem, I found a dark streak running from the small hole to the cell in communication with the larger hole below the joint. The larger holes in the stems are evidently so constructed that they shall afford egress to the perfect insects, but they may have served for the larva's ingress also. I hope Mr. Bignell will give this larva his further attention, and, if possible, investigate its earlier history.—RICHARD SOUTH; September 1, 1884.

CARNIVOROUS BEETLES VEGETABLE FEEDERS.—*A propos* of Mr. Horner's remarks on *Pterostichus melanarius* (Entom. xvii. p. 238), I think few carnivorous beetles will refuse to eat fruit, fleshy roots, or tubers occasionally. I have seen three specimens of *Carabus violaceus* disputing possession of a half-rotten apple, and turning savagely with open jaws on to my fingers when I attempted to dispossess them of the "bone of contention." My cellar communicates with the open air by means of a flight of steps, covered by folding-doors, which latter are greatly affected by changes of weather. Not only insects, but frogs, toads, and other Reptilia find their way into the cellar. Of beetles, three *Carabi*, some half dozen *Pterostichi*, sundry species of *Anchomenus*, *Amara*, *Bembidium*, *Harpalus*, and numerous *Brachelytra* have been taken there from time to time; and, although they have not been clearly detected, there is *prima facie* evidence to connect them with the holes eaten in potatoes, turnips, and the like, which for convenience have been placed in the cellar. I am glad to say we are not troubled with *Blatta*, or that might have to bear some part of the charge. Under the circumstances

it is difficult to account for the holes, if not caused by the beetles. I also have frequently found *A. spinipes* on the flower and seed-heads of *Centaurea nigra*, but have connected them with the presence of Aphides and small plant-bugs, which generally abound. It is possible that the pollen or the milky condition of seed was the real source of attraction.—THOMAS H. HART; Park Farm, Kingsnorth, Ashford, Kent.

‘THE ENTOMOLOGIST’ LIST.—A correspondent writes:—“In your remarks anent this matter (Entom. xvii. 240) you speak of the ‘growing desire on the part of many British entomologists to cast off their insular prejudices,’ &c. May I ask what this means? Is it that it does not *now* matter whether a specimen or variety be British or continental, and that the former are now of no more value than the latter? This would be very unpleasant for those who have spent both time and money in order to make their collections really British.” I have already expressed my views upon “British Lepidoptera” (Entom. xv. 111), and these opinions I still hold. My remarks above quoted do not in any way intend to express the opinion that those who choose to study only British insects should be dissuaded from making such veritable collections. On the other hand, frequent applications for advice (especially since the publication of Dr. Lang’s fine work on the European butterflies) as to where to obtain other than British species of Lepidoptera, induce me to repeat that such “growing desire” to study those Lepidoptera closely allied to species which occur in this country, and indeed the whole European fauna, exists among many British entomologists.—JOHN T. CARRINGTON; Savage Club, Savoy, London, W.C., October 8, 1884.

ACHERONTIA ATROPOS AT EARLS COLNE.—*Acherontia atropos* has been found in some quantity in small lots of potatoes grown in this village. Some few were brought me in both larval and chrysalid state. I hear that many more have been seen, and met with an untimely end. A few fine specimens have emerged.—J. A. TAWELL; Earls Colne, Essex.

LAPHYGMA EXIGUA NEAR BASINGSTOKE.—On August 17th, whilst sugaring on some hurdles dividing two fields near Basingstoke, I took a lovely specimen of *Laphygma exigua*,

in company with *Epunda lutulenta*, *Agrotis suffusa*, and others.—  
PERCY RENDALL; 20, Ladbroke Square, London, W., October  
21, 1884.

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#### REVIEWS.

*Third Report of the United States Entomological Commission.*  
Washington: 1883. 347 pp. Demy 8vo, with Appendices,  
85 pp.; one coloured and three plain maps and 64 plates.

THIS very handsome production, on the part of Mr. C. V. Riley and his colleagues, makes one feel how much ahead are our American cousins in practical Entomology, and some shame that our Government should not follow the enlightened example of the American United States Department of Agriculture. Much as some of our friends have done privately in the cause of Economic Entomology in this country, it is too much to expect of them to issue such works as these American reports, when the enterprise, being for the public good, ought to be that of the State.

The Report now under consideration deals with "The Rocky Mountain Locust, the Western Cricket, the Army Worm, Canker Worms, and the Hessian Fly; together with descriptions of larvæ of injurious forest insects, studies of the embryological development of the locust and of other insects, and on the systematic position of the Orthoptera in relation to other orders of insects." A large proportion is devoted to locusts, of which there have been already no less than 273 species identified on the North American Continent, north of Mexico; "and," says the author of the report (Mr. Lawrence Bruner), "probably many others remain to be discovered." He continues "All these are more or less injurious to the agriculturist, and to those who are in any way dependent upon products of the soil for their living." The remarks upon these insects are most exhaustive and interesting; for not only do they deal with locusts in America, but an appendix reviews their history as known in other parts of the world, especially in China and Russia.

So important is the subject of the Hessian fly (*Cecydomia destructor*) a very small dipteran, which is allied to our familiar daddy-long-legs or crane-flies, that ninety-three pages and a map

showing its distribution are devoted to it. It appears that this pest was unnoticed until 1779, since which year it has spread to such an extent that the cultivation of wheat in the New England States was abandoned about twenty years ago, on account of the ravages of this fly and the wheat midge. Its present range appears to embrace all the United States north of the 35th parallel of latitude and east of the 93rd meridian.

These reports must be of the greatest use to the intelligent farmers of the States, as they not only describe their natural enemies, but give valuable suggestions for the reduction of the numbers of these pests or their actual extermination.—J. T. C.

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*The Butterflies of Maine.* By C. H. FERNALD, A.M. 104 pp.  
Augusta, 1884.

AN addition to the title-page of this work explains that it is "designed for the use of the students of the Maine State College, and the farmers of the State." It is illustrated with somewhat unsatisfactory woodcuts, representing types of genera, which are frequently accompanied by cuts of the ovum, larva, and pupa of the species under consideration. Mr. Fernald has evidently taken great pains to so present the subject to his readers as to make it lucid and easily grasped, in which object he has quite succeeded. Any person, no matter how completely ignorant of insects, after mastering his very terse, yet lucid, introduction of less than a dozen pages, cannot fail to learn enough to form a foundation of knowledge for future successful study.

There appear to have been sixty-nine species of the Diurni in Maine, a schedule of which is given at the commencement of the work, with scientific and trivial names. Among the latter are some which are characteristic of our American cousins; for instance—*Vanessa antiopa* is known in Maine as the "Mourning Cloak," and *Pamphila zabulon* as the "Mormon." We ought to add that this list is evidently only intended for reference, as such names do not appear in the body of the work, which is throughout most carefully compiled, and constructed on thoroughly scientific lines.—J. T. C.

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*Remarks on Scientific Nomenclature.* By C. S. GREGSON.  
Dedicated to the young Naturalists of the world. Liverpool, 1883.

ALTHOUGH issued early last year, this pamphlet has only just come under our notice. It is a curious stringing together of a series of "remarks" upon somewhat disconnected subjects,—such as the British Constitution; Editors of Scientific Magazines, whose "little learning puffs them up" (when they decline to insert certain articles); Mrs. Noah receiving the Animals as they entered the Ark; Scientific Nomenclature; the British Association not supplying everyone with a gratuitous copy of their Reports; the origin of Hooker's Flora; and some original poetry;—all written we presume for an elaborate joke, as the author says in his preface, "whilst in a merry humour one idle night," and "published exclusively for young naturalists; experience teaches that it is useless writing for old ones." The writer of the pamphlet is rather hard on the "old ones." Why not allow them also to participate in the joke? unless it is intended for "beginners only." The whole gist of these "Remarks" may be summed up as a recommendation to young naturalists that in future nomenclature "anything will do," if only a recognised terminal be used; even such a name as *Charlesstuartgregsonella*.  
—J. T. C.

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#### OBITUARY.

WE regret to have to record the death of Mr. ALFRED HARPER, which occurred somewhat suddenly at his residence, 66, Mansfield Street, Kingsland, on the 19th inst. Mr. Harper had nearly completed his seventy-first year, and had been from his earliest days an ardent and persevering collector of British Lepidoptera; and had, with the assistance of his sons, formed a very complete collection, containing many rarities and local species. He was one of the original members of the Haggerston Entomological Society, and up to the time of his death filled the post of Treasurer to that institution, in the proceedings of which he always took the warmest interest. His ever ready willingness to impart information to young entomologists, coupled with his general amiability of disposition, endeared him to, and made him respected by, all those who had the pleasure of his acquaintance.

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[No. 259.

A NEW BRITISH DELTOID, *HYPENA OBSITALIS*, Hüb.



*HYPENA OBSITALIS*, Hüb.

ON the 21st of September last, I captured a moth unknown to me, at rest on a door jamb in my flower-garden. It was evidently a *Hypena*, but quite distinct from either of our known British species. My old friend, Mr. F. Bond, has kindly compared it with specimens in the British Museum collections, and determined it to be *Hypena obsitalis*, Hüb., not before recorded as British.

O. P. CAMBRIDGE.

Bloxworth, Blandford, Dorset, Nov. 10, 1884.

[From *Hypena rostralis*, which is our nearest allied species, *H. obsitalis* differs considerably in having somewhat longer anterior wings, which are pointed and more mottled with black than in *H. rostralis*. The best character for identification is the angular or elbowed line across each anterior wing in *H. obsitalis*; these wings are brown, and in addition to the black markings already mentioned, are some of an obscure pale yellow colour. In our collections this addition to our fauna will follow *H. rostralis*. The figure above is taken from a Continental example of *Hypena obsitalis* formerly in the possession

of the late Mr. Henry Doubleday, and closely resembles the specimen recently captured by the Rev. O. Pickard-Cambridge.—ED.]

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#### RANDOM NOTES ON NEW ZEALAND LEPIDOPTERA.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

(Concluded from p. 250.)

ON February 7th I had arranged to go to Drayton, at the foot of Mount Hutt, and some seventy miles from Lyttelton, where I had been kindly invited by Mr. Chapman (a brother-in-law of Mr. Fereday's) to stay for a few days for the purpose of ascending the mountain for *Erebia pluto*, which is to be found there at an elevation of 4000 feet. Unfortunately when I rose in the morning it was pouring with rain, and the glass showed such evident indications of bad weather that I decided not to go, especially as I had been told that *E. pluto* only flew in the brightest sunshine. Moreover, Drayton was a long way off, and there was only one train daily each way, as far as Methven, from which one had to drive five or six miles further to Drayton. As it afterwards turned out I was sorry I did not go, for there was no rain at Drayton, and this and the two following days were beautifully bright and fine. I have since found out that it often rains and blows at Lyttelton when it is perfectly fine inland.

On February 9th I went to Springfield, a small township near the Mount Taurus range, in the hope that I might be able to ascend some distance, and by chance come across *E. pluto*; but when I reached the place, and asked the proprietor of one of the hotels how long it would take to walk to the top of the nearest point, I was informed, much to my disgust, that I should have started at daylight, and that then I could not have got there and back unless I happened to be an exceptionally good walker; so, as I had only about four hours at my disposal, I had to give up all idea of it. The air in this country, particularly near the mountain regions, is so beautifully clear and highly rarefied that distant objects always appear to be very much nearer than they really are. My time being so short I procured a trap and drove to the foot of one of the nearest spurs, and as this took me more than an hour I had only about two hours left to wander about in;



and of course I could not expect to do very much in this time. *Argyrophenga antipodum* were flying in large numbers, and there were a greater proportion of females than there were at White-cliffs on the 31st of last month; and *Chrysophanus salustius* and *C. boldenarum* were plentiful. I also had the pleasure of taking to-day, for the first time, *Lycena oxleyi*, a very delicate and distinct species; and a very pretty *Euclidia* was disporting itself in a rough stony place on the hill-side, where it was difficult to catch. By the time I had pinned and boxed a sufficient number of these species, with the addition of a few small Geometræ, it was time to return to the farm where I had left my trap, and drive back to the station, where I arrived just as the last train was starting, and reached Lyttelton again at nine o'clock. The railway carriages near Springfield were full of a small Pyrale (*Scoparia diptheralis*), which were disturbed as the train passed, and came flying in through the open windows.

On February 17th we arrived at the Bluff, the port of Invercargill, almost the southernmost point of the middle island; and the next morning I left by the first train for three days' fishing to a place called Waipahi, a small township intermediate between Invercargill and Dunedin. The country through which we passed was mostly flat, though in some places hilly or undulating, with a lofty range of mountains to the westward. As we got further away from Invercargill it became wilder and wilder in appearance, until at last for miles on each side of the line there was nothing but unbroken ground overgrown with the usual tussock grass. In some places where it was low and marshy, and by the margins of all the creeks, as they call small streams in this country, there was plenty of native flax, which grows in large clumps, the broad sharp-pointed leaves attaining a height of six or seven feet, while the flowering stems are a foot or two higher; at a distance they look something like aloes. Waipahi is situated upon a river of that name, and is fifty-six miles from Invercargill; we took three hours and twenty minutes on the journey, so the speed was not dangerously rapid. The three days I was there were almost entirely devoted to trout fishing, and nearly all the fish were caught with a small Cicada placed and thrown upon an artificial fly. These Cicadæ were found in the tufts of tussock grass; and when the sun is bright and warm they crawl up the stems and chirrup in a most lively fashion, and are then

easy to see, but by no means easy to catch, as they fly off rapidly in their peculiar jerking manner if abruptly approached. When the weather is dull they creep down amongst the thick stems, and are then difficult to find, although when one's hand is drawn over them they at once begin to chirrup, and so betray themselves. The males are a pale umber-brown, and the females a light green; the former were the most attractive bait.

On one occasion, whilst hunting for these Cicadæ, I found a male *Argyrophenga antipodum* sitting on a stem beside its empty chrysalis; the chrysalis was attached by the tail to the stem of grass, after the ordinary Satyrid fashion. A prolonged search failed to disclose any more, although I have no doubt that there were many others close at hand; but I frequently came across larvæ of different *Leucanidæ*, and a strange-looking *Pterophorus* was not uncommon, and when disturbed, instead of flying, it endeavoured to creep and hide itself away amongst the thickest stems. Many of the clumps were a good deal eaten, especially the tops of the stems, and there was a quantity of old frass at the roots of most of them. Probably anyone sweeping the tussocks at night a month earlier would have been rewarded by the discovery of the larva of *A. antipodum*, which I expect crawls up the stems to feed, after the manner of *Satyrus janira*, *S. tithonus*, *Cœnonympha pamphilus*, &c.; and I am not aware that it has yet been described by anyone.

In addition to *Argyrophenga antipodum*, which was abundant at Waipahi, *Chrysophanus salustius* was common; but I saw no *C. boldenarum*; it was perhaps too far south for it. *Lycæna oxleyi* occurred in some numbers, and *L. phœbe* was not rare. This latter butterfly appears to be generally distributed throughout New Zealand, Australia, and Tasmania; and I have also taken it in Fiji, the New Hebrides, and New Caledonia.

The river ran within a few hundred yards of the little inn I was staying at, and after my evening meal I strolled out to its banks for a quiet pipe. Noctuæ were flying in numbers over the rushes and flax, and most of them appeared to be *Leucanidæ*, among which were *Leucania semivittata*, something like *L. obsoleta*; and *L. unica* and *L. sulcana*, which are evidently antipodean representatives of our English *L. impura* and *L. pallens*. Later on *Nitocris comma*, a *Noctua* not unlike *Noctua c-nigrum*, came fluttering round the lamp upon my sitting-room table; and

various Crambites swarmed at the same time. Next day *Auchmis composita* was taken at rest on palings, and larvæ of *Heliothis* sp.? in thistle-heads; and the following day I returned to my ship.

From the Bluff we proceeded to visit several of the beautiful Sounds on the west coast, where nothing was done in the way of Entomology, my whole time being occupied in collecting ferns and shooting birds; and from thence, after brief stoppages at Wellington and Auckland, where I saw *Pyrameis itea* flying about the streets, we returned to Sydney.

H.M.S. 'Espiègle,' Suva, Fiji, June, 1884.

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#### ENTOMOLOGICAL NOTES, CAPTURES, &c.

**THANAOS TAGES.**—It may be worth while to note, in connection with Mr. F. W. Frohawk's account (Entom. xvii. 49) of the sleeping position of *Thanaos tages*, that as long ago as June, 1857, I took two examples of that skipper under circumstances almost precisely similar to those mentioned by Mr. Frohawk. I subjoin the notice I then published of the observation, only adding that, until Mr. Frohawk's account and excellent woodcut came to my knowledge, I have never met with any confirmation of what I recorded so many years ago. 'Entomologist's Weekly Intelligencer,' vol. ii., p. 101, June 27, 1857:—"In the 'Manual' I see *Thanaos tages* mentioned as having 'wings in repose horizontal;' and certainly when settling on flowers or on the ground, in the sunshine, the wings are always kept so. But, on the 5th inst., while collecting *P. alsus* in a chalk-pit, just at sunset (which, by the way, is much the best time for collecting that species, as they have then taken up their quarters for the night, and are easily taken while sitting on the grass-stems), I saw what I took to be a small *Noctua* resting on a thick stalk of grass. On stooping to examine it I found, to my surprise, that it was a specimen of *T. tages*, apparently fast asleep, as I tapped the grass on which it rested several times without causing it to move. The wings were folded so as to form a roof, as in most of the Bombyces and Noctuæ, with the upper side outwards; thus further proving the close affinity of the Hesperidæ to the moths. I pinned the *Tages* just as he was, and, after a slight flutter, he settled down into the same position. I afterwards thought that this might be an

exceptional instance, and that the *Tages* in question might only have been trying this position to see whether it was a comfortable one to repose in; but, on the 8th, in the same chalk-pit, during a slight shower of rain, I found another in a precisely similar position; and so am induced to believe that it must be a regular family practice. I find that *Pamphila sylvanus* (which is now abundant at Dorking) always reposes with all its wings erect, when alarmed at a passing object, in a shower of rain, or when resting for the night."—ROLAND TRIMEN; Cape Town, Sept. 12.

COLIAS EDUSA IN NORTH STAFFORDSHIRE.—On Sunday, September 28th, I noticed a male specimen flitting about in my garden in the afternoon. This insect has not been noticed here since 1877, when it was excessively plentiful almost everywhere in England, it being probable that there were as many as three distinct broods. It is remarkable that it should occur so far north this year, as I gather from your pages that, although somewhat widely distributed, it was not abundant. Among other insects I have noticed here, that have been strangers for some years, are *Macroglossa stellatarum* and *Vanessa cardui*; indeed of this latter I never saw so many here before. — THOS. W. DALTRY; Madeley Vicarage, North Staffordshire, October 28, 1884.

COLIAS EDUSA.—I saw two specimens of this insect in the New Forest in October this year; and one at Catford Bridge, Lewisham.—J. JENNER WEIR; Chirbury, Copers Cope Road, Beckenham, Kent.

COLIAS EDUSA IN KENT.—During the first week in August I saw a specimen of *Colias edusa*, flying at a rapid rate over the shingle at Walmer (near the Castle). I netted a lovely female specimen of the same species near Halling, Kent, on September 6th; and on the 15th and 16th of the same month I captured a dozen specimens, including three females, in a clover-field near Strood, Kent. These, with the exception of two examples taken near Sandown, Isle of Wight, are the only specimens I have seen since the memorable "1877 year," when I took a large number, including several of the variety *helice*. The field in which I took *edusa*, on September 15th and 16th this year, was in 1877 often alive with the species—sometimes several specimens on one clover-head. I should not be surprised if the species were common next season, as the insects I took were in lovely

condition. Being so late in the year, it seems not at all improbable that they might hibernate; or should they deposit ova, the larva might possibly pupate and pass the winter in that stage.—J. TUTT; Beaconsfield Terrace, East Greenwich, S.E., November, 1884.

COLIAS EDUSA AND LYCÆNA ADONIS AT FOLKESTONE AND DOVER.—Noticing the remarks of several of your correspondents as to the appearance of *C. edusa* at various places this autumn, I may record that I found it tolerably common at Dover in September last, having taken some five-and-twenty and seen very many others. I was also informed that it was out in some numbers in the Warren at Folkestone, so there are some hopes that next season may prove another “*edusa* year.” The autumn brood, too, of *Lycæna adonis*, was exceptionally abundant at Folkestone, and, favoured by a spell of remarkably fine weather, one of my boys and myself were able to secure a few very nice varieties of this insect, the most notable being a black male, slightly tinged with dull indigo in certain lights. This was one of my son’s captures, and unfortunately he must have had it in his net some little time before he noticed it, as the margins of the anterior wings are a little split; otherwise, it is a particularly fresh specimen, and is, I believe, a very uncommon form of this species.—E. SABINE; 17, The Villas, Erith, November, 1884.

GONEPTERYX RHAMNI AND COLIAS EDUSA IN DORSETSHIRE.—I have during the last season seen thirteen specimens of *Gonepteryx rhamni* in this county, all more than fifteen miles from the borders of the surrounding counties. As I have always understood that this was not a Dorsetshire butterfly, owing to the absence of buckthorn, I thought it worth noting. *Colias edusa* was very abundant round here in the second and third week of October.—M. J. MANSFIELD; West Lulworth Vicarage, Dorset, November 18, 1884.

VANESSA ATALANTA V. CARDUI, AND PLUSIA GAMMA IN NORTH DEVON.—Not having seen any notice in this magazine, as yet, of the unusual abundance of *Vanessa atalanta*, *V. cardui* and *Plusia gamma* this season, I venture to call attention to this fact. From about the middle to the end of September, and on many fine days since, these three insects have been in large numbers about here. *V. atalanta* I have never seen so plentiful, neither *V. cardui* nor

*P. gamma* since 1879. — Miss HINCHCLIFF; Instow, North Devon, November 13th.

CAPTURES IN AUGUST.—During August of the present year I walked through Surrey, Sussex and West Kent, and it is remarkable that though *Vanessa cardui* turned up at Littlehampton, New Shoreham, Guildford and other places, often being abundant, and usually in very good condition, another equally uncertain species, *Colias edusa*, was not observed at all. I caught an interesting fly, which proved to be *Asilus crabroniformis*, on Witley Common. At Addington I took one specimen of *Plinthus caliginosus*, and another interesting capture was *Hesperia comma*, which was not rare on the hills east of Guildford. *Satyrus semele* was very abundant on Witley Common, and I took one near Guildford. — T. D. COCKERELL; 51, Woodstock Road, Bedford Park, Chiswick, W., November 6.

BRITISH BUTTERFLIES.—I shall be much obliged if any of your readers can give me descriptions of the ova of *Pieris crataegi*, *Anthocharis cardamines*, *Leucophasia sinapis*, *Colias edusa*, and *C. hyale*; or if they cannot do so personally, will they inform me in what work I may find such descriptions; also if *Lycæna acis*, *Thecla pruni*, *Papilio machaon*, and *Leucophasia sinapis* have been taken plentifully this year, and if so, where?—W. HARCOURT BATH; Sutton Park, Warwickshire, Nov. 1884.

[In the last part of the French 'Annales' is an important paper by T. Goossens, on "the eggs of Lepidoptera" (Ann. Soc. Ent. Fr., ser. 6, vol. iv., pp. 129—146; pl. 5); it is illustrated by a beautiful coloured plate, on which the eggs of forty-two species are figured. Fig. 32 shows the egg of *Aporia crataegi*; fig. 23, *Anthocharis belia* (closely allied to *A. cardamines*); and fig. 34, that of *Colias hyale*. The egg of *L. sinapis* is described at Ent. Mo. Mag. iii., 211 (and cf. Newman's Brit. Butt., p. 154), and Mr. Hodgkinson speaks of it as "just the shape of a conical shot" (Ent. vii., 175). The egg of *C. edusa* is figured at Entom. xi., 49.—E. A. F.]

DEILEPHILA LINEATA AT SANDWICH.—Having been located in Sandwich during the past summer, I had the pleasure of capturing, on July 26th, a fine specimen of *D. lineata*. It was at rest on a granite street-crossing, and without doubt would have been crushed had I not rescued it from its perilous position; as

it was it has the appearance of having been touched on the left wing by something passing.—R. HARBOUR; 1, Landport Cottages, Deal.

CHEROCAMPA NERII IN DORSETSHIRE.—I have to record the capture of a specimen of this rare species, at a village about four miles from Blandford, Dorset. It was taken and presented to me by a friend, and is in fair condition. Blandford being more inland than any of the localities recently mentioned in the 'Entomologist' I think your readers may find this notice of interest.—T. B. JEFFERYS; Pacific House, Clevedon, November 4.

PUPA OF SPHINX CONVOLVULI.—Last Friday, October 31st, a boy who works in the garden brought me a pupa of *S. convolvuli*. He told me his father had found it when digging, and had given it to him, and he brought it to me. It is in fine condition and alive; it is very large.—B. B. HUNT; The Grove, Woodford, Essex, Nov. 2, 1884.

LATE OCCURRENCE OF MACROGLOSSA STELLATARUM.—During the last month (October) several specimens of this insect in good condition were observed in different parts of this town. The last specimen I noticed was hovering at geraniums as late as October 31st.—EDWARD A. ATMORE; 3, Haylett Terrace, Lynn, Nov. 8.

LAPHYGMA EXIGUA.—Whilst collecting on the Culver Cliffs, Sandown, Isle of Wight, on August 26th last, in company with my brothers and sister, the latter disturbed a small *Noctua*, which at the time I did not recognise, from amongst the short grass. At the Haggerston Entomological Society's meeting, held Nov. 13th, Mr. E. G. Meek kindly identified the insect as belonging to the above species.—F. W. HAWES; 14, Dovecote Villas, Wood Green.

LAPHYGMA EXIGUA AND ACHERONTIA ATROPOS AT DEAL.—On returning home on September 20th, I found a fine specimen of *A. atropos* had been killed and left by a young gentleman for me to set out for him. By working the gas-lamps here for any of the genus *Ennomos*, of which I only took two *E. tiliaria* and one *E. erosaria* (males), I took another specimen of *L. exigua*, in fair condition.—R. HARBOUR; 1, Landport Cottages, Deal.

LAPHYGMA EXIGUA IN CORNWALL.—I write to inform you that while staying at Antony, Torpoint, Cornwall, I took three specimens of *Laphygma exigua*: one on October 4th, and two on the

6th, all at the same ivy bush on a garden wall. Miss C. L. Pole Carew, who was with me at the time, took a specimen four or five years ago flying in the garden; but not being aware of the value of the insect at the time did not keep a note of the exact date. I may add that not being far from Plymouth I submitted the specimens to Mr. G. C. Bignell, who has no doubt of their identity. I was at Antony till October 20th, and searched the ivy nearly every night, but did not see any more.—WALDEGRAVE; 13, Montagu Place, Montagu Square, W., October 27, 1884.

LAPHYGMA EXIGUA IN LANCASHIRE.—On the 16th of September, while in the Reform Club, Preston, I noticed a moth come into the room with a jerking flight, which for the moment I took to be *Stenopteryx hybridalis*. It shortly afterwards flew to a gas-light and dropped on to a table beside me. For a time I was somewhat puzzled, for though like *Caradrina cubicularis* its narrow wings and peculiar markings denoted some other species. It was off in a moment and disappeared, when I at once recollected that it was this rare species, having four specimens in my cabinet with which to refresh my memory.—J. B. HODGKINSON; 15, Spring Bank, Preston, November 1, 1884.

LAPHYGMA FRUGIPERDA.—It is noteworthy to remark, that while the very rare *L. exigua* is turning up in all directions in England, the closely allied *L. frugiperda*, Guenée, is proving an injurious insect in the United States. In the last Circular (No. 116) of the Illinois State Board of Agriculture, S. A. Forbes, the State Entomologist, writing from Normal, Illinois, under date October 14th, 1884, gives a four-page history of this pest, illustrated by a woodcut, with details of its larva. He writes:—"The winter wheat fields of Tazewell, Mason, and Fulton counties, and probably of adjacent territory, have lately been devastated by a caterpillar which has been very generally mistaken for the true army worm. . . . The damage already inflicted is very considerable, many hundreds of acres of winter wheat having been completely devoured in those counties, and subsequently resowed; but the loss impending is much more serious, since another brood of the caterpillars is likely soon to appear, making its attack upon the wheat at a period too late to allow replanting." Then follow remarks on its previous history (it has been known as an enemy of agriculture since 1845, when



it attacked the grass, corn, and sugar-cane of Georgia; but in Illinois it made its first appearance as an injurious insect in 1868 and 1870, and has not since been numerous enough here to attract attention), description, life-history, injuries to vegetation and remedies (mechanical destruction and poisoning).—EDWARD A. FITCH; Maldon.

URTICATING BY *LIPARIS CHRYSORRHŒA*.—There is, I believe, no doubt that the handling of the larva and of the cocoon of this moth ordinarily produces an attack of urticaria, a skin affection “characterised by the development of wheals, and accompanied by sensations of stinging, itching, and burning, like those produced by the sting of a nettle” (Liveing). I have no doubt that this is produced by the hairs, which hairs form a large part of the materials of the cocoon. A schoolfellow of mine, some years ago, had what I now recognise as an attack of the above affection, after having carried home several of these larvæ. Country children, who are in the habit of collecting these larvæ, being attracted by their bright colours, are very subject to it. After carrying them home in their handkerchiefs and aprons, and depositing them, they perhaps wipe their faces and necks, and forthwith suffer from an acute attack. The hairs, on examination, may be found sticking into the skin. In the case mentioned by your correspondent, the broken hairs must have been conveyed from his hands to his neck, and they were the direct irritant in both cases. Anyone who examines the human skin by the aid of a powerful lens, may see the innumerable orifices of the sudoviparous and sebaceous glands, commonly termed “the pores of the skin,” through which they might get access to the deeper layers, even if they were not strong enough to pierce the cuticle. I hope at some further time to be able to compare these hairs microscopically with the brittle knob-tipped hairs of *Urticaceæ*.—PERCY RENDALL; St. Bartholomew’s Hospital, E.C.

THE URTICATING PROPERTIES OF THE HAIRS OF SOME LEPIDOPTERA.—I am glad that your correspondent has called attention (*Entom.* xvii. 257) to this subject, and trust some definite information may be elicited concerning “urtication.” It may, perchance, not be generally known that the imagines of *Liparis chrysorrhæa* and *L. auriflua* possess this stinging property. I

was once conveying a newly-emerged specimen of the latter to the poison-bottle, and in some way or other let it fall up my arm, between the flesh and shirt-sleeve. It remained there but a second, as I immediately gave a shake, and got it down again without any apparent detriment to the moth; but in a very few minutes my arm looked as if it had been stung by nettles, and the irritation, which was almost unbearable, continued for nearly two hours. About this time my brother captured another, which he carried home in his hat. Like myself, being unacquainted with the poisonous nature of the perfect insect, he was surprised to see his forehead covered with little white lumps, causing an intolerable itching. So bad was it that he went to his medical man for advice, who told him that he must have checked the perspiration, and gave him some medicine accordingly. In some seasons the hedges by our canal swarm with the larvæ of *Liparis chrysorrhœa*, and, strange to say, I experience greater discomfort after the moths have left their cocoons, as I can scarcely walk by the hedges (if a wind be blowing) without face, neck, and hands suffering severely, and I dare not beat them for some time afterwards. The reason of this may possibly be, that as the moths emerge, the hairs, which are so plentifully used in the construction of the cocoons, are set free. Surely there must be some poisonous property in the hairs; the simple penetration of the skin could not cause such discomfort. Again, many hairy larvæ, such as *Acronycta aceris*, *Arctia lubricipeda* and *A. menthastri*, shed all their hairs, and with them line their cocoons, yet may be handled with impunity. In the case of the imago of *L. chrysorrhœa* and *L. auriflua*, I am inclined to believe that the irritation is caused by the white hairs which fringe the inner margins of the wings, and not the golden tail-tufts, as I have rubbed the latter over my hands with no unpleasant results. —JOSEPH ANDERSON, JUN.; Chichester, November, 1884.

*EUPITHECIA NANATA*, VAR. *CURZONI*.—In the 'Entomologist' (Vol. xvii., p. 240), is an account by Mr. C. S. Gregson of the northern form of *Eupithecia nanata*, which he describes as a new species, under the name of *Eupithecia curzoni*. As I have had more experience of this insect than any other collector, I should like to make a few remarks upon the subject, stating what I know of it. In the summer of 1880, I was collecting in the Shetland Islands for Mr. E. G. Meek, and, as your readers will remember,

I succeeded in getting together a very interesting collection of Lepidoptera, including a few of this variety of *E. nanata*. This was the first time that this variety was observed and recorded. In 1881 I again collected in the Shetlands, chiefly in Mainland, and again I took the variety, but this time a longer series, varying from our southern type to those dark-banded forms which were figured in the 'Entomologist' (vol. xiv.). In the season of 1883, with aid from Mr. C. E. Fry, I determined to work the extreme northern islands of the Shetland group, and succeeded while there in not only capturing the imagines in plenty, but also in breeding this variety in quantities, and afterwards sent them to our most eminent entomologists, who all agreed with me in considering it to be a very interesting form of *Eupithecia nanata*. After many opportunities of observing it in both larval and imago states, I must record my strong opinion that it is nothing more nor less than a variety of *E. nanata*. Mr. Gregson must have been perfectly aware of all these facts; and even allowing that it is a distinct species, which I am sure it is not, unless he received Mr. Curzon's permission to use his name, which I doubt, I think entomologists will agree with me that he has shown somewhat questionable taste in naming it after a gentleman who has collected but one season in the far north.—H. McARTHUR; Fareham, Hants, November, 1884.

[In the last part of the Stettin 'Zeitung' is a, to British entomologists, very interesting paper by August Hoffmann, on 'The Lepidoptera of the Shetland Isles, with notices of the occurrence of the species in other northern countries, in the North and Central German Mountains, and in the Swiss Alps.' (Stett. Ent. Zeit., xlv., 353—375). Of *Eupithecia nanata* (?) Herr Hoffmann writes:—"Of this peculiar form I received six specimens, which are like those figured in the 'Entomologist' for 1881, pl. i., figs. 2 and 3. Dr. Staudinger, to whom I presented a pair, writes me as follows, 'A form of *Eupithecia* new to me, probably only a dark *E. nanata*. It probably comes next to the form *nanata* aberr. *obscurata*, Stgr., but exhibits such considerable differences from it that it does not agree with it.'" Then follows the description. "In my opinion this Shetland form deserves a distinct name. Whether it is to be considered a good species, or is to be placed as a variety of *E. nanata*, I do not attempt to decide. It flies in June."—E. A. F.]

COLLECTING IN SUFFOLK.—I had the pleasure of collecting in the neighbourhood of Tuddenham, in the early part of August, and was very much pleased with the result of three days' work. The following are my principal captures:—*Acidalia rubricata*, abundant in one field, scarce elsewhere; *Agrophila sulphuralis*, eight specimens only; *Spilodes sticticalis*, eight or nine; *Pterophorus lætus*, over forty in very fine condition, nearly all on one evening, just before dark. *Catoptria citraria*, abundant; *Anticlea sinuata*, three larvæ on *Galium verum*, and larvæ of *Heliothis dipsacea* on low plants. I returned to town on the third day with over 250 insects on my setting-boards. What a contrast to my trip to the Isle of Unst, where I often had to work sixteen or eighteen hours for six or eight moths. Upon my second visit I spent all my time exploring in walking and driving. I inspected several pretty fens on the River Lark, also Fordham, Chippenham, &c. I shall be very much surprised if we do not hear of many rarities from this district, besides those already recorded.—E. G. MEEK; 36, Brompton Road, London, S.W.

NOCTUÆ NEAR BROMLEY, IN 1884.—Noctuæ round Bromley this season have been very erratic in their appearance, and it would be interesting to know whether other collectors in different parts of the country have noticed the same peculiarity. As I did not do any collecting during the early part of the year, I cannot say what insects came to the shallows or to sugar until the beginning of June; but during that month and July I worked a very good locality near this town, generally sugaring several times a week if the weather was suitable. On June 5th one specimen of *Cymatophora* or came to the sugar: in comparison with the succeeding evenings in June this might be considered very successful, as the usual result was absolutely *nil*, with sometimes one or two specimens only of such insects as *Acronycta psi*, *A. megacephala*, *Noctua festiva*, or *Grammesia trilinea*; the two latter of these are usually very common here, but this season I did not notice a dozen specimens of either species, and not one *Agrotis exclamationis*. In a grassy field *Leucania impura* was abundant; and this, with *Plusia gamma*, was the only Noctua which appeared during the month in any numbers. In July I met with no better success, seldom seeing more than two or three Noctuæ at sugar on the same evening, and these were,

without exception, of the commonest species; the only representative of the large number of this family, which are on the wing at this time of the year, and which was at all common, being *Miana furuncula*. During these two months, in which more than half the Noctuæ are out, not more than two dozen species came to sugar; and this surely cannot be put down to a want of warm evenings, as in the latter part of June, and again in July, the temperature was higher in London than it had been for some years past, and the days were followed by close, sultry evenings; but whether this was the case or not it did not seem to make any difference to the number of these Lepidoptera, of which there seemed a complete dearth, with the few exceptions mentioned above. During the first ten days in August a bright moon was visible in the evenings; but on the 11th, an intensely hot night, I sugared, and was much surprised at the result. On that evening at the trees there were more insects than I had seen on all the evenings of the two previous months put together:—*Apamea oculatea*, *Miana strigilis*, *Tryphæna pronuba*, *Cosmia trapezina*, and *Xylophasia polyodon* were abundant; and *Tryphæna janthina*, *Leucania lithargyria*, and *Amphipyra tragopogonis* were also fairly represented. On the 15th, besides increased numbers of the above, *Noctua xanthographa* began to be a pest; and single specimens of *Tethea subtusa*, *Cerigo cytherea*, and *Catocala nupta* put in an appearance. During the next few days *Noctua xanthographa* was very abundant, as many as twenty often coming to one patch of sugar, and the following were noticed for the first time:—*Amphipyra pyramidea*, *Cosmia affinis*, *Mamestra brassicæ*, *Noctua c-nigrum*, *N. rubi*, *Phlogophora meticulosa*, *Gonoptera libatrix*, and *Agrotis segetum*. Towards the end of the month the weather became much colder (one day being 27° Fahr. lower than the previous one), and *Nonagria lutosa* was the only fresh species at sugar; while at the lamps *Luperina testacea* was common; and I also took specimens of *Heliophobius popularis*, *Hydræcia micacea*, and *Tapinostola fulva*. I was away from Bromley during the first fortnight in September, so did not sugar until the 15th of that month: the result on that evening was one *Amphipyra pyramidea* and one *Catocala nupta* at the sweets; one *Triphæna pronuba* and one *Xanthia silago* on the wing; and nothing fresh at the lamps; this, too, on an exceptionally warm evening for the time of year. Soon after this the weather turned

quite cold again, and Noctuæ were again as scarce as they had been in the early part of the summer. Thus during the month of August Noctuæ were at least as common as in ordinary seasons; while in the other months of the year, with about three exceptions, there was scarcely one to be seen. I should be glad to know whether any explanation can be given as to the cause of this peculiarity; and may mention in conclusion that other Lepidoptera did not share in the irregularity of the Noctuæ, but were uniformly scarce throughout the season.—P. WATCHURST; 11, Hope Park, Bromley, Kent, October, 1884.

EFFECT OF THE HOT SUMMER ON LEPIDOPTERA.—During the past season many larvæ have fed up in a very short time; eggs of *Ephyra pendularia* and *E. porata* laid between July 31st and August 2nd began hatching on August 6th; the *E. pendularia* fed up the quickest. The first larva to turn to a pupa was on August 18th (only twelve days from the time the larvæ hatched), followed next day by several more, and the last turned on August 31st. Out of twenty-eight eggs, twenty-six went to pupæ. As they fed up and turned to chrysalids in so short a time, I naturally expected a third brood, but none have emerged. *E. porata* did not grow quite so rapidly; the first turned to a pupæ on August 26th, and the last on September 20th. A female *Acidalia aversata* of the ordinary type laid a good batch of eggs on July 9th, which hatched on July 26th; these fed well on knot-grass, principally by night. During the daytime they scarcely moved. They grew fast and went to pupæ from August 15th to September 7th, and the imagos appeared from August 26th to October 2nd, altogether about one hundred, and the banded variety appeared to be about one in four. The banded form have produced some very dark and freshly-marked specimens. I have had to feed up this insect in previous years, but they always hibernated and died in the winter; and as I kept them in the same place this year as previously, the extreme heat must have been the cause of their feeding up so rapidly; yet it does not seem to have had any influence on some species. A female *Numeria pulveraria* taken at Loughton on May 24th, deposited eggs the same night, which hatched the beginning of June. They grew very slowly from the commencement. The first did not spin up until the middle of August, and some were feeding

as late as the middle of September, having fed them for fifteen weeks. Those that had not spun up I turned loose. My experience has been that the past season was no improvement entomologically upon the previous bad years, and I hear the New Forest has been a total failure.—J. N. KENWARD REDCLYFFE; Corona Road, Lee, October, 1884.

COLEOPHORA POTENTILLÆ, *Boyd*.—I am indebted to the kindness of Mr. Fletcher, of Worthing, for a liberal supply of larvæ of this new species; and knowing how much better larvæ of this genus thrive on growing plants, I went for a plant over to Wanstead, where *Potentilla tormentilla* grows in plenty. This I set in a large flower-pot, put a glass ring over it, placed the larvæ on the plant, and covered it with gauze. *P. tormentilla* grows under the shelter of dwarf bushes, principally bramble; and while digging the plant up I noticed some of the bramble leaves were blotched, which I found was the work of a *Coleophora* larva, so closely resembling those sent me by Mr. Fletcher that I believe them to be the same species. They occurred only on the bramble leaves nearest the ground, and were so abundant that I collected a hundred in about a couple of hours.—WM. MACHIN; 29, Carlton Road, Carlton Square, E., Nov. 10.

A NEPTICULA NEW TO SCIENCE.—In April last I reared two males and one female of a very handsome *Nepticula*, from leaves of a garden rose. Thinking they were *N. centifoliella*, I sent them to Mr. Stainton for inspection. He has, however, pronounced them to be quite new, and honoured me by naming them *Nepticula hodgkinsoni*. The beauty of this new little moth is fully conveyed in Mr. Stainton's remark, "What a resplendent insect it is!" I have been hard at work among rose trees, from the middle of August until the middle of October, but cannot tell whether or not I shall breed any more.—J. B. HODGKINSON, 15, Spring Bank, Preston, November 1, 1884.

HAGGERSTON ENTOMOLOGICAL SOCIETY.—The Annual Pocket-box Exhibition of this Society was held on Thursday, November 13th, and as regards the number of members and visitors present was very successful. The exhibits, however, were hardly so numerous as on previous occasions, though many interesting boxes were on the table. Prominent among these was Mr. Meek's very fine lot of *Hepialus humuli*, from Unst, consisting of the

peculiar forms which are now so well known to entomologists. In the same case were several specimens of *Melanippe montanata* var. *shetlandica*, *Emmelesia albulata* var. *thules*, black varieties of *Noctua glareosa* and *Larentia cæsiata*, together with *Mamestra furva*, dark varieties of *Noctua conflua*, and some very extraordinary and beautiful forms of *Agrostis cursoria*. Mr. Meek also contributed specimens of the new *Eupithecia curzonii* and *Criniodes exulis*, all from the above locality. Mr. J. A. Cooper showed a magnificent lot of *Melitæa artemis*, reared on honeysuckle, and also specimens of *Polyommatus phlæas*, which he had succeeded in rearing from the ova; the specimens were full-sized and very brilliant in colour. In the same case were observed *Endromis versicolor* and *Petasia nubeculosa*, from Rannoch; two specimens of *Anthocharis cardamines*, having yellow markings in place of orange; a variety of *Lycæna corydon* with spotless underside, and many other interesting species. Mr. J. A. Clark exhibited a small box containing a suffused specimen of *Crocallis elinguaris* of peculiar colour, the insect looking more like *Ellopiia fasciaria*; also *Melanippe rubiginata* var. *plumbeolata*, and a variety of *Cidaria fulvata*; four varieties of *C. corylata*, *Phibalapteryx lapidata*, *Dianthechia irregularis* and very fine *Melitæa artemis*. Mr. W. Harper had a nice series of *Angerona prunaria*, and also a second brood of same, the difference in size being very marked; also specimens of *Platypteryx falcula*, *P. lacertula*, *P. unguicula* and *P. hamula*. Mr. Southey showed a fine series each of *Hepialus sylvanus*, *Noctua rubi*, *Tæniocampa rubricosa*, *Xylophasia scolopacina* and varieties of *Abraxis grossulariata*. Mr. Gee also exhibited his splendid specimen of *A. grossulariata*, having the wings richly suffused with orange. Other exhibits were by Mr. Bartlett, *Phycis betulella*, *P. ornatella*, *P. subornatella* and *Crambus dumetellus*; Mr. Hockett, series each of *Callimorpha dominula*, *Boarmia rhomboidaria* var. *perfumaria*, and a variety of *Lycæna corydon*, with spotless underside; Mr. G. Gates, varieties of *Arctia caja*, all much suffused, and one entirely smoke-coloured with the exception of the body. These were a second brood, and Mr. Gates has obtained a third brood this year, some of which young larvæ he exhibited; Mr. May, case of life-histories of Lepidoptera; Mr. Machin, *Geometra smaragdaria*; Dr. Pool, specimen of *Chærocampa nerii*, captured at Tottenham; Mr. Boden, red form of *Tæniocampa gracilis*;



Mr. Williams, *Acronycta leporina*, *A. alni*, *A. ligustri*; also larvæ of *Macroglossa stellatarum* and *Ennomos angularia*; Mr. Hawes, specimen of *Laphygma exigua*, two varieties of *Smerinthus tiliæ* and others; Mr. Pratt, specimen of *Prionus coriarius*, captured at Chingford. Certain prizes having been offered for competition, these were awarded; and the President, in presenting them, expressed his regret that members had not taken more interest in them.—ERNEST ANDERSON, Hon. Sec.

SOUTH LONDON ENTOMOLOGICAL SOCIETY.—The Pocket-box Exhibition, held at the rooms of the above-named Society on the 20th ult., was a pleasant surprise to those who attended. No better display of Lepidoptera and Coleoptera has been seen for a considerable time, and it reflects great credit upon the members of the Society, which seems to be a growing one. Apart from the assistance mutually rendered in the identification of doubtful species, such meetings tend to produce a kindly feeling among collectors, and by bringing them together make them better known to each other. That the past collecting season has been somewhat better than its immediate predecessors can hardly be doubted, if the display at this Exhibition can be taken as a criterion; for not only were common species abundant, but many rarities figured among the exhibits. Standing out prominently were the Tortrices shown by Mr. R. South, among which were *Pædisca semifuscana* and *P. sordidana*, obtained during his recent visit to North Devon; also the Pterophori of Mr. Wellman, including *Oxyptilus teucrîi* from Boxhill, and *Platyptilus zetterstedti* from Folkestone; and, what was more interesting to breeders of Macro-Lepidoptera, three successive broods of *Timandra amataria*, in gradation from large to small, while in some *Acidalia incanaria* the reverse was the case. Long rows of each of *Sesia chrysidiformis* and *S. cynipiformis*, and of peculiar types of *Teniocampa gracilis*, were shown by Mr. C. Boden, and among his *Nyssia hispidaria*, which were very fine, was one much-admired specimen with full borders to the fore wings. Nine *Boletobia fuliginaria* were shown by Mr. E. Upton, and Mr. R. Adkin exhibited varieties of *Smerinthus tiliæ*, besides Tortrices and Tineæ. Mr. H. Jobson's exhibit showed how variable an insect is *Angerona prunaria*; and Mr. G. Elisha, besides an extensive exhibit of Tineæ, showed a large number of well-preserved larvæ, among which I noticed that of *Pachnobia alpina*; also

preserved larvæ, showing the life-histories of many common species, were exhibited by the Secretary, Mr. Walter A. Pearce. Mr. H. T. Dobson's box contained a very good specimen of *Vanessa antiopa*, caught at New Malden; also *Stauropus fagi* and others. Among the other exhibitors were—Mr. West, of Streatham, with *Anticlea sinuata*; Mr. Cook with *Deilephila livornica*; Mr. Machin with *Acronycta alni* and *Geometra smaragdaria*; and Mr. W. H. Tugwell with *Vanessa urticæ* of very uncommon dark appearance, besides *Sesia sphegiformis*, *Acronycta alni*, and others. Nor were the Coleoptera or Hymenoptera unrepresented, for the excellent exhibits of Mr. T. R. Billups and Mr. G. A. Lewcock formed an exhibition in themselves. Among the numerous specimens shown by the former gentleman was *Dytiscus lapponicus* from Scotland, the rare and minute *Gymnusa brevicollis*, *Orchesia micans*, and a species believed to be new to Britain, viz., *Trichopteryx brevicornis*; and among the Fossorial Hymenoptera was *Odynerus reniformis*, with its parasite *Elampus panzeri*, and an exceeding rarity in the shape of a seven-legged specimen of *Phorbia fluccosa*. Among Mr. Lewcock's exhibit I noticed *Donacia menyanthidis*, *Pachyta collaris*, and the local species *Malachius ruficollis* and *M. pulicarius*, besides others equally good in the eyes of coleopterists; the whole forming an exhibition of which the South London Entomological Society may be proud.—W. H. WRIGHT; Secretary's Department, Inland Revenue, November 21, 1884.

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#### REVIEW.

*Rhopalocera Europæ descripta et delineata. The Butterflies of Europe described and figured.* By HENRY C. LANG, M. D., F. L. S., &c. Illustrated with more than eight hundred coloured figures, drawn, mostly from nature, under the direction of the author. Royal 8vo. London: L. Reeve & Co., 1884. Vol. i., text pp. viii., 396; vol. ii. pp. xii. plates lxxxii.

OF late years the study of Entomology bids fair to rival the popularity of that of Botany. It is true that the subject is one of enormous extent, and that very much still remains to be done before our knowledge of even British insects can be said to be anything like complete; but every year the number of important

works is increasing. With our modern facilities for travel, and the increased study of modern languages, too, our knowledge is no longer confined to British species or British publications. Although J. F. Stephens wrote in English, he complained bitterly fifty years ago of German entomologists for not writing in Latin; and many of the errors in his works are attributable to his having frequently attempted to identify British species with those of Oechsenheimer and Treitschke, for example, by the aid of the Latin diagnoses only. The lepidopterists of a later period (about twenty-five years ago) collected only British species, and looked on the study of foreign insects with great dislike, and almost with contempt. Although there were several entomologists who collected foreign Lepidoptera at that time, yet the only man in England who made a special study of European Lepidoptera was Mr. J. R. Hind, who shortly afterwards gave up the study of Entomology, but to whose encouragement, and to that of Mr. Stainton, was really due the publication of Kirby's 'Manual of European Butterflies,' a book which, whatever its imperfections, broke the ice, and encouraged travellers on the Continent to collect and study butterflies for themselves; and the study of European Macro-Lepidoptera has recently been further popularised by the same author's 'European Butterflies and Moths.'

The publication of Dr. Lang's elaborate work marks another advance. Being restricted to a limited group (for the European butterflies only number about 300 species), the author has endeavoured to work up his subject thoroughly, and has not only described every recognised European species, with full notices of transformations, varieties, localities, &c., but has given us excellent figures of all the species, with but two exceptions, and of many of their larvæ. The indices too, a matter of no little importance, are very full.

Nor has Dr. Lang wholly confined himself to European species. One argument employed against collecting European insects was, that we could not draw a hard-and-fast line, and that if we extended our collections beyond Britain, in order to study the allied Continental species, we must likewise collect those of the adjacent parts of Asia. This is true in a wider sense than the objectors supposed, for everyone now clearly recognises that Europe forms but a part of the Palæarctic Region; and the authors of the standard 'Catalogue of European Lepidoptera'

(Staudinger and Wocke) have always given a subsidiary place in their work to the species of Northern, Western, and Central Asia, and Northern Africa; while the whole fauna of the Circumpolar Regions and of temperate North America is very similar to that of Europe. Hence, although Dr. Lang has only given figures and full descriptions of European species, he has added incidental notices and frequently short descriptions of most of the outlying species included by Staudinger, as well as of some of the allied North American species. We believe that it is Dr. Lang's intention, should circumstances permit, to prepare a companion volume to the present, in which all the butterflies of the non-European portion of the Palæartic Fauna should be fully described and illustrated. This would, from a scientific point of view, be an even more valuable work than the present, for the descriptions and figures of the greater part of these outlying species are scattered through a large number of periodicals, many of which are only accessible in the largest entomological libraries, and even so, are by no means easy to compare. While the first work will probably find its largest sale in England (although more comprehensive than any good Continental book issued at anything like a moderate price), the second would be indispensable to almost every lepidopterist who collects European butterflies at all; for nearly all lepidopterists who do not restrict their studies to the species found in their own immediate neighbourhood, open their collections to all species from the districts included in Staudinger's Catalogue.

Staudinger's last Catalogue, of 1871, although published thirteen years ago, and not based upon the latest and most natural system of classification, according to our present ideas, is yet the standard text-book of all collectors of European Lepidoptera; and we think that Dr. Lang has acted wisely in adopting its classification, and taking it as his general standard for the limits of species and varieties, although he has not followed it servilely, and has endeavoured to avail himself, as far as possible, of all accessible sources of further information up to the present date. The bibliography which he has appended to his work, though it might have been rendered more complete (for we miss the names of some authors whom we think Dr. Lang should have consulted, such as Berce and Speyer), will be found very useful to those who wish to carry on the study systematically,

and to refer to the original authorities ; and on the whole we can heartily congratulate the author on the production of a very useful and meritorious work.

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OBITUARY.

ARNOLD FÖRSTER (or Foerster, his earlier use) died at Aix-la-Chapelle, on August 13th last, at the age of 74. He was born there on January 21st, 1810, educated at the public school there, soon to return as "Lehrer," in April, 1836, "Oberlehrer" in April, 1850 ; and in 1855 became entitled to "Prof. Dr. Foerster," an acknowledgment of his entomological studies from his country and from his university. He entered the University of Bonn in 1832, and, entomologically speaking, his own words now become of interest to all hymenopterists. In 1868 he wrote,—“ In Nees von Esenbeck's rich collection, which I became acquainted with at Bonn, I obtained the first suggestion—as it were the first bias—to a study which presented a new world full of unexplained phenomena. Here I also learnt, as I still keep in lively and thankful remembrance, to know the main generic types of the different orders of insects ; the knowledge of which could indeed only be attained to through autopsy, or with great exertions, from the deficient literature of that early period. The Neesian collection first gave my studies a fixed direction and determination. This author's 'Hymenopterorum Ichneumonibus affinium Monographiæ' treats of the first three tribes of the parasitic hymenoptera,—the Chalcididæ, Proctotrupidæ, and the Braconidæ,—the study of which I have eagerly pursued throughout.” And so it is, for Förster has been a most voluminous writer on the parasitic Hymenoptera since 1841, when his monograph of the 'Pteromalinen' appeared. Since then we have had most elaborate—too elaborate—monographs of *Pezomachus* (1850—1), *Campoplex* (1868), *Hyleus* (*Prosopis*) (1871), *Plectiscus* (1871), and *Stilpnus* (1876), published in Wiegmann's 'Archiv,' the 'Rheinland,' and the 'Vienna Verhandlungen.' When we find one species, Gravenhorst's *Exolytus lævigatus*, divided into 57 species of females and 136 of males, it is natural to feel somewhat alarmed (see Verh. ver. Rheinl. xxxiii., 47—118). His various papers on the Tenthredinidæ, Proctotrupidæ and Chalcididæ in various serials, and his three "Centurien" of new

Hymenoptera in the 'Rheinland Verhandlungen,' are known to all hymenopterists. His best known works, however, are his 'Hymenopterologische Studien,' separately published in two volumes at Aix (Aachen), in 1851 and 1856; the first relating to the ants ("Formicariæ"), the second to the "Chalcididæ" and "Proctotrupii." It was on his Synopses of the Cynipidæ, 1869 (93 genera!); of the Braconidæ 1862 (210 genera!); and of the Ichneumonidæ, 1868 (640 genera!), that most labour was spent. These are presented in the forms of analytical tables, which in the case of these numerous hypothetical genera, about which there is a certain philosophy, does not altogether serve to lessen the labours of those who come after, although this was doubtless Förster's intention; for in his monograph of *Campoplex*—in which he describes seventy-two species from three Gravenhorstian ones—he prefaces it with these remarks:—"Without the help of an analytical table I should scarcely venture to offer the entomological public such prolix and numerous descriptions." As Francis Walker truly said of him—"Many of his genera have no certain resting-places, and the author would have deserved more praise if he had described a typical species of each genus." Förster was, however, a great master of the parasitic Hymenoptera and did some good work; whether his numerous genera and species will ever be adopted remains to be seen; extended knowledge will soon test their value. Doubtless he was a conscientious worker and a very laborious one; he was a fairly good correspondent (although Frederick Smith would certainly not have said so of him) and distributed specimens freely, too often, however, with manuscript names. We can but regret that so great a master is no longer amongst us, and can fully corroborate what we are told the journals of Aix-la-Chapelle are unanimous in saying, that Dr. Förster leaves to his fellow citizens the grand example of a life full of honour and of work. Förster's collection is said to be a remarkable one, and on the disposition of this greatly depend the ultimate results of his busy life. Förster, like his master Nees, was a distinguished botanist as well as entomologist; he was a whilom member of the London, French, Stettin, Vienna, and several other entomological and natural history societies.—E. A. F.

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TABLE SHOWING THE CHANGES OF NOMENCLATURE,  
&c., FROM DOUBLEDAY'S LIST, MADE IN THE  
'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH  
LEPIDOPTERA.

To save the time of our readers, and to assist them in the use of 'The Entomologist Synonymic List of British Lepidoptera,' I have made out an alphabetical list of the changes from Doubleday's List.

In the first column will be found the Doubleday names, placed alphabetically; in the second column, their equivalents in the new List, the figures denoting the page where the name in question may be found. In both columns the species are set back, and the genera, families, &c., set slightly forward. A genus in the second column, opposite a species in the first column, means that the name of the genus is changed, but not that of the species. A species, in the second column, followed by a genus (in parenthesis), signifies that both specific and generic names are changed. A Doubleday genus split up into several genera appears as in *Botys* and *Gelechia*.

The remaining columns are reversed, the first column giving the 'Entomologist' List names placed alphabetically, and the second column their Doubleday equivalents: (pt.) after a genus means that it is one of the genera into which the Doubleday genus has been divided, or in other words that it is a "part" only of the Doubleday genus. Species of which the genus only is changed are omitted from these reversed columns, and hence the difference in length.

I trust the labour expended upon the alphabetical arrangements of these changes will minimise the inconvenience our readers will naturally at first feel in adopting a nomenclature for our Lepidoptera which I believe will remain permanently in use.

The additions to the British fauna since the publication of Doubleday's List and Supplements are not included below.

JOHN T. CARRINGTON.

November, 1884.

<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
Abdominella	abdominalis	35	Abdominalis	abdominella
Abietella	Dioryctria	21	Acanthodactyla (Am.)	acanthodactylus
Abrostola	Habrostola	10	Acetosæ	acetosella
Abscisana	fuligana	23	ACIDALIDÆ	ACIDALIDÆ
Acanthodactylus	{ acanthodactyla } { (Amblyptilia) }	19	Acipitilia (pt.)	Pterophorus
Acerifoliella	sylvella	38	ACONTIIDÆ	ACONTIIDÆ
Aceriana	Hedya	23	Adæquata	blandiata
Acetosella	acetosæ	39	ADELIDÆ (pt.)	TINEIDÆ
ACIDALIDÆ	ACIDALIIDÆ	13	Adornatella	dilutella
Acis	semiargus	2	Æmulana	modestana
ACONTIDÆ	ACONTIIDÆ	10	Æthiops	blandina
Acuminatella	Lita	32	Æthiops (Lita)	æthiopella
Adelphella	rhennella (Nephopt.)	21	Acanthophila (pt.)	Gelechia
Adipellus	sylvellus	19	Affinis (Bryotropha)	affinetella
Adjunctana	forsterana	22	Aglaja	aglaja
Adonis	bellargus	2	Albiceps (Pœcilia)	albicapitella
Ægeria	Pararge	1	Albicosta	albicostella
Ænea	viridaria	11	Albistria	albstriella
Æthiopella	æthiops (Lita)	32	Albovenosa (Arsilon.)	venosa
Affinetella	affinis (Bryotropha)	32	Alcella	tesserana
Affinis	Calymnia	9	Alchimiella	swederella
Agestis	astrarche	2	Alniaria (Eugonia)	tiliaria
Aglaja	aglaja	1	Alpina	paralis
Alacella	Acanthophila	33	Alternana	daleana
Albicapitella	albiceps (Pœcilia)	33	Alternana	gigantana
Albicostella	albicosta	36	Amandana	sordaliana
Albimaculella	angustella	34	Amandana	sodaliana
Albipalpella	Anacamptis	33	Ambiguella	ambiguana
Albistriella	albistria	35	Amblyptilia (pt.)	Pterophorus
Aleella	scaella	32	Amphisbatis (pt.)	Butalis
Alexis	icarus	2	Anacamptis	Gelechia
Allionella	aureatella	30	Anellus (Melissob.)	anella
Alpella	Cerostoma	31	Angularia	viduaria
Alpina	hyperborea	8	Angustana	augustana
Alpinella	monticola	37	Angustea	coarctalis
Alternana	chrysantheana	24	Angustella	albimaculella
Alveariella	grisella (Achroea)	21	Annulata (Zonos.)	omicronaria
Ambiguana	ambiguella	27	APAMEIDÆ	APAMEIDÆ
Amenana	incarnatana	23	APHELIIDÆ	APHELIIDÆ
Anella	anellus (Melissob.)	21	Apicella	cacuminatella
Anguinalis	nigrata	18	Apodia (pt.)	Gelechia
Angustella	Alispa	20	Applana	applanella
Anthocharis	Euchloë	1	Arbutella	arbutana
Anthyllidella	Anacamptis	33	Arceuthina	arceuthinella
APAMIDÆ	APAMEIDÆ	6	Arctia (pt.)	Chelonia
APHELIDÆ	APHELIIDÆ	28	Arcuatella	arcuosella
Applanella	applana	32	Argentella	cygnipennella
Arbutana	arbutella	24	Argentula	argentulella
Arbuti	tenebrata (Heliaca)	10	ARGYRESTHIDÆ	ARGYRESTHIDÆ
Arceuthata	helveticaria	15	Argyrites (pt.)	Gelechia
Arceuthinella	arceuthina	35	Argyropeza	argyropezilla
Arcuosella	arcuatella	39	Arsilonche	Simyra
Arge	Melanargia	1	Arundinis	typhæ
Argentimaculella	Tinea	29	Asiliformis	cygnipiformis
Argentulella	argentula	36	Associata	dotata
ARGYRESTHIDÆ	ARGYRESTHIDÆ	35	Asteroscopus	Petasia
Argyropezilla	argyropeza	39	Astrarche	agestis
Aridus	bipunctactyla	19	Atemelia (pt.)	Butalis
Artemis	aurinia	1	Atrata	chærophyllata
Artemisiella	Lita	32	Atracollis	atricolella
Artemisiella	cinerosella (Euzop.)	20	Aurana	mediana
Arundinetella	Doryphora	33	Aurata	puniccalis
ASPIDÆ	(not used)		Aureatella	allionella
			Aurifrontella	flavicapitella



<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
Asperella	Cerostoma	31	Aurinia	artemis
Assimilis	exulis (Crymodes)	9	Auroguttella	atriplicivorella
Atrella	Lamprotes	33	Avellanella	avellanæcolella
Atriclella	atricollis	39	AVENTIIDÆ	AVENTIÆ
Atriplicivorella	Lita	33		
Audouinana	auroguttella	36		
Augustana	bifasciana	28		
Aurimaculella	angustana	25		
Autumnana	nigricomella	39		
Autumnitella	rufana	22		
Avellanella	pygmæana	35		
Avellanæcolella	Semioscopus	28		
AVENTIÆ	avellanella	36		
	AVENTIIDÆ	11		
Baja	baia	8	Baia	baja
Bajularia	pustulata	12	Baliodactyla (Acipt.)	baliodactylus
Baliodactylus	baliodactyla (Acipt.)	19	Bapta	Corycia
Barbalis	Pechypogon	11	Bellargus	adonis
Barretti	luteago	9	Betulæ	betulella
Basaltinella	Brytrophia	32	Betulæ	betulævorella
Baumanniana	hartmanniana	28	Beticola	betulicolella
Bembeciformis	crabroniformis (Tro.)	2	Bicolor	bicolora
Bertrami	Platyptilia	19	Bicolorata	rubiginata
Betulella	betulæ	20	Bicoloria	furuncula
Betulævorella	betulæ	36	Bifasciana	audouinana
Betulicolella	betulicola	39	Bilunaria	illunaria
Betulina	Fumea	29	Bimaculata (Bapta)	taminata
Bicolora	bicolor	5	Binævella	eluvella
Bifractella	Apodia	33	Binaria (Drepana)	hamula
Bimaculana	similana	25	Bipunctidactyla	{ aridus serotinus bipunctidactylus
Bipunctidactylus	{ bipunctidactyla } { (Mimæseoptilus) }	19	Bistriga	bistrigella
Bipunctosella	flavella	31	Bjerkandrella (Cho.)	vibrana
Birdella	Ochsenheimeria	29	Blabophanes (pt.)	Tinea
Biselliella	Tineola	29	Blomeri	blomeraria
Bisontella	Ochsenheimeria	29	BOARMIDÆ	BOARMIDÆ
Bistrigella	Phylloporia	29	Boleti	chorargella
Bistrigella	bistriga	20	BOLETOBIIDÆ	BOLETOBIIDÆ
Blanda	taraxaci	7	BOMBYCOIDÆ	TRIFIDÆ
Blandiata	adæquata	15	Brachmia	Gelechia
Blandina	æthiops	1	Brachycrossata (pt.)	Gelechia
Blomeraria	blomeri	13	BREPHIDES	PHALENOIDÆ
BOARMIDÆ	BOARMIDÆ	12	Brochella	brockeella
BOLETOBIIDÆ	BOLETOBIIDÆ	11	Brongniartellum	brongniardella
BOMBYCIFORMES	(not used)		Brunneata (Halia)	pinetaria
Botys (divided)	Botys	18	BRYOPHILIDÆ	TRIFIDÆ
	Eurrhypara	18	Brytrophia	Gelechia
	Perinephele	18		
Bouchardana	rubiginosana (Pæd.)	25		
Brachydactylus	Leioptilus	19		
Branderiana	Orthotænia	24		
Brizella	Ergatis	33		
Brockeella	brochella	35		
Brogniardella	brongniartellum	36		
Bucephala	Phalera	5		
	Butalis	34		
Butalis (div.)	Amphisbatis	34		
	Atemelia	34		
Cacuminatella	apicella	36	Cæsiella	griseocapitella
Caja	caia (Arctia)	3	Cagnagellus (Hypo.)	cognatella
Callunæ	quercus	4	Caia (Arctia)	caja
Calvella	hirsutella	29	Calamia (pt.)	Leucania

<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
Cambricaria	cambrica	13	Calymnia	Cosmia
Camelina	Lophopteryx	5	Cambrica	cambricaria
Campoliana	subocellana	25	Candidulana	wimmerana
Carbonana	fuligana	23	Captiuncula (Photh.)	expolita
Carbonariella	fusca	20	Carpinata	lobulata
Cardamines	Euchloë	1	Carterocephalus (pt.)	Hesperia
Carmelita	Lophopteryx	5	Castanea	neglecta
Carnella	semirubella	20	Cembræ	cembralis
Carpinetella	parasitella	29	Ceratophora (pt.)	Gelechia
Carpini	pavonia	4	Cerostoma	Ypsolopha
Cassentiliellus	craterellus	20	Cerostoma	Hypolepia
Cassinea	sphinx (Asteroscop.)	10	Cervinata	cervinaria
Cassiope	epiphron	1	Chærophyllellus	chærophyllella
Caudana	Rhacodia	22	Chærophylli	{ chærophyllivo- rella
Caudella	mucronella (Theris.)	31	Chariclea (pt.)	Heliothis
Cautella	nigra	32	CHELONIDÆ	CHELONIDÆ
Cembralis	cembræ	17	Choreutes	Symæthis
Centaureata	oblongata	15	Chrysantheana	alternana
Cerago	fulvago	8	Chryson	orichalcea
Cerealella	Sitotroga	33	Chrysozona	dysodea
Cerella	mellonella	21	Cidarella	cidariella
Certata	Eucosmia	16	Cilliella	ruficiliana
Cervinaria	cervinata	17	Cinerosella (Euzop.)	artemisiella
Chelonia (div.)	Arctia	3	Cingulata	cingulalis
	Nemophila	3	Circellaris	ferruginea
CHELONIDÆ	CHELONIDÆ	3	Citrinalis	christiennella
Chenopodii	trifolii	9	Cladodes (pt.)	Gelechia
Chorargella	boleti	29	Cleoceris (pt.)	Epunda
Chortobius	Cænonympha	2	Cnæmidophorus (pt.)	Pterophorus
Chærophyllata	atrata	17	COCHLIPODIDÆ	COCHLIPODIDÆ
Chærophyllella	chærophyllellus	37	Cænobia (pt.)	Nonagria
Chærophyllivo- rella	chærophylli	32	Cænonympha	Chortobius
Christiennella	citrinalis	34	Combinella	compbella
Chrysorrhœa	Porthesia	4	Comes	orbona
Cidariella	cidarella	39	Compositella	composana
Cinctalis	verticalis	18	CONCHYLIDÆ	CONCHYLIDÆ
Cinerella	Brachycrossata	33	Confusalis	crystalalis
Cinerosella	Euzophora	20	Congelata	gelatella
Cingulalis	cingulata	17	Consequana (Præd.)	hawkerana
Citraria	ochrearia	14	Conspersana	perterana
Citrinella	sulphurellum	36	Coracina	trepidaria
CLEDEOBIDÆ	(not used)		Corollana	heergerana
Clorana	Earias	3	Corticana	picana
Clostera	Pygæra	5	Corticella	emortuella
Coarctalis	angustea	17	Coryli	corylella
COCHYLIDÆ	CONCHYLIDÆ	27	Cosmia	Euperia
COCLIPODIDÆ	COCHLIPODIDÆ	4	COSMIDÆ	COSMIDÆ
Cognatella	cagnagellus (Hypo.)	30	Cosmodactyla (Amb.)	punctidactylus
Complanula	lurideola	3	Costalis	fimbrialis
Composana	compositella	26	Costosa	costosella
Comptella	combinella	30	Crabroniformis (Tro.)	bembeciformis
Conchana	rivulana	23	CRAMBI	CRAMBITES
Concolor	extrema (Tapinostola)	6	Cratægella	cratægalis
Conformis	furcifera	10	Cratægi	cratægifoliella
Conscriptella	hubnerella	34	Craterellus	{ cassentiliellus rorellus
Conspersa	nana	9	Cribrum	cribrella
Conspicua	limbaria	14	Croesella	sulzella
Coronillella	Anacamptis	33	Cruciferarum	xylostella
Corycia	Bapta	13	Crymodes (pt.)	Hadena
Corylella	coryli	38	Cuculla (Lophop.)	cucullina
Cosmia	Calymnia	9	Cucullata	sinuata
COSMIDÆ	COSMIDÆ	9	Cuculipennellum	cuculipennella
Costella	Lita	32		

<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
Costella	Cerostoma	31	Cultraria (Drepana)	unguicula
Costosella	costosa	31	Cupriacellus	cupriacella
Cœnosa	Lælia	4	Curtisellus (Prays)	curtisella
CRAMBITES	CRAMBI	19	CYMATOPHORIDÆ	{ NOCTUIDÆ BOMBYCIDÆ
Crassalis	fontis (BromoIocha)	11		
Crassiorella	Fumœa	29		
Cratægalis	cratægella	17		
Cratægata	luteolata	11		
Cratægi	Aporia	1		
Cratægifoliella	cratægi	39		
Crenata	Glyphisia	4		
Cribrella	cribrum	20		
Cribrum	Emydia	3		
Cristulalis	confusalis	3		
Cruda	pulverulenta	8		
Cubicularis	quadripunctata	7		
Cuculipennella	cuculipennellum	36		
Cucullina	cuculla (Lophop.)	5		
Cupriacella	cupriacellus	30		
Curtisella	curtisellus (Prays)	31		
Curtula	Pygœra	5		
Cygnipennella	argentella	38		
CYMBIDÆ	NYCTEOLIDÆ	3		
Cynipiformis	asiliformis	2		
Cynosbana	variegana	23		
Cythœrea	matura	6		
Cytisaria	pruinata	12		
Daleana	alternana	24	Dealbana	incarnatana
Davisella	genistella	21	Deplana	helveola
Davus	typhon (Cœno.)	2	Designata	propugnata
Dealbana	Hedya	23	Didyma	oculea
Dealbata	lineata	14	Diffinis	diffinella
DELTOIDES	(not used)		Dilutaria	osseata
Denotata	pimpinellata	15	Dilutaria	interjectaria
Derivata	nigrofasciaria	16	Dimidiana	ochromelana
Desertella	Bryotropha	32	Dimidiata	scutulata
Despecta	rufa (Cœnobia)	6	Dipoltella	dipoltana
Diffinella	diffinis	32	Discipunctella	pastinacella
Diffinis	Calymnia	9	Dispunctella	triseriatella
Diluta	Asphalia	5	Dissimilis	suasa
Dilutella	adornatella	21	Diversana	transitana
Diphthera	Moma	5	Domestica	domesticella
Dipoltana	dipoltella	28	Dorsana	lunulana
Dispar	Ocneria	4	Doryphora (pt.)	Gelechia
DIURNI	RHOPALOCERA	1	Dotata	pyraliata
Dodecella	Teleia	33	Drepana	Platypteryx
Dodonea	trimacula	5	Dubitalis	pyralalis
Domesticella	domestica	32		
Dotata	associata	17		
DREPANULÆ	(not used)			
Drurella	eximia	37		
Dubitata	Triphosa	16		
Dubrisana	zephyrana	28		
Durdhamella	schmidiellus (Hypr.)	34		
Dysodea	chrysozona	9		
Elutata	sordidata (Hyps.)	16	Emydia	Eulepia
Eluviella	binævella	20	EPIGRAPHIIDÆ	EPIGRAPHIDÆ
Elymi	Tapinostola	6	Epiphron	cassiope
Emortualis	Zanclognatha	11	ERASTRIDÆ	ERASTRIDÆ
Emortuella	corticella	29	Ergatis (pt.)	Gelechia
Empyrea	flammea	9	Ericetaria	plumaria
Emyella	marginœa	38	Erxlebenella	erxlebella

<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
Ennomos	Eugonia	12	EUBOLIDÆ	EUBOLIDÆ
ENNYCHIDÆ	(not used)		EUCHELIDÆ	EUCHELIDÆ
Ehippana	populana	26	Euchloë	Anthocharis
Ephyra	Zonosoma	13	EUCLIDIDÆ	EUCLIDIDÆ
EPIGRAPHIDÆ	EPIGRAPHIDÆ	28	Eucosmia (pt.)	Scotosia
Epunda (div.)	Epunda	9	Eugonia	Ennomos
	Cleoceris	9	Euphorbiæ	myricæ
ERASTRIDÆ	ERASTRIDÆ	10	Eurrhypara (pt.)	Botys
Ericetata	minorata	15	Evonymellus (Hyp.)	evonymella
Ericinella	Ergatis	33	Exanthemata	exanthemaria
Erosaria	Eugonia	12	Eximia	drurella
Erxlebella	erxlebenella	35	Extimalis (Orobena)	margaritalis
EUBOLIDÆ	EUBOLIDÆ	17	Extrema (Tapinosto.)	concolor
EUCHELIDÆ	EUCHELIDÆ	3	Exulis (Crymodes)	assimilis
EUCLIDIDÆ	EUCLIDIDÆ	11		
Eulepia	Emydia	3		
Euperia	Cosmia	9		
Euphorbiata	murinata	14		
Euthemonia	Nemeophila	3		
Evonymella	evonymellus (Hyp.)	30		
Exanthemaria	exanthemata	13		
Expolita	captiuncula (Photh.)	7		
Expolitella	politella (Bryotro.)	33		
Extersaria	luridata	12		
Fabriciana	oxyacanthella (Sym.)	27	Falcataria (Drepana)	falcula
Falcula	falcataria (Drepana)	4	Fascelinellus	pedriolellus
Farrella	Epischnia	20	Fasciana	fuscula
Fascelina	Dasychira	4	Fasciellus	schiffermillerella
Fasciaria	prosapiaria	11	Fasciellus (Hypsilo.)	fasciella
Fasciella	fasciellus (Hypsilo.)	34	Favillaceana	ochraceana
Favillaceana	sponsana	22	FIDONIDÆ	FIDONIDÆ
Ferruginea	circellaris	8	Flammea	empyrea
Ferruginella	Blabophanes	29	Flavago	silago
Fibrosa	leucostigma	6	Flavella	liturella
FIDONIDÆ	FIDONIDÆ	14	Flavella	bipunctosella
Fimbrialis	costalis	17	Flavicincta	flavicincta
Flammeana	mygindana	24	Flavicinctata	ruficinctata
Flavicornis	Asphalia	5	Flexana	weirana
Flavago	ochracea	6	Fœnella	fœnana
Flavicapitella	aurifrontella	37	Fontis (Bomolocha)	crassalis
Flavimaculella	fulviguttella	34	Formosa	formosella
Flavocincta	flavicincta	9	Forsterana	adjunctana
Formosella	formosa	21	Forsterella	oculata
Fœneana	fœnella	26	Fulgana	carbonana
Fraternella	Lita	32	Fulgana	abscisana
Fugitivella	Teleia	33	Fulvago	cerago
Fuliginosa	Spilosoma	4	Fulviguttella	flavimaculella
Fulva	Tapinostola	6	Furcifera	conformis
Fulvago	paleacea (Cosmia)	9	Fusca	carbonariella
Furuncula	bicoloria	7	Fuscescens	fuscescentella
Fuscantaria	Eugonia	12	Fuscoœnea	fuscoœneella
Fuscocentella	fuscescens	34	Fuscocuprea	fuscocuprella
Fuscoarella	unitella	34	Fuscocuprella	fuscociliella
Fuscocuprella	fuscocuprea	34		
Fuscodactylus	pterodactylus (Mim.)	19		
Fuscula	fasciana	10		
Fuscoœneella	fuscoœnea	34		
Fuscociliella	fuscocuprella	36		
Galactodactylus	galactodactyla (Acip.)	19	Galactodactyla (Acip.)	galactodactylus
Galatea	Melanargia	1	GALLERIDÆ (pt.)	PHYCIDÆ
Gallicolana	obscurana	26	GELECHIDÆ	GELECHIDÆ
Ganomella	lapella	29	Gemmaria	rhomboidaria

<i>Doubleday.</i>	<i>Entom. List.</i>	<i>Entom. List.</i>	<i>Doubleday.</i>
Gelatella	congelatella 28	Genistæ	genistella
	Gelechia 32	Genistæ	genistæcolella
	Brachmia 32	Genistella	davisella
	Bryotropha 32	Germarana	puncticostana
	Lita 32	Glaucata	spinula
	Teleia 33	Glutinosæ	glutinosella
	Recurvaria 33	Glyphisia	gluphisia
	Pœcilia 33	Gœdartella	literella
	Argyrites 33	Gonodactyla (Platy.)	trigonodactylus
	Nannodia 33	GRACILARIIDÆ	GRACILARIIDÆ
	Apodia 33	Grandipennis	grandipennella
Gelechia (div.)	Sitotroga 33	Grandis	grandella
	Ptocheuusa 33	Griseata	nivearia
	Ergatis 33	Grisella (Achrœa)	alveariella
	Doryphora 33	Griseola	stramineola
	Monochroa 33	Guttea	guttella
	Lamprotes 33		
	Anacampsis 33		
	Acanthophila 33		
	Tachyptilia 33		
	Brachycrossata 33		
	Ceratophora 33		
	Cladodes 34		
GELECHIDÆ	GELECHIDÆ 31		
Gemmella	nivea (Pœcilia) 33		
Genistæcolella	genistæ 36		
Genistella	genistæ 34		
GENUINÆ	(not used)		
Germarana	roseticolana 27		
Gerronella	Cladodes 34		
Geryon	Ino 3		
Gigantana	altermana 28		
Glandifera	muralis 5		
Globulariæ	Ino 3		
Gluphisia	Glyphisia 4		
Glutinosella	glutinosæ 39		
Gnomana	Dichelia 22		
GRACILARIIDÆ	GRACILARIIDÆ 35		
Grandella	grandis 34		
Grandipennella	grandipennis 34		
Granulosella	zephyrella 32		
Gregsoni	nigrella 37		
Grisealis	Zanclognatha 11		
Griseocapitella	cæsiella 30		
Guenéi	testacea 6		
Guttella	guttea 36		
Hadena (div.)	Hadena 9	Halterata	hexapterata
	Crymodes 9	Harpagula (Drepana)	sicula
Hamula	binaria (Drepana) 4	Hartmanniana	baumanniana
Harpella	xylostella 31	Haworthana	haworthella
Hawkerana	consequana (Pæd.) 25	Heliaca	heliodes
Haworthella	haworthana 35	Heliozele	Tinagma
Haworthiata	isogrammaria 15	Helveticaria	Arceuthata
Heegerana	corollana 26	Heracleana	heraciella
Heliodes	Heliaca 10	HERMINIIDÆ	HERMINIIDÆ
Heliothis (div.)	Heliothis 10	HESPERIIDÆ	HESPERIIDÆ
	Chariclea 10	Hexadactyla	polydactyla
Hellmanni	Tapinostola 6	Hirsutella	calvella
Helveola	deplana 3	Hispidus	hispidia
Heparata	obliterata 13	Homœosoma	Homœosoma
Heraciella	heracleana 32	Hubnerella	conscriptella
Herbana	lacunana 23	Hübneri (Lita)	hubnerella
Herbida	prasina 9	Humeralis (Teleia)	lyellella

<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
Hermannella	Nannodia	33	Humilis	humiliella
HERMINIDÆ	HERMINIDÆ	11	HYBERNIDÆ	HYBERNIDÆ
Hesperia (div.)	Hesperia	2	Hybridella	hybridellana
	Carterocephalus	2	Hyperanthes (Epin.)	hyperanthus
HESPERIDÆ	HESPERIDÆ	2	Hyperborea	alpina
Hexapterata	halterata	16	Hyponomeuta	Yponomeuta
Hieracii	Oxyptilus	19	HYPONOMEUTIDÆ	YPONOMEUTIDÆ
Hippocastanella	thoracella	39	Hypsilophus	Macrochila
Hippochoë	Dispar	2	Hypsipetes	Ypsipetes
Hispida	hispidus	6		
Hohenwarthi- ana	scopoliana	27		
Homæosoma	Homæosoma	20		
Hoporina	Oporina	8		
Horridella	Cerostoma	31		
Hubnerella	hübneri (Lita)	32		
Humiliella	humilis	38		
HYBERNIDÆ	HYBERNIDÆ	14		
Hybridalis	noctuella (Nomoph.)	17		
Hybridellana	hybridella	27		
Hyciniana	tædella	26		
Hyperanthus	hyperanthes (Epine.)	2		
Hypericella	liturella	31		
Hypolepia	Cerostoma	31		
Icterana	palleana	21	Ianira (Epinephele)	janira
Illigerella	illigerellus	37	Ianthina	janthina
Ilunaria	bilunaria	11	Ianthinana	janthinana
Illustraria	tetralunaria	12	Icarus	alexis
Imbutata	paludata	17	Illigerellus	illigerella
Imella	Blabophanes	29	Impudens	pudorina
Immaculatella	Anacamptis	33	Incarnatana	amœnana
Impluviata	trifasciata (Hypsip.)	16	Incerta	instabilis
Incanaria	virgularia	13	Inflatæ	inflatella
Incongruella	Amphisbatis	34	Ino	Procris
Inflatella	inflata	36	Inopella (Ptocheu.)	paupella
Inopella	Ptocheuusa	33	Inornatana	subarcuana
Inopiana	Ephippiphora	25	Irrorellus (Hypon.)	irrorella
Inornatella	Ceratophora	33	Insecurellus	insecurella
Insecurella	insecurellus	37	Instabilella (Lita)	ocellatella
Instabilella	Lita	33	Intermediella (Fum.)	roboricolella
Instabilis	incerta	8	Isogrammaria	haworthiata
Intaminatella	pulveratella (Dory.)	33		
Interjectaria	dilutaria	13		
Interruptana	leguminana	26		
INTRUSÆ	(not used)			
Irrorella	irrorellus (Hypono.)	30		
Isodactylus	Platyptilia	19		
Janira	ianira (Epinephele)	1	Juniperellus (Hyps.)	juniperella
Janthina	ianthina	8		
Janthinana	ianthinana	26		
Juniperella	juniperellus (Hyps.)	34		
Junctella	Lita	32		
Kindermann- ella	quadripunctata	34	Kleemannella	kleemannella
Kleemannella	kleemannella	38		
Knaggsiella	Lita	33		
Lacertula	lacertinaria (Drepa.)	4	Lacertinaria (Drepa.)	lacertula
Lætana	lactana	25	Lactana	ramana
Lætus	distans (Oxyptilus)	19	Lactana	lætana
Lancealis	Perinephele	18	Lacunana	herbana

<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
LARENTIDÆ	LARENTIIDÆ	14	Lambda	zinkenii
Lathonia	latona	1	Lamprotes (pt.)	Gelechia
Lathyri	lathyrella (Brach.)	32	Lapella	ganomella
Lemnalis	lemnata	18	LARENTIIDÆ	LARENTIIDÆ
Lepidana	politana	24	Laripennella	tengstromella
Leucania (div.)	Leucania	5	Lathyrella (Brach.)	nigricostella
	Calamia	5	Lathyriella (Brach.)	lathyri
LEUCANIDÆ	LEUCANIIDÆ	5	Latona	lathonia
Leucatella	Recurvaria	33	Leguminana	interruptana
Leucographa	Pachnobia	8	Leioptilus	Lienigianus
Leucomelanella	Lita	32	Leioptilus	Pterophorus
Lienigianus	Leioptilus	19	Lemnata	lemnalis
LIGIDÆ	LIGIIDÆ	14	LEUCANIIDÆ	LEUCANIDÆ
Lignata	vittata	16	Leucostigma	fibrosa
Ligulella	Anacamopsis	33	LIGIDÆ	LIGIDÆ
LIMBATÆ	(not used)		Limacodes (Hetero.)	testudo
Linea	thauomas	2	Limæseoptilus	Plagiodyctylus
Lineata	livornica	2	Limbaria	conspiciuata
Lineolalis	lineolea	17	Limitata	mensuraria
Lineolella	lineolea	36	Linearia (Zonosoma)	trilinearia
Lineolata	virgata (Mesotype)	17	Lineata	dealbata
Liparis	Porthesia	4	Lineolea	lineolella
Literalis	literata	18	Lineolea	lineolalis
Literella	gœdardella	35	Lita (pt.)	Gelechia
Lithargyrellus	warringtonellus	20	Literata	litalis
Lithodactylus	Edematophorus	19	LITHOSIIDÆ	LITHOSIIDÆ
LITHOSIIDÆ	LITHOSIIDÆ	3	Littoralis	littorana
Lithoriza	Areola	10	Liturella	hypericella
Littorana	littoralis	23	Livornica	lineata
Littorella	Ptocheuusa	33	Logiana	tristana
Liturella	flavella	31	Longicornis	longicornella
Lobella	Henicostoma	31	Lophopteryx	Notodonta
Lobulata	carpinata	16	Lorquiniana	uliginosana
Lœwii	zophodactylus (Mi.)	19	Lunaris	lunarella
Longicornella	longicornis	32	Luridata	extersaria
Lubricipeda	Spilosoma	3	Lurideola	complanula
Lucella	Cerostoma	31	Lutarea	lutarella
Lucidella	Doryphora	33	Lutarella	pygmæola
Luculella	Teleia	33	Luteago	barretti
Lunarella	lunaris	34	Luteolata	cratægata
Lunulana	dorsana	26	LYONETIIDÆ	LYONETIDÆ
Lupulinalis	nubilalis	18		
LURIDÆ	(not used)			
Lutarella	lutarea	30		
Lutosa	Calamia	6		
Lutulentella	Doryphora	33		
Lyellella	humeralis (Teleia)	33		
LYONETIDÆ	LYONETIIDÆ	38		
MACARIDÆ	MACARIIDÆ	14	MACARIIDÆ	MACARIDÆ
Macrochila	Hypsilophus	34	Macularia	maculata
Maculata	macularia	11	Maculea (Lita)	maculella
Maculella	maculea (Lita)	32	Margaritaria	margaritata
Maculiferella	Lita	32	Marginaria	progemmaria
Margaritata	margaritaria	11	Marginea	emyella
Margaritalis	extimalis (Orobena)	18	Marginicolella	marginicolella
Marginella	marginellus (Hyp.)	34	Marginellus (Hyp.)	marginella
Marginata	umbra (Chariclea)	10	Marginepunctata	promutata
Marginecolella	marginicolella	39	Maritima	maritimella
Maritimana	zephyrana	28	Maritima	ulvæ
Maritimella	maritima	39	Marmorea	marmorella
Marmorella	marmorea	21	Marmorea (Lita)	marmorella
Marmorella	marmorea (Lita)	33	Matura	cytherea
Mascullella	musculella	30	Melanargia	Arge

<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
Mediana	aurana	27	Mellonella	cerella
Megæra	Pararge	1	Mendica	medicella
Mendica	Spilosoma	3	Mercurella	mercurellalis
Medicella	medicella	35	Mercuriana	monticolana
Mensuraria	limitata	17	Mimæseoptilus	Pterophorus
Menthastri	Spilosoma	3	Minimellus	minimella
Mercurellalis	mercurella	17	Minorata	ericetata
Miana (divided)	Miana	6	Monochroa (pt.)	Gelechia
Micra	Photheses	7	Monodactylus	pterodactylus
Microdactylus	Thalpochares	10	Monoglypha	polyodon
Minimella	Leioptilus	19	Monticola	alpinella
MINORES	minimellus	30	Mucronella (Theris)	caudella
Minos	(not used)		Muralis	glandifera
Modestana	pilosellæ	3	Murana	muralis
Molybdeola	æmulana	27	Murinata	euphorbiata
Monacha	sericea	3	Muscaella	musculella
Monachella	Psilura	4	Musciformis	philanthiformis
Monticolana	Blabophanes	29	Mygindana	flammeana
Mouffetella	mercurellalis	26	Myllerana	scintilulana
Mundella	Brachmia	32	Myrmecocela (pt.)	Tinea
Murallis	Bryotropha	32		
Mussehliana	murana	17	Nana	conspersa
Myricæ	Eupœcilia	28	Nannodia (pt.)	Gelechia
	euphorbiæ	5	Nemeophila	{ Euthemonia
				{ Chelonia
Nanella	Recurvaria	33	Nemorivaga	tædana
Nebritana	nigricana	26	Nervosa	nervosella
Neglecta	castanea	8	Nicellii	nicelliella
Neglectana	Hedya	23	Nigra	cautella
Nervosella	nervosa	32	Nigrata	anguinalis
Nicelliella	nicellii	38	Nigrella	gregsoni
Nictitans	Hydrœcia	6	Nigricana	pisana
Nigritella	Anacamptis	33	Nigricana	nebritana
Nigricostella	lathyrella (Brach.)	32	Nigricomella	aurimaculella
Nisana	nisella	25	Nigrofasciaria	derivata
Nivearia	griseata	17	Nisella	nisana
NOCTUO-			Nisoniades	Tages
BOMBYCIDÆ	CYMATOPHORIDÆ	5	Nisoniades	Thanaos
NOCTURNI	(not used)		Nitidana	redimitana
	Cœnobia		Nivea (Pœcilia)	gemmella
Nonagria (div.)	Tapinostola	6	Niveana	treveriana
	Nonagria		Noctuella (Nomoph.)	hybridalis
Notatella	Teleia	33	NOCTUO-	
Notodonta (div.)	Lophopteryx	5	BOMBYCIDÆ (pt.)	TRIFIDÆ
	Notodonta	5	Nomophila	Stenopteryx
Næviferella	stipella (Nannodia)	33	Nubilalis	lupulinalis
Nubeculosa	Asteroscopus	10	NYMPHALIDÆ	VANESSIDÆ
Nymphæalis	nymphæata	18	Nymphæata	Nymphæalis
			NYCTEOLIDÆ	CYMBIDÆ
Obfuscata	obfuscaria	12		
Obliquaria	rufata	17	Obfuscaria	obfuscata
Oblitella	Doryphora	33	Obliterata	heparata
Obscurata	obscuraria	12	Oblongata	centaureata
Obsoletella	Lita	33	Obscura	ravida
Ocellana	Hedya	23	Obscurana	gallicolana
Ocellatella	instabilella (Lita)	33	Obscuraria	obscurata
Ocellella	ocellana	32	Obscurella	Subobscurælla
Ochraceana	favillaceana	24	Ocellana	ocellella
Ochreella	ochrea	36	Ochracea	flavago
Ochrodactylus	ochrodactyla (Plat.)	19	Ochrea	ochreella
Ochromelana	dimidiana	23	Ochrearia	citraria
Octomaculalis	octomaculata	18	Ochraceella (Myrm.)	perochraceella
Oculea	didyma	6	Ochrodactyla (Plat.)	ochrodactylus
Ocularis	octogesima	5	Ochsenheimeria	Phygas



<i>Doubleday.</i>	<i>Entom. List.</i>	<i>Entom. List.</i>	<i>Doubleday.</i>
Oculatella	forsterella 35	Octogesima	ocularis
ODONTIDÆ	(not used)	Octomaculata	octomaculalis
Omicronaria	annulata (Zonos.) 13	(Edematophorus (pt.)	Pterophorus
Ononiella	ononidis 36	Ononidis	ononiella
Orbicularia	Zonosoma 13	Oporina	Hoporina
Orbona	comes 8	Orbona	subsequa
Orichalcea	chryson 10	Ornithopus	rhizolitha
Orion	Moma 5	Orobena (pt.)	Pionea
ORTHO SIDÆ	ORTHO SIDÆ 8	ORTHO SIDÆ	ORTHO SIDÆ
Osseata	dilutaria 13	Osseana	pratana
Osseella	Ptocheuusa 33	Oxyacanthella	{oxyacanthæ- colella
Osteodactylus	Leioptilus 19	Oxyacanthella (Sym.)	fabriciana
Ostrina	Thalpochares 10	Oxyptilus (pt.)	Pterophorus
Oxyacanthæ- colella }	oxyacanthella 39		
Padella	padellus 30	Padellus	padella
Padifoliella	prunifoliella 39	Palæmon (Carteroce.)	paniscus
Pallidulalis	pallida 17	Paleacea (Cosmia)	fulvago
Palpella	Haplota 34	Palleana	icterana
Palpina	Pterostoma 4	Pallida	pallidulalis
Paludellus	paludella (Calamo.) 19	Paludata	imbutata
Paludicolella	propinquella 37	Paludella (Calamo.)	paludellus
Paludum	Acipitilia 19	Panolis	Trachea
Palumbaria	plumbaria 17	Panzerella	subochreella
Palustrella	Doryphora 33	Paralellaria	vespertina
Pamphilus	Cænonympha 2	Pararge	Satyrus
Panicus	palæmon (Carteroce.) 2	Parasitella	carpinitella
Paralis	alpina 17	Pascuana	pasivana
Pariana	Symæthis 27	Pavonia	carpini
Parva	Thalpochares 10	Pectinea	zinckenella
Parvidactylus	Oxyptilus 19	Pedaria	pilosaria
Pasivana	pascuana 24	Pentadactyla (Acip.)	pentadactylus
Pastinacella	discipunctella 32	Perinephele (pt.)	Botys
Paula	Thalpochares 10	Petiverella	petiverana
Paupella	inopella (Ptocheu.) 33	Pflugiana	scutulana
Pauperana	Hedya 23	Phalera	Pygæra
Paykulliana	ramella 25	Phasianipenella	quadruplella
Pectinitaria	viridaria 15	Phæoleuca	phæoleucalis
Pedriolellus	fascinelinus 20	Phlæas	phlæas
Pendularia	Zonosoma 13	Phothedes (pt.)	Miana
Pentadactylus	pentadactyla (Acip.) 19	Phylloporia (pt.)	Tinea
Perochraceella	ochraceella (Myrm.) 29	Pigra (Pygæra)	reclusa
Perpygmæella	pygmæella 39	Pilosellæ	minos
Perterana	conspersana 24	Pimpinellæ	pimpinella
Perspicillaris	polyodon 6	Pimpinellata	denotata
Petasia	Asteroscopus 10	Pinellus	pinetellus
Petasisit	Hydræcia 6	Pinguis (Euzophera)	pinguedinella
Petiverana	petiverella 27	Platyptilia	Zetterstedtii
Petrificata	socia 10	Platyptilia (pt.)	Pterophorus
Phæodactylus	Mimæseoptilus 19	Plumbana	ulicana
Phæoleucalis	phæoleuca 17	Plumbaria	palumbaria
PHALENOIDÆ	BREPHIDES 11	Plumbellus (Hypo.)	plumbella
Philanthiformis	muscifformis 3	Poæ	poella
Phlæas	phlæas 2	Podana	pyrastrana
Phragmitidis	Calamia 5	Pœcilia	Gelechia
	PHYCIDÆ 21	Politana	lepidana
PHYCIDÆ (div.)	GALLERIDÆ 21	Politella (Bryotro.)	expolitella
Phygas	Ochsenheimeria 29	Polyodon	perspicillaris
Picana	corticana 23	Pomonella	pomonana
Pictella	Argyritis 33	Populana	ephippana
Pilosaria	pedaria 12	Popuictorum	populettella
Pilosellæ	Oxyptilus 19	Porphyrea	satura
Pimpinella	pimpinellæ 32	Porthesia	Liparis

<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
Pinastri	scabriuscula	6	Poterii	poteriella
Pinetaria	brunneata (Halia)	14	Præangusta	præangustella
Pinetellus	pinellus	20	Prasina	herbida
Piniaria	Bupalus	14	Prodromana	walkerana
Piniperda	Panolis	8	Propinquella	paludicolella
Pinguedinella	pinguis (Euzophera)	20	Prosapiaria	fasciaria
	Pionea	18	Pruinaria	cytisaria
	Orobena	18	Prunetorum	prunetella
Pisana	nigricana	26	Prunifoliella	padifoliella
Plagiodactylus	Mimæseoptilus	19	Pterodactylus (Mim.)	fuscodactylus
Plantaginis	Nemeophila	3	Pterostoma	Ptilodontis
Platypteryx	Drepana	4	Ptocheusa (pt.)	Gelechia
PLICATÆ	(not used)		Pubicornis	pubicornella
Plumaria	ericetaria	14	Pulehrina	v-aureum
Plumbella	plumbellus (Hypo.)	30	Pulla (Epichnopt.)	pullella
Poella	poæ	37	Pulveratella (Dory.)	Intamenatella
Polydactyla	hexadactyla	19	Pulverulenta	cruda
Polyodon	monoglypha	6	Punctularia	punctulata
Pomonana	pomonella	26	Purpurea	vaccinella
Popularis	Neuronia	6	Pustulata	bajularia
Populella	populetorum	35	Pygæra	Clostera
Populella	Tachyptilia	33	Pygmæana	autumnitella
Porata	Zonosoma	13	Pygmæella	perpygmæella
Porphyrea	strigula	7	Pyrausta	pyraustella
Poteriella	poterii	39		
Prasinana	Hylophila	3		
Pratana	osseana	28		
PROCRIDÆ	(not used)			
Procris	Ino	3		
Prodromaria	strataria	12		
Progemmaria	marginaria	14		
Promutata	marginepunctata	13		
Propugnata	designata	16		
Proximella	Teleia	33		
Præangustella	præangusta	37		
Prælongana	sororculana	23		
Prunetella	prunetorum	39		
PSEUDO-BOMBYCES	(not used)			
Psittacata	siderata	16		
Pterodactylus	monodactylus	19		
	Cnæmidophorus	19		
	Platyptilia	19		
	Amblyptilia	19		
	Oxyptilus	19		
Pterophorus	Mimæseoptilus	19		
(divided)	Edematophorus	19		
	Leioptilus	19		
	Pterophorus	19		
	Aciptilia	19		
Pteroxia	Theristis	31		
Ptilodontis	Pterostoma	4		
Pubicornella	pubicornis	28		
Pudibunda	Dasychira	4		
Pudorina	impudens	5		
Pullella	pulla (Epichnopt.)	29		
PULVERULENTÆ	(not used)			
Punctidactylus	cosmodactyla (Amb.)	19		
Punctaria	Zonosoma	13		
Puncticostana	germarana	27		
Punctulata	punctularia	12		
Punicealis	aurata	17		
Pygmæola	lutarella	3		
Pygæra	Phalera	5		
Pyralalis	dubitalis	17		

<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
Pyraliata	dotata	17		
Pyralina	Calymnia	9		
Pyrastrana	podana	21		
Pyraustella	pyrausta	30		
Pyrophila	simulans	7		
Quadra	Gnophria	3	Quadripunctata	cubicularis
QUADRIFIDE	(not used)		Quadripunctata	kindermanniella
Quadruplella	phasianipennella	36	Quercana	quercella
Quercella	quercana	31	Quercus	callune
			Quercus	roboris
Radiatella	Cerostoma	31	Ramella	paykulliana
Radiella	Epichnopteryx	29	Recurvaria (pt.)	Gelechia
Ramana	lactana	25	Remutaria	remutata
Ratzburghiana	Pædisca	25	Resinea	resinalis
Ravida	obscura	7	Resinella	resinaria
Reclusa	pigra (Pygæra)	5	Reticulata	saponaria
Redimitana	nitidana	27	Rhacodia	Teras
Remutata	remutaria	13	Rheediella	rhediana
Resinalis	resinea	17	Rhenella (Nephopt.)	adelphella
Resinana	resinella	26	RHOPOLOCERA	DIURNI
Resplendella	Heliozele	35	Rivulana	conchana
Reticella	Epichnopteryx	29	Roboris	roborella
Revayana	undulanus (Saroth.)	3	Roseticolana	germarana
Rhediana	rheediella	27	Rubiginata	rubricata
Rhizolitha	ornithopus	10	Rubiginosana (Pæd.)	bouchardana
RHODOCERIDE	(not used)		Rufa (Cænobia)	despecta
Rhododactylus	Cnæmidophorus	19	Rufana	autumnana
Rhomboidaria	gemmaria	12	Rufata	obliquaria
Rhomboidæa	stigmatica	8	Rufescens (Ceratop.)	rufescentella
Ridens	Asphalia	5	Rufocinerea	rufocinerella
Roborella	spissicella (Neph.)	21	Rupicola	rupicolana
Roborella	roboris	38	Ruralis	verticalis
Roboricolella	intermediella (Fum.)	29		
Roboris	quercus	4		
Rorellus	craterellus	20		
Ruberata	Hypsipetes	16		
Rubiginata	bicolorata	16		
Rubricata	rubiginata	13		
Rubricollis	Gnophria	3		
Rubricosa	Pachnobia	8		
Rufescentella	rufescens (Ceratop.)	33		
Ruficiliana	ciliella	28		
Ruficinctata	flavicinctata	15		
Rufocinerella	rufocinerea	38		
Rupicolana	rupicola	28		
Ruricolella	Scardia	29		
Rusticella	Blabophanes	29		
Russata	truncata	16		
Russula	Nemeophila	3		
Salicana	salicella	23	Salicella	salicana
Salicella	Dasystema	28	Salicis	salicivorella
Salicis	Leucoma	4	Saligna	salignella
Salicivorella	salicis	39	Sambucaria (Urop.)	sambucata
Salignella	saligna	39	Scabiosata	subumbrata
Salopiella	unimaculella	30	Scabiosella	scabiosæcolella
Sambucata	sambucaria (Urop.)	11	Scabiosellus	scabiosella
Sangiella	Anacamptis	33	Scabriuscula	pinastri
Saponariæ	reticulata	6	Scalella	aleela
Satura	porphyrea	9	Schmidiellus (Hypr.)	durdhamella
Satyrus (div.)	Pararge	1	Schreiberiana	schreibersiana
Scabiosæcolella	scabiosella	38	Sciopteron	Sesia
Scabiosella	scabiosellus	30	Scoliiformis	scoliaformis

<i>Doubleday.</i>	<i>Entom. List.</i>	<i>Entom. List.</i>	<i>Doubleday.</i>
Schiffermillerella	fasciellus	30	Scopoliana
Schreibersiana	schreberiana	28	Semiargus
Scintilulana	myllerana	27	Semifascia
Scoliaeformis	scoliiiformis	2	Semifusca
SCOPARIDÆ	(not used)		Semirubella
Scotica	zelleri	17	Senescens
	Triphosa	16	Sequax (Teleia)
Scotosia (div.)	Eucosmia	16	Sericea
	Scotosia	16	Sericopeza
	Teleia	33	Serricornis
Scriptella	Teleia	33	SESIDÆ
Scutulana	pflugiana	25	Siccifolia
Scutulata	dimidiata	13	Siderata
Semifasciella	semifascia	36	Similana
Semifuscella	semifusca	35	Similis (Bryotro.)
Senectella	Bryothropa	32	Simulans
Senescentella	senescens	34	Sitotroga (pt.)
Sequacella	sequax (Teleia)	33	Socia
Sequella	Cerostoma	31	Sociata
Sericicella	Heliozele	35	Sordidata (Hyps.)
Serotinus	bipunctidactyla (M.)	19	Sororculana
SERPENTINÆ	(not used)		Sparganella (Ortho.)
Serricopezella	serricopeza	39	Sphinx (Astero Scop.)
Serricornella	serricornis	38	Spilodactyla (Acip.)
Servillana	Hedya	23	Spissicella (Neph.)
	Trochilium	2	Sponsana
	Sciopteron	2	Stagnata
Sesia (div.)	Sesia	2	Steinkellneriana
SESIDÆ	SESIDÆ	3	STENIADÆ
Siccifoliella	siccifolia	36	Stephensi
Sicula	harpagula (Drepana)	4	Stettinensis
Silago	flavago	8	Stigmatica
Simiella	similis (Bryotro.)	33	Stipella (Nannodia)
Simplana	Hedya	23	Strataria
Simyra	Arsilonche	5	Stratitotata
Sinuata	cucullata	16	Strigata
Sircomella	Anacamptis	33	Strigilaria
Smaragdaria	Phorodesma	12	Strigula
Sociella	Aphomia	21	Strobilella
Sodaliana	amandana	27	Subalbidella
Solidaginis	Calocampa	10	Subocellana
Sordaliana	amandana	27	Sulphurellum
Sparganiella	sparganella (Ortho.)	31	Sylvanus
Spilodactylus	spilodactyla (Acip.)	19	Sylvata
Spinula	glaucata	4	Sylvella
SQUAMOSÆ	(not used)		Sylvellus
Stagnalis	stagnata	18	Symæthis
Stanneella	Heliozele	35	
Statice	Ino	3	
Steinkellneriella	steinkellneriana	28	
STENIADÆ	STENIADÆ	18	
Stenopteryx	Nomophila	17	
Stephensiella	stephensi	37	
Stettinella	stettinensis	38	
	(not used)		
STILBIDÆ			
Straminalis	Orobena	18	
Stramineola	griseola	3	
Stratitotalis	stratitotata	18	
Strelitzella	Lita	32	
Strigilata	strigilaria	14	
Strobilana	strobilella	26	
Suasa	dissimilis	9	
Subarcuana	inornatana	24	
Subdecurtella	Ergatis	33	
			hohenwarthiana
			acis
			semifasciella
			semifuscella
			carnella
			senescentella
			sequacella
			molybdeola
			serricopezella
			serricornella
			SESIDÆ
			siccifoliella
			psittacata
			bimaculana
			similella
			pyrophila
			Gelechia
			petrificata
			subtristata
			elutata
			prælongana
			sparganiella
			castanea
			spilodactylus
			roborella
			favillaceana
			stagnalis
			steinkellneriella
			STENIADÆ
			stephensiella
			stettinella
			rhomboidea
			næviferella
			prodromaria
			stratitotalis
			thymiaria
			strigilata
			porphyrea
			strobilana
			subochreella
			campoliliana
			citrinella
			sylvinus
			ulmata
			acerifoliella
			adipellus
			Xylopada

<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
Subobscurella	obscurella	38		
Subocellella	Ptocheuusa	33		
Subochreella	subalbidella	38		
Subochreella	panzerella	34		
Subsequa	orbona	8		
Subtristata	sociata	16		
Subumbrata	scabiosata	15		
Suffusana	trimaculana	23		
Sulphuralis	trabealis	10		
Sulzella	crossella	30		
Swederella	alchimiella	35		
Sylvella	Cerostoma	31		
Sylvinus	sylvanus	3		
Symæthis	Choreutes	27		
Tages	Nisoniades	2	Tachyptilia (pt.)	Gelechia
Taminata	bimaculata (Bapta)	13	Tædella	hyrciniana
Tanacetana	tanaceti	27	Tanaceti	tanacetana
Tarquiniella	Argyritis	33	Tapinostola (pt.)	Nonagria
Tarsipennalis	Zauclognatha	11	Taraxaci	blanda
Tetradactylus	tetradactyla (Acip.)	19	Teleia (pt.)	Gelechia
Temerata	Bapta	13	Tenebrata (Heliaca)	arbuti
Temerella	Tachyptilia	33	Tenebrella (Mono.)	tenebrosella
Tenebrella	Monochroa	33	Tenuicornis	tenuicornella
Tenebrosella	tenebrella (Mono.)	33	Testacea	guenèei
Tengstromella	laripennella	36	Tetradactyla (Acip.)	tetradactylus
Tenuicornella	tenuicornis	30	Tetralunaria	illustraria
Tephradactylus	Leioptilus	19	Thalpochares	Micra
Teras (div.)	Rhacodia	22	Thaumas	linea
Terrella	Bryotropha	32	Theristis	Pteroxia
Tesserana	alcella	28	Thoracella	hippocastanella
Testudo	limacodes (Hetero.)	4	TINEIDÆ (pt.)	Tinea
Teucrui	Oxyptilus	19	Tinea (pt.)	Tinea
Thanaos	Nisoniades	2	Trabealis	sulphuralis
Thymiaria	strigata	13	Triatomea	triatomella
Tiliaria	alniaria (Eugonia)	12	Trifasciata (Hypsip.)	impluviata
Tinagma	Heliozele	35	Trifolii	chenopodii
	Blabophanes	29	Trigrammica	trilinea
	Tinea	29	Trimacula	dodonea
	Tineola	29	Trimaculana	suffusana
Tinea (divided)	Phylloporia	29	Tripartita (Habro.)	urticæ
	Myrmecocela	29	Triphosa	Scotosia
TINEIDÆ (div.)	TINEIDÆ	29	Tripuncta	trisignella
	ADELIDÆ	30	Trochilium	Sesia
Tithonus	Epinephele	2	Truncata	russata
Torquatella	Atemelia	34	Truncicolella	truncicolalis
Tædana	nemorivaga	26	Typhon (Cæno.)	davus
Tæniolella	Anacamptis	33		
Trachea	Panolis	8		
Transitana	diversana	21		
Trapezina	Calymnia	9		
Trepidaria	coracina	12		
Treveriana	niveana	22		
Triatomella	triatomea	38		
Trilinea	trigrammica	7		
Tricolorella	Lita	32		
	Noctuo-	}		
	BOMBYCIDÆ		5	
TRIFIDÆ (div.)	BRYOPHILIDÆ	5		
	BOMBYCOIDÆ	5		
Trigonodactylus	gonodactyla (Platy.)	19		
Trilineararia	linearia (Zonosoma)	13		
Triparella	Teleia	33		
Triplasia	Habrostola	10		
Triseriatella	dispunctella	38		

<i>Doubleday.</i>	<i>Entom. List.</i>		<i>Entom. List.</i>	<i>Doubleday.</i>
Trisignella	tripuncta	34		
Tristana	logiana	22		
Truncicolalis	truncicolella	17		
Turfosalis	Tholomiges	11		
Typhæ	arundinis	6		
Ulicana	plumbana	27	Umbra (Chariclea)	marginata
Uliginosana	lorquiniana	23	Uncula	unca
Ulmata	sylvata	14	Undulanus (Saroth.)	revayana
Ulvæ	maritima	5	Unimaculella	salopiella
Umbrosella	Bryotropha	32	Unitella	fuscoarella
Unca	uncula	10	Upsilon	ypsilon
Undulata	Eucosmia	16	Urticata (Eurrhyp.)	urticalis
Unguicula	culturaria (Drepana)	4	Ustulellus (Hypsi.)	ustulella
Urticæ	tripartita (Habro.)	10		
Urticæ	Spilosoma	3		
Urticalis	urticata (Eurrhyp.)	18		
Ustulella	ustulellus (Hypsi.)	34		
Vaccinella	purpurea	31	Valerianata	viminata
Vaculella	Ochsenheimeria	29	Variiegana	cynosbana
Valligera	vestigialis	7	Vauaria	wavaria
VANESSIDÆ	NYMPHALIDÆ	1	Versicolor	versicolora
VARIEGATÆ	(not used)		Verticalis	cinctalis
V-aureum	pulchrina	10	Vestigialis	valligera
Venosa	albovenosa (Arsilon.)	5	V-flava	v-flavella
Vernaria	Geometra	12	Vigintipunctatus (Hy.)	vigintipunctella
Versicolora	versicolor	4	Viminetorum	viminetella
Verticalis	ruralis	18	Virgata (Mesotype)	lineolata
Vespertaria	paralellaria	11	Virgaureæ	virgaureella
V-flavella	v-flava	37	Virgularia	incanaria
Vibrana	bjerkandrella (Cho.)	27	Viridaria	ænea
Vicinella	Lita	32	Viridaria	pectinitaria
Viduaria	angularia	12	Vittata	lignata
Vigintipunctella	{ vigintipunctatus } { (Hyponomeuta) }	30	Vulnerariæ	vulnerariella
Villica	Arctia	3		
Viminalis	Cleoceris	9		
Viminata	valerianata	15		
Viminetella	viminetorum	38		
Virgaureella	virgaureæ	36		
Viscariella	Lita	32		
Vittella	Cerostoma	31		
Vorticella	Anacampsis	33		
Vulgella	Teleia	33		
Vulnerariella	vulnerariæ	36		
Walkerana	prodromana	22	Warringtonellus	lithargyrellus
Wavaria	vauaria	14	Weaveri	weaverella
Weaverella	weaveri	39		
Weirana	flexana	27		
Wimmerana	candidulana	27		
Xylopora	Symæthis	27		
Xylostella	cruciferarum	31	Xylostella	harpella
Yeatiella	yeatiana	32	Yeatiana	yeatiella
Yponomeuta	Hyponomeuta	30		
YPONOMEUTIDÆ	HYPONOMEUTIDÆ	30		
Ypsilon	upsilon	8		
Ypsipetes	Hypsipetes	16	Zelleri	scotica
Ypsolopha	Cerostoma	31	Zephyrana	{ dubrisana maritimana
Zetterstedtii	Platyptilia	19	Zephyrella	granulosella
ZEUZERIDÆ	(not used)		Zophodactylus (Mi.)	leewii
Zinckenii	lambda	10	Zonosoma	Ephyra
Zinckenella	pectinea	30		

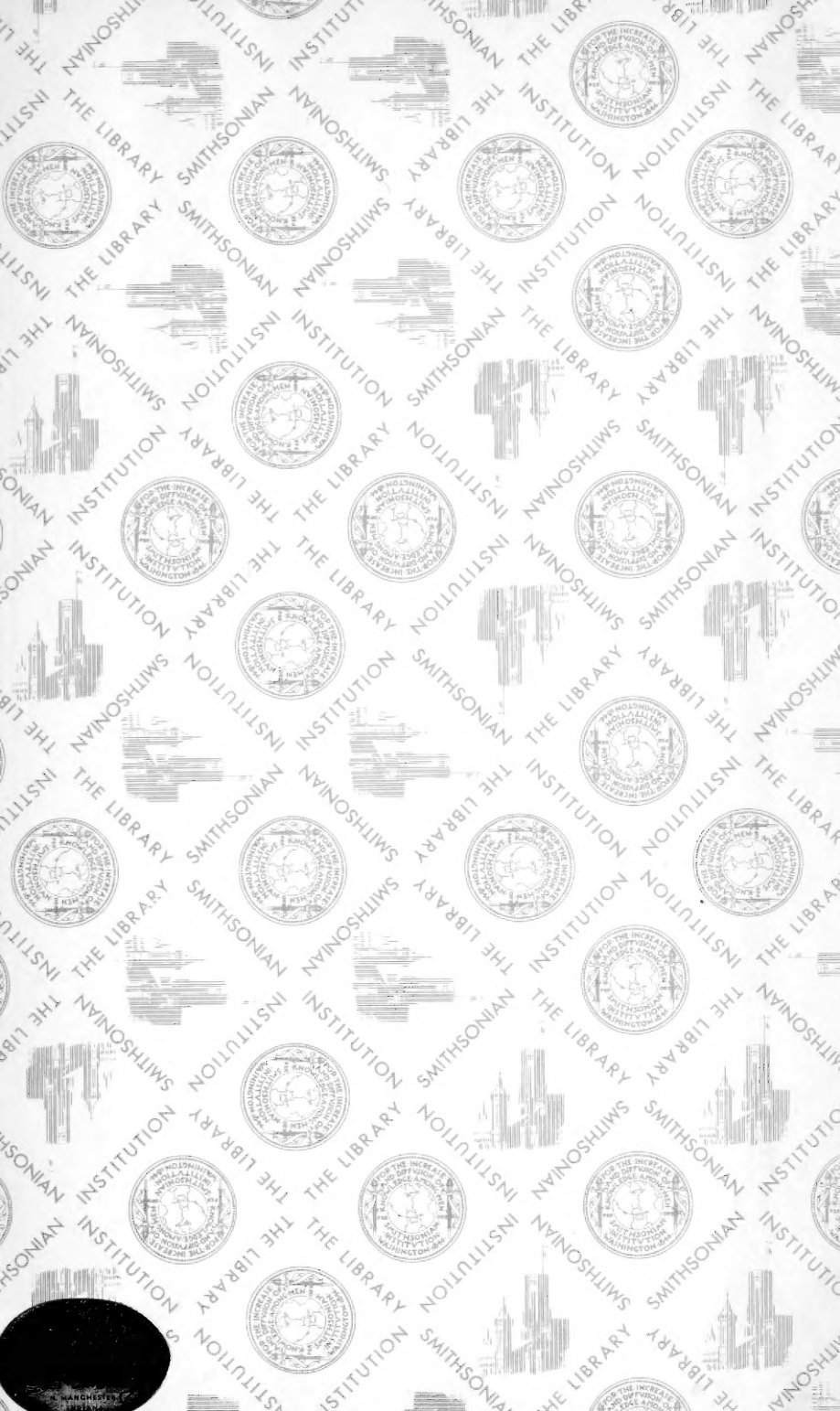












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