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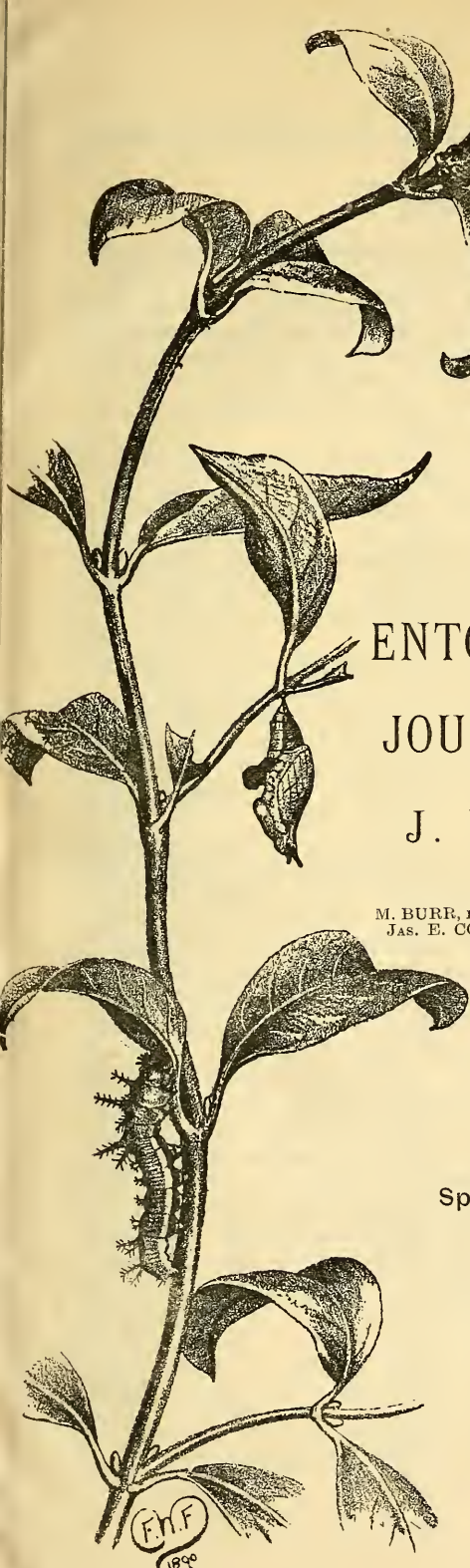
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PREFACE.

With this number we complete our eighteenth volume, and again have to thank our numerous contributors and subscribers for their continued support. We have had a well-maintained, and, on the whole, suitable, supply of material, and year by year the number of plates published appears to grow larger. For help in this direction we have to thank Dr. Chapman, Mr. Bentall, Mr. Sheldon, etc. We are always glad to hear of contributors who are willing to supply blocks to illustrate the articles sent for publication.

Having been exceptionally busy with other entomological pursuits during the past year, we have been especially indebted to friends for help with the magazine. To Mr. Donisthorpe and Professor T. Hudson Beare our thanks are especially due; to the Rev. C. R. N. Burrows we have again to acknowledge our indebtedness for the General Index; whilst Professor T. H. Beare, Mr. Burr, Mr. J. Collin, and Mr. H. J. Turner, are now at work on the Special Index to the volume. This we hope to publish with the January number.

Our own work on British butterflies has perhaps been responsible for a special influx of notes relating to what is usually supposed to be the best known section of our native lepidoptera. Whether this be so or not, we trust most sincerely that the interest will continue, for, far from our knowledge of this group being at all complete, it is remarkable how many elementary details are lacking in even what are supposed to be our best known species.

Probably one of the most interesting papers that we have published this year is the summary of the facts collected by Mr. Bateson and summarised by Mr. L. Doncaster, under the title "Collective Inquiry as to Progressive Melanism in Lepidoptera." The facts are important although they do not push our knowledge of the cause of the phenomenon much further. We hope, if time allows, to write a constructive criticism on the more recent pronouncements on this subject for publication in these pages. It is remarkable how little our knowledge of the matter has really increased during the last 15 years.

We also hope to continue our series of Practical Hints during the next season. The three parts of the work specially devoted to this subject, already published, and independently available, render general hints purposeless, as they could only lead to duplication, but special groups will be worked through as opportunity offers.

In conclusion we would again thank every one who has contributed to the success of our last volume, and would also ask for the continuation of their valued aid, as well as their kind word in support of our magazine to their Entomological friends.

The Entomologists's Record and Journal of Variation.

VOL. XVIII.

SPECIAL INDEX.

By T. HUDSON BEARE, B.Sc., F.R.S.E., F.E.S. (Coleoptera), M. BURR, B.A., F.Z.S., F.E.S. (Orthoptera), and H. J. TURNER, F.E.S. (Diptera, Hemiptera, Hymenoptera, Lepidoptera, etc.).
Coleoptera arranged in order of Genera. The other orders arranged by Species.

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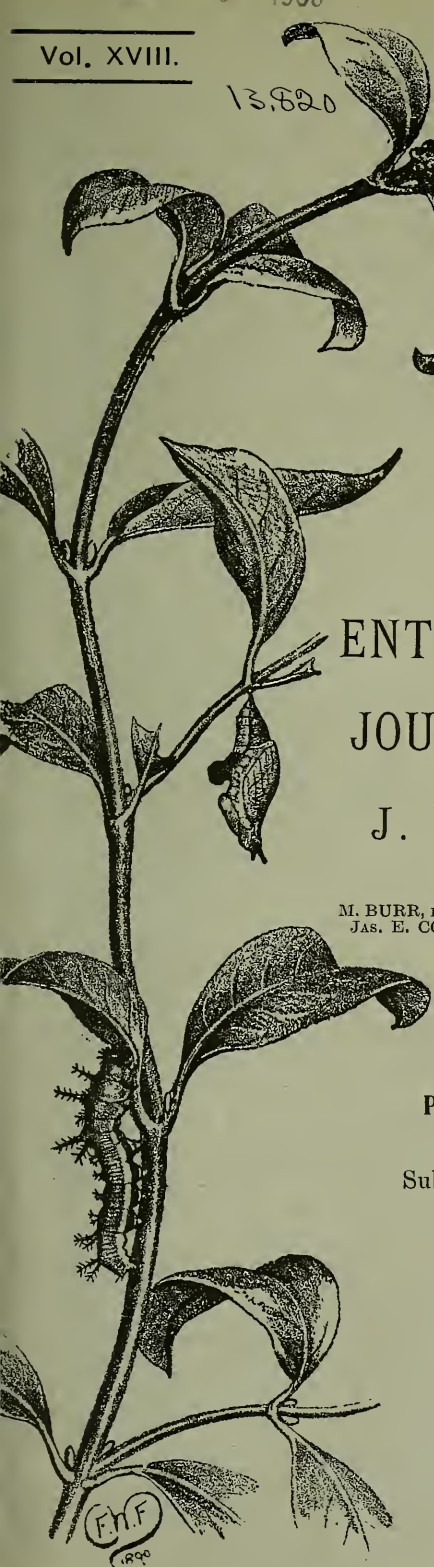
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The Entomologist's Record

AND

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Retrospect of a Coleopterist for 1905.

By PROF. T. HUDSON BEARE, B.Sc., F.R.S.E., F.E.S.

The past year has seen an increase to our list, much in excess of the additions I have been able to chronicle during the past three years, 1902-1904, and, as was the case last year, several of these additions have been most unexpected, and it is surprising in the extreme that these species have remained so long undetected; it would certainly repay any student of British coleoptera to go through our list, and compare it carefully with the French and German lists, as possibly this would lead to careful search in their proper habitats for species which, from their continental distribution, are also likely to occur here, although so far they have not been discovered.

AMARA ANTHOBIA, Villa.—Recorded by Mr. W. E. Sharp (*Ent. Mo. Mag.*, vol. xli., p. 87). This insect was taken in large numbers by the Rev. G. A. Crawshay at Leighton Buzzard, and the publication of the above note at once elicited the information that several other coleopterists had taken it in past years in various localities, but had confused it with its near ally *lucida*, Duft. QUEDIUS VARIABILIS, Heer.—Recorded by Mr. E. A. Newbery (*Ent. Mo. Mag.*, vol. xli., p. 197). It was taken by Mr. Kidson Taylor at Sherwood Forest, in October 1904. It belongs to the second section of the genus (*Quedius* proper), and its near ally is *mesomelinus*, Marsh. OXYPODA SERICEA, Heer.—Taken by Mr. H. St. J. Donisthorpe at Dulwich Wood, on June 17th, 1904 (*Ent. Record*, vol. xvii., p. 67). In his note Mr. Donisthorpe gives characters for separating this species from its ally *O. nigrina*, Wat. DINARDA HAGENSI, Wasmann.—Mr. H. St. J. Donisthorpe introduced this, perhaps the most interesting of this year's additions, to our fauna (*Ent. Record*, vol. xvii., p. 181). He took it on May 13th, with the rare ant, *F. eusecta*, at Bournemouth, and again later in the year. TRIPLAX BICOLOR, Gyll.—Taken in large numbers by Mr. R. S. Bagnall (*Ent. Mo. Mag.*, vol. xli., p. 86 and p. 135), at Gibside, with the rare *T. aenea*, Schal. I gave an account of the European species of this genus, and a table of differences for the British species (*loc. cit.*, p. 176), and had the pleasure, in company with its discoverer, of taking the insect last June. DACNE FOWLERI, Joy.—Specimens of this insect, new to science, were taken last June by Dr. Joy, at Bradfield, in a hole in a large oak log (*Ent. Mo. Mag.*, vol. xli., p. 274); it appears to be intermediate in its character to our other two species, *humeralis*, F., and *rufifrons*, F. LÆMOPHLEUS MONILIS, F.—Dr. Joy also introduced this.

species (*loc. cit.*) on ten specimens taken at Streatley, Berks, on October 8th, by himself and Mr. Chitty. This insect is a large and fine species, and, as was the case with *Anolonium sulcatum*, Ol., it is a most unexpected addition to our list. *MELANOPHTHALMA DISTINGUENDA*, Comolli.—This is the third of the three species introduced to our list by Dr. Joy in the note cited above. Specimens were taken on Lundy Island last August; this small island in the British Channel has now furnished two or three insects to our list, which have not so far been captured elsewhere in our islands. *MELANOPHTHALMA TRANSVERSALIS*, Gyll.—Up to the date of Mr. Donisthorpe's capture (*Ent. Record*, vol. xvii., p. 103) of a specimen of the type at Pevensey, on October 15th, 1904, only the var. *wollastoni*, Wat., had been in our list. *SILVANUS MERCATOR*, Fauvel.—Introduced by Mr. J. R. Tomlin (*Ent. Mo. Mag.*, vol. xli., p. 37); it was taken by Mr. Atmore in a bakery at King's Lynn; Mr. Newbery, in a later note, stated that he had also taken it in 1882 at Merton. *TETROPIUM CRAWSHAYI*, Sharp.—The Rev. G. A. Crawshay (*Ent. Mo. Mag.*, vol. xli., p. 223) has taken at Leighton Buzzard large numbers of a species of *Tetropium*, which Dr. Sharp states (*loc. cit.*, p. 271) is new to science, and he has named it "*crawshayi*" in honour of its discoverer. The insects previously taken in various localities in England, and referred to as *T. fuscum*, F., are identical with this new species. *TETROPIUM PARCUM*, Sharp.—In the above cited note by Dr. Sharp, he introduces also another species of the genus as new to science, *parcum*, and states that he does this on the strength of two specimens, labelled "near Manchester, 1865," in the Crotch Collection of British Coleoptera at Cambridge; nothing further is known as to their history. *TETROPIUM GABRIELI*, Weise.—Dr. Sharp (*loc. cit.*) is of opinion that the Market Bosworth specimens of this genus taken by Mr. Bouskell, and referred to *T. castaneum*, L. (= *luridum*) are in reality *gabrielii*, which has only recently been described by Weise as a species new to science. Specimens of a fourth species of this genus, but clearly imported with timber, have been taken at Hartlepool; Dr. Sharp thinks they are probably a variety of *T. luridum*, L. *PHYMATODES LIVIDUS*, Rossi.—Introduced by Mr. F. Bouskell (*Ent. Record*, vol. xvii., p. 295). This is undoubtedly an introduced beetle, but it has been breeding freely, for 11 years now, in casks at Reading; it is very closely related to *P. variabilis*, L. I shall refer later on in this article to the question of introduced species. *GRAMMOPTERA HOLOMELINA*, Pool.—This insect was introduced by Mr. Pool (*Ent. Record*, vol. xvii., p. 133) as an ab. of *ruficornis*, F., but Mr. Donisthorpe (*loc. cit.*, p. 182) claims that it is a genuine species; it was taken in fair numbers at Enfield with *ruficornis*, but there were no intermediate forms, and it is certainly abundantly distinct from that insect in general appearance. *MALACHIUS BARNEVILLEI*, Puton.—Introduced by Mr. Champion (*Ent. Mo. Mag.*, vol. xli., p. 15) on the strength of ten specimens taken by Mr. Thouless on the sand-hills at Hunstanton, June 21st, 1899. It is very like *viridis*, F., but belongs to the subgenus *Hypoptilus*, having a narrow transverse excavation at the apex of the elytra of the ♂. *MALACHIUS VULNERATUS*, Ab.—This second addition to the genus in one year is due also to Mr. Champion (*Ent. Mo. Mag.*, vol. xli., pp. 66 and 88), who discovered that he had taken three specimens at Sheerness on June 6th, 1869. Mr. J. J. Walker had also taken it there in 1894, and there are three specimens, taken at Sheerness, June 11th, 1859, in the Power collection. Mr. Champion at first thought

these specimens were to be referred to an allied species, *spinus*, Er. This species belongs to the subgenus *Clanoptilus*, it is rare, but is widely distributed. *HADROTOMA NIGRIPES*, F.—Mr. H. W. Ellis states (*Ent. Record*, vol. xvii., p. 270) that this insect was taken by the late Mr. Blatch by sweeping and beating near Tewkesbury, but as Mr. Blatch himself made no attempt to introduce this capture into our local list, possibly he considered that the specimen he captured was an introduced one.

The following new varieties are also introduced definitely into our list:—*NEBRIA GYLLENHALI*, Sch., var. *RUFESCENS*, Stroem, by Mr. Donisthorpe (*Ent. Record*, vol. xvii., p. 103); it is a red variety, and occurs in the north of England and Scotland; I have found it on the Cairngorms (*Ent. Mo. Mag.*, vol. xxxv., p. 267). *CRYPTOCEPHALUS PUSILLUS*, F., var. *MARSHAMI*, Weise, taken by Mr. H. W. Ellis at Knowle (*Ent. Record*, vol. xvii., p. 270); *MYCETOPORUS CLAVICORNIS*, Steph., var. *FORTICORNIS*, Fauvel, also introduced (*loc. cit.*) by Mr. Ellis; Canon Fowler, in his work (*Col. of Great Britain*, vol. ii., p. 217), is doubtful about this variety.

There are thus 17 additions claimed, and 3 varieties, and there are, moreover, several important synonymy changes to which attention has been drawn this year; some of these have already been mentioned.

Mr. Champion says (*Ent. Mo. Mag.*, vol. xli., p. 198) that the insects standing under the name of *Anisotoma oblonga*, Er., are really *A. lucens*, Fairm., and that *grandis*, Rye, is only a form of *cinnamomea*, Pz., but that as the English forms differ slightly from those on the continent, our insects might be named *A. cinnamomea*, Pz., var. *anglica*, Rye. The same gentleman states (*loc. cit.*, p. 210) that the *Elater aethiops*, Lac., of our catalogue is really *E. nigerrimus*, Lac. He also draws attention to the fact (*loc. cit.*, p. 224) that Sahlberg has split *Limnobaris t-album*, L., into two species, both of which occur generally distributed over Great Britain, the second species being called *L. pilistriata*, Steph.; this latter is always larger than *t-album*, L., and the hairs on the interstitial punctures are longer. Mr. Ellis (*Ent. Record*, vol. xvii., p. 270) claims that *Phloeopora transita*, Muls. et Rey, is a genuine species; Canon Fowler in his work (vol. ii., p. 43) considers it to be only a variety of *reptans*, Gr., and the characters given by Mr. Ellis and M. Fauvel for separating the two insects, certainly seem hardly important enough to justify specific rank.

Some of the species introduced to our list during the year, as for example, *Silvanus mercator*, Fauvel, and *Phymatodes lividus*, Rossi, raise the difficult question as to whether or not insects such as these, known to be introduced from abroad, and living in this country only under purely artificial conditions, should be given a place in a list of British insects. The view generally held is that when it can be shown that an introduced insect has thoroughly established itself, and can be proved to go on breeding under natural conditions, then it is entitled to a place in our list. Furthermore, it is well known that numbers of insects now in our lists, and which have been there for perhaps over a century, were probably in the first instance introduced by commerce, and thus obtained a footing, therefore why exclude similar cases when they occur at the present day. No doubt these are strong arguments, but I cannot help thinking it would be more scientific to adopt a

different method of dealing with these insects. Surely no naturalist in compiling a list of Australian mammals would dream of including the rabbit in that list, or the English fox, or the English hare, yet in that continent these three animals breed under natural conditions far more freely than they do in their original home; yet in compiling a list of Australian mammals, which would give a true idea of existing conditions, there would certainly have to be a list of introduced mammals, as an addenda to the list of genuine native animals. The same argument applies to the scores of European plants which have been introduced by the white man into Australia, and have thoroughly established themselves. Fortunately, in the case of Australia, the difficulty is more apparent than real, as all these non-indigenous animals and plants have been introduced within a comparatively limited period of time, and the history of the introduction of all of them is well known. In Great Britain we cannot, as a rule, speak with any certainty in the case of insects supposed to be in the strict sense non-indigenous, when the introduction has not been a matter of recent date, but that is surely no reason why we should go on perpetuating this confusion; we can make a beginning and separate from the general list those insects of the introduction of which we have indisputable evidence, and date such a separate list from some definite year, say 1900. Every insect known to have been introduced into this country since 1900 would then always appear in a list supplementary to the general catalogue, such supplementary list being entitled "Beetles introduced by commerce, etc., since 1900, and since breeding in this country." A chance capture, at say a seaport, of some foreign insect, without any evidence of its breeding, should not be recorded in any catalogue. Another advantage of keeping such a supplementary list would be that these introduced beetles would be kept in a separate drawer in a well arranged cabinet, and would thus be much more useful for purposes of study connected with insect distribution.

The past year has been singularly fruitful in the capture in numbers of beetles usually considered to be very rare, but I have space to refer to only a few of the records. *Agathidium badium*, Er., introduced to our list only last year, has been taken in some numbers by Mr. Donisthorpe and Mr. Bagnall in Northumberland. *Dibolia cynoglossi*, Koch, has again been taken at Pevensy, this time freely, by Mr. Donisthorpe. *Longitarsus curtus*, All., another of last year's additions, has been detected amongst beetles captured in two or three localities in Kent and Surrey, by Mr. Chitty and Mr. Champion. *Lymexylon navale*, L., has been taken during the summer by several collectors in the New Forest. *Apion brunripes*, Boh., was found by Mr. Bedwell in some numbers near Lowestoft, in August; *Apion astragali*, Pk., and *A. sanguineum*, De G., in numbers near Oxford by Mr. W. Holland, in September. *Tropideres sepicola*, F., has been recorded both from near Colchester, and from the New Forest. Mr. Holland also records the capture in numbers of the brilliant green form of *Harpalus ignavus*, Duft., known as *H. honestus*, Duft. *Quedius nigrocoeruleus*, Muls. et Rey, has been captured by Mr. Dollman at Ditchling, and Mr. Bedwell records quite a little haul of this species near Lowestoft, while lastly *Pterostichus parumpunctatus*, Gr., has been found freely at Gibside, on the Derwent, by Mr. Bagnall, Mr. Donisthorpe, and the writer.

Of articles published in our entomological journals during the year may be mentioned the following:—On distribution of our beetle fauna, a note by the writer on species of coleoptera, taken by Mr. Eagle Clarke in the remote Flannan Islands (*Ent. Mo. Mag.*, vol. xli., p. 19); further notes on the Isle of Man fauna, by Dr. Bailey, who discusses (*loc. cit.*, p. 90) the species of the genus *Aphodius* found in that island, and by Mr. Tomlin, who contributes (*loc. cit.*, p. 252) an extensive list of Manx coleoptera; a first rate account of the coleoptera of the Oxford district by Mr. J. J. Walker (*loc. cit.*, p. 180); and, lastly, an account of some of the *Nitidulæ* of the Derwent (Durham) valley by Mr. Bagnall (*loc. cit.*, p. 162). Dealing with life-history, habits, etc., the following deserve attention:—A note on the foodplant of *Apteropeda orbiculata*, Marsh, by Mr. Newbery (*loc. cit.*, p. 210); one on the foodplant of *Dibolia cynoglossi*, Koch, by Mr. Donisthorpe (*loc. cit.*, p. 256); and an article by the same observer on "Myrmecophilous Coleoptera in 1905" (*Ent. Record*, vol. xvii., p. 271).

On matters of synonymy and specific characters, in addition to those to which reference has already been made, the following notes have appeared—one by Mr. Chitty on *Hydroporus bilineatus*, Stm. (*Ent. Mo. Mag.*, vol. xli., p. 66), and another by the same gentleman on specific characters of *Ocyusa maura*, Er., and *O. picina*, Aub., (*loc. cit.*, p. 91); Mr. Newbery (*loc. cit.*, p. 93) deals with the synonymy of *Ptinus tectus*, Boield., and (*loc. cit.*, p. 115) with that of our specimens of the so-called species *Orchestes sparsus*, Fahr. In the *Ent. Record*, pp. 18-20 and 42, was published the concluding article by Mr. Newbery on some doubtful or very rare British Coleoptera, and the joint reply by Mr. Donisthorpe and the writer to this note. It may be interesting to point out, in reference to these notes, that several of the species, which Mr. Newbery stated were doubtfully indigenous, owing to the fact that they had not been taken for many years, have again been captured in their old localities, for example, *Rhantus adspersus*, F., *Graphoderes cinereus*, L. (*Trans. Norfolk and Norwich Naturalists' Society*, vol. viii., pt. i., p. 71), and *Cryptohypnus pulchellus*, L., taken by Mr. Black in shingle on the banks of the Spey, near Newtonmore (the specimens were sent by the writer to Herr Reitter, who has confirmed the identification). These three cases show how very unsafe it would be to remove from our list a beetle, when the old records were reliable, simply because it has not been taken for many years, and how unscientific it is to make such statements as "if correctly determined" when no attempt has been made to verify the correctness of the original identification. Mr. Edwards, in an excellent note (*Ent. Record*, vol. xvii., p. 103), gives a good table for separating our three species of *Thryogenes*, and shows that *scirrhosus*, Gyll., is by no means a very rare insect in this country. Mr. J. J. Walker has continued (*Ent. Mo. Mag.*, xli., pp. 216, 228, 265) his interesting and valuable notes on his collecting experiences in Australia, the present article being devoted to the district round Sydney.

The coleoptera papers in the *Transactions of the Entomological Society of London for 1905*, are not numerous, but several of them are of great interest. Mr. Champion and Dr. Chapman contribute a joint paper on "Another Entomological Excursion to Spain," with long lists of the lepidoptera, coleoptera, and hemiptera-heteroptera captured. I have already, in previous retrospects, alluded to the great value of

such papers in stimulating the interest of British entomologists in the distribution of coleoptera on the European continent, and thereby helping to solve many of the difficult problems, which are at present apparently hopeless enigmas, as to the anomalous distribution of our own insular fauna. The discovery of two species of *Criocephalus* in Great Britain has induced Dr. Sharp to revise thoroughly the synonymy of the species of this genus, and the results of his labours are given in a paper published in the *Transactions* (*loc. cit.*, p. 145) with notes on the distribution of the genus, taxonomy, &c., and descriptions (illustrated by a plate) of larvæ of some of the species. Dr. Sharp describes two new genera *Cephalocrius* and *Cephalallus*, and five new species. Jointly with this paper another by Mr. Gilbert Smith was read (*loc. cit.*, p. 165) on the habits of *Asemum striatum*, L., and *Criocephalus ferus*, Muls., an interesting and valuable record of field observations in the New Forest on the complete life-history of these two longicorns, and of the author's methods of rearing larvæ and pupæ in captivity. It has long been a reproach that the *Transactions* contain so few papers by British coleopterists on life-histories of British beetles, and of records of accurate field observations; a few more papers like Mr. Smith's, and this reproach would be a thing of the past. Though dealing with a dipterous insect, I may be permitted to refer here to the extremely interesting paper on the life-history of *Psychoda sexpunctata*, Curtis, by Mr. J. A. Dell (*loc. cit.*, p. 293); a study of the living organisms which breed in the sewage tanks employed in the bacterial treatment of sewage, is of the utmost importance to the community, and though an unsavoury subject it is to be hoped that this is to be only the first of a series of papers by Mr. Dell on this subject.

At a meeting of the Society on October 5th, a paper by Mr. A. M. Lea on "The Blind Coleoptera of Australia and Tasmania" was read, but I have not yet had an opportunity of studying this memoir, as the part of the *Transactions*, in which it will be included, has not yet been issued to members.

A paper of great value, by Mr. F. Balfour Browne, on "A Study of the Aquatic Coleoptera and their Surroundings in the Norfolk Broads District," was published in the *Transactions of the Norfolk and Norwich Naturalists' Society* (vol. viii., pt. i., p. 58). This paper is the outcome of a scheme of work proposed by its author for the investigation of the bionomical problems of the county of Norfolk. The intention of the scheme was to undertake in the field a systematic investigation into the local distribution, or localisation, of species, and then to enquire into the cause or causes of such localisation. From February to November, 1904, Mr. Balfour Browne collected water-beetles on a thoroughly well-organised and systematic plan, at a selected number of stations distributed throughout the Broads district; he made in all 1079 collections, each of the so-called collections being an indefinite number of sweeps of the water-net in a pond, or along a selected length of dyke, continued in each case until he was of opinion that no species which occurred at that time in the place worked had been passed over. Mr. Balfour Brown has tabulated the results of this work, he has drawn curves to illustrate the facts which his tables bring out, and he has finally attempted, in the case of certain selected species, to express in definite numerical values the

relative values of a number of other species as associates of these selected ones. I hope every British coleopterist will obtain a copy of this paper, will study it with the care it deserves, and will take to heart the lesson it so clearly inculcates. Mr. Balfour Browne, by this most admirable piece of work, brings home clearly what a wide field of work lies at the door of every one of us; the harvest is waiting to be garnered, who will be the harvesters?

The year now closing has been a most fruitful one, much good work has been done, but the band of real workers still remains far too scanty in numbers to make much impression on the mass of investigations still needed before it can be said with truth that we possess a real scientific knowledge of our beetle fauna.

Over and Over again. Variation of *Heliophobus hispidus*. What is *Tæniocampa gothica* ab. *gothicina*?

By A. M. COCHRANE.

I read in the report of a recent meeting of one of the London Entomological Societies as follows: "Mr. Stonell exhibited (1) A picked series of *Heliophobus hispidus* to show the very small variation in British specimens. (2) A long series of *Tæniocampa gothica* and its var. *gothicina*, extremely varied, some of the latter form having the 'gothica' mark obsolete." I ask myself, what does Mr. Stonell mean? (1) I cannot see any logical connection between Mr. Stonell's series of *H. hispidus* and the possible extent of its variation in the British Isles; his series surely can only show that the specimens he has in his possession vary little. As a matter of fact, I am here girding at the illogicality, as well as the probable incorrectness, of such a conclusion. (2) I ask myself whether there can be such a thing as a var. *gothicina*, with the *gothica*-mark obsolete, or whether Mr. Stonell has discovered anything new about Herrich-Schäffer's *gothicina*. Here I am girding at an apparently definite inaccuracy of assumed very elementary fact.

I do not propose going behind the very simple facts that are as easily accessible to Mr. Stonell as myself. Let us look first of all at the variation of *Heliophobus hispidus* (or, rather, *hispidus*, as Geyer named it). At a meeting of the South London Entomological Society for April 23rd, 1891, *i.e.*, 14½ years ago, Mr. Tutt pointed out that there were two "races" of this species in the British Isles, inhabiting two districts so near each other as Portland and Torquay. It cannot be said surely that a species, presenting two "distinct" races within the limits of the counties of Dorset and Devonshire, is subject "to very small variation in the British Isles." As a matter of fact, within certain limits there is no doubt that *H. hispidus* is a very fairly variable species. Looking at our, at present, standard work on the subject (*The British Noctuae and their Varieties*, vol. i., pp. 125-127), we note that Geyer figured the type specimen, with the pale markings tinged with a delicate shade of violet, and Guenée at least implies that such a violet-tinged form was known to him. There is never this decided tint in British specimens, but Tugwell (*Proc. South Lond. Ent. Soc.*, 1890, p. 54) exhibited bred British specimens that he said showed a violaceous tint, Richardson, too, quoted by Tutt (*Brit. Noctuae, etc.*, i., p. 126) says that in certain Portland specimens there is "an approach to a violet tinge on the transverse line just beyond the

reniform, but it is scarcely violet, rather steel-grey." This slightly violet-tinged form Mr. Tutt (*op. cit.*) called ab. *intermedia*. Between the two geographical races existent in Britain and mentioned by Tutt, *viz.*, (1) the race with the much clearer white markings from Portland, (2) the much more ochreous form from Torquay, and which Mr. Tutt named respectively var. *pallida* and var. *suffusa*, there is considerable difference, a difference exactly paralleled in *Epunda lichenea* (in its typical form, and var. *viridicincta*) from the same districts, and dealt with at length (*Brit. Noct.*, etc., iii., pp. 52-53). Not only are these two races absolutely distinct but within the limits of the Portland race, var. *pallida*, Tutt, there is considerable aberrational difference, in one direction to an excess of the white markings culminating in ab. *argentea*, Tutt, in the opposite direction to a lessening of the white markings culminating in ab. *obsoleta*, Tutt. This may represent a "very small" amount of variation, but I should like a definition of what Mr. Stonell means by "very small." Of course, I know Tiger moths and Gooseberry moths present a greater or more readily observed range of variation. And all this was written 14½ years ago.

As to the second point mentioned above, *viz.*, that referring to *gothicina* with obsolete *gothica*-mark. Without attempting to go further than the work quoted above, I would call Mr. Stonell's attention to the following paragraph, etc. (*British Noctuae*, ii., p. 150) written nearly 14 years ago: "*T. var. suffusa*, mihi.—This form has the ground-colour entirely reddish, with the characteristic dark *gothica*-mark well-developed. It is very rarely mottled and is altogether a more unicolorous, as well as redder, variety. The reddish subvariety, in which the *gothica*-mark is fainter and reddish in colour, has been described as *gothicina* by Herrich-Schäffer. His special diagnosis is 'Inter stigmata ambo macula quadrata ferruginea.' He then adds: 'What is black in *gothica* is rust-coloured in *gothicina*. I have both sexes from Lapland. The species resembles *gothica* very much. The size, shape, and markings are the same as in that species, the colouring, however, is very different. The ground-colour is rust or reddish in the central area of the wing, with slaty-grey discoidals, and similarly coloured shading on the costa, with pale transverse lines. There is no trace of black in the *gothica*-mark. The outer transverse, wavy, subterminal line and interrupted row of dots on it are ochreous. The hind-wings and undersides are brown-grey as in *gothica*' (*Systematisches Bearbeitung*, vi., p. 196, figs. 125-6). This form, then, is not really an obsolete form as we are apt to consider it. Herrich-Schäffer, accustomed to the dark Linnean type, appears to lay stress, firstly, on the reddish ground-colour, secondly, on the rust-coloured *gothica*-mark. The application of the name *gothicina* to our pale Scotch specimens with a purely obsolete *gothica* mark, is, therefore, entirely wrong, the name being applied by Herrich-Schäffer to a form which appears to be generally distributed in Britain, and to be found with the other endless aberrations of the species, wherever it is common. I have specimens of var. *suffusa* from Hereford, Darlington, Morpeth, and Rannoch; and var. *gothicina*, in its true sense, from the same localities."

This perfectly plain statement of what *gothicina* is, may surely readily be referred to by all lepidopterists, in fact, one would suppose, if there were any real interest in the variation of *T. gothica*, apart

from the specimens exhibited, it would be the first thing referred to; and how much more valuable and interesting would be an exhibit with the forms of a variable species properly grouped and named, than a higgledy-piggledy lot of aberrations, not grouped, not even arranged, and a general inaccurate statement, instead of a carefully thought-out account of the exhibition that would be interesting to the well-informed members, who must of necessity be present. These points were cleared up long ago; it seems that they must still be cleared up "over and over again."

As one of the weaker sex, celebrated for illogicality and inaccuracy, I had never felt inclined to be proud of my weaknesses in this direction, until I commenced to study! entomology, and interested myself in the statements and writings of some of my fellow workers in the various branches of this interesting subject. Now that we are to have reports of societies again in the *Record*, it may be well, occasionally, to look into the remarks that are made.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from vol. xvii., p. 331.)

GENUS III: EUNAPIUS, Stål.

TABLE OF SPECIES.

- | | |
|--|-----------------------|
| 1. Central keel of pronotum longitudinally sulcate. | |
| 2. Vertex rugose, occipital carinula obsolete; prosternum with 4 tubercles | 1. TERRULENTUS, Serv. |
| 2.2. Vertex smooth, with distinct occipital carinula; prosternum with only 2 tubercles | 2. STÅLI, Borm. |
| 1.1. Central keel of pronotum smooth above (tubercle of prosternum compressed, with 2 teeth) | 3. BOLIVARI, Stål. |

1. EUNAPIUS TERRULENTUS, Serville.

The distinction of this species from the following is somewhat doubtful, as Bolivar notes that the form of the prosternal tubercles is variable in the four specimens he possesses, coming from Malaga; he suggests that a character may be found in the elytra. Length of body, 22mm. ♂, 37mm. ♀; of pronotum, 8.2mm. ♂, 11.8mm. ♀; of elytra, 5.2mm. ♂, 5.8mm. ♀; of post-femora, 12mm. ♂, 15.5mm. ♀.

This is a rare species, and the collection of considerable material is necessary in order to finally distinguish it from the following.

Spain; Malaga; Fischer records it from Seville, but Bolivar considers his specimen to be of *E. stali*.

2. EUNAPIUS STALI, Bormans.

Length of body, 28mm.-44mm. ♂, 44mm.-50mm. ♀; of pronotum, 8mm. ♂, 12mm.-13mm. ♀; of elytra, ?mm. ♂, 7mm. ♀; of post-femora, 12.5mm. ♂, 19mm. ♀.

? Portugal. Spain, Chiclana, Seville.

3. EUNAPIUS BOLIVARI, Stål.

Length of body, 32mm. ♂, 39mm. ♀; of pronotum, 11mm. ♂, 13mm. ♀; of elytra, 5.5mm. ♂, 8mm. ♀; of post-femora, 14.5mm. ♂, 20mm. ♀.

Spain; Chiclana, Malaga, Gibraltar.

Fam. 5: ACRIDIDÆ.

This family includes a very large number of genera distributed throughout the world; only a small portion being found in Europe. It is characterised by the not elongated vertex (in European forms), which passes without angle into the frons; the elytra has no intercalate vein in the discoidal area; an important character is the presence of a distinct spine, sometimes very long, on the prosternum.

TABLE OF GENERA.

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|--|---------------------------|
| 1. Posterior tibiæ cylindrical; mesosternal lobes separated from each other. | |
| 2. Posterior tibiæ with an apical spine on the outer border. | |
| 3. Frons vertical; pronotum swollen anteriorly; prosternal tubercle spiniform; elytra and wings well developed | 1. DERICORYSTES, Serv. |
| 3.3. Frons oblique; pronotum not swollen, obtusely tectiform; prosternal spine transverse and wedged-shaped; elytra squamiform .. | 2. PLATYPHYMA, Fisch. |
| 2.2. Posterior tibiæ with no apical spine. | |
| 3. Pronotum without lateral carinæ. | |
| 4. Posterior border of pronotum angled; wings and elytra well developed, longer than abdomen; very large. | |
| 5. Pronotum tectiform; cerci ♂ conical; infraanal plate ♂ strongly tridentate (in the European species) | 3. ACRIDIUM, Geoffr. |
| 5.5. Pronotum depressed; cerci ♂ short, broad, depressed | 4. SCHISTOCERCA, Stål. |
| 4.4. Posterior border of pronotum round or nearly truncate; wings and elytra absent or squamiform | 5. PODISMA, Latr. |
| 3.3. Pronotum with lateral carinæ more or less distinct, at least in the prozona. | |
| 4. Frons nearly vertical, especially in ♀s; posterior femora short and broad, in ♀s $2\frac{1}{2}$ times as long as pronotum; anal segment of ♂ very large, the cerci as long as the pronotum (in the European species). | |
| 5. Elytra and wings well developed; pronotum obtuse, angled behind | 6. CALOPTENUS, Serv. |
| 5.5. Elytra lobiform; pronotum truncate behind | 7. PARACALOPTENUS, Bol. |
| 4.4. Frons oblique; femora posterior slender, more than three times as long as pronotum in ♀; anal segment ♂ normal, small; cerci small. | |
| 5. Posterior tibiæ with 15 spines on outer border | 8. THISOICETRUS, Brunner. |
| 5.5. Posterior tibiæ with 8-12 spines on outer border | 9. EUPREPOCNEMIS, Fieb. |
| 1.1. Posterior tibiæ flattened above; mesosternal lobes united to form a longitudinal suture. (Body and especially pronotum cylindrical.) | 10. TROPIDOPOLA, Stål. |

GENUS I: DERICORYSTES, Serville.

Characterised by the form of the pronotum elevated and gibbous in the prozona. A single European species.

1. DERICORYSTES MILLIERI, Finot.

Greyish in colour; of graceful build; wings tinted with rose; the elytra and wings well developed; in the var. *carthagonovae*, Bol., the elytra do not generally surpass the posterior femora; the rosy colour

of the wings extends less than in the type. Length of body, 18mm. ♂, 27mm. ♀; of pronotum, 5mm. ♂, 7mm. ♀; of elytra, 16mm. ♂, 24mm. ♀.

The type occurs in the north of Africa, but the variety has been found at Cartagena in southern Spain.

GENUS II: PLATYPHYMA, Fischer.

This genus has the wings abortive and elytra rudimentary; the only European species is very small, and superficially somewhat resembles *Podisma*, but differs in the generic characters. One European species.

1. PLATYPHYMA GIORNÆ, ROSSI.

Small, brown, wingless. Length of body, 11.5mm.-13mm. ♂, 15mm.-18mm. ♀; of pronotum, 3mm.-3.5mm. ♂, 3.6mm.-4.8mm. ♀; of elytra, 2.8mm. ♂, 2.5mm.-3.2mm. ♀.

Abundant throughout southern Europe. Extremely common in the south of France, and all Spain but the north, and in Portugal; the larvæ appears in July, and the perfect insect passes the winter and lives until the following early spring; it occurs in dry herbage, and is very often found in copula. Brunner describes a variety *rufipes*, which has the lower sulcus of the posterior femora red, which is peculiar to Andalusia.

(To be continued.)

Notes on *Coleophora nigricella* and *C. conyzæ*.

By H. J. TURNER, F.E.S.

COLEOPHORA NIGRICELLA.—Attached to a leaf of the hawthorn sent me by Mr. Sich, on April 14th, with the cases of *C. hemerobiella* on it, was a roughly made curved and keeled case of quite a different pattern and construction. This I rightly supposed to be the young case of *C. nigricella*. The larva it contained fed on until May 5th, when it fastened its case down, and after it had remained so for a week, I suspected that it was dead. To my surprise, on May 14th, it commenced to move about again, and from the next mine made, a new case was constructed, but this time a straight one. This new case was made from a portion of a leaf quite away from the margin, and was finally cut out by May 27th. This newly-cut case was very flimsy at first, flattened, with an irregular waved keel all round. The anal valves were not formed, and, although the mouth was fixed down, it was not yet properly fashioned. At the field meeting of the South London Entomological Society, held on May 14th, at Ashted, several larvæ of this species were kindly given me by Mr. Edwards and other members, all beaten from sloe. All the cases were straight in form, and were evidently only just cut out, as they were in a more or less unfinished condition. Nearly all were very rough, and of a light brown, that they might be mistaken for *C. fuscadinella*. But when these cases were finished there was no fear of them being taken for that species. As in *C. hemerobiella*, these straight cases are the final ones, and they are also made much darker by a deposit made by the larva on the inside. The larva of this species is most restless, in nature as well as in confinement, moving continually from leaf to leaf, mining only a very small area around the mouth of the case, and

never wholly entering its mine except when it is making a larger one, from which to cut out a new case. It is extremely fond of the smaller leaves and leaflets, and rarely makes more than one small round, or nearly round, blotch in each. One may look over quite a number of twigs, with several leaflets on each, disfigured by these blotches, before meeting with the culprit. The terminal portions of the twigs are preferred, probably because there the pabulum is more succulent. Normally the cases of this species are three-valved, but two of the cases when fully completed, possessed only two valves to the anal opening. The larvæ obtained from Ashtead had all finished feeding by May 30th, and had moved away to a fresh unblotched leaf, or to a stem, to which they had very securely fastened their cases. The first emergence from these cases was on June 30th, exactly a month from the time of fixing the case to prepare for pupation. I should like to record that, at Sanderstead, I found a larva of this species feeding on crab-apple.

COLEOPHORA CONYZÆ.—For this very local species I am indebted to the kindness of Mr. Eustace Bankes, of Corfe Castle. On April 26th, 1904, I received a very nice batch of larvæ just taken by him in the Isle of Purbeck, feeding on *Inula conyza*. In his letter, Mr. Bankes says that *C. conyzae* is rarely found on *I. dysenterica*, but two or three of the larvæ sent had been found on that plant. He stated that this species was "extremely local even in its favourite haunts," and "most capricious in its appearance; it may be common one year, and then one may see little or nothing of it for several years afterwards." He pointed out the fact that *C. conyzae* is one of those species which does not enlarge its case, but cuts out a new one when it requires it. Thus it happens that for every larva taken one always meets with several empty cases. He goes on to say, "A careful examination of the leaves and stems will shew you some very small blackish cases, which are the earliest cases of *C. conyzae*. Some of these are doubtless empty by now (April 25th), but a few of them are certainly still tenanted, and if you do not see the larvæ, you can pretty well decide whether the case is tenanted by the freshness, or the reverse, of the appearance of the mined blotch." Among the cases received were, as Mr. Bankes said, a number of these little, blackish, cylindrical cases, most of them abandoned, and situated as a rule near where a case had been cut out. The small cases containing larvæ were chiefly attached at or near the tips of the leaves, and frequently there were two on a leaf. After considerable search I found a favoured spot at Ranmore Common, where an *Inula* was growing in quantity, but, unfortunately, I did not know *I. conyza* sufficiently well, and after my larvæ had nibbled and dwindled, I found that the plants I had secured were *I. dysenterica*, for which they have but little liking. Thus all of the larvæ were dead or pupated by June 8th, and the only one bred emerged on June 30th. A considerable number of the larvæ produced parasites, quite in accord with what Mr. Bankes has stated elsewhere, that when any of the species are abundant in any year in the larval stage, it very frequently happens that by far the larger number fall victims to ichneumons, etc. The following is a description of the larva :—

The 1st thoracic dorsal plate is very large, covering so much that it leaves only a small margin of larval skin around it. It has no division down the middle. Head plates are all intensely black. The mesothorax has an oblong dorsal plate

covering a considerable portion of the back, and divided down the middle by a very fine line; this plate is roughly oblong in shape. The metathorax has two black points on it. All these three segments have a good-sized circular black plate on the sides. I should have stated above that the plate on the mesothorax was about half the width of that on the prothorax. One larva examined had a ground colour of very intense brown, with legs darker on the outside. Another larva (in a smaller case) was not nearly so intense in colour.

I trust the next time I have the larva of this species, that more success will attend me. At any rate, I now know both what the foodplant is like and where to get it. One curious fact I had almost omitted. A larva was found wandering about without its habitation on May 15th, and was, by means of a pair of fine forceps put in a case, and strange to say, that although the case was much too large for it, it made itself quite at home, and continued to inhabit it for, at any rate, the few days that I kept it under close observation.

The season 1905 in Germany. Lepidoptera.

By E. M. DADD, F.E.S.

(Continued from vol. xvii., p. 328.)

On June 25th I left Berlin for Oberstdorf, in the Allgäu, the most southerly town in Germany, and geographically belonging to the Alps. This little place, practically unknown, I believe, to English tourists, deserves to be better known, as its surroundings are beautiful and prices moderate compared with those in Switzerland and the Tyrol. It is about half-an-hour by train from Immenstadt, which latter lies on the direct route between München and Lindau.

It was about midday when I reached Oberstdorf and found my wife, who had preceded me with her mother and sister, awaiting me on the station, and after dinner we took a walk up the Falkenbach Fall to the Seealp. Very little entomologically was seen, *P. argus* (*aejon*) and *P. argyrognomon* were plentiful, and odd specimens of *Cabera exanthemaria*, *C. pusaria*, *Lomaspilis marginata*, and *Acidalia incanaria* picked up. A little further up, among the rocks about the fall, various Geometrids were obtained by flicking the undersides of the rocks with the net. By this means *Larentia tophaceata*, *L. incultraria*, and *L. aptata* were obtained. The Seealp itself, a large, gradually rising slope leading to the Näbelhorn, was disappointing; no doubt it was too early for this altitude. An odd specimen of *Pieris* var. *bryoniae* and a few *Euchloë cardamines* were the only butterflies seen. On the way back, through the woods, a few interesting captures were made, notably a fine female of *Zonosoma trilinearia* and several male *Epichnopteryx pulla*. A large number of smaller lepidoptera, principally Pyralids, were obtained during this trip, but as I know little of these small things I cannot say whether rarities were found or not.

The next day was unfavourable for collecting, and, with the exception of a spell of two hours' sunshine during the morning, it rained all day. I took a short walk along the river-bank and beat a few Geometrids from the rocks, among others a specimen of *Macaria alternata*, rather a peculiar habitat for this species. At a spot where the river had formed an extensive sandbank, overgrown with willow and other bushes, butterflies were fairly common. *Lycaena arion*, *Nomiades semiargus*, *Polyommatus bellargus*, *P. icarus*, *Cupido minima*,

Plebeius argus and *P. argyrognomon* were all equally common. *Chrysophanus hippothoe* was worn, and *Melitaea athalia*, *M. dictynna* and *Coenonympha pamphilus* in good condition. *Aporia crataegi*, as usual, was abundant everywhere, and, on the rocks, an occasional *Pararge maera* was obtained, but, on this occasion, as on the previous day, it was principally to the Microlepidoptera that I paid particular attention, some very interesting Pyralids and Alucitids occurring among the luxuriant vegetation on the river flats.

The next day was devoted to an excursion up the Oythal to the Stuibenthal. At first it promised to be fine, but gradually it clouded over until finally we had several showers. Our way lay at first up the Trittachtal, a fairly deep gorge covered with extensive forests. There were many rocks along our path, and from these occasionally Geometrids started up. They were principally *Larentia aptata*, but an odd specimen each of *L. flavicinctata* and *L. olivata* proved that one must carefully examine all specimens. At the junction of the Oy and Trittachtal, two thoroughly mountain torrents, there was a fine sunny bank alive with butterflies. *Melitaea athalia*, *M. dictynna*, *Brenthis euphrosyne*, *Argynnis niobe*, *A. aglaia*, *Chrysophanus hippothoe*, *Polyommatus icarus*, *P. bellargus*, *Cupido minima*, *Lycaena arion*, *Plebeius argus*, *Polyommatus astrarche*, *Pararge maera*, *Enodia hyperanthus*, *Epinephele janira*, *Coenonympha iphis*, *C. pamphilus*, and, above all, *Aporia crataegi*, were common. Further up the valley an odd specimen or so of *Erebia oeme* and *Cyclopides palaemon* were found.

As one got further up the valley butterflies became scarcer. Most of the above-mentioned species disappeared, but were not replaced by other more alpine forms. It was evidently too early. Blues were most frequently seen, particularly *Cupido minima*, which was in boundless profusion and simply covered every patch of damp earth. They were accompanied by *Nomiades semiargus*, ♂ mostly worn and ♀ fresh, and occasional *Lycaena arion*. Why is it that one never gets the latter species in good condition? I have taken many hundreds at one time and another, but have not yet got a decent series of a dozen specimens. *Leptidia sinapis*, *Papilio machaon* and *Colias palaeno* were further noted, but the latter, the only specimen of this species seen by me during my visit to Oberstdorf, escaped.

On leaving the Oythal Wirtshaus we at first passed through a gradually rising valley, which would probably have produced something if the weather had been more favourable, but, as it was, nothing was taken until we reached the higher ridges about the Stuibenthal. For about 200 metres below the Stuibenthal the mountain-sides are covered with dense thickets of deciduous trees—hazel, ash and planes predominating, at other spots there are huge growths of the basket-fern, the like of which I have never seen before, and hereabouts Geometrids were fairly common. I again had the satisfaction of taking *Nemoria viridata*, but the specimens were mostly worn; further I captured *Lobophora sexalisata*, *L. appensata*, *Larentia pomerearia*, *L. tristata*, *L. ferruginata*, *L. turbata*, *Lomaspilis marginata*, *Abraxas sylvata*, *Iodis lactearia*, and *Eupithecia veratraria*.

On the following day I spent the morning on the lower slopes of the Seealp, at first with meagre success. On the way up, blues were plentiful, but only the usual common species, *Nomiades semiargus*, *Plebeius argyrognomon*, *P. argus* and *Polyommatus icarus*, with an occa-

sional *Lycaena arion*. *Melitaea athalia*, *M. dictynna* and *Pararge maera* were the only other species seen. I soon got tired of this tameness, and, having devoted half-an-hour to getting together a series of several interesting Pyralids, I decided to descend more towards the valley. I was almost immediately rewarded by finding *Polyommatus astrarche*, and further down *P. bellargus*, in abundance. While engaged in sorting out good specimens a somewhat lighter coloured male caught my notice, which proved to be the first *P. hylas*, and almost immediately afterwards the first *Coenonympha satyrium* fell to my net. As this spot seemed to be fairly productive I decided to remain, and in the course of an hour had increased my catch by *Erebia oeme* and *Brenthis amathusia*. I was naturally very delighted at finding this last species, as it was new to me. Burnets were busily employed buzzing about from flower to flower, and a good many were captured, but only *Anthrocera achilleae*, *A. filipendulae* and *A. purpuralis* seemed to be present. On the way home, at the foot of the hill, a swampy hollow proved very productive; the commoner blues were in hundreds, accompanied by *Chrysophanus hippothoe*, *Argynnis niobe*, *A. aglaia*, *Brenthis amathusia*, *Enodia hyperanthus*, and, above all, a fine large form of *Coenonympha tiphon*. In the afternoon a visit was paid to Moorbad, and, on the moor, *C. tiphon* and *Brenthis pales* were found in abundance, the latter, unfortunately, no longer in good condition.

(To be concluded.)

The Pupa of *Chrysophanus dispar* (with plate).

By DR. T. A. CHAPMAN.

In the photograph (pl. i., fig. 1) the spiracle of the left side of the 6th abdominal segment is shown, with its surrounding territory ($\times 100$). We have here a very definite difference between the sculpture and hairs, otherwise so much alike of *Chrysophanus phlaeas* and *C. dispar*. In *C. phlaeas* there appear to be no hairs except the trumpet-hairs, whilst in *C. dispar* we have long hairs (0.08mm. to 0.17mm.) of more ordinary type. These occur, however, only in the circumspiracular region, including the prothorax. Each hair is a little swollen in its last third, and from the surface of this portion arise a number of fine spiculæ, generally standing out at right-angles to the axis of the hair, producing a very different appearance from the spiculated hair so often met with. Amongst these hairs in the photograph is one, viz., that pointing and with its end close to the side of the spiracle, which, instead of terminating in a sharp point, has an oblique flat end, armed with spiculæ, clearly a hair that was not quite sure it ought not to have been a trumpet-hair. Several trumpet-hairs may also be seen in the photograph. The great mass of the circles unprovided with hairs are no doubt lenticles—some may be hair-bases where the hairs have been lost. Unfortunately, in the preparation, a majority of them have succeeded in retaining an air bubble, which makes them look black in the photograph. Nearly all those, however, that are not so obscured, possess a membrane or diaphragm of minutely dotted structure, like that usually met with in lenticles. The spiracle is of elaborate structure. It may be described as an oval tube nearly as long as it is wide, with the opening it presents diminished to a central slit by membranous outgrowths on the sides, nearly meeting in the middle.

Each of these seems to be a pillar of transparent material expanded at top into a flat plate. This differs much, if not in essential structure, certainly in appearance, from that of *C. phlaeas*, in which each spiracle has an outer projecting mass, of a *cheval de frise* character, looking as though the pillars (in *C. dispar*) did not end within the spiracle, but, bending, emerged from the middle of the spiracle, and then bending outwards in rounded batons closely set together, of a length rather greater than half the width of the spiracle, formed a sort of outer basket-shaped structure, but of such transparent materials that it is difficult to decide whether it does consist of a number of separate batons, or whether the lines are only grooves on a continuous structure.

The pupæ of *C. dispar* and of *C. phlaeas* present certain spiculated areas that very strongly suggest the spiculæ on the Nepticulid pupa and those of other lower micro-lepidoptera, which are the forerunners and primary forms of the rows of spines so well-developed on the pupæ of Tortricids and various other of the higher micro-lepidoptera.

They agree with these micro-spiculæ in their distribution and in their attitude, *i.e.*, directed backwards (not dorsally but terminally). They are very small, but are more or less similarly arranged in rows. On the forward abdominal segments they are dorsal only. On the 7th and 8th they are also lateral, and on the 9th and 10th they occur ventrally and over wider areas. In both species they occur as an anterior band along the anterior borders of the segments, and a posterior close to the hind margin. The anterior row occurs in *C. phlaeas* on all segments 2-9, the posterior on 1, 3, 4, 5, 7, and 8. The posterior row on 2nd abdominal segment is quite forward of the posterior margin, without being quite in the middle the segment. This is also the case in *C. dispar*, in which the anterior row exists on 2, 6, 7, 8 and 9, and the posterior on 3, 4, 5, 6, 7 and 8.

Plate i., fig. 2, represents a portion of the cremaster of *C. dispar*. The cremaster consists of a very large number of hairs about 0.14mm. long, with a double anchor-like hook, or pair of hooks, at the free end. Just above these, on the right, is seen an area of skin-points, which are very similar to, and continuous in distribution with, those already referred to as forming the micro-like rows.

These rows of spicules have no apparent relation with any larval structures; the full-grown larva of *C. phlaeas* has spiculated hairs, but no skin-points, the skin surface being divided into a mesh of hexagonal cells by a fine network of lines. It seems difficult to avoid looking for some relationship with some micro-ancestor to account for them, and yet it is almost more difficult to explain their survival, since they must have been useless for their original functions for many ages. It is, however, no easier to suggest any other origin for them, or to imagine what useful functions they can now perform. To return to the cremastral area and its hooks, I find it impossible to satisfy myself as to the limits of the 9th and 10th abdominal segments. On the ventral line, the 7th segment is clear enough, but the 8th is so contracted and fused with the 9th, that even its limits are doubtful. Except on the ventral line, the posterior margin of the 8th is definite enough. Within the circle it encloses, to take the specimen of *C. dispar* before us, and specimens of *C. phlaeas* agree with it, we find first in the dorsal half, an area much like the rest of the pupa, with buttons, ribs, and trumpet-hairs, but with a small central area smooth, except for some

lines radiating from its centre. This has all the appearance of a scar, not unlike that of the horn in Sphingids, but whether of some injury or normal might be doubtful, were it not that other specimens present a very similar appearance. Turning to the ventral half of the area, we find it more delicate and transparent, and divided across the middle by a suture, which does not, however, reach either side. The whole of the area is armed with the cremastral hooks, except a portion in the middle line, slightly behind the suture noted, but chiefly between it and the front of the segment. In the middle of this clear area are two projecting points side by side, and running forwards from between them two fine ridges with a groove between, ending in front by widening out into a rounded lappet, with a surface of extremely fine spiculations. This appears to be at a different level from the portion of segment that seems to overlap it from either side and carries the hooks, and one might suppose this to be 9th and the hooks on 10th, but those immediately behind the surface are continuous, without intervening suture.

Random Notes on the Lepidoptera observed in the Season 1905 in the Rochester and Strood district.

By J. OVENDEN.

The season opened fairly well and to time, *Hybernia rupicaprariva*, *H. marginaria*, *Anisopteryx aescularia*, *Phigalia pedia* and *Amphidasys strataria*, males being rather common on the gas-lamps on the outskirts of the towns during January, February and March. Sallow bloom I found a failure, as the only nights on which I could get out it was either wet and cold, or windy and cold with bright moon. Even larvæ appeared to be scarce, only a few *Noctua triangulum*, *N. baja*, *Triphaena fimbria* and *Epinephele janira* being taken. During May, imagines were very shy, owing to the cold winds, a few *Corycia bimaculata*, *C. temerata*, *Zonosoma porata*, *Z. annulata*, *Lygdia adustata*, *Lomaspilis marginata* and *Acidalia remutata* being the only insects netted.

At the end of May and early in June a good deal of hard work with the beating-stick produced a very fair return in larvæ of *Thecla w-album*, *Himera pennaria*, *Cosmia trapezina*, *Taeniocampa munda*, *Hybernia defoliaria*, *Scopelosoma satellitia*, while a few each of *Nola cucullatella*, *Asteroscopus sphinx*, *Diloba caeruleocephala*, *Miselia oxyacanthæ*, *Cosmia affinis*, *C. difinis* and *Hybernia aurantiaria* helped to give variety to the bill of fare. A week or two later, imagines of *Adscita statices*, *Angerona prunaria*, *Melanthia albicillata*, *Asthena luteata*, with *Anthrocera loniceræ* pupæ, and larvæ of *Enodia hyperanthus*, *Ebulea crocealis*, and *Oidaematophorus lithodactyla* were easily obtained when wanted. My special quarry was, however, larvæ of *Toxocampa pastinum*, but it seemed to have followed *Nota albulalis* and vanished from its old haunts at Chattenden, although, later on, the species occurred in the perfect state in fair numbers on the outside of a wood about six miles away, with a few other good things such as *Agrotis cinerea*, *Acrionicta leporina*, *Noctua stigmaticea*, *Chariclea umbra* and *Cymatophora fluctuosa*, together with a nice lot of *Cucullia umbratica* larvæ.

A visit to its restricted locality produced about fifty larvæ of *Orendenia septodactyla* (*lienigianus*). By the way, how excessively local this plume seems; an excitable collector could easily exterminate the

insect completely from this locality in about ten minutes, the whole of the infected plants could be covered by one sweep round of the net, and, although we have tried planting some of the larvæ on other patches of the foodplant growing within twenty yards of the spot, I can never find it there the next season. Early in June, *Adactylus bennettii* was to be found in the marshes very abundantly—ova, pupæ, larvæ and imagines all occurring at the same time and place, while *Eupithecia scabiosata*, *E. oblongata*, *E. linariata*, *E. absynthiata*, *Scoparia cembrae* and *Adopaea lineola* were fairly plentiful if worked for, as were also the larvæ of *Gortyna ochracea* in the thistles. Strange to say, I quite failed to rear the perfect insect, owing, I believe, to the ichneumons. An evening spent in early July for *Nola albulalis* drew blank. I have not seen that species since 1902, when four imagines were taken in as many evenings. *Melanthia rubiginata*, *Timandra amataria*, *Ebulea crocealis*, and *Oidaematophorus lithodactyla* were, however, very common and in lovely condition.

During June and July, the breeding-cages kept one fairly busy with *Geometra vernaria*, *Leucania conigera*, *Eupithecia scabiosata*, *E. absynthiata*, *Malacosoma castrensis*, *Noctua ditrapezium*, *E. isogrammata*, *E. valeriana* and *E. oblongata*, while, from an old apple-tree in my garden, *Aegeria myopiformis* kept emerging from late June till mid-July. About two or three dozen were captured, but scores got off to dance in the sunshine round the treetop. I only came across one larvæ of *Cosmotriche potatoria*, but, oddly enough, that produced the finest aberration I have ever seen of that species, it is a ♂ with the coloration of the lightest ♀s. *Mamestra abjecta* appeared true to time, from July 14th to 23rd, in fair numbers, also *Hydroecia paludis*, *Calamia phragmitidis*, *Leucania conigera*, *Eupithecia subnotata*, *Mylophila cribrella*, *Gillmeria pallidactyla* (bertrami), *Chilo phragmitellus* and *Hoemosoma binaevella*; these, with a few each of *Apamea ophiogramma*, *Leucania straminea*, *Senta ulvae*, and a few other species, made collecting in our marshes fairly lively for about a fortnight. By way of a change, a visit to the woods was proposed, where we got a nice series of *Orobena stramentalis*, *Eupisteria heparata*, *Lithosia griseola*, *Rivula sericealis*, *Ebulea crocealis*, *Epione apiciaria*, *Timandra amataria*, and a few rather worn *Coremia quadrifasciaria*. A bit of fun was occasioned one evening by my companion trying to negotiate a muddy ditch with the aid of an old treetrunk thrown across by way of a bridge; of course, when he got to the centre of the stream the treetrunk canted over a trifle, my friend landing up to his middle in the black odoriferous slime, and, scrambling to the opposite bank, he seated himself to scrape and wring his nether garments, meanwhile using very unparliamentary language to help dry them, whilst I, inwardly smiling, and with a real feeling of satisfaction that I had escaped, found it hard work to catch and box the imagines of *Acidalia emarginata*, which fairly swarmed at the spot. By the way, I think we read of a very similar adventure in one of our Editor's books (*Woodside*, etc.), which happened a few years ago on Cooling Marshes. On that occasion he was the victim.

A week later, one evening at sugar, I had some *Pyralis glaucinalis* visit one particular post; I only caught two as they were very skittish, so, as I wanted the species, I made a daylight inspection of the locality, and soon came across some farm-buildings well covered with old thatch and a fine old stack of hopbine. The day forbade

active work, and I had to content myself with looking and thinking, but Monday found the sugar-pot at work, and *P. glaucinalis* fairly swarmed. I boxed 40 or 50, and filled all my boxes, while scores got away. Two nights later I essayed to repeat the performance with a greater number of boxes. Imagine my chagrin when not a sign of the species was to be found. I was fairly nonplussed, the weather had been grand, and yet here was a species in swarms one evening, and two nights later not to be seen, while all the other species were in about the same abundance as on the first night. Being exceptionally busy, the autumnal larvæ got a rest, but I saw during the daytime *Acidalia marginepunctata* dotting every lamp in the district, while a nice lot of *Calamia lutosa* were found clinging to the reeds, with two or three *Charaeas graminis* and *Tapinostola fulva* on the wing, when a search was made for these species, just after dark.

An afternoon and evening spent in and round the woods capping the chalk downs in June gave a fair supply of such insects as *Ilythia carnella*, *Emmychia nigrata*, *Pyrausta purpuralis*, *P. aurata*, *Crambus pinetellus*, *Larentia olivata*, *Triphosa dubitata*, *Selenia illuminaria*, *Hypsipetes sordidata* (fine forms), and a few others. I only paid the ivy bloom two visits, and saw nothing worth noting. One evening I felt considerably fogged; we went to an old castle, the walls of which were covered with ivy in bloom, from which the pollen was falling in clouds with every puff of wind; it was an ideal night, but the only insects I saw were one *Anochelis pistacina* and a caddis-fly. A nice walk round Cobham Park in the third week of November gave a fine series of *Hybernia aurantiaria*, both sexes; *H. defoliaria*, males only; while *Cheimatobia brunata* hung in hundreds from the grass-stems, the fences, and every imaginable place, and marched like soldiers up the smooth trunks of the beeches and hornbeams in every direction. This, I think, finished my entomological rambles for the year, and I think I can say I have been nearly satisfied with the season of 1905.

Mendel's Law of Heredity.

By L. DONCASTER, M.A.

In the October number of the *Entomologist's Record* a paper appeared by my friend Rev. G. H. Raynor, under the heading "Heredity Notes." In it occur one or two statements which seem to me to be founded on a misapprehension, and which I should like to correct. In Mr. Raynor's statement of Mendel's Law he writes that a normal male paired with an aberrant female, or *vice versa*, will give progeny of the first generation which are all normal. This is not necessarily the case. In species which follow Mendel's Law all the offspring will follow one parent or the other (provided that both parents are "pure" to start with), but only experiment can show whether the "type" or the "variety" is dominant. For example, in *Angerona prunaria* the var. *sordidata* is dominant, and a pure *sordidata* bred with a *prunaria* will give offspring all having the *sordidata* character. So it is plain from the facts given by Mr. Raynor that the var. *comma-notata* is dominant over the typical *C. truncata*.

Secondly, in his statement of the law, Mr. Raynor says that when first-cross young are paired together they will yield offspring one-third of which are aberrant, two-thirds normal. The ratios are not one-

third and two-thirds, but one-quarter and three-quarters; for example two cross-bred *sordiana* paired together give three *sordiana* to one *prunaria* among their offspring. Mr. Raynor's experiments with *Cidaria truncata* bear out this proportion very fairly, though there is a slight excess of the type.

Mr. Raynor has done such valuable work in testing the application of Mendel's law to Lepidoptera, that I do not like to let such a misapprehension pass unnoticed, and am confident that he will be pleased to find that his recent experiments supported the law instead of contradicting it.

(C) COLEOPTERA.

COLEOPTERA IN THE ENFIELD DISTRICT:—Amongst the accumulation of beetles, with which I have filled numerous store-boxes during the seasons of 1903, 1904 and 1905, are a few species which appear to be worth recording. *Cychrus rostratus*, one under loose beech-bark at Enfield. *Notiophilus rufipes*, a few amongst dead leaves. *Licinus silphoides*, one running upon the pavement near Enfield Town Station. *Platyderus ruficollis* occurs rarely under loose bark, and in grass tufts at Edmonton. *Amara convexiuscula*, several by sweeping herbage on old rubbish heaps at Edmonton. *Calathus fuscus*, a few under stones and rags. *Sphodrus leucophthalmus*, in a cornshop at Edmonton, where also occurred—*Ptinus fur*, *P. brunneus*, *P. tectus*, *Niptus crenatus*, *N. hololeucus*, *Tenebrio molitor*, *T. obscura*, *Tribolium confusum*, *Mycetophagus quadriguttatus*, etc. One specimen of *Bembidium quinquestriatum* occurred under a stone at Enfield in October. *B. flammulatum*, *B. articulatum*, and *B. varium* in numbers at Edmonton and Enfield. *Dromius agilis* occurs at High Beech and Waltham, but I have not seen it at Enfield. *Xantholinus fulgidus* occurs occasionally on pavements, etc. *Oxyporus rufus* was swarming in fungi at Edmonton during the summer of 1903, but I have not seen it since. *Coprophilus striatulus* taken occasionally on pavements and in decayed vegetable matter. *Homaliun caesum* ab. *tricolor*, *H. striatum*, *H. vile*, *H. concinnum*, *H. iopterum*, in bark, fungi, etc. I am indebted to Mr. Donisthorpe, who discovered two specimens of *Hapalaraea pygmaea* amongst my collection of *Homalii*. *Prognatha quadricornis* and its curious larvæ swarm under damp elm-bark in a timber-yard at Enfield. A nice series of *Agathidium nigripenne* occurred in a similar situation. *Eumicrus rufus*, a few have occurred under bark of beech, elm and fir. *Symbiotes latus* turns up pretty frequently under elm-bark at Enfield, and about twenty examples occurred in powdery fungoid matter under alder-bark near Waltham Abbey. *Triplax russica*, *Paromalus flavicornis*, *Dendrophilus punctatus*, *Abraeus globosus*, and a few species of *Hister* occur in fungi and under bark. *Nitidula rufipes*, swarming in the dried-up carcase of a fowl at Cheshunt. *Laenophloeus binaculatus* and *L. ferrugineus* under sycamore-bark at Enfield. *Atomaria fimetarii* in stems of fungi at Edmonton, and *A. fumata* in fungi at Enfield. The whole of the *Mycetophagidae* occur at Enfield, with the exception of *Mycetophagus populi* and *M. fulvicollis*. The little *M. quadriguttatus* is abundant in the rotten wood of an old elm at Enfield; an aberration with six distinct spots forms the greater part of this colony. I have not seen this species alive in the open country elsewhere in the district, it appears to be confined to the one tree. The common *M. 4-pustulatus*

turns up in great numbers throughout the district, and appears to differ greatly from the other species of the genus, by the rarity of any variation from the usual form. I have examined some thousands of living examples, but have found only four specimens which differ from the common form. One of these is a remarkable form, with two spots on one elytron and only one spot on the other. Another specimen has irregular-shaped spots, which meet and form a bar on one elytron. The other specimens are very similar, but the spots do not quite meet. Strange to say, the preponderance of red marking appears on the left-hand side of each of the specimens here mentioned. I have taken one specimen of *M. piceus* without any black marking on the elytra. *Melasis buprestoides* turned up in abundance in dead birches at Enfield and Winchmore Hill. *Elater lythropterus* and *E. balteatus*, under oak bark, near Waltham Abbey. *Athous rhombeus*, one specimen in a sycamore stump at Enfield. The black larvæ of this species is very common here, but up to the present time I have failed to discover more than the one beetle. *Ptinus lichenum* is abundant in July on old fences, at Enfield. *Ptinus sexpunctatus*, one specimen crawling on a doorstep, at Enfield. *Rhizophorthera pusilla*, abundant in July on fences, etc., near an old mill at Ponder's End. Numerous species of *Cis* occur in fungi, about the best being *C. fuscatus*. *Xestobium tessulatum*, in abundance at Waltham and other parts, in old willows, etc. *Prionus coriarius*, *Callidium variable*, *C. violaceum*, *Tetrops praeusta*, *Leiopis nebulosus*, and a fine series of *Clytus mysticus*, are amongst the longicorns I have taken at Enfield. Of the species of *Donacia*, no less than twelve have fallen to my net, others may occur when I know more about the district. My list includes *D. crassipes*, *D. dentata*, *D. bidens*, *D. sparganii*, *D. linearis*, *D. typhae*, *D. menyanthidis*, *D. semicuprea*, *D. cinerea*, *D. sericea*, *D. affinis*, and *D. thalassina*, all of these occur in abundance. *D. cinerea* appears to be confined to a pond near Waltham Abbey; *D. thalassina*, on rushes at the edge of a disused portion of the new river, at Enfield. The others may be taken in various parts of the river Lea, between Edmonton and Cheshunt. *Crepidodera helvins* and the ab. *cyanea* on aspens at Enfield and Northaw. *Orchesia micans* swarmed in fungi on various trees. *Hallomenus humeralis*, rarely in fungi and under bark. *Conopalpus testaceus*, a pair bred from an oak-stick picked up at Palmer's Green. *Anisoxya fuscula*, several specimens in a dead sloe-stick, near Waltham, and one beaten from a sloe hedge at Edmonton. *Brachytarsus fasciatus*, one example settled on a reed at Edmonton. *Maydalis barbicornis*, one beaten from hawthorn at Cheshunt. I have succeeded in breeding four specimens of *Aulonium sulcatum* from larvæ taken in the burrows of *Scolytus multistriatus*, at Edmonton. One dead specimen of *Aulonium* was taken from a spider's web on an old elm at Winchmore Hill. This tree is now in the clutches of the *Scolytus* grubs, so I am looking forward to another batch of *Aulonium* next season.—CHARLES J. C. POOL, Enfield. November 29th, 1905.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

LARVAL VARIATION OF *ACRONYCTA ALNI*.—In the *Ent. Record*, vol. ii., p. 128, and in *Ent. Mo. Mag.*, xxiii., 226, I called attention to the circumstance that, occasionally, the larva of *A. alni*, which has four

moult, and passes *per saltum* from an immature to the well-known mature plumage, varies into having a fifth moult, and so adds an intermediate instar, in which it agrees exactly with neither the immature ("bird dirt") stage or the adult larva, but is more or less intermediate, with some features wanting in both. I have just happened to notice the account of *A. alni* given by Costa in *The Fauna of the Kingdom of Naples*. He had a larva which he took on chestnut, in 1848, and which he says was in the first instar. He notes it as having five moults, and describes each instar. This specimen then, possessed the extra moult and had the added fifth instar. This he both describes and figures. It agrees to a much greater degree with the fourth instar as I observed it, than with the extra fifth instar I met with, except in one particular, *viz.*, that the clavate hairs are nearly as well developed as in the last instar. Now in the normal fourth instar they are very poorly developed, and in the fifth I found them smaller than they are shown in Costa's figure. Costa had only the one larva, was it accidentally a five-moulter, the four-moult form being normal at Naples as here, or does *A. alni* always moult five times at Naples? I met with two distinct forms in the extra fifth instar, Costa's larva would appear to present a third form. Is this normal for Naples, or was it an aberration there as it would be here? These are interesting questions to which we may hope one day to have an answer. At present I can only surmise that, like the larvæ of a good many species now known to do so, the larva of *A. alni* presents considerable geographical variation.—T. A. CHAPMAN, M.D., Betula, Reigate. *December 12th, 1905.*

NOTES ON THE PUPÆ OF *SMERINTHUS OCELLATA* × *POPULI* HYBRIDS.—Mr. L. W. Newman has very kindly given me for examination nineteen specimens of *Smerinthus ocellata* × *populi* hybrids that have died in the pupal stage. They are on the whole a quite normal-looking lot of pupæ, two only being slightly malformed, one by having two deep depressions on the ventral area of the 7th abdominal segment, probably only an extra deep scar of the larval prolegs. The other is malformed as regards the cover to the second pair of legs, the fusion of these with the antenna-cases has completely failed, leaving a deep open seam. Both in shape, colour, as well as rugosity of surface, they are far nearer to *Amorpha populi* than *Smerinthus ocellata*, although there are three that show a partial smoothing and polishing of surface in the direction of the male parent, but this tendency is confined to the wing-cases and central appendage shield; there are also some signs of the male parentage in the shape of a few specimens, but, taken as a whole, they would easily pass with the uncritical as pupæ of *A. populi*. Probably the point of greatest interest is the fact that the whole nineteen have male genital scars, and these are quite normal, with one exception, but in this the malformation is no greater than in a male pupa-case of *A. populi* that I happen to have by me.—A. BACOT, F.E.S., 154, Lower Clapton Road, N.E. *November 23rd, 1905.*

REMARKS ON "PRACTICAL HINTS," PART III.—Mr. Tutt will, I am sure, pardon me for drawing attention, in the interests of science, to the following inaccuracies that occur in the third part of his *Practical Hints*, published in January last: (1) On p. 89, "*Bucculatrix cicadella*" should be "*Bucculatrix cidarella*," as shown by the mention of the foodplant, etc. "*Cicadella*" is a *Galanthia* (*Butalis*), not a *Buccu-*

latic. (2) On pp. 89 and 107, "*Gracilaria imperialella*" should evidently be "*Gracilaria hofmanniella*," since the latter is the species that feeds on *Lathyrus* ("Orobus") *niger*, the former confining its attentions, as far as is known, to *Symphytum*. (3) On p. 109, "*Nephoptyx abietella*" should everywhere be "*Dioryctria splendidella*," as clearly proved by the reference (p. 108) to the larva feeding on cones of spruce fir, and by our knowledge that Dr. Wood's published notes, upon which the hints are founded, refer to the latter species. Formerly, both *splendidella*, H.-S. (*sylvestrella*, Ratz.), and *decuriella*, Hb. (*abietella* (S.V.), Zk.), were confused in Britain under the one name "*abietella*." I have no doubt that the hint on "*Nephoptyx abietella*" on p. 120, is also based on experience with *splendidella*, rather than with *decuriella*.—EUSTACE R. BANKES, M.A., Norden, Corfe Castle. November 26th, 1905. [We are much indebted to Mr. Bankes for these corrections of misused names. There are one or two others, inseparable from handling so large a mass of material, when one thinks more of things than names, and calls things by the old familiar names, without troubling as one should to look up recent corrections, etc.—ED.]

NOTES ON COLLECTING, Etc.

BREEDING PAPILO MACHAON AUTUMNAL IMAGINES.—In Mr. Floersheim's interesting account (*antea*, xvii., p. 277) of breeding *P. machaon*, he shows that *Skimmia fragrans* is the favourite foodplant on which the ova were laid. I have also this year bred *P. machaon* and *P. asterias* in a large out-of-door cage covered with tiffany of coarse mesh. Acting on Mr. Floersheim's advice I had *Skimmia oblata* bushes, which is closely allied to *S. fragrans*, the only other foodplant being fennel. My experience differs in that both species laid freely on fennel, and that no searching revealed ova on *Skimmia*. I have nineteen *Skimmia* and four large fennel plants. The original *P. machaon* pupæ came from the Continent. Being away on the Continent during July, I was unable to observe the larvæ during their later stages, and, prior to this, most of the larvæ were transferred to beds of carrot and fennel outside the butterfly-house, and only protected by bird-netting. On my return most of the larvæ had wandered from these beds; those still in the butterfly-house had, with few exceptions, suspended themselves among the bushes and on the sides of the house. During the autumn several *P. machaon* and *P. asterias* emerged, both in the garden and also in the butterfly-house. I regret that a large proportion of the pupæ in the houses were destroyed by some small fly and, I believe, beetles, before I rescued the remainder. I believe the only safe way of saving pupæ of this species will be in future to remove the full-fed larvæ to cages covered with leno.—E. E. BENTALL, F.E.S., The Towers, Heybridge, Essex. November 26th, 1905.

APPEARANCE AND DISAPPEARANCE OF LEPIDOPTERA AT MARLOW.—In the *Ent. Record*, 1902, p. 24, I noticed the appearance at Marlow of *Polyommatus bellargus*. It has now, apparently, altogether disappeared. Why this should have happened it is difficult to say, I am disposed to attribute it to the spread of tall coarse grasses over the few patches of *Hippocrepis*. This may have prevented the ♀s from laying their eggs on the foodplant, or may have retained the rain and dew to such an extent as to make the place too damp for the health of the larvæ.

Whatever the cause may be, the insect has not been seen since the autumn of 1902. *Polyommatus corydon*, however, still flourishes in the same locality, but not in its former abundance. Two novelties have been taken at Marlow this year, *Plusia moneta*, which flew into the house on July 2nd, and *Agrotis agathina*, which must, like *P. bellargus*, be an immigrant, for the root or so of heather amongst which it was found did not exist in the 'seventies, and there is no expanse of that plant within a circuit of at least five miles.—A. H. CLARKE, F.E.S., 109, Warwick Road, London, S.W. November 27th, 1905.

LEPIDOPTEROLOGICAL REMINISCENCES.—As a matter of ancient history I may mention that, in 1855 and 1857, *Augiades sylvanus* was abundant, and *Polyommatus astrarche* and *Hesperia malvae (alveolus)* by no means scarce, on the West London Railway embankment at Wormwood Scrubbs, and especially on that portion of it which runs alongside Latimer Road. I also took a *Polyommatus corydon* ♀, and saw another in Ladbroke Square, Notting Hill, on August 14th, 1864.—IBID.

FEMALE HYBERNIA DEFOLIARIA AT LIGHT, WITH SOME THOUGHTS AS TO WHY APTEROUS FEMALES MOVE UPWARDS.—On the night of November 25th I was surprised to see a female *Hybernia defoliaria* running about on the glass outside a window, as if seeking a way in, evidently drawn thither by the lamp in the room. One does not usually expect to find an apterous female so attracted, especially by a light in a house, and I should very much like to know if a similar case has occurred before. I have since been wondering whether their natural habit of climbing trees, etc., is, as is generally supposed, solely due to maternal forethought, aided by keenness of scent, in finding a suitable foodplant for their future progeny. May not the attracting power light has on insects induce them, to some extent, to travel upwards? After emergence, the first idea of most moths seems to be to use their legs, and, in captivity, one may observe that they crawl to where most light enters the pupa box. In the case of the winter moths in a state of nature, the attracting light would be the sky, comparatively bright even at night, and, being above, might start them off in the right direction, and perhaps they may have an instinctive feeling that they must get away from utter darkness after all the months they have been bottled up, in total obscurity, under ground. Dr. Chapman thinks the apterousness of the females of the winter moths has come about so as to prevent them going right away from their foodplants, which, in winter, when vegetation is dormant, would give out such little scent that a moth, flying, would fail to detect it. He says, in his article "On Winglessness of Winter Moths" (*Ent. Rec.*, xv., 45), "how is the moth to find the foodplant on foot? It emerges from the earth, and may tramp away anywhere. In the first place, however, it does it, we know it does it, and does it easily and abundantly. Probably pupation takes place where this shall be tolerably easy, where the ordinary upward climb a moth does on emergence shall bring it to the stem of the required tree. Probably at these close quarters scent is not altogether inappreciable." But if, as I suggest, the light of the sky is sufficiently strong to attract, would not the moth desire to travel up the first prominent object looming in sight and extending in the right direction—upwards? This object would probably be a tree or bush and also the correct foodplant, for it would be pertaining to the particular vegetation growing in the locality where the moth passed its

larval existence; thus most of the winter wingless females would reach a suitable place to lay their eggs when the time came for them to do so.—J. F. BIRD, The Nurtons, Tintern, Monmouth. December 1st, 1905.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. November 23rd, 1905.—**BRITISH APORIA CRATÆGI.**—Mr. J. P. Barrett exhibited a long series of this species, including specimens taken in the New Forest in 1871, and in East Kent in 1901-1905. **ABERRATIONS.**—Mr. J. P. Barrett also exhibited (1) an aberration of *Argynnis adippe* from Three Bridges, the hindwings considerably suffused with black, and the markings thereof running into streaks. (2) An aberration of *Melanargia galathea*, the black markings of all four wings almost entirely confined to the marginal and submarginal areas. **ABERRATIONS OF ANTHROCERA FILIPENDULÆ.**—Mr. R. Adkin exhibited a series of this species to illustrate the gradual change in the colour from the typical rich crimson (*filipendulæ*) through shades of terracotta (ab. *intermedia*) and orange (ab. *aurantia*), to a pale clear yellow (ab. *flava*); also an example in which the four basal spots were united into an irregular elongated patch (ab. *bipunctata*). [These forms are all described in Tutt's *Nat. Hist. of the British Lepidoptera*, i., pp. 508-520]. **ABERRATION OF PARARGE MEGÆRA.**—Mr. Adkin also showed a *Pararge megera* in which the apical ocellated spot was absent from the right forewing, there being only a minute black dot. It was also without the ocellus on the underside. **ABERRATIONS OF APLECTA NEBULOSA.**—Messrs. A. Harrison and Main exhibited a series of *Aplecta nebulosa* bred from larvæ taken in Delamere Forest, in 1905. Altogether 11 per cent. of the black and very dark forms were obtained, and a considerable proportion of forms intermediate between these and the ordinary Delamere form. The difference between the two extremes is very great, and the gap between them is bridged over by an almost regularly graded series of intermediates. The most extreme specimen is of the wholly black form with white fringe and margin. For comparison a few taken in the New Forest were shown. From the Delamere larvæ 18 per cent. of ichneumons were bred, whilst in 1904, from larvæ taken on the same ground, no ichneumons were obtained. **ABERRATIONS OF HYPSSIPETES SORDIDATA.**—They also exhibited a series of this species bred from larvæ taken at Windermere, Seal Chart, and Delamere, with a few taken on the wing at Barmouth. The Windermere insects show a considerable variation, ranging from light mottled forms to almost black. Twenty-two specimens bred from Windermere larvæ gave 4 almost black (forewings), and the remaining 18 are graded from very dark to light mottled, difficult to classify and give proportions. **ABERRATIONS OF XYLOPHASIA RUREA.**—Also a series of this insect from the New Forest, Delamere, and Simonswood Moss, Lancashire, with specimens of ab. *combusta* from the two latter localities. **AGROTIS EXCLAMATIONIS AB. PICEA.**—A black aberration of this species from Simonswood Moss, Lancashire. **ABERRATIONS OF XYLOPHASIA MONOGLYPHA.**—A varied series from Barmouth and Crosby sandhills, showing one very dark aberration from the latter locality. **CYMATOPHORA DUPLARIS AB. OBSCURA.**—Also a melanic series of *C. duplaris* from Simonswood Moss, where this species, so far as the experience of the

exhibitors goes, seems to produce only dark forms, some being almost black. **ABERRATION OF MELANIPPE FLUCTUATA.**—A specimen taken in Woodford, Epping Forest, having the central band much reduced and the ground colour somewhat brown. **ABERRATION OF ACRONICTA LEPORINA.**—A specimen from Delamere Forest, with black thorax and abdomen, and the forewings suffused with smoky-black coloration; another Delamere and a Lancashire specimen varying in the same direction, but with the black coloration less pronounced. **ARCTIA VILICA VAR. KONEWKAI.**—Dr. T. A. Chapman bred specimens of this variety from Sicily, in which the spots of the forewings run together to form a fascia; he also showed larvæ of the same, these had black heads instead of the red of the type. **ANTHROCERA ? HIPPOCREPIDIS (STEPHENSII) AND A. TRIFOLII.**—Mr. A. L. Raywood, examples of an insect with the sixth spot almost absent on upper-, and faint on underside, taken near Bude, July 9th, 1905, on the slope of a grassy furze-covered hill, flying in company with insects supposed to be *A. filipendulae*. The examples exhibited were taken in a few minutes, and no doubt more could have been taken as they were flying freely. The area within which they occurred, however, appeared to be a restricted one. No *A. trifolii* were taken nearer than about a mile away, within which distance the species is abundant in two places, one in a westerly and the other in a southeasterly direction. In these *trifolii* grounds no *hippocrepidis* (or *filipendulae*) were taken. **CABERA PUSARIA AB. ROTUNDARIA.**—Mr. G. B. Browne, a bred series of this form, the larvæ, it is believed, coming from Horsley or Oxshott. **LITHOSTEGE GRISEATA.**—Also a series of this species taken June 19th, 1905, at Tuddenham. **MELANIC CRANIOPHORA LIGUSTRI.**—Also a rusty-brownish example of this species taken at Lee. **DRAGONFLIES IN THE NORFOLK BROADS.**—Mr. Dobson, the following species taken in the summer in the Norfolk Broads, viz.—*Libellula fulva*, *L. quadrimaculata*, *Orthetrum cancellatum*, *Æschna isosceles*, *Brachytron pratense*, and *Cordulia aenea*. **ABERRATION OF CUPIDO MINIMA.**—Mr. Joy, a specimen of *Cupido minima*, in which the submarginal spots on the underside of the hindwings were elongated into partial rays. **AGLAIS URTICÆ BRED ON HOP.**—Mr. South showed a series of *Aglais urticae* bred from larvæ fed on hop; they were unusually small. **ABERRATIONAL FORMS OF TRIPHÆNA COMES.**—Mr. Bacot, a very extensive series representing several generations of *Triphaena comes*, originating from parents bred from larvæ collected in Aberdeenshire, and by Messrs. Bacot, Prout, Gardner, Newman, Raynor, Harrison, and Hamlyn. The results were—First gen., ♂ melanic × ♀ red = 21 melanic, 32 red. Second gen., ♂ × ♀ both melanic = 212 melanic, 71 red; ♂ × ♀ both red = 285 red. Third gen., ♂ × ♀ both melanic = 68 melanic, 5 red; ♂ melanic × ♀ red = 17 melanic; ♂ × ♀ both red = 26 red.

CURRENT NOTES.

Mr. Verrall records the capture by Colonel Yerbury of *Dolichopus argyrotarsis*, Walsh, at Nethy Bridge, on June 19th, 1905, and *Porphyrops gravipes*, Wlk., at Nairn and Nethy Bridge, from May 30th to June 16th, 1905, both additions to the British list.

The officers and council of the South London Entomological and Natural History Society for 1906 are as follows.—President: R.

Adkin, F.E.S. Vice-Presidents: W. J. Kaye, F.E.S.; H. Main, B.Sc., F.E.S. Treasurer: T. W. Hall, F.E.S. Librarian: A. W. Dods. Curator: W. West (Greenwich). Hon. Secretaries: Stanley Edwards, F.L.S., etc. (Corresponding); H. J. Turner, F.E.S. (Report). Council: F. B. Carr; T. A. Chapman, M.D., F.Z.S., F.E.S.; F. Noad Clark; A. Harrison, F.L.S., F.Z.S., F.E.S., etc.; A. Sich, F.E.S.; E. Step, F.L.S.; W. West (Ashtead).

At the annual meeting of the Lancashire and Cheshire Entomological Society, held December 18th, 1905, on the motion of Mr. Tait, seconded by Dr. Edwards and supported by Messrs. Webster, Stott, Cotton and the Chairman, a vote of thanks was accorded the retiring secretary, Mr. Sopp, for his services to the society during the four years he had held office. It was further resolved that the motion be specially recorded in the *Transactions of the Society*. We heartily endorse this, and have no hesitation in asserting that Mr. Sopp's untiring energy and industry has done more to lift again this Society into the first rank of our provincial societies, a position from which, a few years ago, it was slowly but surely slipping for want of some such initiative as Mr. Sopp has put into it. We understand, too, that Mr. Tomlin will soon leave the district, and observe that he also ceases to be a Secretary of the Society but has been appointed Editor. May we hope that we shall soon have some original papers in the *Transactions*, and that this active Society may give us a small volume on the lines of those of the smaller London Societies?

Part III of *A Natural History of British Butterflies*, etc., published on December 15th contains, in the section on the general subject, the completion of the chapter "Photographing Butterfly Eggs," and part of another "Obtaining Eggs of Butterflies." In the systematic section the study of *Thymelicus acteon* is concluded, and deals with the "Pupa," "Time of Appearance," "Habits," "Habitat," "British Localities," and "Distribution." This is followed by a consideration of the sub-family *Urbicolinae*, the tribe *Urbicolidi*, the genus *Augiades*, Hb., with detailed "Synonymy," etc., and then a study of the species *Augiades sylvanus*, Esp., under the headings "Synonymy," "Original Description," "Imago," "Sexual Dimorphism," "Variation" (with tabulated account of the various forms presented and including five new aberrations, one new and five already described races, as well as a consideration of Turati's *faunus* described quite recently as a new European butterfly), "Egglaying," "Ovum," "Habits of Larva," "Larva" (comprising studies made in 1905 by Chapman, Sich and Tutt), "Foodplants," "Puparium" and "Pupa." The rest of the study of this species with that of *Urbicola comma* will come into Part IV. The plate with Part III contains that of the rest of the Urbicolid and three species of Chrysophanid eggs (for comparison with that of *C. phlaeas*).

Will entomologists interested in British butterflies please send us all details, that they consider worthy of publication or notice in the above work, relating to Coppers, Blues and Hairstreaks, in short summarised form, but including all important facts relating to the matter forwarded?

The last meeting of the Entomological Club was held at 27, Hereford Square, S.W., on the evening of December 15th, 1905, when Mr. and Mrs. A. J. Chitty were the host and hostess. The members and guests,

who began to arrive shortly after 6.30 p.m., were received by the host and hostess. Retiring to the Museum, expert coleopterists talked beetles, whilst the "butterfly men" discussed other things. An excellent supper was served at 8.30 p.m., when the following entomologists were present—Professor E. B. Poulton, Colonel Swinhoe, Commander J. J. Walker, Dr. Joy, Messrs. R. Adkin, F. Bouskell, G. C. Champion, H. Donisthorpe, T. W. Hall, M. Jacoby, A. H. Jones, H. Rowland-Brown, R. South, J. R. Tomlin and J. W. Tutt.

On November 28th and 29th, 1905, the remainder of the "Mason Collection" was sold at Stevens' auction rooms. The species sold comprised the Tortricids, Tineids, Alucitids, etc. The prices as a whole ruled low, the striking exception being that for the series of *Peronea cristana*, a species monographed by Mr. J. A. Clark (*Ent. Record*, vol. xiii.), the series of 1673 specimens producing a total of £47 8s., nearly £10 more than was realised for the whole of the rest of the collection of Tortricids of 10954 specimens, of which the series of *Peronea hastiana* produced £7 10s. The *cristana* were arranged under their varietal names, and ab. *gumpiana* at £1 2s., £1 10s., £1 10s., and £1 10s., ab. *tolana* at £2 5s., £2 17s. 6d., £2 15s., ab. *curtisana* £3 3s., ab. *masoniana* £2 5s. and £3 3s. per specimen, are worthy of consideration. How many collectors have these rarer forms in their collections without knowing them? Of course they are worthless whilst unknown, yet one wonders why lepidopterists do not work out their series of this and other variable species. Even some of Mason's specimens were still unnamed and others incorrectly so. We now require a monograph of *Peronea hastiana* on the same lines as Clark's monograph of *Peronea cristana*.

The Psychids fetched very fair prices, some 422 specimens producing a total of £10 8s. One would like to know what authenticity there is about the example of *Phalacropteria muscella* and *Whittleia undulella* as British species. We are quite outside the range of both these more or less eastern species and the possibility of their occurrence in Britain is exceedingly remote. *Solenobia clathrella*, too, is another eastern species, with some doubt about the recorded northern localities belonging really to this species, and not at all likely to occur here. The unique specimen of *Bankesia douglasii* sold cheaply in a lot of 44 other specimens for 11s. The Alucitids fetched very fair prices—although nothing very special.

When the duplicates came out, the purchasers of the Microlepidoptera seemed to disappear and quite a new set of buyers came in; many of the examples were in bad condition, old, faded, illset and otherwise damaged. The total of the two days' sale produced £356 5s. 6d., made up as follows:—

1673	examples of <i>Peronea cristana</i>	£47	8	0	in collection.
1952	" " <i>Peronea hastiana</i>	7	10	0	" "
4	" " <i>Agrotis subrosea</i>	2	2	0	" "
432	" " Psychides	10	8	0	" "
9002	" " Tortricides	31	15	6	" "
22742	" " Tineina	136	19	0	" "
1070	" " Alucitides	7	1	0	" "
15344	" " Macrolepidoptera	32	4	0	duplicates.
4290	" " Pyralides	4	16	0	" "
10885	" " Tortricides	8	18	0	" "
15244	" " Tineina, etc.	10	4	0	" "
	" " Cabinets	57	0	0	" "

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EXCHANGES.—*The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of address" is open free to subscribers so far as there is space available.*

Duplicates.—Mundaria*, Griseola, Dominula*, Dispar*, Auriflua*, 3 Quercifolia*, Ziczac, Putrescens, Phragmitidis, Putris, Basilinea, Literosa, Ambigua, Puta, Saucia, Fimbria*, Slago*, Gracilis, Lota*, Pennaria, Autumnaria, Angularia*, Obscurata, Citraria, Tersata, Rivata, Galiata, Procellata, and many others. Exchange lists invited.—W. R. Goodale, Oatlands, Paignton.

Duplicates.—Scolopacina (a few), Dahlii (a few), Brunnea*, Baja*, Thalassina, Polyodon (black), Pulchrina, Suspecta, Salicis*, Autumnaria*, Angularia*, Cæsiata, Multistrigaria, Ulmata, Testata. *Desiderata.*—Athalia, Hyperanthus, Elpenor, Ocellata, Tiliæ, Villica, Dominica, Ligniperda, Limacodes, Binaria, Cultraria, Furcula, Bifida, Myricæ, Festuæ, Interrogationis, Strataria, Bajularia, Cervinata, &c.—B. Morley, Wind Mill, Skelmanthorpe, Huddersfield.

Duplicates.—A. crategi, Furva, Abietaria, Rusticata, Pygmæola, Albulalis, Caniola (4), Permutana, Cæcana, Grossana, Juliana, Splendana, Cihana, Roseana, E. nigricana, Greyana, Sylvestrana, Perterana, Mygindana, Branderiana, Quadrana, Incarnatana, Cinctana, Simplanata, Composana, Servillana, etc. *Desiderata.*—Asellus, Fluctuosa, Auricoma, Ulvæ, Concolor, Rubricata, Contiguaria, Straminata, Irriguata, Grotiana, Scabrana, Maccana, Tristana vars., Euphorbiana, Sordidana, Bifasciana, Micana, Aspidiscana, Pariana, and many others to renew.—C. Fenn, Eversden House, Burnt Ash Hill, Lee, Kent.

Duplicates.—Depuncta, Paleacea, Absynthii*, Fulvago and var. Flavescens, Umbra*, Dentina, Phragmitidis, L. comma, Impudens, Neustria*, Hepatica, Brunnea, Typica*, Ianthina*, Morpheus, Baja*, Augur*, Circellaris, Dahlii, Anomala, Putrescens, Monacha*, Cursoria, Chrysorrhœa*, Salicis*, Perla, Blandina, Lineata (Dealbata), Unidentaria*, Rivata*, Annulata*, Tersata*, Bicolorata vars. and var. Plumbata, Linearia*, Absynthiata*, Isogrammata*, Oblongata*, Tenuiata, Lariciata, etc. *Desiderata.*—C-album, Pruni, Palæmon, Globulariæ, Limacodes, Leporina, Alii, Obsoletea, Brevilinea, Scolopacina, Leucophœa, Connexa, Leucostigma, Sobrina, Leucographa, Citrago, Gilvago, Oo, Diffinis, Affinis, Dianthœcias, Acidalias, Eupithecias, and many others. Lists exchanged.—John E. Gardner, 204, Evering Road, Upper Clapton, London, N.E.

Desiderata.—Cicindelidæ (Tiger Beetles) of the entire globe desired, in exchange for insects of North America. I offer many of our rarest species in first-class condition.—H. F. Wickham, State University, Iowa City, Iowa, U.S.A.

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Atriplicis, *Margaritalis*, *Myellus*, *Pulveralis*, *Marmorea*, and other rare or local species. None but well set insects, on black pins, accepted.—*E. A. Atmore, King's Lynn, Norfolk.*

WANTED.—Correspondence with Lepidopterists and Hymenopterists in Canada, United States, and Germany, with a view to exchange of specimens and mutual help.—*J. W. H. Harrison, B.Sc., The Avenue, Birtley R.S.O., Durham, England.*

WANTED.—Ova: I wish to obtain photos of the ova of British lepidoptera. Will anyone having ova of any species, and willing to lend same, send me a list on postcard? I will undertake to return complete and undamaged as quickly as possible, and willingly pay postage.—*Alfred E. Tonge, "Aincroft," Reigate, Surrey.*

WANTED.—British and European Tortricids, especially those species credited to both Europe and America in Meyrick's *Handbook* and Standinger and Rebel's *Catalog*, pinned and set in English style acceptable. Will make liberal returns in any family of North American Lepidoptera named or other orders unnamed.—*W. D. Kearfott, 114, Liberty Street, New York City, U.S.A.*

WANTED COLEOPHORIDS.—As I wish to breed and record the life-history of all the species of *Coleophora*, I should be pleased to receive any cases and living larvæ which entomologists may meet with. I will do what I can in return.—*Hy. J. Turner, 98, Drakefell Road, New Cross, S.E.*

EXCHANGE.—I am desirous of obtaining butterflies from the Malayan Archipelago, and the Pacific Islands. For such I offer perfect diurnals from North and South America, North American Coleoptera.—*Levi W. Mengel, Boys' High School, Reading, Pa., U.S.A.*

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WANTED.—Parasites from British Coleoptera. Beetles infested with *Gordius*. Any material will be gratefully acknowledged.—*H. St. J. K. Donisthorpe, 58, Kensington Mansions, S.W.*

PARASITICAL DIPTERA WANTED.—Will lepidopterists who may breed any dipterous parasites from larvæ or pupæ kindly forward such as they do not require to me? If so I shall be greatly obliged.—*C. J. Wainwright, 2, Handsworth Wood Road, Handsworth, Staffs.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Annual meeting, January 17th, 1906. February 7th.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. January 16th, "Breeding British Tiger Moths." February 6th, Exhibition of Preserved Larvæ; February 20th, "The identity of the British *Nonagria neurica*," by H. M. Edelsten.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Field Meetings: January 14th, Loughton; Liverpool Street, 9.45 a.m.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. January 25th (ANNUAL MEETING, at 7 p.m.). February 8th, Exhibition of Lantern Slides; February 22nd, "Collecting in Trinidad," by W. J. Kaye.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. The 2nd and 4th Tuesdays in the month. December 19th.

Lancashire and Cheshire Entomological Society.—Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained.

Birmingham Entomological Society, Norwich Union Chambers, Congreve Street, at 8 p.m. January 15th; February 19th (annual).

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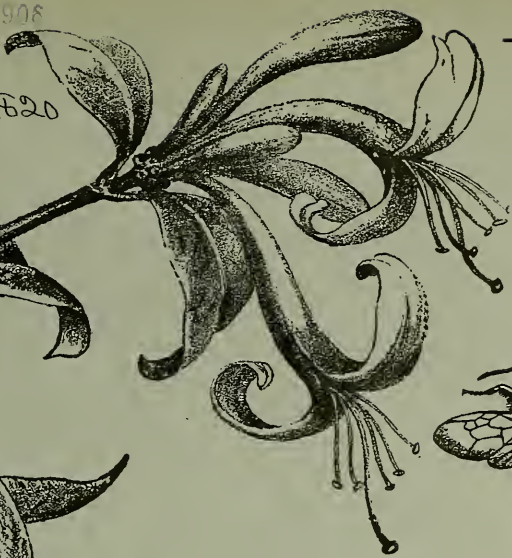
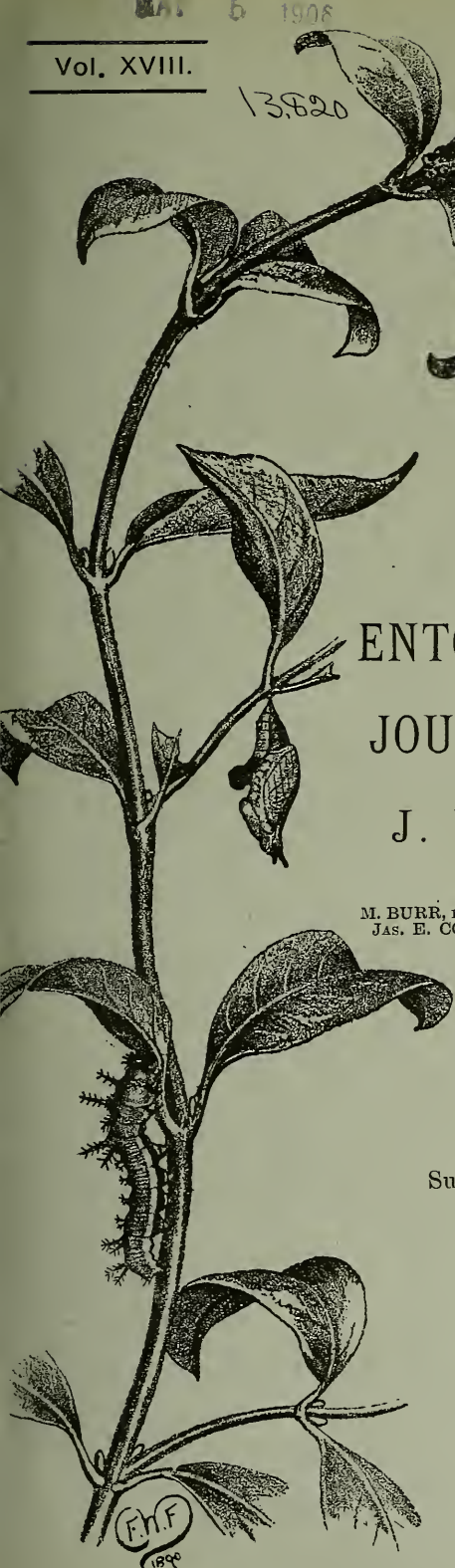
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A Critical Study on some often disputed aberrations of *Amorpha populi*, Linn.* (with plate).

By M. GILLMER.

I have remarked in my article on *Amorpha populi* ab. *tremulae*, Borkh. (*Insekten Börse*, xix., 1902, p. 229), that it might be possible to show that the figure of Koch (*Schmett.-d.-südwestl. Deutschlands*, 1856, tab. i) is identical with Glaser's description of ab. *tremulae*, but, till now, I have not come to any definite conclusion in this matter. Although Esper (1779-81), Borkhausen (1789, 1793), Glaser (1853, 1854, 1863), and Koch (1856) speak of the same light-grey aberration of *Amorpha populi*, and have used the same name and published two figures, their ideas do not agree. Bartel thought that the name *tremulae* belonged to Fischer's Russian species, and so changed the name *tremulae* of the German aberration into ab. *borkhauseni* (1900), but this is not the case, for the name *tremulae* was used by Borkhausen in 1793 for Esper's aberration of *A. populi*, and, being the older one, the name of Borkhausen's ab. *tremulae* should not be changed, but the name of the Russian species. Therefore I have suppressed the name of ab. *borkhauseni*, Bart., for Glaser's aberration *tremulae* in the *Insekten Börse*, 1902. But, in doing this, I have not accomplished much, for I have not changed the name of Fischer's Russian species, yet I did not mean to neglect consideration of the Russian form, although at the time I only wanted to restore the name to Borkhausen's ab. *tremulae*, which he had given, but which had not been accepted by authors. I did not think it necessary, for historical motives, to change Fischer's name, although the rules of nomenclature require it, and Mr. Tutt (*Brit. Lep.*, vol. iii., 1902, p. 469), therefore, proposes the name *amurensis*, Stdgr. I have got several specimens of the Russian *tremulae* and of the aberration *amurensis*, but I do not think this material sufficient to alter the name of the Russian species. Also the figures and descriptions of the species *tremulae* and ab. *amurensis* do not tempt me to change the name. In his works, Fischer has not given any description but only a figure of the species *tremulae*, which Zetter had then recently found near Moscow. On plate x., fig. 1, he shows the ♂, fig. 2, the ♀, and fig. 3, the caterpillar.

Treitschke gave the first diagnosis of the new Russian form in 1834, in his book (*Schmett. von Europa*, vol. x., pt. 1, p. 140), Herrich-Schäffer gave new descriptions and a figure in his *Syst. Bearb. d. Schmett. von Europa*, vol. ii., p. 91 (1847), in his *Nachtrag*, p. 50 (1856), and in his *Suppl.*, pl. 4, fig. 12. Besides this, Duponchel mentioned the same species in his continuation of the *Hist. nat. des Lépidoptères de France*, suppl. to vol. iii., p. 29 (1835), pl. ii., figs. 2a, b, and Ménétriés gave a comparative description in his *Enumeratio corp. anim. Mus. imp. acad. scient. Petrop.*, pt. ii. (1857), p. 138.

Herrich-Schäffer ignored Koch's restitution of ab. *tremulae*, Borkh., and, in his review of Koch's work (*Corresp. Blatt d. zool.-mineralog. Vereins Regensburg*, 1857, p. 67), he talks without authority of a vindication of this name, so that ab. *tremulae*, Borkh., seemed as if it should be suppressed. Esper's picture (*Schmett. Eur.*, 2 Tl., pl. xxii., suppl. iv., fig. 2) is,

*To understand clearly the points raised in this article, British lepidopterists should consult Tutt's account of *Amorpha populi* (*Natural History of the British Lepidoptera*, vol. iii., pp. 469-471).

compared with the description on p. 177, quite a failure. The artist does not give a light-grey variety but one with light reddish-grey ground colour, as Werneburg remarks in his *Beträgen zur Schmetterlingskunde*, vol. ii. (1864), p. 22. They belong to quite different groups of *A. populi*, the one corresponding with the description belongs to the *cinerea* group, the other corresponding with the figure to the *ferruginea* group. In my "Uebersicht der von E. Busack bei Schwerin und Waren gefangenen Gross-Schmett." (*Archiv d. Ver. d. Fr. d. Naturg. in Meckl.*, vol. 58, 1904, p. 69), I called the first form *tremulae* Borkh. (the mark "ab." is missing by mistake), the second form *ab. ferruginea*, Gillmer. One cannot find out exactly which of the two corresponds with Jung's specimen, the one described by Esper or the one painted at his command.* Borkhausen does not seem to have noticed the contradiction existing between Esper's description and the painting. He follows the description and does not seem to have considered the figure. Koch (1856) was the first who drew attention to the difference between the two. On p. 52 of his work (*Schmett. d. südwestl. Deutschlands*), he says that Esper has given a far too reddish-coloured figure whilst describing the aberration as being of a light-grey colour. Even Koch prefers the description to the figure. The following is my description of Esper's figure :

The upperside of the forewing is of a reddish-grey ground colour, nervures and hind margin brown. The hindwing shows a yellow-grey ground colour, the basal spot is of a slight rusty-red tint, nervures and margin are brown, whilst the cells between the nervures appear slight grey-blue. On the underside, the forewing is yellow-greyish the cells between the nervures are violet-grey, the nervures, margin and costa brown, whilst the underside of the hindwing shows a light brownish-yellow ground colour and greyish tinged cells between the nervures. The thorax above light yellow-brownish with a bluish-grey shading; the light-brown abdomen shows dark-brown shading; antennæ yellow-brown.

It is therefore a reddish-yellow form with a slight lavender-blue tinge, which in my opinion belongs to the *ferruginea* group.

In his *Naturgeschichte d. europ. Schmett.*, ii., p. 181, and in his *Rheinisches Magazin*, p. 649, Borkhausen does not say anything new respecting the description of Esper's aberration; but, yet, he still tries to support the staggering opinion of its distinctness by the quotation of certain data relating to the caterpillar (half size, slender figure, only living on aspens), and names this so-called aberration *Sphinx tremulae*, but Ochsenbeimer has definitely cast aside this opinion in the second volume of his *Schmett. von Europa* (1808), p. 254. Meigen also does not mention anything new of this aberration of Esper in his *System. Besch. der europ. Schmett.*, vol. ii. (1830), p. 150; nor do we observe anything of importance in his lithograph copy.

In 1853, Dr. L. Glaser describes, in his "Schmett. des Grossherzogthums Hessen" (*Berichte der Oberhess. Ges. f. Natur-und Heilkunde*, 3 Ber., 1853, p. 53), a new form of *A. populi* as var. *tremulae*, Borkh., which is "smaller, lighter than *populi*, white-grey mixed with a weak rusty-yellow colour," and which often appears as a constant variety of

* As far as I was able to find out, the collection of Jung (died 1816) fell into the hands of a certain Mr. Krämer in Uffenheim. This gentleman divided the collection between schoolboys, as his son, banker Ottomar Krämer, wrote me.

A. populi on aspens in the "Hinterlande" near Biedenkopf (*ibidem*, 4 Ber., 1854, p. 28).*

Although there is not much difference between "white-grey" and "light-grey," this new form of Glaser does not belong anyhow to Esper's and Borkhausen's ab. *tremulae*, because the aberration of the two latter authors has no mixture of rusty-yellow colour either in the description or in the figure. Glaser's aberration is far more in agreement with ab. *pallida*, Tutt, *Brit. Lep.*, vol. iii., p. 469, as I have already mentioned in *Insekten Börse*, xx., p. 29 (relatively in *Societas Ent.*, xvii., 1903, p. 162). Dr. P. Speiser is of the same opinion in *Zeitschr. f. wissensch. Insektenbiologie*, i., 1905, p. 173. In my scheme of variation (*Arch. d. Ver. d. Fr. d. Naturgesch. Meckl.* 58, 1904, p. 70), I therefore referred it to the *pallida* group, the ground colour of which is white-grey or pale, and which often appears rusty-yellow in the median and outer area of the wings. The first notification for my reason for not having restored the name ab. *borkhauseni*, Bart., confiscated already by me in 1902, appears in *Insekten Börse*, xx., 1903, p. 29 (relatively in *Societas Ent.*, xvii., 1903, p. 162), and of this I shall later give details.

Glaser did not remain steadfast in the description of his variety, (var. *tremulae*, Borkh.) of the "Hinterland" (Oberhessen), for, in 1863, he describes the same in *Neuen Borkhausen*, p. 83, as being of "greenish-whitish ground colour with weaker markings, mostly also with a nearly disappearing rust-coloured spot." But a "white-grey" form mixed with a weaker rust-yellow colour and a "greenish-white" form cannot absolutely be identical, and the latter belongs to my *cinerea* group in which often light grey specimens with olive-coloured median and outer areas appear. This olive colour gradually turns into bronze colour and then into rust colour, whilst the ash-grey ground colour gradually turns yellowish-white.

In his *Palaearkt. Gross-Schmett.*, ii., p. 194, Mr. Bartel has called ab. *borkhauseni*, the small and light form of Glaser with a "greenish-grey ground colour, with weaker markings, and with a nearly obsolete rust-red basal spot of the hindwings." My ab. *cinerea-diluta* (*Arch.*, 58, 1904, p. 69), newly described in my variation scheme of

* Glaser is, however, very uncertain about ab. *tremulae*, Borkh.: in 1853, he confuses it with the Russian species *tremulae*, Fischer de Waldheim, which Heydenreich quotes as *tremulae*, Zett., in his *System. Verz. d. europ. Schmett.*, ed. iii., 1851, p. 19. Although he alters this mistake in 1854, at the instigation of Herr von Heyden, yet, he commits a new mistake, making the Russian *tremulae*, Fisch. de Waldh., a Lapland species. This error he committed by falsely reading the abbreviation "Zett." as "Zetterstedt," and thinking that this species was described in *Insecta Lapponica descripta, Lepidoptera*, which is not the case at all. Even Koch, who otherwise has carefully looked over the literature on ab. *tremulae*, Borkh., and who records the same in his *Schmett. d. südwestl. Deutschlands*, 1856, pp. 51, 52, has followed Glaser's example and committed the same error. In *Neuen Borkhausen*, 1863, p. 83, Glaser repeats Koch's literature and also his own (Glaser's) old error, so that between 1854 and 1863 the error had not been corrected. The right synonymy of ab. *tremulae*, Borkh., given by Glaser (1854) and by Koch (1856), has been set aside again by the first-named author in his *Catalogus etymologicus Coleopterorum et Lepidopterorum*, 1887, p. 137. He says (no. 22): "Populi, L., Pappelschwärmer, with the var. *tremulae*, Treitschke, Espenschwärmer, small or pale Pappelschwärmer (the caterpillar upon *Populus tremula*, L., Zitterpappel or Espe)." There truly cannot be anybody to assert that Glaser is to be taken seriously as to ab. *tremulae*, Borkh., after all the muddle concerning this aberration made in 1853, 1854, 1863 and 1887 by him.

A. populi, would *pro parte* be identical with the above aberration; yet, my nomination is more comprehensive, as I have included in it all the lighter-grey or ash-grey coloured specimens the outer area of which appears often olive-coloured, bronze-brown or rust-brown, the markings of which generally are more or less obsolete, and the rust-coloured basal spot of which is usually of a weaker colour. Therefore I have not restored the name *ab. borkhauseni* in my variation scheme, because this name only fits an aberration of an absolute greenish-grey colour. One does not require an extension of *ab. tremulae*, Borkh., which also appears in the *cinerea* group, because it is without any markings, and because all areas seem of the same light-grey colour.

The identification of *ab. borkhauseni*, Bart., and of *ab. pallida*, Tutt, made by Dr. Speiser, and already referred to, is therefore not accurate. The aberration of *A. populi*, described 1853-4 by Dr. Glaser as var. *tremulae* is, indeed, identical with *ab. pallida*, Tutt, but Glaser's aberration is, as mentioned already, neither *ab. tremulae*, Borkh., nor *ab. borkhauseni*, Bart. I do not agree with Mr. Tutt's suggestion (*Brit. Lep.*, vol. iv., p. 473) that Glaser probably intended to include in his *ab. tremulae* all the pale obsoletely-marked aberrations of this species known to him, although he does not say so. If Glaser has not said it, he surely did not mean it. I maintain my opinion, published in 1903, that Glaser, in diagnosing his var. *tremulae*, has shown himself unreliable. (*Cf.* the preceding footnote.) Glaser probably changed his diagnosis, through having seen, in 1856, the newly-published figure of var. *tremulae* by Koch. It would appear that Glaser, thinking that the description of his var. *tremulae* (1853-4) did not very well agree with Koch's picture, changed his diagnosis, considering no longer the "white-grey moth mixed with a weak rust-yellow colour" as var. *tremulae*, but the one with "greenish-white colour, weaker markings and more or less obsolete rusty-coloured basal spot." I think that hereby this remarkable alteration of his diagnosis is to be explained.

In his above-mentioned work, Koch evidently thought it necessary to make sure of *ab. tremulae*, Borkh., as it seems that he did not think Glaser's description in 1853-1854 either sufficient or accurate. Anyhow it is remarkable that he, against his usual habit, does not refer to Glaser this time. He only mentions Glaser as mixing Borkhausen's *tremulae* with the Russian *tremulae*, F.d.W. It must be remembered that, owing to the critical remarks published by Herr von Heyden and Koch (*Stett. ent. Zeity.*, 1855, p. 41, p. 113 and p. 294; 1860, p. 301; 1861, p. 57 and p. 225), the latter was boycotted at that time in Frankfurt-a.-M. As the figure of Esper was a failure, Koch painted from nature a specimen exactly corresponding with Borkhausen's description, remarking on p. 475, that the original shows even less shading than the figure and is quite of a light-grey colour. Yet, his picture again is of quite a different colour. Perhaps, at the base of the forewings the light-grey colour predominates, and is to be seen in the greater part of the median area, and as a light band in the outer area; but the ground-colour is rather light grey-brown, in which the nervures of the forewings, as also the margin, appear brown; the nervures of the hindwings are of a reddish-brown colour, whilst the base of the latter appears weak rusty-red. The thorax is lighter than the abdomen, which has brown segmental incisions, the antennæ are uncoloured.

(*To be concluded.*)

The season 1905 in Germany. Lepidoptera.

By E. M. DADD, F.E.S.

(Continued from vol. xviii., p. 15.)

On July 2nd I made an early start, as I intended to ascend to the top of the Sölleneck, which seemed from afar to give promise of many things. On the way up very little was seen, chiefly owing to the fact that I was too early, and, in fact, with the exception of a few Geometers and Micros, my boxes were empty when I reached the summit. On the way down amongst the rhododendrons I had good sport with that pretty little species *Psodos quadrifaria* and an *Eupithecia*, whose species is at present undetermined, but I was again disappointed in finding absolutely no butterflies at high altitudes, and it was not until I had reached a considerably lower level that they commenced to appear. The first butterfly seen on the way down was an *Erebia*, which I unfortunately missed, and, although I spent some time searching about the spot, no further specimens were seen, so that its identification must remain unknown. Still lower I met with an odd specimen of *Lycaena arion*, and almost immediately afterwards netted a *Papilio machaon*, whilst all the time I was traversing alpine meadows carpeted with flowers, and the sun doing his very best. This absolute absence of butterflies was to me unaccountable, but I presume the altitude was too great. Still lower down, things began to get commoner, and a few specimens each of *Colias phicomone*, *Pieris napi* var. *bryoniae*, *Melitaea aurinia* and *Brenthis euphrosyne* were obtained, as also a specimen of *Hemaris fuciformis*; on leaving this meadow, however, and descending into the next, things immediately underwent a change, and I was soon hard at work netting *Polyommatus bellargus*, *Nomiades semiargus*, *P. icarus*, *Cupido minima*, *Lycaena arion*, *Colias hyale*, *C. phicomone*, *Aporia crataegi*, *Erebia melampus*, *Pararge hiera*, *Coenonympha satyrion*, *C. iphis*, *Euchloë cardamines* and *Syrichthus alveus*; the *C. phicomone* were my especial quarry, and I soon had a fine series, but this was not to continue for long, as heavy clouds commenced to cover the sky, the sun was soon obscured, and, long before I reached shelter, I was drenched through and through by an almost tropical storm, but nevertheless fairly well satisfied with the results of my outing. After the rain had finished I made my way home, collecting being out of the question for that day. On the way I had the pleasure of making the acquaintance of the small black salamander for the first time, these little fellows being fairly frequent on the path, which was wet from the storm. The next day was spent in the locality where I first found *Brenthis amathusia*, and I succeeded in getting a fair series as well as another *Polyommatus hylas* and numerous *Coenonympha tiphon*, but nothing new was turned up.

On the 4th, we had decided to pay a visit to the Breitachklam, a gorge which has only recently been opened to the public, and it was arranged that the ladies should take a carriage as far as the entrance. I decided to make an early start on foot in order to collect by the way. My way led me over the low ridge which divides the valleys of the Trittach and Breitach, and, as the sun was again doing his very best, I was soon hard at work. *Coenonymphas* have a special attraction for me, and *C. tiphon* is a species of many forms; I was, therefore, pleased to come across some marshy ground where a large dark form of this

species was common. Other species, especially Argynnid, were abundant, and I soon had my boxes full of overflowing with *Argynnis niobe*, *A. aglaia*, *Brenthis amathusia*, *B. ino*, *B. pales*, *B. euphrosyne*, *Melitaea dictynna*, *M. athalia*, *Chrysophanus hippothoe*, *Coenonympha iphis*, *C. satyrion*, and the usual blues. My way then led me down through magnificent beech woods to the Breitach, and, on crossing the bridge, my attention was immediately attracted by a dark Argynnid, which proved on capture to be *Brenthis thore*. This was immediately followed by a second specimen and also a female of *Callimorpha dominula*, so that I decided to give the banks of the Breitach a thorough search in spite of their wild overgrown condition, and was quickly rewarded with another fresh species, *Erebia ligea*. I could not, however, delay long, so, after securing half-a-dozen *B. thore* and a couple of *E. ligea*, I hurried on. Further up the valley I came upon an open space where the river had forsaken its old bed for a new one, the old bed being overgrown with bushes of a species of willow, and more especially the shingle banks being overgrown with thyme. On these patches of thyme a small blue was very common, but as they were no longer fresh I only brought home a type specimen; I regret this, however, deeply, as it has proved to be *Plebeius argyrognomon* var. *aegidion*; a few more *B. thore* and *E. ligea* were captured before reaching the entrance to Breitach Klamm, where I found the ladies awaiting me. We then took our way through the Klamm, a magnificent cañon, and afterwards climbed out at the other end; but very little else, entomologically, was observed this day.

The following day was again spent in the Breitach Valley, in order to get a series of *B. thore*, but this insect was over, and only worn specimens rewarded my efforts.

July 8th was again devoted to an expedition up the Oythal, but with the exception of *Polyommatus anteros* (one specimen), no new butterflies were obtained. The rocks in the Trittich Valley were, however, more productive than before, *Larentia flavicinctata* being in fine condition, *Arentia flexula*, *Boarmia repandata*, *Larentia salicata*, *L. olivata*, *L. aptata*, *Anticlea berberata*, *Ellopia* var. *prasinaria*, and *Angerona prunata*. On returning home I found a letter calling for my immediate return to Berlin, so that my holiday was cut short just as I was beginning to get a good idea of where to go and what to seek.

After my return my wife and sister-in-law made an expedition to the Näbelhorn, and my wife made a small collection on the upper slopes, which, though small, was sufficient to show me that a good many other species would have been found if I could have remained longer. My wife's captures included *Polyommatus pheretes*, *Erebia epiphron*, *Erebia lappona*, *E. evias*, *Brenthis dia*, *Dryas paphia*, *Gnophos glaucinaria*, *G. dilucidaria*, and *Larentia verberata*.

I returned to Berlin the following day, July 9th, and a few days later my friend, Herr Heinrich, and I sugared in the Grunewald, but beyond noting a remarkable abundance of *Xylina lithoxylea*, and some nice black forms of *X. monoglypha*, very little worth notice turned up, although the sugar was fairly crowded with insects. I netted one or two Geometers, notably a specimen of *Acidalia verbatana*, which I had at first taken for *A. perocharia*.

The following Sunday I went with Herr Heinrich to Rüdersdorf, in hopes of turning up some of the specialties which occur there. In the

chalk-pits, however, *Phasiane glarearia* was found to be over, only two worn specimens rewarding two hours' search. It was also too early for *Polyommatus corydon* and the special *Anthroceras*; none of the former and, of the latter, only *Anthrocera achilleae*, *A. purpuralis*, and *A. filipendulae* turning up, and, although we carefully examined many of the burnets, no *A. carniolica* ab. *berolinensis* nor *A. ephialtes* ab. *peucedani* was obtained. However, we otherwise did well, *Acidalia humiliata*, *A. strigaria*, *A. perocharia* and *A. imitaria* were common, and I got a nice series of each; *Cupido minima* was not uncommon, and *Leptidia sinapis*, *Melanargia galatea*, *Melitaea didyma*, *Argynnis niobe*, *Dryas paphia*, *Eugonia polychloros*, *Aglais urticae*, *Thecla w-album*, and *Epinephele lycaon* were all in fine condition, and I again had the good luck to take the only *Hesperia carthami* seen during the outing. After dining we took the boat to Woltersdorf, in hopes of getting *Lycaena euphemus*, which occurs there, but were not in luck. However, other butterflies were about in quantities, and we took long series of *Coenonympha arcania*, *Satyrus alcyone*, *S. semele*, *Epinephele lycaon*, *Polyommatus virgaureae*, *Argynnis niobe*, *Dryas paphia*, *A. aglaia*, *Adopaea lineola* and *Thymelicus acteon*. Although we visited the exact spot where, the year before, I had taken *Melitaea didyma* in numbers, this insect was not to be found.

On July 18th, we paid a visit to Spandau, with Mr. Herz added to our company, and together sugared about two miles of trees. Dusking was very productive, *Acidalia imitaria* and *A. dimidiata* being frequent and in good condition, and, for the first time, I took specimens of *Larentia bicolorata*, unfortunately no longer what they should have been. The pretty little *Rivula sericealis* was very common, but worn, and *Herminia tentacularia* females, abundant. On lighting our lamps we found the sugar patches smothered to an extent that I have never seen before in my life, and I flatter myself that I have seen some good sugaring. Numbers of the visitors were what I may designate wrecks of a former period, such species as *Leucania turca*, *L. impura*, *L. impudens*, *L. conigera*, *L. lithargyria*, *Aplecta prasina*, and *A. occulta*, etc., being absolutely useless as specimens, as they were worn mostly beyond recognition. The night was also remarkable for the immense numbers, firstly, of the two Lithosiids, *Lithosia griseola* and *L. muscerda*; secondly, for the large numbers of Micros which visited the sugar. At least four or five *L. muscerda*, and two *L. griseola*, were on every tree. Besides these the following were obtained in lovely condition—*Apamea pabulatricula* (*connexa*), *Xylina monoglypha* (black abs.), *X. lateritia*, *X. scolopacina* (one), *Dryobota furra*, *Apamea secalis* and ab. *leucostigma*, as also a remarkable specimen obtained by Herr Herz, with wonderful greenish-white markings; *Acronycta leporina*, *A. cuspis*, *Toxocampa pastinum*, *Cymatophora duplaris*, *Dyschorista suspecta*, *Calymnia pyralina*, *C. trapezina* and *Cosmia paleacea*. I have referred above to various species which were too worn to be of use, but these by no means filled the list, as many Noctuid species, of the genera *Noctua*, *Mamestra* and *Caradrina*, were also present. We very quickly filled all our available space, and the last train alone compelled us to quit the field.

(To be concluded.)

Synonymic Notes.

By LOUIS B. PROUT, F.E.S.

The following synonymic notes require putting on record :—

Superfamily HYPSIDÆ; *Deilemera* (*Nyctemera*) *adversata*, Schall.= *plagifera*, Walk.—In *Der Naturforscher*, xxiii., p. 52, pl. i., fig. 13 (1788), Schaller described and figured this conspicuous species under the name of *Phalaena* (*Geometra*) *adversata*, which has 66 years' priority over Walker's name of *plagifera*. Apparently *Der Naturforscher* has been little consulted by students of extra-European species, and it is unfortunate that I did not make this identification in time for use by Colonel Swinhoe in his valuable revision of "The Genus *Deilemera*" (*vide Trans. Ent. Soc. Lond.*, 1903, p. 67).

Superfamily GEOMETRIDÆ: *Eriopygidia quadripunctata*, Walk.= *subrosea*, Schaus.—Walker's type specimen of "*Ypsipetes*" *quadripunctata* (*List*, 1711) was a disreputable example from Venezuela, and it is very excusable that Mr. Warren, in arranging the British Museum Geometrides, passed it over as an example of *Spargania cultata*, Guen.; but it is certainly in reality the insect which has been recently presented to the Museum by Mr. Schaus as his *Hammaptera subrosea* (*Trans. Amer. Ent. Soc.*, xxvii., p. 268). I believe I am right in referring this species to *Eriopygidia*, Warr. (*Nor. Zool.*, vii., p. 175), rather than to *Hammaptera*: the palpi and abdomen seem very characteristic, neither can I find the peculiar hindwing structure which gives *Hammaptera* its name. I take this opportunity to fix *magnoliata*, Guen., as the type of *Spargania*—the only species of which he knew both sexes. This has already virtually been done, both by Guenée himself, in the fact just named, and especially by Warren, in erecting a distinct genus *Eriopygidia* (*loc. cit.*) with type *angustaria*, H.-S.—Guenée's first species in order; but I want to avoid any possible risk of having *angustaria* made the type of *Spargania*, according to the craze of the moment, and *Eriopygidia* consequently wasted as a synonym.

On some enemies of the Diurnal Lepidoptera.

By CECIL FLOERSHEIM, B.A., F.Z.S., F.E.S.

My observation of the life-habits of the diurnal lepidoptera has convinced me that whilst, in England anyhow, they enjoy a far greater immunity from attack when on the wing than has generally been supposed; on the other hand, when at rest, they are exposed to dangers which entomology has hitherto taken but little into account. I have seldom seen a bird attack a butterfly when flying. Indeed, the only instance I can remember is having once witnessed a sparrow chase and catch a fine specimen of *Argynnis adippe*, which seemed half paralysed by the pursuit. I saw a male robin once strike at *Pyrameis atalanta*, but, on the butterfly turning, he made no further attempt, and was, perhaps, only sexually excited to jealousy of the bright colouring of the insect. Of course I am aware that in other countries this is not the case, and that Scudder, Pöppig, Hahnel and others testify to the contrary. With dragonflies my experience has been much the same, and, though I have watched them in the early autumn hawking for small flies round a tank at home, I have never seen them attack the Pierids or Vanessids which feed unconcernedly on the

dablias growing round it. I have found it otherwise, however, with the Rhopalocera during their hours of sleep. For some years past, I have noticed that the butterflies in my butterfly-house have had a way of disappearing without any apparent reason, and, though I have occasionally found their wings, sometimes scattered, sometimes still attached to the headless thorax, lying on the ground, in the majority of cases their mysterious enemies have left no trace of their victims behind. My experiments have been principally concerned with the *Papilionidae*, and, before their final disappearance, I have frequently noticed that my butterflies have lost the tails of their wings, and one or both of their antennæ. I used to think that this was due to the wear and tear of existence in a confined space, but I feel convinced now that this was not always the case. I have read and been told that ants sometimes attack butterflies when the latter are asleep, but with the exception of one of the smaller species of garden ant, my butterfly-house is free from this branch of Hymenoptera, and, though I could imagine that the large black wood-ants would be able to seize and kill insects of the power and size of *Papilio turnus*, *P. machaon*, *P. ajax*, *P. troilus*, *P. cresphontes*, *P. philenor*, etc., I felt that this would be most unlikely with such ants as those in question, to say nothing of the fact that they were not particularly abundant.

It became evident to me that I must look elsewhere, probably to the predaceous beetles, many of which I knew to be nocturnal in their habits, for this deadly and mysterious enemy. Events have confirmed my surmise.

In the late spring of last year, I was trying to procure ova of *Araschnia levana* for Mr. Merrifield, and had a number of these butterflies alive and at large in my house. I had just previously lost at least a dozen-and-a-half *Euchloë cardamines* in one night, and was on the look-out for fresh misfortune. The imagines of *Araschnia levana* have a habit of roosting low amongst the herbage, and are consequently more exposed to attack than the Papilionids, which, I find, generally sleep at least four or five feet from the ground, unless benumbed by wet or cold.

During the course of my experiment some garden-pest traps, which I had ordered from Mr. Gardner of High Holborn, arrived, and within three days I was enabled to verify my suspicions by finding in one of them two of the smaller black garden beetles, along with the forewings and thorax of a female *A. levana*, the head, hindwings and abdomen, having disappeared. As egress from the traps in question is impossible for any insect which has once entered them, and as they are placed underground, and are, therefore, unlikely to be chosen as a resting-place by a butterfly, I felt confident that the *A. levana* had been brought there by one of the carnivorous beetles in question. Perhaps this habit of beetles of carrying their prey underground (I have on many occasions found the wings of butterflies on turning up the surface of the earth in my butterfly-house) is one of the reasons why one so seldom sees a dead butterfly.

To make certain that the beetles were my real enemies, I went down to my house at nights with a dark lantern, and have there on several occasions seen the beetles crawl up to the side of the structure and attack the sleeping butterflies. However, the darkness and the beetles' aversion to light, made the attack difficult to observe in detail, so

I put some of the smaller beetles into a breeding-cage with a female *Papilio asterias*, and sat up one night with a shaded candle in a dark room, doubtful if the beetles would still attack the butterfly under these conditions. It was some time before the beetles got over their dislike to the confined quarters and the partial light, but, when at last they began to move, I saw one of them make two attacks on the *P. asterias* which was sleeping near the top of the cage. The first onslaught was unsuccessful, as the beetle only bit off the tails of the butterfly's hindwing, but on the latter falling to the floor of the cage in alarm and fluttering there, its enemy, dashing up from behind, seized its abdomen in its jaws and began to devour the living butterfly which flapped helplessly along, dragging the beetle along with it. I released the butterfly, which was, however, much injured, though able to fly the next morning when I gave it its liberty.

Between the end of last May and the beginning of October, I took from a dozen traps in my butterfly-house nearly 3000 carnivorous beetles, including many of the larger kinds, one of which I think I have identified as *C. violaceus*, and towards the end of the period I found that my butterflies did not disappear with anything like the frequency with which they used to during the early summer.

Chary, as I know one should be, of hasty generalisations in matters of this kind, I should like to suggest that the danger from carnivorous beetles and other nocturnal enemies may have had much to do with evolving the sleeping habits, and appearance when at rest, of the Rhaplocera as we know them. The vertically-folded wings would protect the insect from a sudden attack from behind on its head which I have observed to be the point generally chosen, whilst the wing-cases, legs, etc., would adequately shield the sides. I notice that *Papilio palamedes*, which has the habit of roosting on the highest trees it can find, is said to sleep with its wings open, which Scudder calls very remarkable. Perhaps in this attitude it is safe from the attack from Coleoptera and other nocturnal foes. Again, I have noticed that the Papilios, which represent a somewhat primitive form of butterfly, sleep with their antennæ outstretched as though to warn them of any danger, whilst the more highly specialised kinds, such as the Vanessids, sleep with their antennæ pressed up against the costa of the forewings, and evidently rely for protection upon their resemblance to surrounding objects, the markings of their undersides being much more developed than is the case with the *Papilionidae* which I have observed. I have noticed, too, that I lose butterflies protected like *Pyrameis cardui*, *Vanessa io*, *Eugonia polychloros*, etc., much less frequently than the Papilios. Again, the habit of so many butterflies such as the *Lycaenidae*, *Satyridae*, etc., of roosting on slender grass stems, may serve as a protection against bulky enemies such as the larger beetles, which would bear them down in the effort to climb, and so awaken their prey. Perhaps, also, the tails of the Papilios are protection against the beetles, for, by projecting, they both shield the butterfly's abdomen, and may, by resembling antennæ, cause their foes to attack a less vital part than the head. Hahnel, quoted by Weismann, shows how the tails afford protection against lizards, "which, after snapping, often find themselves obliged to be content with the tail alone, while the rest of the animal flies away practically uninjured," and I have certainly been

struck by the resemblance of the tails to outstretched antennæ at night time.

These suggestions are, I feel, made on altogether insufficient data, and it is only the despair of ever being able to get enough reliable ones, that makes me feel justified in throwing them out.

In addition to my experiences with the beetles, it may be of interest to record that I have observed both spiders and larvæ of ladybirds (the latter probably only because Aphides had failed them) attack and kill young larvæ of *Papilio machaon*. The spiders would even attack almost fullgrown larvæ, which soon died and turned black after being bitten.

About ninety per cent. of the ova laid on fennel by my *Papilio asterias* last season were sucked and destroyed by a small Hemipteron, which I have, up to the present, been unable to identify. This insect, which was only too common in my butterfly-house last summer, seemed to spend its days flying from bush to bush and plant to plant in search of the ova of butterflies. When it discovered one, it proceeded to insert its beak, and, having sucked the ovum dry in a very short space of time, flew or crawled on to the next. Some large plants of carrot were covered with the prismatic white eggshells, whose living contents it had devoured.

Amblyptilia cosmodyctyla, Hb. (acanthodyctyla, Tr.), ab. nivea, nov. ab.

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

Head and *thorax* whitish, dusted with fuscous. *Forewings* white, dusted with brown towards the costa; the clearly-defined antemedian costal spot, postmedian costal blotch, and subterminal bar crossing the lobes, with the terminal portion of the lower lobe, brownish-black; terminal cilia blackish, chequered with white. *Hindwings* brownish-black, with the dorsal margin of the third feather whitish; cilia brownish, partially dark-spotted. Scale-teeth of all the cilia blackish. *Abdomen* dorsally and ventrally white, dusted with fuscous, laterally blackish. *Legs* white, broadly barred with brownish-black.

The above description of this most striking and beautiful aberration was recently made from two British examples (♂ and ♀) in Mr. W. H. B. Fletcher's collection. They were taken, either as imagines or larvæ, by Mr. W. Salvage several years ago, probably in Sutherlandshire, though this is uncertain. If other lepidopterists secured examples of this albinic aberration from Mr. Salvage, perhaps they will kindly make known the data received from him, for there seems little doubt that he only met with it in one locality, where it occurred rarely during a single season. These two specimens are the only ones I have seen. To prevent confusion, it seems advisable to add that the name *A. cosmodyctyla* is used above for the common reddish-brown species, popularly known in Britain as *A. acanthodyctyla*, and not for the rare olive-brown insect generally known as *A. punctidactyla* or *A. cosmodyctyla*. In *Ent. Record*, xi., 238 (1899), Mr. Tutt showed that the former is the true *cosmodyctyla*, Hb., while the latter is really *acanthodyctyla*, Hb., but in the *Catalog* by Staudinger and Rebel (1901), although the reference to his note is given, the erroneous use of Hübner's names is maintained.

Scents of Insects and their Meanings.

By A. W. BACOT, F.E.S.

Dr. Chapman's interesting note (*Entomologist's Record*, xvii., pp. 321-322) on "Scents of Insects and some thoughts about their possible meanings," reminds me of my failures when attempting to cross *Amphidasys strataria* and *A. betularia*. These, I think, suggest that there may be more openings for sexual selection among the assembling Heterocera than is usually thought to be the case.

My attempts to obtain fertile ova extended over three seasons, beginning with numerous attempts in which the moths were placed in large cages both indoors and out, but these never produced a single pairing, chiefly, I fancy, because the males did not have room for a sufficiently extended flight, but partly, at any rate, owing to the restlessness of the females. At the same time it was possible, under these same conditions, to get as many pairings between individuals of the same species as desired.

In the woods I was twice successful in obtaining pairings between wild males of *A. strataria* and females of *A. betularia* var. *doubledayaria*. On the occasion of the first success I saw the *strataria* enter the open compartment of the cage in which the female *A. betularia* was situated, and pairing took place almost immediately without any hesitation on the part of either moth. At the second successful attempt the female *A. doubledayaria* was resting on the outside of the cage in which the females of *A. strataria* were confined. I did not see the pairing take place but the female had not apparently shifted from her calling position.

Both these females had been out some eight or ten days before pairing took place, but the pairings were apparently quite normal in that the pairs in both instances were carried home by cycle a distance of ten to fifteen miles without disturbing the moths, and on the second occasion the pair was shifted from the cage into a box without their separating. In both instances, the nights were unfavourable ones for assembling, and very few males flew up. With one single exception the ova of both pairings were infertile. But the disappointing though favourable nights, on which the males flew up freely but would not or could not pair, afford the best evidence which bears on the males' possible selection of partners.

On one occasion, when the wind blew almost a gale and there was an abnormally high temperature (I think 60°F.) a single male dashed up, went into the cage, buzzed round for a few moments, and then retired not to return; an unusual circumstance possibly due to the strength of the wind. Upon a decidedly favourable night with a slight breeze, some eight or ten males flew up and several entered the cage, but, although they flew round and fluttered close to, even touching, the females of *betularia*, they made no attempts to pair during my observation, and no pairings took place. Other unsuccessful attempts were made, but my memory is not clear as to what happened, probably they were mostly occasions on which no moths assembled at all. My only attempt in 1905 was made on a calm, almost windless, and somewhat chilly, night, only one male flew up and his attempts to pair were most persistent, on three separate occasions I saw him attempt copulation, and each time the female *A. doubledayaria* avoided him.

This female had only emerged two or three days previously, and it seems possible that, having more energy, she avoided the attempts at copulation because they were in some respects at variance with the normal habits of her species. On the other hand the successful attempts were made with females that may very possibly have been deficient in energy, owing to the lapse of time since their emergence. A certain sluggishness, due to the unfavourable nature of the night, might also account for the lax instinct of the males when pairing, or attempted pairing, took place. That the nights in question were unfavourable is, I think, evinced by the few specimens assembled.

But whether this explanation or variation of the pairing instinct be the cause, the facts would seem to prove that the males do not merely follow up the scent to its source and then buzz round until chance brings them in contact with a female with which they at once pair. There would seem to be some power of recognition other than scent, if not of selection, on their part. That the pairing habit is variable there seems no doubt, as with moths of the same species pairing does not always follow immediately on the male gaining access to the female; sometimes the male quiets down and waits quietly in a corner of the cage while the female continues calling, at other times pairing takes place immediately the male gains admission.

With the females, whether success was due to a lack of energy on their part or not, the fact that, on one occasion at least, the failure to pair was due to female action, even though the male was of another species, suggests that she has not only the power of selection, but the will to use it should the appearance or advances of the male be sufficiently at variance with her instinctive expectations.

Notes on *Coleophora alcyonipennella*.

By H. J. TURNER, F.E.S.

COLEOPHORA ALCYONIPENNELLA.—This species had long evaded my search, but on May 1st, 1904, at Ranmore Common, while endeavouring to get some plants of *Inula conyza*, I met with traces of it on some young leaves of *Centaurea*. They were, however, very scarce, for although I searched assiduously for some time, I was able to find only two cases. One of the characters given in all descriptions of the case of this species, is the presence of two white longitudinal lines somewhere between the keel and the sides of the case, but in none of them have I ever seen an attempt to point out their origin. Perhaps the following may afford a clue. First of all, these two cases had only just traceable white imperfect lines, almost to be described as scratches. Like many species among the Coleophorids, this one enlarges its case by means of an insertion of new substance in a slit made along the lower or keel side, and, in a few days after these cases were obtained, one larva cut a slit in its case and commenced to fill it with new silk in very narrow strips side by side, all the minute ridges where these strips adjoined showing very clearly. By May 11th the new keel piece was completed and was wholly white. The edges of this new piece overlapped the two edges of the slit, and an extremely slight ridge of the new white substance contrasted strongly with the distinct, dull black of the old. The old substance evidently underlapped the new to give sufficient strength to the seam. The larva now proceeded

to darken this new substance, and, in a few days all, except a narrow strip on each side, had assumed the colour of the main body of the case. These two narrow "white lines" then seem to be just the portions of the new substance which overlap the old, and the darkening secretion of the larva appears not to be able to penetrate the double thickness and so stain the overlapping part. As a result we get the white strips sharply defined further from the keel line, but more or less ill-defined on their lower margin; but this varies in individuals, as one would suspect, if the above suggestion were the true explanation of these "white lines," and if the cases are closely examined, traces of other "white lines" may be seen, which have become mostly clouded black-brown by exposure. The cases are strongly constricted, before the commencement of the three valves of the anal opening, as well as before the mouth opening. The sutures of the valves are very prominent and the valves much adpressed. Of the two larvæ one pupated about May 30th and produced an imago on June 18th. The other was ejected from its case and the description of its thoracic plates noted as follows:—

The prothorax has two long, oblong, black plates with a narrow suture between down the back, the front external corners being slightly rounded off. The 2nd, mesothoracic, plates, are four, two small triangles at the back of the segment near together at the middle, with a narrow suture between, and two dots near the front of the segment nearly as far apart as the ends of the plates on segment i. The metathorax has two small dot plates nearer the hind margin than the front, quite straight behind the dot plates on the mesothoracic. All three segments have small spiracular dot plates.

This season, 1905, while out collecting with Mr. R. South at Northwood, I was fortunate to meet with this species again, and after a considerable search I obtained twelve healthy cases on *Centaurea* and two on thistle. I was led to search thistle by noticing blotches on the leaves exactly like those of the *Centaurea*. Many of the thistles on this piece of rough ground showed traces of the larvæ, but only two were met with. In all cases the leaves of the thistles attacked intermingled with the leaves of *Centaurea*, which had been similarly attacked, and in no case did I find a thistle standing alone which showed any traces of the larval depredations. Hence it may perhaps be assumed that the imago did not select thistle upon which to deposit its eggs, but that the two larvæ, under the influence of the wandering spirit, which the Coleophorids possess to an extreme degree, found themselves upon a pabulum, which upon trial was found to be not palatable, and went on making its meals on it. Several of these larvæ produced imagines, while the rest were ichneumonated. I should have said that the larvæ put only the smaller part of their body into the mine, which therefore forms only a small round blotch. One leaf is frequently covered by numerous mines, and so becomes tolerably conspicuous. These larvæ from Northwood were found on June 3rd, 1905. They soon pupated, and the imagines emerged at the end of June and the beginning of July. The ichneumons, which were produced, made a hole in the side of the case near the valves of the anal opening, but did not in any case use the anal opening as a means of exit.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from vol. xviii., p. 11.)

GENUS III: ACRIDIUM, Geoffroy.

This contains a number of large locusts of which several species occur in Africa, but only one in Europe; it is the largest of the European *Acridoidea*.

1. ACRIDIUM ÆGYPTIUM, Linn.

Easily known by its large size, uniform dark grey colour and smoky wings, and purple underside of posterior femora. Length of body, 32mm.-47mm. ♂, 50mm.-66mm. ♀; of pronotum, 9.8mm.-11mm. ♂, 13mm.-15mm. ♀; of elytra, 45mm. ♂, 55mm.-63mm. ♀.

Common throughout southern Europe. In France it is common in the south and reaches as far north as Bordeaux and Montelimar. It is found also in Corsica and in all Spain and Portugal. In Austria it occurs in the Prater and at Dornbach; an isolated specimen is recorded from Erlangen. It is commonly imported into England among cauliflowers and other vegetables. It is abundant in Italy, and common also in Sardinia; the adult may be found nearly all the year round; the immature forms, which are often uniform green or yellow, are found in the autumn and live through the winter.

GENUS IV: SCHISTOCERCA, Stål.

This genus includes a number of American species, but only one occurs in the Old World. It is allied to the preceding, but differs in the indicated generic characters.

1. SCHISTOCERCA PEREGRINA, Olivier.

Light reddish with paler spots and markings. Length of body, 46mm.-55mm. ♂, 57mm. ♀; of pronotum, 9mm.-10mm. ♂, 10mm. ♀; of elytra, 50mm.-60mm. ♂, 60mm. ♀.

This is the famous locust which does so much damage in Algeria; it occurs commonly in Africa, and sometimes strays into Europe. It has been taken in Portugal, the Balearic Islands, and sometimes accidentally in England. It is taken fairly often in the extreme south of Spain, as at Cadiz, Malaga, etc., and appears to be now acclimatised in Portugal. It is not recorded from France. It is an annual plague in southern Algeria, and is often sold in the market as a kind of dried food under the name of "djerad."

GENUS V: PODISMA, Latreille (=PEZOTETIX, Burmeister).

This genus includes a number of mountain insects, of small and stout build; the organs of flight are almost always rudimentary, but occasionally fairly well developed.

TABLE OF SPECIES.

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|---|--|
| 1. Elytra present, rudimentary or developed. | |
| 2. Hind tibiæ red | 1. FRIGIDUM, Boheman. |
| 2.2. Hind tibiæ blue or greenish. | |
| 3. Valves of ovipositor curved. | |
| 4. Hind tibiæ yellowish, at least near the apex | 2. ALPINUM, Kollar. |
| 4.4. Hind tibiæ entirely blue | 3. PEDESTRE, LINN. |
| 3.3. Valves of ovipositor straight | 4. { SCHMIDT, Brunner.
{ (=MENDAX, Br., in <i>Prod.</i>) |

- 1.1. Elytra entirely wanting.
2. First abdominal segment with a tympanum.
3. Subgenital lamina ♂ blunt 5. BALDENSIS, Krauss.
- 3.3. Subgenital lamina ♂ acute 6. SALAMANDRUM, Fischer.
- 2.2. Abdominal tympanum absent.
3. Pronotum with impressed points, the side lobes with a black band interrupted.
4. Hind tibiæ bluish; hind knees dark; ventral segments with black spots .. 7. PYRENEUM, Fischer.
- 4.4. Hind tibiæ reddish; hind knees pale; ventral segments entirely pale .. 8. COSTÆ, Targioni.
- 3.3. Pronotum smooth; dark band of side lobes not interrupted.
4. Cerci ♂ pointed; subgenital lamina ♂ obtuse 9. PEDEMONTANUM, Brunner.
- 4.4. Cerci ♂ somewhat dilated at apex; subgenital lamina ♂ pointed .. 10. COBELLII, Krauss.

1. PODISMA FRIGIDUM, Boheman.

Known by the crimson posterior tibiæ, with rudimentary elytra. Length of body 17mm.-20mm. ♂, 24mm.-26mm. ♀; of pronotum, 4.2mm.-4.3mm. ♂, 5mm.-6mm. ♀; of elytra, 6.2mm.-8mm. ♂, 6.8mm.-8mm. ♀.


A northern species. It occurs in Lapland, at Quickjoek; in Norway in the Dovrefjeld and at Nordland, Hatfjelddalen, and Sankarfjeld at about 3500 feet; in Switzerland on the Rhone glacier, Maderanerthal; also in the Seisseralp and Schlern. In Austria at Pasterze on the Grossglockner, in the Dolomites, South Tirol. In France at Plane (over 7000 feet) near Mount Genève, and on the plateau of Gondran near Briançon.

2. PODISMA ALPINUM, Kollar.

Known by the rudimentary or more or less developed organs of flight, dark bluish or olivaceous hind tibiæ, curved valves of the ovipositor, pointed cerci of ♂ and crimson under sulcus of posterior femora. There are two well-known forms, viz., (1) *alpinum*, Koll., smaller; pronotum truncate behind; elytra lateral, lobiform; hind tibiæ almost entirely blackish-violet. Length of body, 16mm. ♂, 22mm.-27mm. ♀; of pronotum, 3.8mm.-4.2mm. ♂, 5mm.-6mm. ♀; of elytra, 2.5mm.-4mm. ♂, 4mm.-4.5mm. ♀. (2) var. *collinum*, Br., larger; pronotum bluntly triangular behind; elytra and wings fairly well-developed; former lanceolate; posterior tibiæ in both sexes dirty yellow. Length of body, 16mm.-23mm. ♂, 24mm.-31mm. ♀; of pronotum, 5mm.-6mm. ♂, 6mm.-7mm. ♀; of elytra, 7mm.-12mm. ♂, 9mm.-15mm. ♀.

The var. *collinum* is the east European form; it has, however, been taken at Belluno on the southern slopes of the Alps, and an intermediate form at Schneeberg in the Semmering pass. It is rare in France, and its distribution begins in the Wienerwald; the other form is found in all the highlands of west Europe; in France common in the Vosges, Jura, Mont Dore, Alps, and Pyrenees; also in the Black Forest.

(To be continued.)


COLEOPTERA.
***Ptinus pusillus*, Stm., a Species of Coleoptera new to Britain.**

By HORACE St. J. K. DONISTHORPE, F.Z.S., F.E.S.

Mr. Pool having told me that he was taking *Ptinus brunneus* at Edmonton, a species he had captured there before, in the corn shop where he discovered *Ptinus tectus*, I went over to collect there with him. I found, however, that he was taking something new, and it eventually turned out to be *Ptinus pusillus*, Stm., a species new to Britain. We took several specimens, and he has captured quite a number altogether. It is a very active little species, running much faster than others of the genus. The following is a free translation of Boieldieu's description of the insect:—"Oval, very elongate, nearly parallel, of a testaceous-red, pubescence yellow. Head large, bent, longitudinally channelled, covered with yellow hair. Antennæ as long as the body, with slender cylindrical elongate joints. Thorax longer than broad, very convex in front, depressed transversely and contracted behind, punctured and rugose, with a feeble longitudinal furrow in the middle, and four feeble transverse teeth, formed by the yellow hair, stiff and standing up; the transverse part behind is furnished with tufts of yellow hair. Elytra whitish-yellow marked with rows of punctures, the intervals smooth and furnished with rows of standing-up hair; there are two transverse rows of spots formed by white hair and not very apparent, one humeral the other near the extremity. The body underneath furnished with yellow hairs; legs long and pubescent. Length $2\frac{1}{2}$ mm.-2mm., breadth 1mm. ♂ and ♀. Temperate Europe. Lives in granaries." It is common in France and Germany, and there is no doubt it is also British, and will be found commonly when granaries and such-like places come to be more worked. The difficulty is that so many of the people who own corn shops, etc., will not allow anyone to collect in them, and are very indignant at the mere suggestion that they harbour anything so disgusting as beetles

COLEOPTERA OF EPPING FOREST.—Taking advantage of the beautiful weather on January 26th, I went over to Epping Forest for a few hours' collecting. Among my captures there is one which seems to be worthy of record, *viz.*, a specimen of *Megacronus inclinans*, Gr., which was taken out of a decaying oak stump. This same stump also yielded fifty or more of the pretty little *Rhinosimus ruficollis*, L., a species which I have never before met with in this gregarious manner. They were not only under the bark, but were also crawling about it, no doubt lured out of hybernation by the warm sunshine.—HEREWARD DOLLMAN, F.E.S., 14, Newton Grove, Bedford Park.

COLEOPTERA IN THE NEIGHBOURHOOD OF DITCHLING, SUSSEX.—I find a few species among my last years' captures, not previously recorded, which may be of interest: *Malachius marginellus*, Ol., one swept off a hedge-bank in late June. *Lissodema quadripustulata*, Marsh., a few out of an old ash stump, together with *Choragus sheppardi*, Kirb., one example. *Aphthona atrocoerulea*, Steph., *A. atro-rivens*, Först., and *A. herbigrada*, Curt., fairly common, obtained by sweeping flowers on the Downs, the latter in profusion. *Homaloptia ruricola*, F., this was taken in fair numbers on Ditchling Beacon, chiefly on the wing during daytime, but also by sweeping. The black aberration was not uncommon, though few perfect examples were met with.—IBID.

OXYTELUS INSECATUS, GR., IN LONDON DISTRICT.—I netted one example of this scarce *Oxytelus* in Bedford Park, Chiswick, on July 14th, 1905.—IBID.

(R) R T H O P T E R A .

SYNONYMIC NOTE ON THAMNOTRIZON CINEREUS, GMEL.—In a paper by Shuguroff (*Revue Russe d'Entom.*, 1905, p. 3), I observe that the author makes use of the name employed by de Geer for this familiar insect. On looking up the references, I see that it is described by de Geer in 1773 (*Mém.*, etc., iii., p. 436), whereas it is apparently first described as *cinereus* in 1789 (*Syst. Nat.*, ed. Gmelin, i., p. 2071), so that de Geer's name has the prior right; as we have seen elsewhere, Bolivar employs the generic name *Olynthoscelis*, Fischer de Waldheim, which has priority over *Thamnotrizon*, Fischer. If, therefore, this is correct, we must call our old friend under the new and unfamiliar name of *Olynthoscelis griseoptera*, de Geer.—MALCOLM BURR, B.A., F.E.S., 23, Blomfield Court, Maida Vale. *January 11th, 1906.*

S C I E N T I F I C N O T E S A N D O B S E R V A T I O N S .

LITA INTERMEDIELLA, HDGN., AN ABERRATION OF GELECHIA FRATERNELLA, DGL.—At the dispersal of the late Mr. J. B. Hodgkinson's collection, the type specimen of *Lita intermediella*, which he introduced as *spec. nov.* in *Ent. Rec.*, ix., p. 36 (1897), came into my possession, together with another example, worn to a shadow and bodiless, of apparently the same form. The latter is doubtless the second individual he refers to in *Ent. Rec.* (*loc. cit.*). An examination of the type shows that *intermediella*, Hdgn., is undoubtedly a suffused aberration of *Gelechia fraternella*, Dgl., though this statement is superfluous if Mr. Tutt intended his editorial remark (*Ent. Rec.*, *loc. cit.*) that "several Micro-lepidopterists have since referred the specimen to *L. fraternella*," to definitely cancel Hodgkinson's note to which it is appended. Since Hodgkinson merely says that it is "quite distinct from *Lita fraternella* and *Lita viscariella*, the yellow spots being smaller and the insect more mealy in general appearance," I may mention that ab. *intermediella* has the ground-colour whitish-brown instead of bright reddish-brown, and the black scales are more evenly distributed over the forewing, so that it has a more uniform and less variegated appearance than the typical form. The white subterminal fascia is present. Hodgkinson's statement, that "the yellow spots" are "smaller," can only refer to the fact that the reddish-brown ground-colour of *G. fraternella* appears merely as a slight and very partial tinge in his finer example of ab. *intermediella*, in the much wasted one it is entirely absent.—EUSTACE R. BANKES, M.A., Norden, Corfe Castle. *December 30th, 1905.*

OXYPTILUS HIERACII, Z.: DISCREPANCY IN DESCRIPTIONS. — Zeller himself, in *Linn. Ent.*, vi., 350, gives the third feather of the hindwing as having the dorsal scale-tooth "a little before the apex," while Stainton (*Man.*, ii., 441) says that its scale-teeth (which are opposite one another) lie "before the tip," and Meyrick (*Handbook Brit. Lep.*, p. 432) describes them as "apical," since they practically reach the tip. Barrett, however, in *Ent. Mo. Mag.*, xxv., p. 431, states, with

special emphasis, that they are "just beyond the middle," which suggests that he had not the true *O. hieracii* before him.—IBID.

CROSSPAIRING OF VANESSIDS.—SUCCESSFUL REARING OF ZONOSOMA HYBRIDS.—It may be of interest to your readers to know that during the last summer I have paired *Vaessa io* ♂ with *Euvanessa antiopa* ♀, although the eggs were infertile. Similarly I obtained a pairing of *Vaessa io* ♂ with *Eugonia polychloros* ♀; the eggs laid went through all the colour-changes usually associated with fertile ova of *E. polychloros*, yet failed to hatch; they appeared to have dead larvæ within the shell, much as one often observes in the eggs resulting from a pairing of *Amorpha populi* ♂ with *Smerinthus ocellata* ♀. With the hybridisation of the Zonosomas, however, I have been, on the whole, during the past two or three seasons, successful. I obtained pairings of *Zonosoma orbicularia* ♂ × *pendularia* ♀, and the reciprocal cross *Z. pendularia* ♂ × *orbicularia* ♀, *Z. orbicularia* ♂ × *annulata* ♀, its reciprocal *Z. annulata* ♂ × *orbicularia* ♀, and lastly, *Z. orbicularia* ♂ × *porata* ♀. All these produced fertile eggs and larvæ, and, although those from the two last named crosses unfortunately died when nearly fullfed, owing apparently to the very wet weather that occurred whilst I was rearing them (they were fed in the open in sleeves), yet the others produced imagines in due course, of the first two of which I forward you specimens.—H. W. HEAD, Scarborough. December 20th, 1905. [We hope to describe these in an early number.—ED.]

VARIATION.

OPISTHOGRAPTIS LUTEOLATA AB. ALBESCENS, CKLL. = LACTICOLOR, HARRISON.—The pure white form of *O. (Rumia) luteolata* (= *crataegata*) was recorded by Mr. Tero in *Entom.*, xxi., p. 15 (1888), and named *albescens* by Cockerell on p. 113 of the same volume; Mr. Harrison's *lacticolor* (*Ent. Rec.*, xvii., p. 338, 1905) will therefore sink as a synonym. The "Research Section" of the "North London Natural History Society" is devoting part of its attention to the bibliography of variation in the lepidoptera, and my valued assistant, Mr. V. Eric Shaw, promptly called my attention to this duplication of name.—L. B. PROUT (Hon. Res. Sec., N. Lond. Nat. Hist. Society). December 21st, 1905.

ON THE RED SPOT NEAR THE ANAL ANGLE OF THE HINDWING OF THECLA W-ALBUM.—In Mr. Bird's excellent paper (*antea*, vol. xvii., pp. 311 *et seq.*) he writes: "We have noticed a slight variation of the upperside in *Thecla w-album*: this is in the size of the red spot on the hindwing at the anal angle. In every description of this butterfly we have read, this marking has been totally ignored, though it is generally present, or at least indicated by a few red scales. Most of our specimens are so marked, but we have one or two of both sexes where it is quite absent." This must be due to limitations connected with the extent of library, for, in the first description I looked up, Ruhl's *Pal. Gross-Schmett.*, p. 181, I read: "Beim ♀ steht am Afterwinkel der Hinterflügel ein rother, auswärts schwarz umzogener Augenfleck, etc.," which suggests that the mark is known to our scientists, even if exigencies of space have kept its description out of popular books.—A. M. COCHRANE, Lewisham. December 24th, 1905.

NOTES ON COLLECTING, Etc.

EGYPTIAN AND SYRIAN BUTTERFLIES.—CORRECTIONS.—The Egyptian list given by me in the *Entomologist's Record*, xvii., no. 6, contained two doubtful species which now prove to be *Parnara zelleri* and *Hesperia (Syrichthus) phlomidis*. In my Syrian list, appearing in the same volume, I must apologise for having mistaken a very pale form of *Carcharodus althaeae* for *C. lavaterae*, though here Lederer excuses me by noting the likeness between Beyrout *C. althaeae* and the other species. For *Syrichthus nomas* read *S. malvae* var. *melotis*. I took *S. nomas* this year and now appreciate the difference. *S. alveus*, of which I took three specimens at Ain Zahalta, in July 1904, must also be added to my list.—P. P. GRAVES, Turf Club, Cairo. December 6th, 1905.

HYPOLIMNAS MISIPPUS IN EGYPT.—Damaged *H. misippus* have been brought me from Ghizeh and from near Abou Kebir in the Delta, and a friend describes the insect as occurring in summer at Kafr Ammar, some 80 miles south of Cairo. It appears in July and August, and is not common.—IBID.

ERRONEOUS RECORD OF POLIA XANTHOMISTA OCCURRING IN EAST KENT.—In a recent report of one of the societies, Mr. J. P. Barrett is stated to have exhibited a *Polia xanthomista* taken in East Kent, in 1904. Mr. Barrett is an entomologist of such ripe experience that I hardly like suggesting a blunder, but it appears so unlikely that this insect should occur in Kent that I write to enquire. Mr. Tutt, in *The British Noctuae and its Varieties*, iii., pp. 44 et seq., describes in detail the typical form *Polia xanthomista*, Hb., var. *nigrocincta*, Tr., var. *nivescens*, Staud., and ab. *statices*, Gregs., but one assumes that Mr. Barrett has already referred to this work. According to Mr. Tutt, the type only doubtfully occurs in the British Isles, the bulk of the examples being either var. *nigrocincta* or ab. *statices*. At the time of writing *British Noctuae*, etc. (1892), the species was confined to the Isle of Man and Cornwall in the British Isles, and although one supposes it may occur on the North Devon coast, Pembroke, etc., one cannot believe that the insect has been taken in East Kent. Has not Mr. Barrett wrongly identified his specimen?—A. M. COCHRANE, Lewisham. [We observed that Mr. Barrett exhibited at a recent meeting of the South London Entomological Society a specimen of a *Xylina* under this name. We only glanced at it and supposed it to be *Xylina furcifera (conformis)*. There has never been, of course, any confusion between this species and *Polia xanthomista*, but the exhibitor has evidently confused the names of two very distinct species. Until now, however, all the examples of *X. furcifera* taken in Britain have been also confined to the west—Cardiff, Newport and Neath. In a recent note in answer to enquiry from us, Mr. Barrett, who is evidently not clear about the names of these two very distinct insects, states that it is the species that Evan John bred (see *Brit. Noct.*, iii., p. 104), i.e., *furcifera*, he further supposes his example to have been an immigrant, but this, we think, cannot be, since, so far as our memory carries us, the specimen we saw was certainly not the continental form of *furcifera* (our British are entirely different). Could the insect possibly be *Xylina lamda* var. *somniculosa*, which we have described in detail (*op. cit.*, p. 101)? All our British examples

of this insect we believe have been taken so far in the southeastern counties. At any rate Mr. Barrett ought to work the specimen up thoroughly so that no doubt exists (1) as to its species, (2) as to whether it is a purely British form of the species to which it belongs.—ED.]

POLIA CHI IN DEVONSHIRE.—Referring to the notes on the southern range of *Polia chi* in Britain (*antè*, xvii., pp. 295 and 335), I may say that I have found it in plenty, year after year, on the South Devon coast. It comes freely to sugar there, contrary to its habit here, where, although still more abundant, it is quite exceptional to see one at sugar. The South Devon specimens seem to be all of the ordinary very pale form.—GEORGE T. PORRITT, F.L.S., Huddersfield. *January 5th, 1906.*

HABITS OF *EUCHELIA JACOBÆÆ*.—I note Mr. Burrows comment upon my question *re Euchelia jacobææ* (*antè*, p. 335). He evidently misunderstands. *E. jacobææ* is a coast insect in our two counties, and has never been taken inland. In fact, I am almost certain that there was no previous record of its capture in Durham, although it is so abundant in the localities I have indicated in Northumberland. A correspondent points out that a similar question appears in the *Entomologist*, p. 237. Lastly, Mr. Burrows states that the insect is dull and lethargic. Is that so? My impression of capturing it on the wing at Seaton Sluice in 1902, and at Strensall, York, was that it is an active species on the wing, at least, in the sun. Also Mr. W. S. Gilles, in his note in *The Entomologist*, states that they were flying around light—scarcely where lethargic and heavy insects are wont to resort.—J. W. H. HARRISON, B.Sc., F.E.S., The Avenue, Birtley R.S.O., Durham. *December 19th, 1906.*

REVIEWS AND NOTICES OF BOOKS.

QUESTIONABLE ENTOMOLOGY.—Two popularly written books have been sent us for review. The first is Mr. H. W. Sheppard-Walwyn's *Nature's Nursery*.* This divides into two parts, (1) The photographic illustrations, excellently taken and well reproduced; (2) The letterpress, weak, rambling and inaccurate. It takes some three pages to state that *Cerura vinula* glues her eggs for tidiness and precision, followed by the amazing statement that "the cares of motherhood are considerably lessened in the case of the little Blue butterfly, who tosses her eggs about everywhere as if she were sowing a field . . . however, such parents as the Blue butterfly are distinctly in the minority, so we will let them pass" (p. 69). The processes of moulting, expansion of an insect's wing, fluid movements in wing [one note stating that "the veins, through which the fluid is rushing, can be plainly distinguished as they stand up conspicuous above the surface of the wing" (p. 118)], etc., all present many statements that may be accurate, but do not tally with our own observations. It is a great pity, as the actual facts are readily accessible in the best text-books. This book is apparently written for good-sized children, of whose average capacity Mr. Walwyn can have little practical knowledge. False impressions picked up by intelligent children often stick to them as long as they live. There appears to be little difference between the story held up to ridicule on p. 58, and much of the rest of the letterpress. The second book, *Romance of Insect Life*†, by Edward Selous,

* London: Hutchinson and Co., Paternoster Row.

† London: Seeley and Co., Ltd. 38, Great Russell Street, E.C.

is a very different one. Choosing some of the most striking details of insect habits published by authors, ancient and modern—Kirby, Bell, Lubbock, Darwin, Lyonnnet, Howard, etc.—the author writes with a verve and wealth of imagination that converts the book into a real romance. The original facts are dressed in picturesque language, presented from the author's point of view, and so lose most of their original value, and leave an entomologist absolutely helpless on almost every page. Many an entomologist who knows his subject will envy Mr. Selous' wealth of forceful language, but entomologists will certainly wish that Mr. Selous knew something of entomology. Mr. Selous disarms real criticism by the statement that the book is not of a scientific nature, and that he is prepared to defend the inclusion of scorpions, centipedes and spiders in his idea of insects. In consequence, one is not surprised to find the bird-winged *Papilios* named *Orthoptera*, although the author is critical enough to gird at *brookeana*. His paraphrase of Nicéville's account of *Tarucus theophrastus* is really exciting. He says it belongs to a certain family of butterflies, entitled to the scholarly name *Sycanidae*. After detailing (on the authority of Mrs. Wyllie) how a certain black ant milks these larvæ, guides them down the trunk of the tree, digs holes at the foot for them to pupate in, he notes that finally, "if the earth at the base of the tree be removed, chrysalids, and caterpillars that are about to turn into chrysalids, are *clinging all round* the trunks, whilst all amongst them are the ants, helping to place this one or that one in position. The band thus formed round the tree may be several inches broad and it is always remarkably even, as though arranged on æsthetic principles." He then goes on to state that "if the earth be removed, the ants become agitated, and seizing hold of their property—for in this light they consider the caterpillars—begin to rebury them, so that, in time, if the annoyance continues, they will form a fresh circle of bodies lower down the tree Here then is an ants' nest full of butterfly chrysalids, and in about a week it becomes full of butterflies themselves, and amidst the rough black bodies of hosts of earth-working Calibans, colours born of the rainbow gleam and flash from the fairy wings of delicate insect Ariels. Each one of these was helped from its cradle, thus strangely situated, by a little group of these gnomes, who then assisted it to unfold its wings, and guided its uncertain steps," etc. This *may* be all absolutely accurate as to fact, as also very many other similar passages, but it will serve to illustrate the questions we should like to ask the author on many points raised. With regard to this paragraph—If the "chrysalids and caterpillars about to turn into chrysalids are clinging all round the trunk in a band several inches broad," how does Mr. Selous consider the chrysalids cling to the trunk in these closely packed bands arranged on æsthetic principles? If, as in the majority of *Lycænids*, by a silken cremastral pad and body girth, how do the agitated ants, seizing their property, manage to get them away from their moorings? Having got them away from their moorings and reburied them, how do they get them into position to form a fresh circle of bodies round the tree? Of course if they are not fastened up at all (*see* Nicéville), one supposes the busy ant may hold them for a week or two, especially as they help each one from its cradle (we suppose pupa), and here we should like to ask Mr. Selous what he thinks a blue butterfly would look like after

the ants had helped it to unfold its wings and guide its uncertain steps? Both these books would have been of the greatest interest had Mr. Selous stuck absolutely to fact in his own charming and forceful way, and he might then have appealed to an educated public in matters entomological. Similarly, Mr. Walwyn would have gained the gratitude of all sorts and conditions of youngsters, had he written the letterpress to illustrate his beautiful photographs, accurately, and to the point, nor would he have earned the reproach of a little maid, just sitting for the Cambridge Junior exam., and to whom, as she is taking Botany, we gave the chapter on the germination of a bean to read, who concluded that she would not like to reproduce that sort of thing at the forthcoming examination.

SOCIETIES.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*December 18th, 1905.*—ANNUAL ADDRESS: This was given by Mr. Horace St. J. K. Donisthorpe, F.Z.S., F.E.S., Vice-President, who first noted the eighteen species of beetles that had been added to the British list during 1905, and afterwards summarised the more noteworthy papers that have appeared in current entomological literature during the year. Later, in discussing the science of entomology, he exhorted members to undertake original research, and to collect with some special object in view. There were the theories of mimicry and protective resemblance, the courtship of insects, the uses of the scents they bear, attractive and repellent, and other equally interesting problems awaiting solution. In many cases he deprecated a protracted waiting for further evidence before venturing to theorise, and insisted on the faculty of imagination, rightly used, being as essential to a scientist as to a literary man, as instanced in Darwin, and referred to the mass of material already accumulated in the museums of the country. The lecturer then passed to a consideration of our indigenous myrmecophilous coleoptera, a subject with which his name is inseparably associated. On the motion of the Chairman, a cordial vote of thanks was accorded Mr. Donisthorpe, whose paper it was resolved to print in full in the *Proceedings of the Society*. OFFICERS FOR 1906.—*President*: Samuel J. Capper, F.E.S. *Vice-Presidents*: Professor T. Hudson Beare, B.Sc., F.E.S., F.R.S.E.; Richard Wilding; J. H. Bailey, M.B.; E. J. B. Sopp, F.R.Met.S., F.E.S.; Professor E. B. Poulton, M.A., D.Sc., F.R.S.; and J. R. Charnley, F.Z.S., F.E.S. *Hon. Treasurer*: J. Cotton, M.R.C.S., L.R.C.P., L.S.A. *Hon. Secretaries*: H. R. Sweeting, M.A.; W. Mansbridge, F.E.S.; and W. Delamere Harrison. *Hon. Editor*: J. R. le B. Tomlin, M.A., F.E.S. *Hon. Librarian*: F. N. Pierce, F.E.S. *Council*: H. St. J. K. Donisthorpe, F.Z.S., F.E.S.; A. Tippins; W. A. Tyerman; B. H. Crabtree, F.E.S.; J. Kidson Taylor; J. F. Dutton; W. Webster, M.R.S.A.I.; F. R. Dixon-Nuttall, F.R.M.S.; Rev. T. B. Eddrup, M.A.; C. E. Stott; R. Tait, Junr.; and P. Edwards, F.R.C.S., L.R.C.P., L.S.A. The following were re-appointed Recorders—**COLEOPTERA**: J. R. le B. Tomlin. **HYMENOPTERA**: Edward Saunders, F.R.S., F.L.S., F.E.S. **LEPIDOPTERA**: F. N. Pierce. **DIPTERA**: C. R. Billups, M.R.C.S., L.R.C.P., and E. E. Lowe, F.L.S. **NEUROPTERA**: W. J. Lucas, B.A., F.E.S. **ORTHOPTERA**: E. J. B. Sopp. **HEMPTERA**:

Oscar Whittaker. EXHIBITS.—SATURNIA PAVONIA (CARPINI) AS A WEASEL.—A CASE OF MIMICRY.—Exhibition by Dr. P. Tinne, who noted that the moths rest on heather, with head downwards and antennæ loosely folded to suggest whiskers. The resemblance probably protects it from the attacks of birds, etc., and was very effectively shown in the exhibit. BRITISH ORTHOPTERA: The scarce *Mecostethus grossus*, L., from the New Forest, presented to the Society by Mr. W. J. Lucas, was exhibited. ABERRATION OF CREOPHILUS MAXILLOSUS, L.—An example, with a red thorax, from Ashton-on-Mersey, in November, by R. Tait, Jun. PANCHLORA VIRESCENS IN MANCHESTER.—A perfect specimen of the green cockroach, *Panchlora virescens*, Thunb., captured amongst bananas in Manchester by H. Garnett. APTERYGIDA LINEARIS IN LIVERPOOL.—The Central American earwig, *Apterygida linearis*, Esch., from the Liverpool Docks, by Mr. Sopp.

ENTOMOLOGICAL SOCIETY OF LONDON.—December 6th, 1905.—CARABUS MORBILLOSUS.—Dr. K. Jordan exhibited a series from the Mediterranean, showing all intergradations, and presenting a striking case of geographical variability. PTINUS PUSILLUS, STURM, NEW TO BRITAIN. — Mr. H. St. J. K. Donisthorpe showed specimens of this beetle discovered in a corn chandler's shop at Edmonton. APION SEMIVITTATUM, GYLL.—Mr. A. J. Chitty showed a ♂ specimen of this species taken many years ago by Mr. Walton, at Margate, together with a ♀ of the same species swept from long grass near the Chequers Inn, Deal, on September 26th, 1904. HELOPHILUS TRANSFUGUS, L.—Mr. F. B. Jennings exhibited ♂ and ♀ examples of this Dipteron taken from thistle-heads in the Edmonton marshes last July. ODONTOPERA BIDENTATA AB. NIGRA.—A series was brought for exhibition by Mr. G. T. Porritt, who stated that the melanic form was rapidly increasing in the Wakefield district of South Yorkshire. ORNITHOPTERA CHIMÆRA, ROTHSCHILD, ETC.—Mr. O. E. Janson exhibited ♂ and ♀ specimens of this insect with some remarkable species of DELIAS, collected recently by Mr. A. S. Meek, in the mountain region of British New Guinea. CYRIA IMPERIALIS, DON.—Commander J. J. Walker exhibited for Mr. A. M. Lea, Government Entomologist of Tasmania, a specimen of this Buprestid beetle, having, in addition to the normal foreleg on the left side, two supplementary forelegs originating from separate coxæ. TETROPIUM CRAWSHAYI, SHARP.—Mr. G. C. Champion exhibited ♂ and ♀ specimens, bred by the Rev. G. A. Crawshay from eggs deposited in the bark of larches, at Leighton Buzzard. DEPRESSARIA EMERITELLA, STN.—The unique specimen from an unknown locality, upon which the species was added to the British List many years ago, was shown by Mr. E. R. Bankes. CEROSTOMA ASPERELLA, L.—The same exhibitor showed a specimen of this species discovered by Mrs. Hutchinson near Leominster, on September 21st, 1881, and only taken as regards Britain, in Dorset (formerly), and Herefordshire very rarely. HAWORTHIAN TYPES.—Mr. Bankes also exhibited various specimens from the late Dr. P. B. Mason's collection, said to be labelled by Haworth himself. COLLYRIS EMARGINATUS, DEJ.—Mr. R. Shelford showed larvæ of this species from Borneo, and said that it was certainly unusual to find a predaceous larva with mouth-parts fitted to excavate burrows in wood.

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—December 5th, 1905.—NONAGRIA SPARGANII.—Mr. H. M. Edelsten ex-

hibited *Nonagria sparganii* ♂, with the forewings powdered with black scales, and an extra black spot above the reniform stigma. ABERRATION OF *RUMIA LUTEOLATA*.—Mr. T. H. Hamling showed a specimen bred in May, 1905, the ground colour being pale (yellow), with the usual markings on the costa of forewing very indistinct, and the apical blotch absent. *AGROTIS ASHWORTHII*.—Mr. A. Harrison exhibited a second brood, reared in October, from ova laid by imagines reared in captivity from larvæ taken in the spring in north Wales. HYBRIDS.—Mr. C. P. Pickett showed *Smerinthus* hybr. *hybridus*, *Clostera* hybr. *prima*, *Selenia* hybr. *parrilunaria*, and *Notodonta* hybr. *newmani* ♂ and ♀, with specimens of the parent species. *ORGYIA GONOSTIGMA* SECOND BROOD.—Mr. J. Riches exhibited a series of the species reared from Brentwood larvæ. OFFICERS FOR THE YEAR 1906.—*President*: Mr. A. W. Mera. *Vice-Presidents*: Dr. T. A. Chapman, Messrs. J. A. Clark, F. J. Hanbury and L. B. Prout. *Trustees*: Dr. Sequeira and Mr. T. Hockett. *Treasurer*: Mr. C. P. Pickett. *Librarians*: Messrs. G. H. Heath and V. Eric Shaw. *Curators*: Messrs. W. J. Cox and T. H. L. Grosvenor. *Hon. Secretaries*: Reporting, Mr. S. J. Bell; Corresponding, Mr. E. Harris. *Members of the Council*: Messrs. C. R. N. Burrows, A. Bacot, A. Harrison and A. Sich. *December 19th, 1905*.—BANDED *TRIPHAENA COMES*.—The Rev. C. R. N. Burrows exhibited three specimens of a banded form of *Triphaena comes*, taken at Mucking at sugar, and remarked that he had never been able to find a perfect specimen of this form. VARIATION OF *CLEOCERIS VIMINALIS*.—Mr. A. Harrison, a long series of *Cleoceris viminalis*, bred from larvæ taken at Windermere in June, 1905, varying from light to very dark grey. DARK *POLYOMMATUS BELLARGUS*.—Mr. Hodgson three ♂ *Polyommatus bellargus* taken within ten days of the early September frosts, of a decided slaty coloration as compared with the specimens taken before the frost occurred. ABERRATIONS OF *COENONYMPHA PAMPHILUS*.—Mr. C. P. Pickett, *Coenonympha pamphilus* taken at Dover, August, 1905, including two ♂ specimens with strongly marked black marginal bands. LATE *ABRAXAS GROSSULARIATA*.—Also a specimen of *Abraxas grossulariata*, bred on December 15th from a larva taken on October 21st. *BRYOPHILA PERLA AB. FLAVESCENS*.—Mr. V. E. Shaw, a series of *Bryophila perla* taken at Torquay in July, 1905, including specimens of *ab. flavescens*.

SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*December 13th, 1905*.—VARIATION OF *CLEOCERIS VIMINALIS*.—Messrs. Harrison and Main exhibited a series of the species bred from Windermere larvæ, the variation extending from pale grey to very dark, with captured pale specimens from Barmouth for comparison. MELANIC LEPIDOPTERA.—Mr. Stonell exhibited melanic examples of (1) *Phigalia pedaria* from Delamere Forest. (2) *Odontopera bidentata* from Skelmanthorpe. (3) *Camptogramma bilineata* from Shetland. *EUPITHECIA PERNOTATA* FROM LOUGHTON.—Mr. Stonell also exhibited specimens of *E. pernotata* taken at Loughton in 1876. [We would suggest that these specimens be submitted to Mr. Prout with all information available for report. ED.] MELANIC *ODONTOPERA BIDENTATA*.—Mr. R. Adkin exhibited a series of this insect from Durham, some of the examples showing whitish lines and markings. *SIREX JUVENCUS*.—Mr. Tremlin exhibited a specimen of *S. juvenicus* taken at Maidstone. *January 11th, 1906*.—OVUM OF *PIRIS BRASSICÆ*.—Mr. South exhibited a reproduction of the ovum of *Pieris brassicæ*, showing the larva just emerging, and called attention

in the fact that it was different from the erroneous figure that had done duty as the egg of this species for many years. *January 25th, 1906.*—*ANTHROCERA TRIFOLII* AB. *OBSCURA*, TUTT.—Mr. Bellamy exhibited a specimen of this form, described by Mr. Tutt (*Nat. Hist. Brit. Lep.*, i., p. 487), and figured by Oberthür (*Variation chez Lep.*); this example was captured at Ringwood on June 25th, 1899. PROTECTIVE RESEMBLANCE.—Mr. Edwards exhibited pupa-cases of *Cionus scrophulariae* placed among the seedvessels of *Scrophularia nodosa*, to which they bore a remarkable resemblance.

CURRENT NOTES.

The South London Entomological and Natural History Society will hold an Exhibition on Saturday, March 10th, at their Rooms, Hibernia Chambers, London Bridge. Exhibits in all branches of Natural History are invited. Either of the Secretaries (Mr. Stanley Edwards, F.L.S., 15, St. German's Place, Blackheath, S.E.; or Mr. Hy. J. Turner, F.E.S., 98, Drakefell Road, New Cross, S.E.) will be pleased to forward Forms of "Application for Space" to intending Exhibitors.

Will our continental or British friends send, during this year, as opportunity offers, eggs or living females of the following species—*Lycæna arion*, *Brenthis euphrosyne*, *Issoria lathonia*, *Argynnis niobe*, *Eugonia polychloros*, *Pyrameis cardui*, *Leucophasia sinapis*, *Colias edusa*, *C. hyale*, *Pontia daplidice*, *Pieris brassicae*, *Aporia crataegi*, *Papilio machaon*, *Erebia epiphron*, *Enodia hyperanthus*, *Coenonympha typhon*, *Limenitis sybilla*, and *Apatura iris*? These species are wanted for reproduction in connection with our work now in course of publication, *Nat. Hist. of the British Butterflies*. Many of them may be forthcoming in Britain, but anyone visiting the south of France in April and May might send home gravid females of several of them, and the rest from Switzerland a month or so later. Please forward direct to Mr. A. E. Tonge, Aincroft, School Hill, Reigate. We should be glad of a card from anyone who can fairly reasonably promise to get any one or more of them. May we also ask for eggs, larvæ, and pupæ of any species of butterflies found in Britain, from any source whatever, to be sent to Mr. H. Main, "Almondale," Buckingham Road, South Woodford, Essex, as Mr. Main will photograph the larvæ and pupæ, also for publication in this work. We shall be glad also to have photographs of anything good referring to the larvæ and pupæ of the British "blues," "coppers" and "hairstreaks" for publication, from any of our subscribers.

Mr. E. R. Banks adds *Mesophleps silacellus*, Hb., to the British list, this moth having been taken by Mr. A. C. Vine on the downs near Brighton during June and July last. In Staudinger and Rebel's *Cat.*, 3rd ed., it is placed between *Paltodora* and *Ypsolophus*. It is widely distributed throughout central and southern Europe.

Cutocephalus nigriventris, Th., has been bred by Mr. Donisthorpe from cells of *Tetropium gabrieli*, found at Market Bosworth.

An interesting comparative paper on *Amara familiaris*, Duft, *A. anthobia*, Villa, and *A. lucida*, Duft, is published in the *Ent. Mo. Mag.* by the Rev. G. A. Crawshay. He gives their average sizes as $6\frac{1}{2}$ mm., 6mm., and $5\frac{1}{2}$ mm. respectively, the range in each case being $5\frac{1}{4}$ mm.-

$7\frac{1}{4}$ mm., 5mm.- $6\frac{3}{4}$ mm., and $4\frac{3}{4}$ mm.-6mm. Other comparative characters are noted.

An exceedingly interesting address on "The effects of climate and temperature on lepidoptera," with reference to the remarkable limitations imposed on those effects by the nature of the living thing operated on, the two opposing forces giving rise to a state of conflict between the outside power and the organism, was given by Mr. Merrifield at the end of his first year of office as President of the Entomological Society of London. Altogether a most instructive and stimulating essay, based largely on species well known to all British lepidopterists, and appealing especially to those who have learned that, even in entomology, "man doth not live by bread alone."

It is long since we felt greater pleasure than on the occasion of receiving the first number of the *Bulletin de la Soc. lep. de Genève*, the pleasure increased by the knowledge that Mr. Percy A. H. Muschamp has had so much to do with the starting of the Society on its successful course, and that Professor Blachier is one of the foundation members. That the Society will grow under active management is certain, and we trust when the next list of members is sent to us, that all the resident entomologists of the Rhone Valley and many visitors will have enrolled their names as members, and will be doing their best to make the Society a success. The style of the *Bulletin*, its printing and general get-up, are alike excellent, the papers first-class, and the coloured plate very satisfactory. A paper on "Natural selection and protection among lepidoptera," by M. Pictet, the president; "Variation of *Lycæna astrarche*," by Mr. J. W. H. Harrison; "*Satyrus hermione* and *alcyone*," by M. J. Culot; "Mimicry," by Dr. Paul Denso; "Some days at Fusio in July, 1905," by Mr. P. A. H. Muschamp (everyone must read this who wants to know about *Erebia flavofasciata*); "Hitherto undescribed varieties and aberrations," by Messrs. J. Culot and P. A. H. Muschamp. The price of the part is not printed on the cover, but the publisher is A. Jullien, Libraire-Editeur, Genève, Switzerland.

Two more parts of the *Natural History of British Butterflies*, etc., have been published, Part iv, on January 15th, Part v on February 1st. Part iv contains, in the first section, the conclusion of the chapter "Obtaining eggs of butterflies," and part of another chapter "Butterfly Larvæ and their moultings." In the second section there is a continuation of the detailed account of *Augiades sylvanus*, dealing with the "Time of Appearance," "Habits," "Habitat," "British Localities," and "Distribution." Then follows an account of the "Genus *Urbicola*," followed by a detailed account of *Urbicola comma*, under the headings of "Synonymy," "Original description," "Imago," "Sexual dimorphism" (with a long minute account of the structure of the androconia), "Genitalia," and "Variation." In Part v, the first section contains the conclusion of the chapter "Butterfly Larvæ and their moultings," and the commencement of one on the "External structure of the butterfly larva"; whilst, in the second section, the detailed account of *Urbicola comma* is continued under the headings of "Variation," "Egg-laying," "Ovum," "Habits of Larva," "Ontogeny of Larva," "Larva," "Foodplants," "Puparium," "Pupa," and "Time of Appearance." The account of the "Variation" of *U. comma* is most important, dealing, as it does, with the various races that have been

described in Europe, Asia, and America, in the various parts of its range from the Arctic to subtropical regions.

A remark in our "Retrospect" (*antea*, p. 306) *re* past, incompetent, interference with certain historical British collections of lepidoptera in the British Museum, has been held as likely to reflect on Mr. South, who is at present combining these collections. We need not say that, strongly as we feel on the absurdity of interfering with the collections at all, we are not so stupid as to think that Mr. South is in any way responsible for the determination of the authorities to combine them. On the other hand, we congratulate the authorities, that, once having settled on this (to us, absurd) line of action, they have put the matter into the hands of so competent a lepidopterist, one who, indeed, knows well the insects with which he is dealing.

(9) BITUARY.

MRS. EMMA SARAH HUTCHINSON died December 10th, 1905, aged 85 years.—It is with the greatest regret that we have to record the death of Mrs. Emma Sarah Hutchinson, at Grantsfield, on December 10th last, at the age of 85 years. She was probably not very well known to the younger race of lepidopterists, belonging rather to the period of Bond, Doubleday, Newman, and Stainton, and was, perhaps, the last survivor of that group of workers. She continued to take an active interest in entomology to the last, and, we believe, continued to rear the domesticated race of *Eupithecia consignata*, for which she became famous. Mrs. Hutchinson's forte was certainly in rearing larvæ, of which evidence may be found in "Buckler's *Larvæ*, etc." Besides *E. consignata*, her name is well known as an authority on *Polygonia e-album*, of which, indeed, the summer form is named *hutchinsonii*. *Cerostoma asperella*, a Hereford species, was one of her notable discoveries. Unfortunately she was disinclined to publish her observations, and one of her earliest papers of importance, her list of "Herefordshire Lepidoptera," in the *Transactions of the Woolhope Club*, for 1866, is presented as "by the family of the Rev. Thos. Hutchinson," and the same title appears above a supplementary list in the volume for 1870. Amongst other valuable notes in this list, she says: "In 1866, I informed you of the capture of *Eupithecia consignata*, and can now, with pleasure, record that since then we have been able to place specimens in the collections of many friends and other noted entomologists, having reared many splendid moths from the ova." So that she reared this moth continuously for nearly (or more than?) forty years. It was nearly the middle of this period before the inbred race was invigorated by the addition of a captured specimen. A further and more extended list was published in the *Woolhope Transactions* for 1887, by her son, Mr. Thos. Hutchinson, who was by this time a good entomologist, and no doubt had done a fair share of the collecting and of compiling the list, in which also, Dr. Wood's work amongst the micros is very conspicuous. Though too unobtrusive, Mrs. Hutchinson takes quite a first place amongst the lady entomologists of recent years. Her work was localised, but her knowledge of the lepidoptera of the Leominster district, of their habits and life-histories, ranges her with such names as Hellins, Doubleday, Bernard-Smith, Bond, Barrett, etc., and it is to be regretted that she has left record of so little of her knowledge.

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EXCHANGES.—*The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of address" is open free to subscribers so far as there is space available.*

Duplicates.—Monacha ab. eremita* and intermediates, Annulata var. obsoleta and ab. biobsoleta* and intermediates, Oporabia autumnaria*, Ocularis*, Quadrifasciaria*, Moneta*, C. absynthii*, Extersaria*, Contiguaria*, Luctuosa*, Doubledayaria*, Fuscanaria*, Arion, Tenebrata, Cassinea, Opima*. *Desiderata.*—Macrogaster castaneæ, Constrictata, Auricoma, Strigosa, Centonalis, Sparganii, Bicuspis, Harpagula, Empyrea, Nebulosa ab. Robsoni, Vitellina, etc. Single specimens of rare species. Good aberrations.—*W. S. Riding, Buckerell Lodge, Honiton, East Devon.*

Duplicates.—A. crategi, Strigula, Albulalis, Miniata, Abietaria, Cinctaria, Rusticata, Trepida, Aceris, Turca, Venosa, Flammea, Geminipuncta, Lucerna, Affinis, Rhomboidea, Tincta, Petrificata, Semibrunnea (2), Crassalis, Branderiana, Rufana, Permutana, Simpiana, Cinctana, Lepidana, Obtusana, Splendana, Grossana, Pomonana, E. nigricana, Internana, Composana, Regiana, Conterminana, Cæcana, etc. *Desiderata.*—Rubricata, Contiguaria, Straminata (6), Holosericeata (2), Plumaria (2 ♂ s), Pygmæata, Helveticata, Irriguata, Fluviata, Asellus, Fluctuosa, Auricoma, Concolor, Captiuncula (2), Aspiscana, Grotiana, Treveriana, Boscana, Maccana, S. latifasciana, Euphorbiana, Bifasciana, Micana, Penziana, etc.—*C. Fenn, Eversden House, Burnt Ash Hill, Lee, Kent.*

Duplicates.—Corydon (males), Nictitans (greenish and pale forms), Alsines, Trilinea, Sambucata, Bisetata, Proboscidalis, Lutealis, Cespitalis, Pterodactylus, etc. *Desiderata.*—Many common species.—*Miss Hinchliff, Worlington House, Instow, North Devon.*

Duplicates.—Cingulata*, Prasinana*, Citrago, Cerago, Proteus, Psi, Betularia*, Extersaria, Thalassina, Hepatica, Vinula*, Contigua, Lineolata. Also pupæ of H. geniste. *Desiderata.*—Very numerous.—*Rev. A. Downes, Batheaston Vicarage, Bath.*

WANTED COLEOPHORIDS.—Cases and larvæ, particularly those of the *palliatella* group, with pistol-shaped cases. Any cases found during February, March and April, would be particularly acceptable, as very little is known of the wintering cases. Records of captures and localities are also of use. I shall be pleased to do what I can in return.—*Hy. J. Turner, F.E.S., 98, Drakefell Road, New Cross, London, S.E.*

Desiderata.—Cicindelidæ (Tiger Beetles) of the entire globe desired, in exchange for insects of North America. I offer many of our rarest species in first-class condition.—*H. F. Wickham, State University, Iowa City, Iowa, U.S.A.*

WANTED.—Ova: I wish to obtain photos of the ova of British lepidoptera. Will anyone having ova of any species, and willing to lend same, send me a list on postcard? I will undertake to return complete and undamaged as quickly as possible, and willingly pay postage.—*Alfred E. Tonge, "Aincroft," Reigate, Surrey.*

WANTED.—British and European Tortricids, especially those species credited to both Europe and America in Meyrick's *Handbook* and Staudinger and Rebel's *Catalog*, pinned and set in English style acceptable. Will make liberal returns in any family of North American Lepidoptera named or other orders unnamed.—*W. D. Kearfott, 114, Liberty Street, New York City, U.S.A.*

EXCHANGE.—I am desirous of obtaining butterflies from the Malayan Archipelago, and the Pacific Islands. For such I offer perfect diurnals from North and South America, North American Coleoptera.—*Levi W. Mengel, Boys' High School, Reading, Pa., U.S.A.*

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WANTED.—Parasites from British Coleoptera. Beetles infested with *Gordius*. Any material will be gratefully acknowledged.—*H. St. J. K. Donisthorpe, 58, Kensington Mansions, S.W.*

PARASITICAL DIPTERA WANTED.—Will lepidopterists who may breed any dipterous parasites from larvæ or pupæ kindly forward such as they do not require to me? If so I shall be greatly obliged.—*C. J. Wainwright, 2, Handsworth Wood Road, Handsworth, Staffs.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. March 7th, 21st; April 4th: May 2nd, June 6th.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. February 20th, "Nonagria neurica," H. H. Edelman. March 6th, "Hemithea strigata," Rev. C. R. N. Burrows.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Meetings:—March 5th (paper by Mr. H. Wallis Kew); April 2nd (paper by Mr. R. Paulson); May 7th, Exhibition. Field Meetings: February 18th, Epsom (10.15 a.m. London Bridge, L.B. & S.C.R.). March 25th, Coulsdon (10.25 a.m., Cannon, St. S.E.R.).

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. February 22nd, "Collecting in Trinidad," by W. J. Kaye.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. February 24th, Annual Exhibition, February 27th. March 13th, Field Meeting to Hadleigh (train 2.10 p.m., Broad St. to Oakleigh Park).

Lancashire and Cheshire Entomological Society.—Royal Institution, Liverpool.—February 19th, Exhibition. Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained.

Birmingham Entomological Society, Norwich Union Chambers, Congreve Street, at 8 p.m. February 19th (annual).

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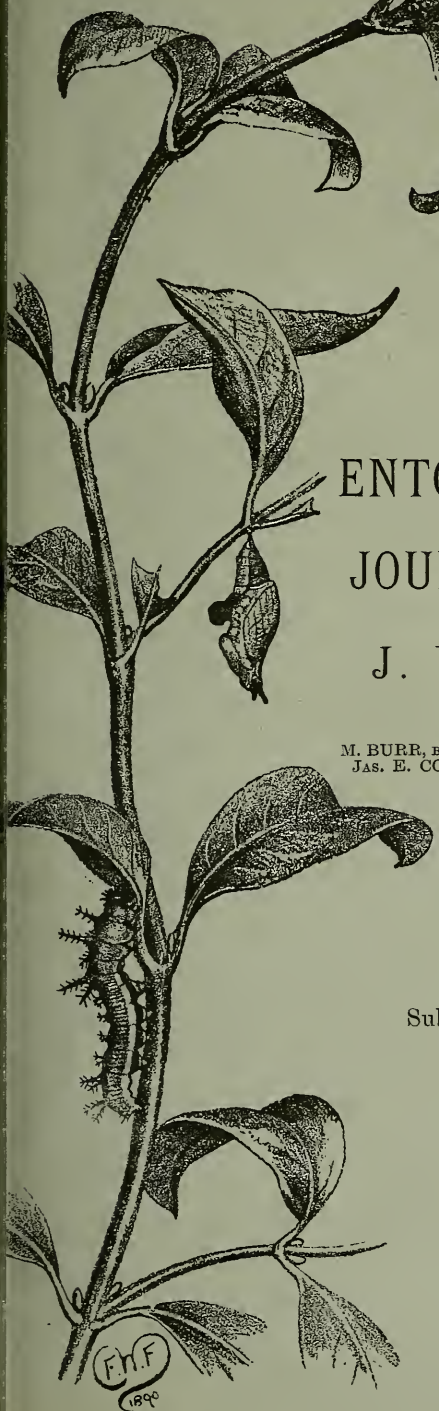
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The Lepidoptera of the Central Spanish Sierras (*with plate*).

By W. G. SHELDON, F.E.S.

"Go to Spain! there is precious little in that country outside the Alhambra that I would take the trouble to see," exclaimed a certain globe-trotting acquaintance to whom I mentioned that I contemplated spending a month or so in the land of Cervantes, during the past summer. I suppose there are a good many who hold similar views, and certainly some of the aspects of Spain, and things Spanish, are not inviting. To the naturalist, however, and especially to the lepidopterist, Spain is undoubtedly, in many respects, the most interesting country in Europe; it presents problems of distribution, at present unsolved, such as those of *Zegris eupheme* and *Satyrus hippolyte*, species common to Russia and Spain, and not occurring in Europe at intermediate stations. Again, most of the forms found in Spain are so different from the central European representatives as to require varietal names, whilst many appear almost sufficiently distinct to be considered good species. His work is usually in the mountains—away from the great heat of the plains—where the temperature in July and August does not usually exceed 75°F.-85°F. in the shade at noon, and is tempered by a most delightful, cool, and invigorating breeze, and by the extreme dryness of the atmosphere. There is, moreover, an almost certainty of fine weather and blue skies; as a matter of fact, during the whole of our visit, we only experienced two slight showers.

Mr. E. F. S. Tylecote and myself left England on July 14th, arriving at Guéthary, near Biarritz, by noon on the following day; our intention being to break journey, and to stay for a couple of days to obtain series of certain local butterflies that Dr. Chapman—who most kindly gave us the benefit of his advice, and unrivalled Spanish experience—had discovered there. There is a series of small swamps and wooded hollows a mile or so inland from Guéthary, which provide very good collecting ground. Amongst the first butterflies seen was *Lampides boeticus*, abundant and of good size, apparently this species feeds upon furze here; with it were flying the last remnants of a brood of *Everes argiades*, and a fine form of *Rusticus argus (aegon)*, with very strongly marked and heavily spotted undersides; *Melitaea dictynna* was common, and in fine condition; *Satyrus alcione*, abundant; *Hipparchia arethusa* var. *dentata*, males plentiful, with a few females. Amongst other species I netted a fine and early specimen of *Euvanessa antiopa*; *Polygonia c-album* turned up, whilst amongst my captures was an interesting female *Melanargia galathea* of the *procida* form, with exceedingly dark brown undersides to the hindwings; it was the only specimen I recollect seeing; *Colias edusa* and *Leptosia sinapis* also occurred. The specialities required were *Enodia dryas*, a very fine and large form, the males plentiful and in good condition, females just emerging. *Heteropterus morpheus*, quaintest of butterflies, was not abundant or in very good condition, my catch comprised a dozen examples; I should say a week or ten days earlier is the time for this. Males of the exceedingly local *Coenonympha oedipus* were abundant, females scarce, I could only manage three. This species sticks strictly to the open rush-covered portions of the swamps.

We left Guéthary, on July 17th, for La Granja, a village in the Guadarrama mountains, some sixty miles north-west of Madrid. La
MARCH 15TH, 1906.

Granja is, in every respect, a most desirable place to stay at; it is charmingly situated at an altitude of nearly 4000 feet, immediately beneath the "Pico de Peñalara," the crowning point of the range, which reaches, according to Baedeker, 7825 feet. The Spanish king, Henry IV., about 150 years ago, built here a fine palace, and formed a large park and gardens, which are laid out in the French style of the period; the fountains in these gardens are magnificent, and are said to be the finest in Europe. La Granja has been, and is, a summer residence of the Royal Family, and consequently several good hotels have sprung up, where a certain amount of French is spoken. We found very good quarters at the Hotel de Roma. The climate was most delightful during our stay, sunshine was almost continuous, and the temperature cool and enjoyable. At La Granja we found many of the most interesting Spanish forms of Rhopalocera. One great point is, that the mountains everywhere around are full of copious springs of most delicious water, invaluable for quenching one's thirst. Our first day was spent in the Royal Park; this so-called park is almost entirely composed of wood and undergrowth in which oak largely predominates, although there is also a certain amount of ash. Here, amongst other species, *Laeosopis roboris* is reported to be abundant, we did not, however, find this to be the case, and only came across odd specimens in this particular spot. Interspread amongst the wood are certain open glades, with a growth of bramble, grasses, etc., and these were found good collecting ground. *Dryas paphia* ab. *immaculata* was abundant on these brambles, *Argynnis aglaia* and *Issoria lathonia* were plentiful, and with them *Brenthis daphne* flew here and there; over the grassy places *Melanargia iapygia* var. *cleanthe* and *M. lachesis* were abundant, and in fine order.

The next day, July 19th, we searched for new ground, walking along a road, fringed with poplars, on the east side of La Granja. About a mile from the village a large brook comes down from the mountains, alongside the foot of which the road skirts. Here, on this and succeeding days, I had one of the greatest collecting treats of my experience. Turning to the right, where the brook crossed the road, and following its course for some two miles, we found quite the best ground in the district. For a distance of a mile or so the brook flowed through a well-wooded dell, with a growth of oak, willows, and various species of broom; higher up, the trees gradually thin out, and the brooms become more numerous, and are mixed with cistus and other low-growing plants, whilst higher up still, at a level of about 2000ft. above the road, mountain pastures and meadows are in evidence. Butterflies simply swarmed at all these levels, and more striking than even their number, was to me the fact that they were nearly all new, if not in species, at least in form. Growing in the brook at the lower levels, at intervals of a few yards, were fine clumps of thistles, and one had only to work these patches to get the whole fauna of the neighbourhood; and what a gorgeous lot they were. Great creamy *Melanargias*, *M.* var. *cleanthe* and *M. lachesis*, with its local and striking ab. *catalenca*, were settled five or six on a thistle, and even more brilliant still were the gorgeous *Argynnis*, *Argynnis adippe*, and var. *chlorodippe*, with lovely green and silver-spotted underside, and var. *cleodippe*, in which the silver spots are obsolete; *A. aglaia* including one very fine aberration, with suffused and banded superiors,

and, grandest of all the genus, *Dryas pandora*, clad in its exquisite livery of claret colour, green, and silver; *A. niobe* var. *eris* had evidently been common, but was getting *passé*; *Dryas paphia* var. *immaculata* was settled on the thistles also—odd specimens. The brilliant Vanessids, too, helped to make the picture; *Vanessa io*, *Pyrameis cardui* and *P. atalanta* were all abundant. Along the slopes grew a plant of the composite order, and on its golden flowers, the brilliant Spanish form of *Chrysophanus virgaureae* var. *niegii* swarmed, both sexes, in the finest of condition. *Melitaea phoebe* var. *occitanica*, *Thecla ilicis*, type and var. *aesculi*, *T. spini* and var. *lynceus*; *Polyommatus astrarche*, large, and with very red undersides; *Gonepteryx rhamni*, *Limenitis camilla*, *Polygonia c-album*, *Brenthis daphne*, *Epinephele jurtina* var. *hispulla*, *Issoria lathonia*, *Melitaea athalia* just emerging as a second brood, and *Satyrus alcione*. A remarkable form of *Epinephele lycaon* was taken here. In the female of this species, the ocellus nearest the anal angle of the superiors is usually somewhat smaller than that near the costal margin; in the specimens taken here, however, and also some of the Albarracin specimens, this ocellus is double the size that obtains in the type, and has a cloudy irregular black outline. *Colias edusa* scudded along in great numbers, with a couple of ab. *helice*: generally distributed were *Chrysophanus* var. *gordius*, *Lampides boeticus*, *Cyaniris argiolus*, and an immense form of *Pyrgus sao*, measuring well over 30mm. in expanse; the whole forming, perhaps, the most brilliant and interesting assemblage of butterflies I have seen in one locality. Higher, where the brook divided, by taking the right branch, I found *Nomiades semiargus* was not infrequent, with an odd example of *Satyrus briseis*; at about 1000ft. above the road, I netted several examples of *Brenthis hecate*, which was evidently on the wane. Still another thousand feet, and we were amongst the mountain-tops; here the fine form of *Erebia stygine* var. *peñalarae* appeared, in good condition, and, with it, we each took a worn example of *E. erias*, which could no doubt have been taken abundantly a few weeks earlier. About half way between La Granja and our brook, on each side of the road, was a series of small swamps; we found here the local Spanish species, *Coenonympha iphioides*, abundant, in both sexes, and in the best of condition. La Granja is noted for producing that much wanted, and usually rare, species, *Laeosopis roboris* in abundance, and, consequently, we spared no effort to secure a series, almost however without success; it is true we saw specimens from time to time in the park, but they were not frequent, and impossible to get; Mr. Tylecote, however, succeeded in netting one example just outside the walls; then we found a spot where its food-plant, ash, was not uncommon, and here we managed to obtain some very battered examples. On our last day, however, on July 24th, we decided to try entirely new ground, and about two miles east of the village came to a large farm, with enclosed fields, and ash-trees growing freely near the fences; here, on the first ash examined, my friend netted a fine female, and we were soon busily engaged. Each tree produced one or two examples, and then I discovered that they were abundant on the bramble flowers round the ash-trees; at this late date many of the specimens were *passé*, but we had no difficulty in obtaining as many as we required, and I have no doubt that it would be easily possible to take a hundred specimens or so in a day here, if one

were so disposed, and the time was ten days or a fortnight earlier than that of our visit.

(To be continued.)

A Critical Study on some often disputed aberrations of *Amorpha populi*, Linn.* (with plate).

By M. GILLMER.

(Concluded from p. 32.)

I have not yet decided to which group Koch's figure is to be referred. Were the light-grey colour predominant and the brown colour only admixed, I would include the aberration in my *cinerea* group; but, if the brown colour is to be considered predominant and the grey-colour only admixed, I should prefer to refer it to my *ferruginea* group. I received a letter from Frankfurt-a.-Main telling me that the figure is brown, whilst the original specimen has become pale-grey in colour, owing to the influence of the light. On the whole, opinion as to the colour of Koch's picture differs; from Stettin, one told me it was of an olive colour, yet, I cannot discover any green shade. Whilst Herrich-Schäffer calls the picture "middling and rather superfluous," Dr. A. Seitz (Frankfurt-a.-Main) and the late clergyman, A. Fuchs (Bornich) call it a good one. As the opinions on this question are so various, one must not be astonished if I cannot decide to which group Koch's specimen belongs until I have seen the moth myself. I picture an uni-coloured bright grey as quite another shade from that which Koch shows in his figure. I, therefore, cannot assert that Koch's *ab. tremulae* bred by Binzer in Giessen was the real thing. To show what I understand as being a light-grey specimen of *A. populi*, I proposed giving the picture of an example bred by Mr. F. G. Tönges in Offenbach (pl. iii., fig. 1), but Mr. Tutt writes me that he could not undertake a coloured figure. For this reason the picture is omitted and a short description is substituted. This specimen represents the real *ab. tremulae*, Borkh., being without special markings of the transverse lines. The light, undulated band of the marginal area is to be seen, the nervures are of a yellowish colour and the ruddy-coloured basal blotch of the hindwings is visible, although weakly marked; for, to the present time, there appears to have been no specimen of *A. populi* without the red basal spot recorded.

I have obtained a photograph, made by the firm of C. F. Fay, in Frankfurt-a.-Main, of Koch's original specimen, which is kept in the collection of the Zoological Gardens in Frankfurt-a.-Main, which is given herewith (as no. 10125). This photograph has been a success, and pl. iii., fig. 2 is a fine copy of it. By it you can see that Koch's specimen, although it is fifty years old and appears quite pale, still shows weak marks of the two dark transverse lines bounding the median area. Besides these it shows a very light-coloured thorax, a bright basal area, a slightly darkened median area, and a pretty dark marginal area in which is to be seen the rest of the light undulated band in the anal angle. The hindwings, the fringes of which appear white in the indentations, are unicolorous, similar

* To understand clearly the points raised in this article, British lepidopterists should consult Tutt's account of *Amorpha populi* (*Natural History of the British Lepidoptera*, vol. iii., pp. 469-471).

in tint to that of the middle area of the forewings, with a slightly darker apex, and show only a slightly rusty-coloured base. The forewings have no discoidal lunule nor the bright apical mark. I do not think it wise to publish any conclusion on this specimen, as I have only seen the photograph and do not know the original at all.

For this reason it is impossible for me to enter into a more detailed comparison of Koch's type with Glaser's described specimens, and it is not, therefore, yet confirmed that Glaser changed his diagnosis, in *Neuen Borkhausen* (1863), in order to make it agree with Koch's picture. I, therefore, shall not be able to decide this point until I have compared Glaser's types of 1853 and 1863 with Koch's type. It is a pity that there is nobody now in Biedenkopf who could undertake this and give a final decision on the point.

In his *Schmetterlinge Deutschlands*, 1865, p. 95, Dr. Holle proposed two names for a new variety of *A. populi*, (1) in consideration of the foodplant of the caterpillar, and (2) the habitat of the moth. In the first case, the moth he said, might be called *salicis* (the caterpillar only living on willows), in the second case it could be called *palustris* (the caterpillar and moth occurring on "mosses.") The caterpillar is said to be similar in its habits to that of *Smerinthus ocellata*, holding its head slopingly upwards and sheltered by the prolegs. The moth is said to have, however, only shaded markings of the transverse lines of *A. populi* and bears the same relation to the latter as *Gastropacha populifolia*, Esp., bears to *G. quercifolia*, Linn., also the same relation as to size. The red colour of the hindwings is said to be missing.

The transverse lines may disappear altogether or partly, in *Amorpha populi*, Linn., as I have shown already in *Insekten-Börse*, xix., 1902, pp. 228-229, for ab. *tremulae*, Borkh., and also in *Allgem. Zeitschr. für Entomologie*, vii., 1902, pp. 375-376, for ab. *subflava*, Gillmer, but this is seldom the case. The colour of *G. populifolia* is yellow-brown, whilst the colour of *G. quercifolia* is copper-brown with a violet gloss. The size of the two is about the same. Judging from von Heinemann (*Schmett. Deutschlands*, i., 1859, p. 203) the length of the forewing from the base to the apex varies in *G. populifolia* from 27mm. to 31.6mm., in *G. quercifolia* from 24.8mm. to 38.4mm., so that *populifolia*, contradicting the opinion of Dr. Speiser, on an average, is not quite the size of *quercifolia*. On p. 117 of his book, Dr. Holle asserts that *populifolia* is larger than *quercifolia*, but this is not the case with his *A. populi*, or otherwise the typical moth *populi* must have been very small at this time in Hamburg, which does not agree with my later observations. Concerning the entire disappearance of the red basal blotch of the hindwings in *A. populi*, I have already remarked that such specimens have not yet been recorded. The basal blotch often appears of a pale colour and reduced, yet it is an exaggeration to write that it is missing entirely. Neither is this assertion borne out by the six specimens of *A. populi* which I possess from Holle's collection. Most probably Holle has gone too far in favour of Esper's variety of olden times, and would like to have secured the recognition of his variety as a distinct species, as was the case with Borkhausen over *tremulae*. Therefore, he gives biological data similar to those of Borkhausen, but, as a separate species, Holle's form must meet the same end as did *tremulae*, Borkh., at the hands of Ochsenheimer (1808).

Concerning Holle's "moss"-form of *A. populi*, I believe that the same must still have been in his collection when he died in 1902. By the help of Mr. E. Sartorius of Hamburg, I obtained from this collection six specimens of *A. populi* of which only one belongs to the "moss" form; pl. iii., fig. 3 is a photo of the same. Holle's collection was placed in boxes on the walls, and has been ruined by the light and by the insecurity of the boxes. Judging from the specimen in question, one can easily estimate that it is at least forty years old. It is of a pretty definite clay-colour (yellow), which is nearly identical with the ochreous colour of *G. populifolia*, the tinge being a little dirtier; the moth is a female. As it is to be seen from the photo, the transverse lines have not quite disappeared; on the boundary of the median and outer area of the forewings, as also of the hindwings, the transverse line is still noticeable. The marginal area beneath the apex of the forewings, as also the hind part of the median area, are of a little deeper ochreous colour. The rust-red basal spot of the hindwings is still distinctly visible, not very extensive, not very pale, but of a distinct reddish tint. The thorax, mixed with a dirty grey colour, appears a little darker than the abdomen, which is identical with the colour of the upperside of the wings. The apex of the hindwings of this specimen is rather prominent. One also recognises the undulating band of a yellowish-white coloration in front of the anal angle of the forewings. A whitish discoidal lunule and the whitish division of the apex are still to be seen. The underside, which has not been affected as much by the influence of the light as the upperside, is of an ochreous colour. (The colour of the upperside has lasted far longer than the colour of two other specimens, which perhaps may be older. The three other specimens seem to be more recent, judging by their condition.) The underside of the first named specimen is of a darker colour on the base of the hindwings and beneath the apex of the forewings; besides this, the transverse line and the undulating band of the forewings are to be seen. As the photo shows, the specimen is 55.5mm. in expanse, and therefore is 11mm. smaller than the largest of the six specimens. The length of the forewings is 31mm., the length of the hindwing 19mm. It is a female of not quite the middle size. The specimen belongs to my *pallida* group and is identical with ab. *pallida*, Tutt. As the transverse lines of the upper- and underside are still to be seen, it cannot be identical with ab. *subflava*, Gillmer. Besides, it is of a far darker yellow colour than my ab. *subflava*, the colour of which in this case is far more like the yellow colour of the male *Sichia quercus*.

In 1902, Holle's collection did not contain a single specimen of *Amorpha populi* agreeing exactly with the description on p. 95 of his book; one has, therefore, reason to think that there never has been a specimen of this sort in Holle's collection. Of course it is possible that Holle has given away all specimens of this variety. But I would not like to do injustice to the dead; and I must state that, making his acquaintance in 1894, on the "moss" of Eppendorf, he left the impression on me of being very conscientious. Anyhow I cannot get rid of the thought that Holle has diagnosed his var. *salicis* or *palustris* under the idea that it was a form adequate to Esper's variety (*viz.*, "the ground colour simply light-grey without markings and rusty-brown basal blotch"). Besides, Esper's variety has a

pale rusty basal spot of the hindwings, and this is also the case with Holle's variety. Holle's embarrassment, enhanced by Esper's description, seems to me to be the reason of the creation of the var. *salicis* or *palustris*, although Holle had not the extreme aberration *subflava*. If there really is an obsolete aberration *palustris* on the mosses of Hamburg (near Eppendorf, Borstel, Niendorf, Ober moss, etc.), as described by Holle, we have a form even surpassing ab. *subflava*. But I can assert with great probability, and the *Entomologische Verein zu Hamburg* is of the same opinion, that the ab. *palustris* has never been found there yet, and it is not likely to be found, because there does not exist a yellow *A. populi* without the red basal blotch of the hindwings. Therefore Holle's ab. *palustris* is, in my opinion, imaginary, and the name invalid. Dr. Speiser, giving Holle's ab. *palustris* the red basal spot of the hindwings, that is to say, by changing the diagnosis, brings about an identification between ab. *palustris* and ab. *pallida*, but this cannot be allowed, although I claim to have shown already that Holle has made a mistake in diagnosing Esper's as well as his own variety. I therefore must for the present retain my variation scheme of *A. populi*, the 2nd and 3rd groups of which are defined as follows:—

II. GROUP.—Hereto belong the lighter grey or ash-grey coloured specimens, the median and marginal area of which often appear of a bronze-brown, rusty-brown, or olive colour—Forma CINEREA.

- (a) Transverse lines strongly developed; rust blotch of the hindwings very distinct=*populi*, Linn., 1758.
- (b) Transverse lines indistinct or weak; rust blotch mostly paler=*ab. cinerea-diluta*, Gillmer, 1904 (var. *tremulae*, Glaser, 1863 *pro parte*; ab. *borkhauseni*, Bartel, 1900 *pro parte*).
- (c) Without transverse lines, all areas of one colour; rust-coloured blotch weak=*ab. tremulae*, Borkh., 1793 (var. *populi*, Esper, 1781).

III. GROUP.—White-grey, pale; median and marginal area often mixed with a rusty-yellow colour—Forma PALLIDA.

- (a) As sub IIa=*ab. pallida-fasciata*, Gillmer, 1904.
- (b) As sub IIb=*ab. pallida*, Tutt, 1902 (ab. *tremulae*, Glaser, 1853, 1854).
- (c) As sub IIc=*ab. subflava*, Gillmer, 1902.

EXPLANATION OF PLATE III.

[FIG. 1.—*Amorpha populi*, Linn., ab. *tremulae*, Borkh., 1793 (coloured figure), is omitted.]

FIG. 2.—*Amorpha populi*, Linn., ab. *tremulae*, Borkh., 1793.—Photo of Koch's specimen taken in February, 1901. This specimen is kept in the collection of the Zoological Gardens in Frankfurt-a.-M., sub no. 10125. Natural size.

FIG. 3.—*Amorpha populi*, Linn., ab. *pallida*, Tutt, 1902.—The most extreme specimen of *A. populi* of Holle's collection, which Holle is supposed to have named *salicis* or *palustris*, and described it erroneously as being without markings (transverse lines), and without any red basal blotch of the hindwings. One-and-a-half times natural size.

The variation of *Polia chi*, Linn.

By J. W. H. HARRISON, B.Sc., F.E.S.

I do not wish, in these few notes, to tabulate the many forms of *Polia chi*, but I desire to point out what are, in my opinion, the causes of the variation. I have worked at this species for about five years, and during the present season (1905), I have captured and classified considerably over a thousand specimens. Most of these, after inspection, have been liberated. When I first began to take the species, I thought, as many do, that the latitude and the mean temperature to which the insect was exposed in all its stages, had to do with the change in colour, but I have since seen the error in that. I have seen specimens from Nenthead, Cumberland, which were the whitest I have ever had. Yet that place is so bleak and cold, that even the common sparrow fails to maintain itself. This seems to indicate that low temperature is not the determining factor. It is generally offered as an explanation of the evolution of the aberration *olivacea*, that it is intended to further protect the species, by causing it to assimilate with the lichens on stone walls. I have several objections to that statement. We generally admit that the coloration of *Bryophila perla*, which undoubtedly mimics the lichens on walls, is a fairly effective protection. Yet, when I first saw *Bryophila perla* at rest several years ago, and even after I took it, I was under the impression that it was a dwarf form of *P. chi*, for, since *B. perla* does not occur here, I had only experience with set specimens before. Is then the coloration of *P. chi*, which, if not exactly that of *B. perla*, yet bears a very close general resemblance to it, less a protection than that of *B. perla*? One would conclude not. Now let us consider a few localities in which I have taken the insect, or have obtained it. Four at once separate themselves from the others, as being the districts for lichen-clad walls of my acquaintance. These are Menethorpe, Yorkshire; Alston, Cumberland; Upper Weardale, Durham; and Brampton, Cumberland. In all four the type form of *P. chi* alone occurs. Take now other districts, in which I have (or a Birtley friend has) taken the insect, *viz.*, Birtley, Dunston, Ouston and Killingworth. All these produce the aberration in the ratio of four to one of the type. In one locality, adjoining Birtley, the proportions are reversed, and as one gets southward, some five miles, the variety does not occur; I shall consider this case later. In the above four districts the walls are absolutely free from lichen. Hence, if the lichen theory of the colours and markings of *P. chi* ab. *olivacea* be true, we have the anomalous position of the protected variety failing to occur in districts where its protection would (presumably) be of most use and vice versa. Lastly, I think, from my own notes, that *P. chi* rarely ascends a wall to dry its wings after emerging, but is found in such places on the second day after its emergence. It is very rare, indeed, to find perfect specimens on walls; they are generally more or less rubbed. Let me now put forward my theory of the colours of *P. ab. olivacea*. Consider the localities in which the species is found, not only those localities I have named, but also those recorded in books on the British lepidoptera. We see that *P. ab. olivacea* occurs in thickly populated manufacturing districts, whereas the type occurs in places which are in their natural wooded condition. In the former, owing to the absence of trees, the larvæ are driven more to a diet of low plants, such as

Rumex, *Plantago*, etc., whereas in the latter, the larvæ feed more generally on *Salix*, *Fraxinus*, *Crataegus*, etc. Thus the imagines, produced by the former larvæ, on emerging, will dry their wings and rest after that on the dock stems, where a variegated green shade, assimilating with the shadows under the leaves, forms an efficient protection. Those produced by the latter larvæ, emerge at the base of the tree they have fed on, and climb up the trunk to dry their wings, where, in turn, their light colour, agreeing with the light blotches on the trunks, again protects the insect. I do not seek to explain the dark green coloration of *P. ab. olivacea* as being due to natural selection of those fitted for a resting habit on smoke-blackened stone walls, for the walls here, with one exception, are usually light in colour. I stated above that the numbers of *ab. olivacea* decreased as we passed southward from Birtley. This I explain readily by my theory; for, though still in a district in which coal pits and smoke abound, the surroundings are the well wooded estates of the Earl of Durham and others.

I mentioned an exception to the rule that the walls here, are in general, light in colour. The main road between London and Edinburgh passes through this village. It formerly, about half a mile to the north, went due north, but many (more than 60) years ago, to shorten the distance between Durham and Newcastle, it was diverted to the north-west. The old road yet remains, and it is bounded by an old blackened wall for about a mile. How old this wall is one may glean from the fact that near it, the Twayblade (*Listera cordata*) and Water Avens (*Genm rivale*) linger as the last survivors of their race in the district. What makes it specially interesting, is that along that wall a local race of *P. chi* has been evolved, which ranges in colour from slate through blue-black to black. These specimens I take to show true melanism, due to their surroundings. That it bears little relationship to the green of *P. ab. olivacea* is readily proved by bleaching both by exposure to sun. *P. ab. olivacea* bleaches to a pale primrose tint, whereas these blues and blacks simply show a tint of their original colour after exposure.

These notes are not intended to be final, but are put forth with the intent of pointing out a detail, which, I think, has been overlooked in investigating the local variation of species in mining and manufacturing districts.

Notes on *Coleophora troglodytella*.

By HENRY J. TURNER, F.E.S.

COLEOPHORA TROGLODYTELLA.—At the same time that Mr. Bankes sent me *Coleophora conyzæ* larvæ, he also sent a very nice batch of the larvæ and cases of *C. troglodytella*, with the remark that “the species was found chiefly on *Inula conyza*, but was also common on *I. dysenterica*, to which it is even more partial than to *I. conyza*, when it has the choice.” These larvæ were found in the Isle of Purbeck on April 25th, 1904. They fed well for a time on the plants of *I. conyza*, which I had potted, and, unlike *C. conyzæ*, they were by no means restless. The portion of the slender cylindrical case, which had come over the winter, was dirty and weather-worn, and very distinct from the new whitish insertion of spring manufacture. The additions soon became browned, and thus the cases varied in dinginess in stripes according to the age

of the different additions. These were made in the usual place along the "keel" side, and also the cases were lengthened at both ends, but more at the anal end than at the mouth opening end. Thus, at each enlargement, there was a necessity for new valves to be formed for the anal opening of the case, and, before these were made, the cases usually had a circular opening for several days, while the rest of the case was being put straight. On close examination one can see the remains of the old valves showing dark against the new white addition. In the case of this species, I paid particular attention to note that the new substance was only put in along the underside and at the ends; the cases were never slit along the back for the purpose of enlargement. Although these larvæ started well, they gradually seemed to dwindle, they fed slower and slower, and scarcely moved, so that, on June 6th, many were still small, and most of the larger ones had dropped. Then I found more than one species of enemy; some of the cases were gnawed asunder, and numerous minute parasites appeared. A week from home left the plants unwatered, thus almost ending the hope of any success as far as that brood was concerned. However, as it happened, I did get two imagines early in July from the cage, one had been out some days, and the other was quite fresh when discovered. On May 30th, I received a few more cases through the kindness of Mr. Bacot, from Essex. They, too, were met with on *Inula dysenterica*. The larval description I made reads:

The general ground colour of the larva was very pale dirty yellowish. The prothoracic segment had an extremely large black dorsal plate almost uniting with the spiracular plate; it was not divided down the middle by a suture. The mesothoracic segment had two oval plates separated by a somewhat pronounced suture (in one larva examined the left hand plate was divided by an oblique suture into 2). The metathoracic segment had two dot plates widely apart. The spiracular plates were larger than the dot plates on segment 3. The anal plate was large, covering the whole top of the segment. The head was light, and only a little darker than the rest of the body.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURRE, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from vol. xviii., p. 44.)

3. PODISMA PEDESTRE, Linn.

In the same group as *P. alpinum*, but the hind tibiæ are bright shining blue; the elytra lobiform, ovate, as broad as long. Length of body, 17mm.-19mm. ♂, 24mm.-30mm. ♀; of pronotum, 5mm.-5.3mm. ♂, 6.3mm.-5.8mm. ♀; of elytra, 3mm.-4mm. ♂, 3.5mm.-5mm. ♀.

Common in the highlands of Central Europe. In Finland, in Germany, in Holstein, and also in the mountains of central and southern Germany. In France, in nearly all the mountains, usually above 3000ft., e.g., in Dauphiny; in Switzerland in the Wengeralp, Rhone glacier. In the south Tirol, at Innsbrück, Schlern, Traunstein, near Vienna; in Sardinia, and the Abruzzi in Italy. In Denmark it is recorded from Jutland. In Scandinavia, in Schonen and Småland in Sweden, Skåne, Gottland, middle Sweden; in Lapland at Torneå, Vesterbotten, Norland in Norway, and Finmark. A rare form with fully developed organs of flight is sometimes taken. In Spain, the type occurs in the Pyrenees, Sierra del Cadi, Vallcebre, Panticosa, and the Picos de Europa. A var.

carpetanum, Bol., is recorded from Escorial, Navacerrada and La Granja; in this variety the typical sulcus is behind the middle, the metazona strongly rugulose-punctate, the central keel nearly obsolete and the elytra extremely short.

4. *PODISMA SCHMIDTI*, Brunner.

[This is the species described by Brunner as *P. mendax* in the *Prodromus*; Scudder has pointed out that the name *P. schmidti*, Br., applies to *mendax* of Fischer and Brunner, while the species called *schmidti* by Brunner in the *Prodromus* is really *P. fieberi*, Scudder; this latter is an Eastern species.] Distinguished by the bright oily green colour (which turns dull brown on drying), pink elytra, transparent hind femora, greenish-blue hind tibiæ, purplish-red knees and cerci, and the peculiar form of the ovipositor, of which the valves are quite straight, the upper pair sulcate above; it is of more slender build than most of its congeners. Length of body 11mm.-16mm. ♂, 18mm.-25mm. ♀; of pronotum, 3.5mm.-4mm. ♂, 4mm.-5.5mm. ♀; of elytra 2.2mm.-3.2mm. ♂, 3mm.-3.5mm. ♀.

Common in the southern Alps—Provence (*teste* Dubrony, but not included by Finot nor Azam); Tessin; Caux near Montreux; Vienna, in Italy at Voltaggio, in the Apennines. Locally distributed.

5. *PODISMA BALDENSIS*, Krauss.

Allied to *P. pedemontanum* and *P. salamandrum*; differs from the first by the presence of tympanum and longer cerci of the ♂; from the second by the smaller size, reddish legs, almost unforked frons, the parallel row of small teeth on the last abdominal segment of the ♂, the pointed supraanal plate of the ♂, and chiefly by the broad and blunt subgenital plate of ♂. Length of body, 14mm.-15mm. ♂, 19mm.-22mm. ♀; of pronotum, 3.2mm.-4mm. ♂, 4.2mm.-4.5mm. ♀.

Above San Giacomo (5000 ft.); Monte Baldo and Rovereto in the south Tirol.

6. *PODISMA SALAMANDRUM*, Fischer.

Distinguished by the entire absence of elytra, presence of tympanum on 1st abdominal segment, smooth pronotum, and sharp subgenital plate of ♂. Length of body, 14.5mm.-18mm. ♂, 20mm.-24mm. ♀; of pronotum, 3.2mm.-3.8mm. ♂, 4.2mm.-4.5mm. ♀.

A rare species occurring in a few localities in the Karst districts of southern Austria. The most western record is Monte Baldo in the Tirol.

7. *PODISMA PYRENÆUM*, Fischer.

Length of body, 15mm. ♂, 19mm. ♀; of pronotum, 4mm. ♂, 4.5mm. ♀; of posterior femora, 9mm. ♂, 11mm. ♀.

A native of the grassy uplands of the Pyrenees, Pic du Midi de Bigorre, Pic du Midi, Bagnères de Bigorre, Barèges, Gavarnie, Canigou. On the Spanish side at Panticosa, and at Nuria in Catalonia.

8. *PODISMA COSTÆ*, Targioni-Tozzetti.

No tympanum, no elytra, dark reddish, with white marks. Length of body, 18mm.-24mm. ♀; of pronotum, 3.5mm.-4.8mm. ♀; of posterior femora, 11mm. ♀.

A little known species taken at Monte Morrone in Abruzzi. The male is not known.

9. *PODISMA PEDEMONTANUM*, Brunner.

Allied to *P. salamandra*. It may be known by the absence of elytra and tympanum, smooth pronotum, and clear red underside of the posterior femora and short straight cerci of the male. Length of body, 15.5mm. ♂, 21mm. ♀; of pronotum, 3.2mm. ♂, 4mm. ♀.

A rare species first recorded from Susa in Piedmont, and since taken in France at Plane, near Mt. Genève, and Gondran (over 7000 ft.) near Briançon.

10. *PODISMA COBELLI*, Krauss.

The cerci, ♂, are somewhat compressed, blackish above and at the apex; somewhat dilated at the apex, the upper margin rounded. Subgenital plate of ♂ not compressed, the rounded margins thickened, strongly pointed posteriorly. Distinguished from *P. baldensis* by the absence of tympanum, forked sternum, and pointed subgenital plate of the ♂; from *P. pedemontanum* it differs in colour, chiefly characterised by the form of the cerci of the ♂, and of the subgenital plate of the ♂. Length of body, 15mm.-15.5mm. ♂, 18mm.-20mm. ♀; of pronotum, 3.2mm. ♂, 3.5mm.-4mm. ♀.

Mountains round Roveredo, Cima Posta, Monte Pasubio (6000 ft.-7000 ft.), in August and September, in the south Tirol.

***Toxocampa craccæ*, Fb., var. *plumbea*, nov. var.**

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

Head anteriorly, and *thorax* (with tegulæ), bluish-grey; head posteriorly, and collar, velvety brownish-black. *Forewings* bluish-grey, more or less mixed with chocolate-brown, and with the terminal third much obscured by it. The costal dark spots and triangular subterminal shade are proportionately darker than in the type. Reniform stigma chocolate-brown, partly black-margined; orbicular represented either by a black dot, sometimes white-ringed, or only a minute white spot. *Hindwings* brownish-grey, more dusky posteriorly. *Abdomen* brownish-grey.

This variety is conspicuously darker than the type, having the forewings of a beautiful bluish-grey, mixed with chocolate, instead of pale ashy-grey, mixed with light walnut-brown, and the hindwings brownish-grey, instead of pale greyish-brown. In the females, the forewings seem to be, as a rule, less strongly bluish-grey, and more decidedly mixed with chocolate-brown, than in the opposite sex. This striking form, which does not appear to have been hitherto described or named, has, during recent years, been bred by a few English collectors from larvæ obtained in Cornwall, where, at any rate in some localities, it takes the place of the typical form, which has long been known to occur in the northern portion of Devonshire. I learn from Mr. W. G. Sheldon that the two races appear to be confined to entirely different geological strata, and that, to the best of his knowledge, the typical form is found solely in part of the north Devon district, in which the soil is "red" [*i.e.*, on the Old Red Sandstone—E.R.B.], while var. *plumbea* has only been met with to the southwest of the haunts of the type, along a stretch of northwest Devon and north Cornwall, where the formation is "dark shale" [*i.e.*,

on the Millstone Grit—E.R.B.]. In his experience the two forms never occur together, but he adds that, in some seasons, the whole of the specimens are much darker than is the case in other years.

Further notes on the lifehistory of *Brenthis thore*.

By W. H. St. QUINTIN, F.E.S.

Although I am afraid I am very late in following up Dr. Chapman's note upon this species in the March number of *The Entom. Record*, xvii., p. 78, I should like to place on record that I reared to the imago stage all the larvæ which survived the winter, 17 in all. When I went abroad in February, I left the larvæ hibernating upon some healthy plants of *Viola biflora*. I could not, however, help feeling some anxiety lest the plants, which die down in the winter completely, might not be ready when the young caterpillars emerged from their hiding-places, which were beech leaves, pieces of plane bark, and dry moss. However, soon after my return, I found all going on well, and by May 4th, the violets had put out plenty of leaves, and these were nicely eaten. The larvæ had clearly moulted at least once since I had seen them. An orange-red patch showed on each alternate segment. Otherwise the larva was entirely black—head, feet, and hair-tufts. On May 9th, several had cast their skins, the general colour now being greyish-black, with black spines, the orange patches being much less conspicuous. The larvæ were feeding up very rapidly now. I kept the cage all this time in a sunny corner, out of doors, sheltered from cold wind. The violet being rather pot-bound, required plenty of water, and, as this soon dried off, all was kept in a healthy condition. On May 12th, the most forward of the larvæ had again moulted, and this brought them into what proved to be the last stage. Skin black, reticulated by greyish spines the lines flesh-colour, or flesh-buff. Head, legs, and claspers, black. The larva in its last stadium approached Hoffmann's plate of *Brenthis daphne*, which, I suppose, might be expected.

By May 25th they had all pupated, suspending themselves from the muslin and wires which formed the cage. The pupa closely resembles Hoffmann's figure of *Brenthis selene*. The first imago (a male) made its appearance on June 3rd, and the remainder quickly followed.

I may add, that I obtained the ova in the Engadine during the middle of July, 1903, and the first larvæ began to hatch on the 28th. I brought them home in glass tubes. I found that *Brenthis thore* larvæ will feed on *V. canina*, but it happened that all the larvæ caged upon that plant perished during the winter, through my having, I believe, kept them too dry.

The season 1905 in Germany. Lepidoptera.

By E. M. DADD, F.E.S.

(Concluded from vol. xviii., p. 35.)

On July 22nd I left Berlin for London, and was kept there during the whole of the month of August, so that it was not until September 2nd that I again took the field. During the month of September I sugared on seven occasions. On the 2nd and 23rd, at Finkenkrug, beyond Spandau, which is specially noticeable on account of its

undergrowth of lime. On the 9th and 20th, at Lichtenrade, where, as I have above stated, there is an extensive aspen wood, and, on the 16th, at our old locality at Bernau. At Finkenkrug, on both occasions, the commonest insect was *Tiliacea (Xanthia) citrigo*, and I could have taken several hundred on each visit had I wished. It is worth noting that, on the first occasion, there was only one female out of 40 specimens brought home, and on the 23rd the females were largely in the preponderance.

At Lichtenrade we were very successful, *Mellinia ocellaris* and var. *lineago* are always good insects, and *Epunda (Aporophyla) lutulenta* was, up to the present, not known to be so common near Berlin. Bernau proved a blank as far as good species were concerned, but a theory held by several entomologists here, that *E. lutulenta* has some connection with heather, was disproved, as this insect did not show up. I believe this insect has some connection with river-banks, as in all the localities I have taken it, waterside vegetation has been near.

On the 26th and 28th I sugared at Leudelage in the Grand Duchy of Luxemburg, and was pleased to meet with an old friend in *Anhocelis pistacina* which does not occur near Berlin. The commonest insect here was *Mellinia circellaris*, which was in endless numbers, but *Xylina ornitopus*, *Orthosia macilenta*, *Anhocelis pistacina*, and *Tiliacea aurago* were all well to the fore.

In conclusion, I may say that I regard the past season as one of the best that I ever remember. Insects were always in profusion whenever and wherever I went, and many species were taken in numbers, which had only been taken in odd specimens in former years. Every method of capture with the exception of light (which I only tried twice) paid to the utmost, and I never remember a year when sugaring has been so universally productive. With the exception of two evenings at the beginning of June, the sugar patches were covered with insects every time I went out, and it has been the same tale with day work; one always came home with full boxes.

At this opportunity, I should be glad to say that I should be pleased to enter into correspondence with any entomologists in England who care for continental things in the way of exchange, and shall be happy at any time to assist, to the best of my ability, any specialists who want certain species, or their ova or larvæ, which are difficult to obtain in England, but common here.

The following is the list of insects obtained at sugar during September, 1905:—

September 2nd, 1906.—FINKENKRUG.—Warm, clear night, no moon: *Noctua xanthographa*, common, worn; *N. baja*, 1, worn; *Agrotis segetum*, few; *A. tritici*, 2; *Heliophobus popularis*, 1; *Hadena porphyrea*, common; *Dichonia aprilina*, 1; *Leucania pallens*, several; *Caradrina quadripunctata*, 1; *Amphipyra pyramidea* and *A. tragopogonis*, common, worn; *Dyschorista suspecta*, 1, worn; *Calymnia trapezina*, several, worn; *Cosmia paleacea*, 1, worn; *Orthosia nitida*, common; *Mellinia circellaris*, several; *Tiliacea citrigo*, ♂ s, very common; *Citria fulvago*, common, ab. *flavescens*, 1; *Xylina socia*, 2; *Lithomia solidaginis*, 1; *Catocala sponsa*, 1; *C. nupta*, 1; *Toxocampa pastinum*, 1, fresh; *Hypena rostralis*, 1. Total species 25.

September 9th, 1905.—LICHTENRADE.—Warm, rather cloudy: *Phaethra rumicis*, 1, worn; *Noctua xanthographa*, few, worn; *N. c-nigrum*, 1;

Triphaena orbona, 1; *Agrotis segetum*, a few; *Mamestra brassicae*, 1; *Brotolomia meticulosa*, 2; *Epunda lutulenta*, 10; *Leucania pallens*, 2; *Amphipyra pyramidea*, worn; *A. tragopogonis*, a few, worn; *Mellinia circellaris*, thousands; *Anchocelis litura*, common; *Citria flavago*, several; *C. fulvago*, common, worn, ab. *flavescens*, 1; *Mellinia ocellaris*, 6, ab. *lineago*, 2; *Scopelosoma satellitia*, 1; *Scoliopteryx libatrix*, 1; *Xylina socia*, 1; *X. furcifera*, 4; *Calocampa exoleta*, 2; *Catocala sponsa*, 1; *C. nupta*, common, worn; *C. fraxini*, common; *Hypena rostralis*, 1; *H. proboscidalis*, 2, worn. Total species 28.

September 16th, 1905.—BERNAU.—Cold and rainy day, better later: *Noctua baja*, 2; *Agrotis segetum*, common; *Peridroma ypsilon*, 2; *Hadena oleracea*, 1; *H. porphyrea*, a few; *Miselia oxyacanthae*, 1; *Brotolomia meticulosa*, 1; *Ammoconia caecimacula*, several; *Tapinostola fulva*, 1; *Luceria virens*, 6; *Leucania pallens*, *Mellinia circellaris*, and *A. litura*, all common; *Orrhodia vaccinii*, 2; *Scopelosoma satellitia*, several; *Xylina ornitopus* and *X. socia*, 1 each; *X. furcifera* and *Calocampa exoleta*, both common; *C. vetusta* and *Lithomia solidaginis*, 1 each. Total species 21.

September 20th, 1905.—LICHTENRADE.—Warm, showery, over-clouded: *Agrotis segetum*, a few; *Peridroma ypsilon*, 1; *Mamestra brassicae*, 2; *Brotolomia meticulosa*, several; *Epunda lutulenta*, 20; *Ammoconia caecimacula*, 1, worn; *Leucania pallens*, 2; *Caradrina quadripunctata*, 1; *Orthosia laevis*, 1, worn; *Mellinia circellaris*, less common than on 9th; *Anchocelis helvola*, 2; *A. lota*, 2; *A. litura*, common; *Citria flavago*, common; *C. fulvago*, worn; *Mellinia gilvago*, 1, worn; *M. ocellaris* and ab. *lineago*, common; *Orrhodia vaccinii*, several; *Scopelosoma satellitia*, 2; *Scoliopteryx libatrix*, common; *Xylina socia*, 1; *X. semibrunnea*, 3; *X. furcifera* and *C. exoleta*, several of each; *Catocala nupta*, 3, worn; *C. elocata*, 1, fresh; *C. fraxini*, 3, worn; *Hypena rostralis*, 1. Total species 29.

September 23rd, 1905.—FINKENKRUG.—Very warm and fine: *Noctua c-nigrum*, 2; *Agrotis segetum*, a few; *Peridroma ypsilon*, several; *Mamestra brassicae*, 1; *Hadena porphyrea*, a few; *H. protea*, 1; *Miselia oxyacanthae*, common; *Dichonia aprilina*, 18; *Brotolomia meticulosa*, a few; *Ammoconia caecimacula*, common; *Leucania pallens*, several; *Amphipyra pyramidea*, 2, worn; *Mellinia circellaris*, going over; *Orthosia macilenta*, 7; *Anchocelis helvola*, several; *A. lota*, 1; *A. litura*, going over; *Tiliacea citrigo*, ♀ s, common; *Citria flavago*, 1; *Orrhodia vaccinii*, 1; *O. spadicea*, 1; *O. erythrocephala*, several, ab. *glabra*, 2; *Scopelosoma satellitia* and *Xylina ornitopus*, several of each; *X. furcifera*, 1; *Calocampa exoleta*, 2; *Hypena rostralis*, 1; *H. proboscidalis*, several worn. Total species 10.

September 26th, 1905.—LEUDELANGE.—Warm, rainy: *Amphipyra pyramidea*, 2, worn; *Anchocelis pistacina*, 15; *Mellinia circellaris*, thousands; *Orthosia macilenta*, 7; *A. helvola*, common; *A. lota*, 2; *Tiliacea* ab. *fucata*, 3, worn; *Orrhodia vaccinii*, common; *Scopelosoma satellitia*, several; *Xylina ornitopus*, common. Total species 10.

September 28th, 1901.—LEUDELANGE.—Warm, rainy, thunderstorm: *Peridroma ypsilon*, several; *Brotolomia meticulosa*, 2; *Tapinostola fulva*, 1, worn; *A. pyramidea*, 1, worn; *Anchocelis pistacina*, 7; *Mellinia circellaris*, thousands; *Orthosia macilenta*, 12; *Anchocelis helvola*, common; *A. lota*, 5; *Tiliacea* ab. *fucata*, common, worn; *Citria flavago*, 3; *Orrhodia spadicea*, common; *O. erythrocephala*, 1; *Scopelosoma satellitia*, many; *Xylina ornitopus*, common; *Calocampa exoleta*, 1; *Hypena rostralis*, 1; *Zanclognatha tarsipennalis*, 2. Total species 18.

OLEOPTERA.

A note on the Coleopterous genus *Dacne*, Latr., with special reference to *Dacne fowleri*, Joy.

By NORMAN H. JOY, M.R.C.S., F.E.S.

In Prof. Hudson Beare's "article," "Retrospect of a Coleopterist for 1905," in the January number of *The Record*, he refers to my new species *Dacne fowleri* as appearing "to be intermediate in its characters between our other two species, *D. humeralis*, F., and *D. rufifrons*, F." I think it very necessary to correct this impression, which I hardly think a careful study of my description gives. *D. humeralis*, F., and *D. rufifrons*, F., are so closely allied that I think it would be very rash to introduce a species with intermediate characters. *D. fowleri* is only intermediate between these two species in the colour of its thorax (the colour of the legs and antennæ are darker than in either), in structure it is one of the most distinct members of the genus, and differs more widely from either *D. humeralis* or *D. rufifrons* than these two species differ from one another. I have obtained all the European members of the genus from Herr Reitter. *D. notata*, Gmel., is a large and distinct long-legged species. The other five members of the genus are closely allied and can be separated into two groups by the shape of the thorax and the width of its reflexed margin. In *D. rufifrons*, *D. semirufula*, Rtr., and *D. pontica*, Bedel, the thorax has the sides almost straight until quite near the anterior angles, and the reflexed margins are narrow. In *D. humeralis* and *D. fowleri* the sides of the thorax are gently rounded throughout, and the reflexed margins are much broader. *D. semirufula* I can only find differs in colour from *D. rufifrons*; *D. pontica* is also very closely allied to *D. rufifrons*, differing in colour, and in being rather smaller and somewhat differently shaped. *D. fowleri* differs from all these and from *D. humeralis* in having distinctly longer and more robust legs, and the margins of the thorax are even broader than they are in *D. humeralis*. The var. *jekeli*, Reitt., of *D. humeralis* corresponds with the testaceous variety (? immature) of *D. rufifrons*, and these two varieties, although quite alike in colour, can be easily distinguished by the characters of the thorax given above.

HOMALIUM CÆSUM AB. SUBRUFICORNE, N. AB.—In October, 1905, I took a number of the ubiquitous *Homalium caesum*, Grav., from a rotten *Polyporus* in Gibside, and on looking over them discovered what I thought to be another species; the antennæ of this latter insect being pitchy black, with the five basal joints of a clearly defined rufotestaceous colour, and thus differing from the type form of *caesum*, wherein the antennæ are reddish and sometimes (though to no appreciable extent) lighter or darker at the base. Mr. Donisthorpe, to whom I sent an example, thought it to be a form of *H. caesum*, and very kindly forwarded it to M. Fauvel, who confirmed Mr. Donisthorpe's view. Mr. Donisthorpe also said that the species recorded by the Rev. Theodore Wood from Rannoch as *H. monilicorne*, Gyll. (*Ent. Mo. Mag.*, 1904, p. 260), was the same as my Gibside capture. In the genus *Homalium* the above noted antennal character (*i.e.*, black with basal joints reddish) though not of specific importance is recognised in several species (*e.g.*, *H. septentrionis*, Th.), and, in such species, seems to be a wonderfully constant character, seldom deviating either one way or the other. The insect

in question is quite a rarity, only three or four examples occurring amongst the hosts of *caesum* examined, and, strangely enough, I did not succeed in discovering any intermediate forms. Therefore, to distinguish this form, I would suggest it be known as ab. *subruficornae*.—RICHARD S. BAGNALL, F.E.S., Winlaton. *February, 12th, 1906.*

NOTE ON THE STRIDULATION OF *CYCHRUS ROSTRATUS*, L.—Six examples of *Cychnus rostratus* have fallen to my lot since November, 1905, and, on one occasion, no fewer than three ♀s occurred from beneath two stones lying close together. I feel certain that the stridulation of this species is caused by friction between a certain part of the abdomen and the elytra, for, when the beetle stridulates, one can see a slight muscular movement at the apex of the abdomen, and if one holds the insect by the forefinger and thumb, the thumb on the underside of the abdomen and the finger pressing the elytra down, it seems to lose its power of producing sound. It is generally thought, I believe, that the insect stridulates when disturbed, but two of the six examples above mentioned would not stridulate at all, no matter the amount of disturbance or provocation to which they were subject. Why then, should these two not stridulate like the other four? Examination showed that the four "songsters" were of the fairer sex, whilst the non-stridulators were males! An interesting point is thus raised. Is the power of stridulation in this species confined to the females, and if so, to what purpose? Granting the supposition to be the case, it would seem that the female, alone possessing the power of producing sound, would not use that power merely as a means of defence, but rather to apprise the male of her whereabouts. Of course it would be folly to make a definite statement on such slight grounds; *C. rostratus*, though so widely distributed, is only occasionally met with, and then, as a rule, but single examples occur, thus it is impossible for one to experiment as one would wish, to any great extent; and I only write this note in the hope that coleopterists, on capturing *Cychnus*, will, in future, note the stridulating powers in relation to sex, etc., so that in time some definite results may be attained. I shall at once record the stridulation of the male if it be my fortune (or misfortune!) to experience it!—IBID. [It does not appear to be known for certain where the true organs of stridulation are situated in this beetle. (See Gahan, *Trans. Ent. Soc. of London, 1900, p. 442*). H. J. D.]

LIODES, LAT., A GENUS OF NIGHT-FLIERS.—In my diary, dated December 26th, 1905, I notice the following entry:—"Found the 'cast-up' of a bat in the hollow of an old beech-trunk: composed of a number of *Liodes* elytra." This beech-tree at one time must have been a veritable forest monarch, and was probably blown down in the great gale which long ago swept the valley, and created such devastation as is difficult to imagine. The shattered trunk is now simply riddled by *Sinodendron*, and is affected by hosts of other insects, etc.: it is slightly hollow on one side and is evidently haunted by a bat or bats. The "cast," referred to above, was composed of hundreds of elytra of *Liodes humeralis*, Kug., amongst which I detected a few wing-cases and bodies of what I believe to be *L. glabra*, Kug., and also the breast-parts of those and other insects. *L. humeralis* is not an uncommon beetle in the Derwent Valley, and every now and then a powdery fungus, growing on oak, is found containing a colony of that species; of *L. glabra*, I have only taken a single example. It would, therefore, appear from this bat's

evidence that *L. humeralis* turns out in swarms at dusk, and also that *L. glabra* is not so uncommon as it is generally thought to be.—*IBID.*

SOME CUMBRIAN COLEOPTERA.—The following is a list of the most interesting species of coleoptera taken by myself during 1905. The greater part of these insects have been seen by Mr. Newbery, who has very kindly verified the naming, and, in some cases, identified the insects for me. During February, I was turning out some old garden seeds and came across the remains of *Anobium paniceum**, L., and a number of larvæ amongst some lettuce seed; these produced a fine series of this beetle during July. A few specimens of *Homalota laevana**, Muls., were taken by shaking moss on the banks of the Eden. *Miscodera arctica*, Pk. (1), was taken beneath a stone on the slopes of Lazonby Fell. *Silpha nigrita*, Cr., occurred on several occasions running amongst grass in the sunshine; I have only met with this species on one occasion, in carrion, but it has occurred to me on several occasions in the flower-heads of dandelion and *Hypochoeris radicata*, L. The following species occurred in flood refuse—*Trechus micros*, Hbst.; *Helophorus nubilus*, F.; *H. affinis*, Marsh.; *H. arvernicus*, Muls.; *Homalota insecta*, Th.; *H. cambrica**, Woll.; *H. longula**, Heer; *H. gyllenhali**, Th.; *H. angustula*, Gyll.; *Ischnopoda coerulea*, Sahl. (1); *Tachyusa atra*, Gr., *Quedius longicornis**, Kr. (1); *Ancyrophorus omalinus*, Er. (in numbers), with hosts of commoner species. *Enicmus rugosus**, Hbst. (1), was taken in powdery fungi on an alder, and another specimen in a similar fungus on an ash-tree. *E. testaceus**, Steph. (2), also turned up on an alder stump. *Apion pallipes**, Kirb., was taken by sweeping amongst *Allium ursinum*, L., in a wood. *Homalota divisa*, Märk., was found in some numbers amongst carrion. *Oxyptoda tarda*, Shp., was taken on sand on the banks of the Eden. *Homalota mortuorum*, Th., and *Morychus aeneus*, F., were both found beneath stones in a gravel bed. *Meligethes viduatus*, Stm., was taken in some numbers by sweeping amongst *Geum rivale*, L. *Epipeda plana**, Gyll. (2), was taken in the burrows of *Scolytus destructor*, Ol., beneath elm bark. *Donacia dentipes*, F. (in numbers), and the rare *D. obscura**, Gyll., were taken by sweeping amongst *Carex* in a swamp, early in May. A small series of *Hydraena atricapilla*, Wat., was taken amongst moss, on rocks in the river Eden. *Ptinus tectus**, Boield., was taken in numbers in an outhouse, where corn and meal are stored; in the same place *Tribolium ferrugineum*, F., *T. confusum*, Duv., *Latheticus oryzae**, Wat., *Ptinus fur*, L., *Niptus hololeucus*, Fall., and *N. crenatus*, F., all occurred in numbers; there is only a very small quantity of either corn or meal stored in this outhouse at one time, but it has been used for the same purpose for a number of years. A number of *Pselaphus dresdensis*, Hbst., and *Phytobius muricatus*, Bris., were taken in moss in a swamp. By shaking moss on the slopes of Cross Fell, the highest point of the Pennines, I secured *Homalota tibialis*, Heer, *H. eremita*, Rye, *H. cavifrons**, Shp., *Arpedium brachypterum*, Gr., and *Otiorhynchus maurus*, Gyll. In wet moss, at waterfalls, *Quedius umbrinus*, Er., *Q. auricomus*, Kies., *Stenus guynemeri*, Duv., were plentiful. A fine ♂ *Choleva intermedia*, Kr., was taken inside a rabbit-burrow at a considerable distance from the entrance. I was in the act of digging out the burrow when I came across this beetle. *Placusa complanata*, Er., is still plentiful beneath dead fir bark in the Eden valley. A single specimen of *Hypocyptus seminulum**, Er.,

occurred in decaying potato tops. *Phloeophilus edwardsi*, Steph., still turns up in limited numbers on the fence posts round a small wood. *Hydrothassa hannoverana*, F., swarmed in the flowers of *Caltha palustris*, L., during May, and, later in the season, the leaves were riddled by the swarms of larvæ. A single example of *Quedius obliterated**, Er., was taken in moss on the banks of the Solway Firth; also an example of *Hypera variabilis**, Hbst., both being additions to our county list. These species are in addition to those recorded by me in the pages of the *Naturalist* during the past season.—H. BRITTON, Prospect House, Salkeld Dykes, Penrith. *February 22nd, 1906.*

DROMIUS AGILIS AB. BIMACULATUS, DEJ., A NEW AB. TO BRITAIN.—Whilst at Hastings last week, Mr. Bennett and I went over to Battle to try for coleoptera in the woods there. Beetles were very scarce, and, having tried moss, dead leaves, and everything we could think of with very little result, Mr. Bennett went off to try and find a better spot, whilst I set to work to scrape the lichen off the bark of a tree to see if that would produce anything. The result was one *Dromius*, which startled me by having two bright yellow spots on the shoulders, and I shouted to Mr. Bennett I had got a new *Dromius* marked like *polystichus*! This turns out to be the ab. *bimaculatus*, Dej. (*Spec.*, i., 240). Ganglbauer writes (*Die Kafer v. Mitteleuropa*, vol. i., p. 407): "In the ab. *bimaculatus*, Dej., the elytra show on the front half a light spot stretching out towards the base, and before the apex a small, often lost, mark." This aberration is of interest as being probably a case of atavism, as many species of *Dromius* are spotted, and probably the ancestral form was so.—HORACE DONISTHORPE. *February 10th, 1906.*

Species marked with * are new to our list.

Retrospect of a Dipterist for 1905.

By J. E. COLLIN, F.E.S.

Undoubtedly the absence of any English text-book on diptera in general is the reason why so few students of entomology take up the study of the order; even European dipterology is sadly in need of another work like that of Schiner, published in 1864, bringing together the results of some forty years' labour; students of our British fauna of diptera must, therefore, have welcomed the appearance of the series of articles dealing with the *Dolichopodidae* by Verrall, and the commencement of a monograph of the British species of *Hydrotæa* by Grimshaw (*Ent. Mo. Mag.*); in the former paper, eight species have been added to the British list during 1905, viz., *Chrysotus femoratus*, Ztt., *Medeterus obscurus*, Ztt., *Xiphandrium lanceolatum*, Lw., *Porphyrops rivalis*, Lw. (all from Scotland, and all taken by Colonel J. W. Yerbury), *Systemus bipartitus*, Lw., *S. leucurus*, Lw., *S. scholtzi*, Lw., and *S. tener*, Lw. (bred by Dr. Sharp and others, from rotten wood débris, mainly in the New Forest district). Two other species of *Dolichopodidae* (*Dolichopus argyrotarsis*, Whlbg., and *Porphyrops rivalis*, Lw.), were also added to our list last year, again due to Colonel Yerbury's collecting in Scotland. The first instalment of what is to be hoped will be a series of "Notes on *Tachinidae*," by Wainwright (*Ent. Mo. Mag.*), introduces ten species of that difficult family to our list, though some of these are only tentatively introduced, the author being satisfied with the identity of

only five, viz., *Roeselia pallipes*, Fln., *Tricholyga major*, Rud., *Ptilops nigrita*, Fln., *Phytomyzeta nitidiventris*, Rnd., and *Craspedothrix vivipara*, B. and B.. Dr. Wood (*Ent. Mo. Mag.*) is responsible for the addition of four species, *Callimya elegantula*, Fln., *Agathomyia boreella*, Ztt., *Homalomyia difficilis*, Stein, and *Pallaptera laetabilis*, Lw., all from Herefordshire. Austen, in the same journal, has added another species of *Erigone* (*E. pectinata*, Girsch.), from Herefordshire, and deals with the other species of the genus, and is also responsible for an article dealing with the synonymy and life-history of *Drosophila melanogaster*, Mg. A further addition to the British list, is due to Wesche, who found *Ulidia nigripennis*, Lw., in Kent. At a meeting of the London Entomological Society, in March, Mr. Grimshaw exhibited *Hydrotaea tuberculata*, Rnd., a species not hitherto recorded as British, and, at another meeting in October, Colonel Yerbury exhibited specimens of a remarkable addition to the British *Syrphidae*, viz., *Hammer-schmidtia ferruginea*, Fln., taken by himself at Nethy Bridge, Scotland. A system for indicating the position of the leg bristles in diptera was suggested by Grimshaw (*Ent. Mo. Mag.*), and he also (*Ann. Scot. Nat. Hist.*) enumerated the dipterous fauna of the Orkney and Shetland Islands; a similar article on the fauna of the Flannan Isles appeared in the same journal from the pen of Henderson.

Dr. Chapman has contributed a few valuable notes on the life-history of *Xanthandrus comptus*, Harris (*Ent. Mo. Mag.*), and J. A. Dell, an exhaustive paper on the life-history and structure of *Psychoda sex-punctata* (*Trans. Ent. Soc. Lond.*).

In the Aphaniptera a new species, *Ceratophyllus farreni*, from Suffolk and Berwickshire, has been described by Rothschild, and *Pulex cheopsis*, Rothschild, has been found at Plymouth (*Ent. Mo. Mag.*).

On the continent the amount of published work on the diptera has been considerably below the average, volume iv of *Kerteszy's Catalogue of Palaearctic Diptera*, by Becker and Bezzi, being one of the most important contributions. Bezzi has also published short papers on the genus *Systropus* (*Redia*) and various *Empidæ* (*Ann. Mus. Hung.*). Becker has dealt with the diptera collected by the Belgian Antarctic Expedition (*Ann. Soc. Ent. Belg.*). Miss Ricardo (*Ann. Mag. Nat. Hist.*) has given notes on Palaearctic *Tabani* in the British Museum, and short articles have been published by Herman on *Asilidae* (*Berl. Ent. Zeitschr.*), by Kramer, on *Sarcophaga* (*Zeitschr. Hym. Dipt.*), by Pandelle on *Chilostia* and *Asilus* (*Rev. Ent.*), and by Eichhoff on *Xylophagus* (*L'Echange*). Handlirsch has given a long obituary notice of Prof. Brauer (*Verh. Ges. Wien.*).

The *Culicidae* still continue to receive the lion's share of attention, the following being a few of the more important contributions:—Blanchard, *Histoire Naturelle et Médicale des Moustiques*, Paris, 673 pp., 316 figs.; Goeldi, *Para Mosquitoes Mem. Soc. Goeldi*, 4to, 154 pp., 21 pls.; Chanterresse et Borel, *Mosquitoes and Yellow Fever*, Paris, 100 pp.; Dyar, "Synoptic Table of N. American Larvæ of Mosquitoes," *Journ. New York Ent. Soc.*; Thompson, "Alimentary Tract of the Mosquito," *Proc. Soc. Nat. Hist. Boston*, 62 pp., 6 pls.; Dyé, "Parasites of Culicidæ," *Arch. Parasit.*, 77 pp. In addition to the above, numerous articles have appeared from the pens of Grabham, Theobald, Putton, Neveu-Lamaire, Eysell, Pressatt, Kulagin, Ludlow, Coquillett, J. B. Smith, etc.

The "Tsetse" has been dealt with by L. Sander (Leipzig, 79 pp., 1 pl., 25 figs.) and Austen (*Ann. Mag. Nat. Hist.*).

Contributions towards our knowledge of the *Anthomyidae* have been made by Stein (*Tijd. Ent. and Ann. Mus. Hung.*), of the *Phoridae* of Peru and the Indo-Australasian Region by Brues (*Ann. Mus. Hung.*), of the *Hippoboscidae* by Speiser (*Zeitschr. Hym. Dipt. Ann. Mus. Genov. and Ann. Mus. Hung.*), of the North American *Cuterebra* by Swenk (*Journ. New York Ent. Soc.*), and of the *Chironomidae* by O. A. Johannsen (*Bull. New York State Museum*), being Part II. of *Aquatic Nematocerosus Diptera*, of which the first part appeared in 1903.

Meunier has published various articles on diptera from amber and copal (*Rev. Soc. Bourbonnais*, the *Misc. Ent.*, the *La Heuille*, etc., and *Ann. Mus. Hung.*).

The *Aphaniptera*, or "Fleas," have received their share of attention from C. F. Baker, who has published a "Classification" of the order (*Proc. Nat. Mus. Washington*) from Rothschild (*Novit. Zool.*), Rainbow (*Rec. Austral. Mus.*), Semenow (*Rev. Russe Ent.*), and others.

ORTHOPTERA.

LEPTOPHYES PUNCTATISSIMA IN WIGTOWNSHIRE.—It may interest some of your readers to hear that I captured a specimen of this "Treehopper," basking in the sunshine on a large flat boulder, above high-water mark and below the Garheugh Rocks, Luce Bay, about 3 p.m., on October 15th, after a severe storm. There are no trees within half a mile of the spot.—J. G. GORDON, F.E.S., Corsemalzie, Whauphill, Wigtownshire. *February 15th, 1906.*

NOTES ON COLLECTING, Etc.

SOME NOTES FROM THE CANNOCK CHASE DISTRICT.—Although not so bad as the season before, I cannot say that 1905 was a good year. I got no early spring insects except two *Brephos parthenias*. Very cold east winds being very much in evidence about that time. In May, *Callophrys rubi* was fairly common, as was *Hadena glauca*. The frost in the early morning of May 28th was a tragedy. Oak, beech, and even birch trees were all wilted, I had over 20 larvæ of *Catocala sponsa* sleeved out, and they were all killed. *Asteroscopus sphinx*, sleeved on the same bough, escaped, though I had hard work to find food for them. All the *Vaccinium myrtillus*, in exposed and low-lying situations was destroyed, and, in consequence, *Bomolocha fontis* and *Eupithecia debiliata* were very scarce; I do not know when the larvæ of these insects are fullfed, and perhaps I should not say "in consequence." Sugar in early June was very unattractive, and was never of much use all through the year. I was glad to get a pair of *Viminia menyanthidis*, in cop., and the ♀ obliged me with a quantity of eggs, from which I have now a nice lot of pupæ. The form of *Viminia menyanthidis* I get here is quite different from any I have seen elsewhere; but never before last year have I been able to breed it, and so get fresh specimens. The pair I got the ova from were as pale as *Acronycta leporina*, and will, I think, constitute a distinct variety. I feed the larvæ on birch in large sleeves, and, when I took the sleeves down, I found three fullfed

Leiocampa dictaeoides in them. *Plusia pulchrina* and *P. iota* were very abundant in my entomological garden at the flowers of campion and valerian, and I also got one *Hecatera serena*, a very scarce insect here. Much searching of corn-fields, etc., produced only two *Cucullia chamomillae*. On July 3rd, I got a pair of *Acidalia inornata*; I tried to force the larvæ through during the autumn, but failed to do so. This insect lays its eggs loose, like a Hepialid, as does *Stilbia anomala*, and evidently sows them about in the grass tufts in a state of nature. In August, I obtained about 90 *Stilbia anomala*, but sugar was a failure. I did not see one *Noctua castanea* or the ab. *neglecta*, but *Noctua dahlia*, was abundant at the heather blossom as was *Triphosa dubitata*. The latter part of the year was very bad, there seemed to be no larvæ, and beating was absolutely useless. Three *Cirrhoedia xerampelina* were the only captures worth mentioning.—R. FREER, M.D., Rugeley, Staffs. February 14th, 1906.

NOTE ON THE ECONOMY OF SYNTOMIS PHEGEA AND PARNASSIUS APOLLO.—I have some dozen larvæ of *Syntomis phegea* doing well up to now. Ova of *Parnassius apollo* hatched on February 1st. It seems a strange time! The larvæ look well and stick well to the foodplant—a *Sedum* (*album* I think)—but I cannot see that they are feeding yet. I keep them in a cold, sunny, greenhouse.—W. H. ST. QUINTIN, F.E.S., Scampston Hall, Rillington, York, February 7th, 1906.

LEPIDOPTERA IN 1905 IN EAST TYRONE.—The past season has been one of the driest we have had here for a long time. May, June, and part of July were fine and dry, and I notice that Noctuid moths have been much scarcer than usual, especially the Plusiids. In January, *Hybernia rupicaprariva* was common, flitting about hedges. On February 15th, *Asphalia flavicornis* emerged in the breeding-cage, larvæ from Roscommon. During April, a nice series of *Demas coryli* also emerged; on April 20th I obtained a fine lot of *Taenioecampa opima* in a bog near Lurgan. In May, *Anticlea nigrofasciaria* and *A. badiata* were fairly common. On May 4th, a nice specimen of *Spilosoma mendica* var. *rustica*, and, on May 18th, *Smerinthus ocellata* commenced to appear in the breeding-cage, whilst, on the 20th, a visit was paid to the mountain for *Hadena glauca*, which was found in fine condition and flying freely to the flowers of whortleberry a much more attractive plant to the species than is sallow. During the month, the following were also taken: *Demas coryli*, *Lophopteryx camelina*, *Clostera reclusa*, *Notodonta ziczac*, *Amphidasys betularia*, *Numeria pulveraria*, *Eurymene dolobraria*. At the beginning of June, *Dianthoecia conspersa* was very abundant at flowers of *Lychnis flos-cuculi*, but very few Plusiids and no *Plusia bractea*; on the 23rd, *Cerura furcula* emerged. Towards the end of the month, and in July, *Aplecta herbida* (*prasina*) and *A. nebulosa* were fairly common at sugar, but nothing else of note. I got one *Plusia bractea* on the sandhills near Bundoran on July 19th, also a few *Cerigo matura*. During August, *Stilbia anomala*, *Celaena havorthii*, *Helotropha leucostigma*, *Hydroecia nictitans* and *Charaëas graminis* were all common on the moorland; also *Coremia munitata*, in fine condition, and *Pseudoterpna pruinata*, rather worn. In August, *Larentia caesiata* swarmed on the heathery ground, and with it *Emmelesia alchemillata*. During September *Ennomos tiliaria* occurred. At ivy, in the autumn, Noctuids were scarce, and the same at sugar. In November, I obtained a few *Hybernia aurantiaria*, which were the last captures of a poor

year.—T. GREER, Lissan, Cookstown, Co. Tyrone. *February 10th, 1906.*

AGLAIS URTICÆ FLYING IN THE WINTER.—A quite noticeable feature here is the frequent appearance of the imagines of *Aglais urticae* flying briskly over the snow. The first was seen at noon on January 29th. Everything is still covered with snow, but, when the weather is clear, the sun shines the whole day long, and the sun's heat is then greater than that of many a July day in England. The butterflies mentioned are more frequently seen on the higher slopes of the mountains than in the valleys. On February 19th, five were seen at a height of 6500 feet. I have noticed the dried stems of nettles here, and these plants are no doubt common along the roadsides at the lower levels. From the number of pupal remains of *A. urticae* casually noticed, I should say that this species must have been abundant here last autumn. True winter moths must be scarce here, or else they have habits different from our winter species. I have searched tree-trunks (alders, ash, spruce fir) and rocks without finding a trace, and no dead specimens have been found in the snow.—ALFRED SICH, F.E.S., Adelboden, Switzerland. *February 20th, 1906.*

HABITS OF YOUNG LARVÆ OF NOCTUA DEPUNCTA.—From ova of *Noctua depuncta* a number of larvæ emerged in September, I gave them sorrel to feed on, but they huddled together, and used the sorrel, not as food but, as a resting place, and remained perfectly quiescent till disturbed with a fine brush. This went on for some weeks, being, each time I looked at them, perfectly quiet and gregarious till touched, then quite lively, settling down again afterwards. Tired of this, I put them out in the garden on a small bed of sorrel, but suppose I shall see nothing of them in spring. I cannot help wondering how, if this is the usual habit, they manage to keep alive through the winter. I do not remember ever reading anything about the life-history of *N. depuncta*. Has anything been published thereon?—J. E. GARDNER, 204, Evering Road, Upper Clapton, N.E. *February 5th, 1906.*

EARLY BUTTERFLIES.—Mr. Sloper tells me that *Pontia daplidice* var. *bellidice* is already on the wing here; I saw two specimens of *Polygonia egea* on February 1st. It may be well also to put on record that *Erebia epistygne* pupated about January 20th.—H. POWELL, 7, Rue Mireille, Hyères, France. *February 3rd, 1906.*

WINTER LEPIDOPTERA. A run on January 31st, showed that the mild weather had brought out a good many of the early species; I took *Hybernia rupicaprararia*, *H. progemmaria*, *Anisopteryx aescularia*, *Phigalia pedaria*, *Orrhodia vaccinii*, and *Cheimatobia brumata*; a very satisfactory result for so early a date.—J. OVENDEN, Frindsbury Road, Strood, Kent. *February 12th, 1906.*

PECULIAR HABIT OF LARVA OF PARARGE EGERIA.—I have noticed a habit in larvæ of *Pararge egeria* (a species which I bred this year (1904) for the first time) of which I have never read. They eat through the blades of grass near their base, causing the part above to fall and wither. They do not appear to attempt to devour the "felled" portion.—H. WOOD, Ashford. *December 11th, 1905.*

OPORABIA AUTUMNATA IN THE NEW FOREST.—I have recently seen specimens of *Oporabia autumnata* bred by Mr. B. W. Adkin in 1899, from larvæ taken at Brockenhurst.—J. E. R. ALLEN, Enniskillen. *January, 1906.*

A SECOND SPECIMEN OF *BANKESIA DOUGLASSII*, STN.—In the *Ent. Rec.* (anteà, p. 28), it is stated that “the unique specimen” of *Bankesia douglasii* was sold at the recent disposal, at Stevens’ auction rooms, of the remaining portion of the Mason collection. This is not so, since the type specimen, to which reference is undoubtedly made, was not sold by auction, for, although it was standing in the “Mason” collection shortly before the sale, I secured the transference of it, and a few other specimens, to the “Douglas” collection of *Tineina*, etc., to which they originally belonged, and which had already been privately disposed of, in its supposed entirety, to Lord Walsingham. Moreover, the type specimen, considered for nearly half a century to be unique, can no longer be so regarded, for a second specimen, identified by Lord Walsingham in 1900 as *B. douglasii*, and doubtless British, was recently sold among the Mason “*Psychidae*”; the statement in the *Ent. Rec.* (*loc. cit.*) would therefore have been correct, had “a specimen” been substituted for “the unique specimen.”—EUSTACE R. BANKES, Norden, Corfe Castle. *January 18th, 1906.*

EARLY WINTER LEPIDOPTERA.—Judging from the dates of the captures I have made at present, the coming season promises to be an early one. Searching tree-trunks in a small wood near Abertillery, during the last week or two, has produced the following: On January 17th, four *Phigalia pedaria* ♀s; on the 22nd, nine more, all males; whilst a day or two later they were abundant. All the specimens I captured of this species in calm weather were, with two exceptions, found at rest on beech-trunks, the two exceptions were on oak; on windy days, however, they were invariably found half-concealed under the loose bark of pines. Not a single specimen on these windy days was to be found on any tree but pine. On the 26th, several specimens of *Hybernia leucophaearia*, all males, were found at rest on oak. On the 30th, one *Hybernia progemmaria* ♂, and one *Anisopteryx aescularia* ♀, together with several *H. leucophaearia* and *Phigalia pedaria*. January 30th seems to be a very early date for *A. aescularia*.—W. RAIT-SMITH, “Nenadd House,” Abertillery, Monmouthshire. *January 31st, 1906.*

POLYGONIA C-ALBUM IN EPPING FOREST.—Referring to a note in the *Entomologist's Record*, xvii., p. 338, by the Rev. C. R. N. Burrows, I well remember seeing seven specimens of *Polygonia c-album* that were taken by Mr. F. A. Sneyd in Epping Forest—Mr. Sneyd was an assistant of mine at the time. I regret to say he died on August 16th, 1891, and, as well as I can remember, they were taken at the end of the season, about September, 1888, in a part of the Forest near Wood Street Station. I may add that I have never taken the species myself in Epping Forest.—J. A. CLARK, F.E.S., Weston Park, N. *January 16th, 1906.*

QUERY RE FOODPLANT OF *MELITÆA MATURNA*.—May I ask if any of your readers have reared *Melitæa maturna* from the egg? I have twice failed, though I took great pains. Plenty of larvæ hatched in 1903 and 1904; but I could get them to eat nothing. I tried *Plantago* of various species, *Viola biflora* and *V. canina*, *Scabiosa (arvensis and succisa)*, *Spireæe* various, and the common ash.—W. H. ST. QUINTIN, Scampston Hall, Rillington, York. *February 7th, 1906.*

VARIATION.

ABERRATION OF *MELANIPPE FLUCTUATA*.—Following my usual custom, when able easily to get a large quantity of any common larvæ, I bred a large number of *Melanippe fluctuata* from *Nasturtium* this year, all were normal but one, that was very curious, and almost teratological. It was very small, expanse of wings a little under .75in. The central band, or costal patch in the centre of the forewing has disappeared, and is represented by four small black dots, the whole central area of the wing being whitish.—R. FREER, M.D., Rugeley, Staffs. *February 12th, 1906.*

MELANIC *LARENTIA DIDYMATA*.—I have taken this year, a black *Larentia didymata*, that is to say, black with the exception of the usual white dots. I do not know if a black form of this pest has turned up in any other melanic areas, but it is the first time I have seen it here. It had a very different appearance on the wing from that of the ordinary form.—IBID.

AMPHIDASYD *BETULARIA AB. DOUBLEDAYARIA* (*sens. lat.*).—As I have bred this insect from Cannock Chase larvæ, and from ova from the same district, it presents four fairly well marked forms:—(1) entirely black; (2) entirely black, with the exception of small well marked white spot at the junction of forewings and thorax; (3) black forewings, with a whitish somewhat irregularly-shaped patch on the upper margin and near the outer angle of hindwing; (4) the same as number three, with the white spots of number two. The first two are distinct and well marked forms. Of the other two forms, I have one in which the rather semilunar shaped mark is prolonged by a streaky band of whitish-grey to the outer margin of the hindwing. I shall be glad if any of your readers would examine their series of *A. ab. doubledayaria*, and report how far their diagnosis coincides with mine. I have refrained from naming these aberrations, as I do not know to which the name *doubledayaria* should be applied.—IBID.

CURRENT NOTES.

The 29th *Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society* show signs of the business activity of the Council, which ought to result in a large increase in its output of entomological material. Its officers and council contain the names of a great variety of entomologists, from men in the front ranks of entomological science, to others that one has never heard of as entomologists, so that all phases of the membership are well represented. The *Proceedings* this year are arranged in the same manner as those of the smaller London societies and make very interesting reading. Mr. Donisthorpe's address is a very instructive piece of work, whilst Mr. Tomlin's "Some Notes on Manx Coleoptera" (2 papers), and Mr. Sopp's "Birth and infancy of *Dytiscus punctulatus*," are also very interesting. More papers of this type and dealing with a wider range of subjects are wanted.

The Leicestershire Entomological Society held its annual dinner at The Royal Hotel, Leicester, on the evening of the 23rd, when Mr. G. B. Dixon, F.E.S., was in the chair, and Mr. F. Bouskell, F.E.S., in the vice-chair. Professor T. Hudson Beare, Mr. H. St. J. K. Donisthorpe, Mr. Groves, and Mr. J. W. Tutt were the guests. After

an excellent dinner, and when the usual loyal toasts had been duly honoured, the Chairman proposed the toast, "Success to Entomology," to which Mr. Tutt, whose name was coupled with the toast, replied. "The Success of the British Association," which meets at Leicester in 1907, proposed by Mr. Bouskell, was duly responded to by Professor Beare, who gave an excellent account of his observations in South Africa on the occasion of the British Association's visit last year. "Our Visitors," proposed by Mr. Vice, brought up Mr. Groves and Mr. Donisthorpe; whilst Messrs. McAlpine, Talbot, Taylor and Holyoake, contributed, by songs and recitations, to the further success of the evening. There is, no doubt, sufficient foundation in this Society to make it one of the best provincial ones in the kingdom; a little more motive force is wanted, however, to bring it to the level of the Liverpool, Birmingham and other societies, of whose scientific work we are proud.

We should be very grateful if those lepidopterists, who have specimens of *Eucnemidophorus rhododactyla*, *Amblyptilia acanthodactyla*, *A. punctidactyla*, *Marasmarcha phaeodactyla*, *Oxyptilus distans*, *O. pilosellae*, *O. parvidactyla*, and *Buckleria paludum*, in their cabinets, would send us without delay the localities and dates (if possible). The "plume" volume is now rapidly going through press, and details sent now will be published; in a short time it will be too late for some of these species.

Mr. H. L. F. Guermont describes (*Ent. Mo. Mag.*) a new genus and species to the list of British *Psocidae*, viz., *Reuterella helvimacla*, Enderl., from specimens taken on August 12th, 1892, at Bognor, and August 7th, 1905, at Chobhan.

The Hon. N. C. Rothschild describes a new British flea, *Ceratophyllus insularis*, from a ♂ specimen taken by Dr. Joy, near Reading. It is most closely allied to *C. gallinae*.

Mr. Bankes records the capture of a specimen of *Sterrhia sacrvaria* on September 6th, 1905, near Corfe Castle, also an example of *Phalonia manniana*, taken on July 14th, 1905, in a bog on the Isle of Purbeck.

We have to note with the greatest regret the death of the Rev. Joseph Greene, at the age of 82, the veteran author of *The Insect Hunter's Companion*, a book for beginners that has long filled a useful place as a guide to those absolutely ignorant of field entomology. He is best known, however, by his paper "On pupa-digging" (*Zool.*, 1857, pp. 5384-5398), an article which, from the point of view of our present knowledge, may appear poor enough, yet which, at the time, put many a collector in the way of getting insects hitherto considered rare, and also opened up a new mode of collecting lepidoptera when there was little else of other field entomology to do. We have also, unfortunately, to record the death of Mr. C. W. Dale, who has quite recently died. His entomological work has been comparatively limited, and confined to short notes in the magazines, except for his *History of the British Butterflies*, which is largely a compilation of the notes made by Lewin, Donovan, Stephens, Curtis, Newman, Hellins and Buckler, on our British butterflies, but, unfortunately, contains nothing new. Few men have begun entomological life under such excellent auspices, his wealthy father having left him a most valuable collection and entomological library, but modern scientific entomology advanced too rapidly, and he loved above all things to indulge in retrospection of

things that had been, rather than to take a share in the advance of things that are.

The last meeting of The Entomological Club was held in the Entomological Salon of the Holborn Restaurant, on February 6th last, Mr. Verrall being the host. Some 70 members and their friends were present, including Professor E. B. Poulton, Professor Meldola, Dr. T. A. Chapman, Dr. Dixey, Mr. F. Merrifield, and other well-known entomologists. After a long gossip on matters entomological, supper was announced, after which Mr. Verrall, in an excellent speech, proposed the toast—"Prosperity to the Entomological Club." The toast of "Our Host" was proposed in very happy terms by Mr. F. Merrifield, the President of the Entomological Society of London. A most enjoyable evening was spent, during which Mr. Jacoby charmed the company with his delightful violin solos.

SOCIETIES.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*February 19th, 1906.*—ANDROCONIA OF CALLOPHRYS RUBI.—Mr. F. N. Pierce exhibited microscopical preparations to show the difference between the androconial scales and the ordinary scales of *Callophrys rubi*; the dissimilarity between the form and depth of the scars, left on the removal of the scales, was also strikingly illustrated. BRITISH PHYTOPHAGOUS COLEOPTERA.—Mr. E. J. B. Sopp exhibited series of *Chrysomela serualis*, *Hydrothassa hannoverana*, and other local and scarce species.

ENTOMOLOGICAL SOCIETY OF LONDON.—*February 7th, 1906.*—LATHROBIUM LÆVIPENNE, HEER.—Mr. W. E. Sharp exhibited a specimen of this beetle, which is new to Britain, taken by himself in a sandpit near Oxted, Surrey, in August, 1905. BUTTERFLY SCENTS.—Dr. F. A. Dixey exhibited South African butterflies, the odour of which he and Dr. Longstaff had observed in the field, and suggested that odours of a pleasant nature were, as a rule, confined to the male, while those of a displeasing kind were common to both sexes. MALE DIPTERA VISITING BEES' NESTS.—Professor Poulton exhibited two diptera which had been observed by Mr. A. H. Hamm following the bee, *Audrena labialis*, and, communicated Mr. Hamm's note. Col. Yerbury had pointed out that both specimens were males, and Mr. G. H. Verrall had identified them as a *Chortophila*. Professor Poulton suggested that their purpose was to discover the females, which might have arrived earlier at their habitat.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*January 2nd, 1906.*—POCKET BOX EXHIBITION.—MALENYDRIS MULTISTRIGARIA.—Melanic examples from Huddersfield, exhibited by Mr. J. A. Clark. ANGERONA PRUNARIA.—Bred from Monmouth and Essex parents, showing a small proportion of banded forms. Also a fine striated ♀ of SPILOSOMA LUBRICIPEDA approaching var. RADIATA, captured at Leyton in June, 1904, Mr. G. R. Garland. HYLOPHILA PRASINANA.—With the area between the silver lines on forewings, occupied by a white band, bred from Tilgate in 1904, Mr. T. H. L. Grosvenor. COLOTOIS PENNARIA.—Suffused with black scales, Epping Forest, Mr. H. M. Edelsten. APLECTA NEBULOSA.—A long bred series ranging from the pale form to var. *robsoni*, bred from larvæ collected in Delamere Forest in 1905, 11%

being more or less melanic, Mr. A. Harrison. *NONAGRIA SPARGANII*.—Bred in August, 1905, from pupæ taken in east Kent, some miles from the old south-east Kent locality, Mr. L. B. Prout. *AGLAIS URTICÆ*.—An aberration with hindwings entirely black, and the marginal bands on the forewings much wider than usual, captured at Bexley, August, 1905, Mr. V. E. Shaw. *ACRONICTA LEPORINA*.—A melanic example, the forewings entirely black, the hindwings darker than in the type, bred from south Essex, 1905. Also a gynandromorphous specimen of *AGROTIS PUTA*, by Mr. A. J. Willsdon. *January 16th, 1906*.—EXHIBITS. —*ARCTIA VILICA* VAR. *KONEWKAL*.—A ♀, together with its progeny, from Sicily, April, 1905, by Dr. Chapman. *HYBRID NYSSIA ZONARIA* × *LAPPO-NARIA*.—A ♀, one of 17 bred this winter, no ♂ having appeared, Mr. A. W. Mera. *EPUNDA LICHENEA*.—Larvæ bred from ova laid by a ♀ taken at Torquay; although in the same stadium they varied from light to dark green and brown, Mr. V. E. Shaw. *February 6th, 1906*. —*PRESERVED LARVÆ*.—*Lasiocampa quercus*, with the varieties *callunae*, *sicula*, *spartii*, *meridionalis*. Also, of the mongrels *spartii* × *meridionalis*, *spartii* × *callunae*, *callunae* × *meridionalis*, *sicula* × (*spartii* × *meridionalis*), Mr. A. Bacot. *MISCELLANEOUS LEPIDOPTERA*.—Two hundred species, including *Aporia crataegi*, *Eremobia ochroleuca*, *Phlogophora omphyrea*, and *Cucullia absinthii*, Rev. C. R. N. Burrows. *AMPHIDASYS BETULARIA*.—Progeny from one brood, those fed on willow being brown, those on birch, green, Mr. A. W. Mera. *February 20th, 1906*. EXHIBITS: *NONAGRIA NEURICA* from Mucking, Cambridge, East Kent, and ab. *hessii* from Rainham, by the Rev. C. R. N. Burrows. *NONAGRIA NEURICA*, Hb., *N. DISSOLUTA*, Tr., and var. *ARUNDINETA*, Schmidt, received from Herr Pungeler, of Aachen. Also, specimens of *N. neurica* from various English localities, with the ova, larvæ and pupæ, Mr. H. M. Edelsten. *LEUCANIA BREVILINEA*, including a large specimen closely resembling var. *bilinea*, Mr. Capel Hanbury. *ZONOSOMA PENDULARIA* from Reading, bred, series showing a strong central pink band, also var. *subroseata* from Staffordshire, Mr. W. J. Kaye. *OPORABIA DILUTATA* from the New Forest, the pale form commonly distributed over England; from Epping, generally darker, and with little or no trace of the band on forewings; and from Delamere Forest, still darker, but with the band distinctly marked, Mr. A. W. Harrison. THE IDENTITY OF THE BRITISH *NONAGRIA NEURICA*.—Mr. H. M. Edelsten read a paper on this subject in which he showed that Hübner figured two different species under this name, and contended that the insect at present known to us as *neurica* is really the var. *arundineta*, Schmidt, of *Nonagria dissoluta*, Tr. (= *neurica*, Hübner, figs. 659-661 nec fig. 381 = *hessii*, Bdv.), and that the form known as ab. *hessii* is the type form = *Nonagria dissoluta*, Treitschke.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 8th, 1906*. — EXHIBITS. — *CIDARIA SAGITTATA*. — Preserved larvæ showing their close protective resemblance to the flowers of *Thalictrum*, and noted their proneness to the attacks of ichneumons, Mr. Kaye. *OVA OF BUTTERFLIES*.—Microphotographs of nearly every British species were shown by means of the lantern, Mr. Tonge. *February 22nd, 1906*. — EXHIBITS. — *TREPHEOSIA BISTORTATA*.—First brood captured in the New Forest; second brood, bred; also a DOUBTFUL *DREPANA* bred from oak, which seems to partake of the characters of both *D. binaria* and *D. cultraria*, both by Mr. Goulton.

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WANTED COLEOPHORIDS.—Cases and larvæ, particularly those of the *palliatella* group, with pistol-shaped cases. Any cases found during March and April, would be particularly acceptable, as very little is known of the wintering cases. Records of captures and localities are also of use. I shall be pleased to do what I can in return.—Hy. J. Turner, 98, Drakefell Road, New Cross, London, S.E.

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PARASITICAL DIPTERA WANTED.—Will lepidopterists who may breed any dipterous parasites from larvæ or pupæ kindly forward such as they do not require to me? If so I shall be greatly obliged.—*C. J. Wainwright, 2, Handsworth Wood Road, Handsworth, Staffs.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. March 21st; April 4th; May 2nd, June 6th.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. March 20th, Discussion concerning *Triaena tridens* and *T. psi*, opened by Dr. T. A. Chapman. April 3rd, Contribution to the study of the Microlepidopterous Fauna of the London district, A. Sich, F.E.S.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Meetings:—April 2nd (paper by Mr. R. Paulson); May 7th, Exhibition. Field Meetings: March 25th, Coulsdon (10.25 a.m., Cannon St. S.E.R.). April 29th, Chingford (10.13 a.m., Liverpool St.).

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. March 27th, "Neo-Lamarckism," also Special Exhibition of winter and early spring Moths. April 10th, "A Summer in the High Alps," by S. Austin. May 8th, "An Entomological Holiday in North Cornwall," by L. Sabine. Walking tour, April 13th-16th, Slough to Berkhamsted.

Lancashire and Cheshire Entomological Society.—Royal Institution, Liverpool. March 19th; April 16th. Field Meeting, June 16th, to Prestatyn. Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained.

Birmingham Entomological Society, Norwich Union Chambers, Congreve Street, at 8 p.m.

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Part IV contains, in addition, the conclusion of the chapter "Obtaining Eggs of Butterflies" and part of another, "Butterfly Larvæ and their Moultings." It also contains the completion of the study of AUGIADES SYLVANUS, the genus URBICOLA, and the first part of a comprehensive study of the species URBICOLA COMMA, considered under the following headings: "Synonymy," "Original Description," "Imago," "Sexual Dimorphism," "Genital Organs," "Variation (including a summary of the forms occurring in the Palæarctic area)," a critical review of the "European" forms, the "Eastern" forms, and the "Southern" forms, etc. A plate illustrating the eggs of Thestorids and Lycænids with this number. Parts V and VI conclude the study of URBICOLA COMMA and CYCLOPIDES PALEMON.

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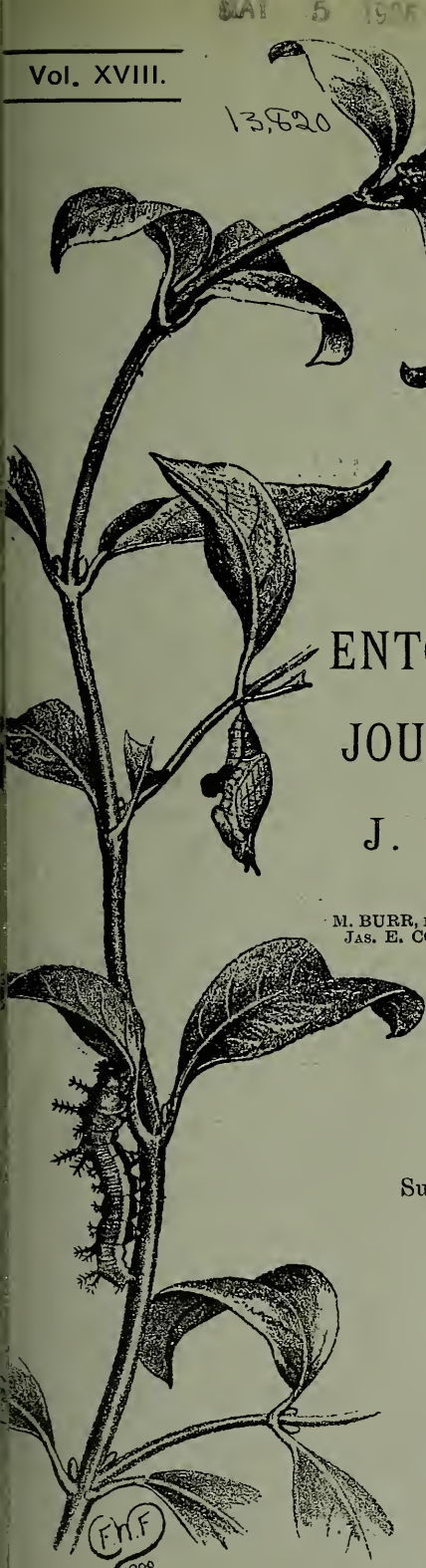
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Oporabia christyi, Prout : A distinct species.

By J. E. R. ALLEN, M.A.

Oporabia christyi is described by Mr. L. B. Prout (*Ent. Rec.*, vol. xi., p. 122) as an aberration of *O. dilutata*, with the remark that it "seems inclined to form a local race in some places." The description is as follows: "Pale grey or dirty-white, glossy, weakly marked, central spot of forewings extremely small, second line angulated almost as in *O. autumnata*, Bkh., and *O. filigrammaria*, H.-S." It is figured in *Entom.*, vol. xxxiii., pl. ii., figs. 7 and 8 (March, 1900), with some further remarks, in the course of which Mr. Prout says "At one time I fancied it might be a distinct species." I have had the opportunity of studying this form at Enniskillen somewhat minutely for some seasons past, and I am strongly of opinion that it ought to take rank as a species. The evidence of its specific distinctness falls under three heads: (1) Difference in markings in the imago. (2) Extreme localisation. (3) Fidelity to type. I shall be able to state the evidence more fully at the end of this article, after presenting all the data which I have been able to obtain as to its general characteristics, variation, habitat, etc.

Mr. Prout's description, quoted above, stands as the original diagnosis of the species. I may here add that its most striking features are—smaller size as compared with *O. dilutata*: pale clear ground colour, especially in the female, as compared with the corresponding local form of *O. dilutata*; tendency of the transverse lines to group themselves into bars, a bar of two lines within the central spot, and a bar of three lines outside it; tendency of the lines in the male to become obliterated, except on the costa, inner margin, and nervures; wide curve of the outer line round the central spot; glossy and rather fragile general appearance. In some respects it is intermediate between *O. dilutata* and *O. autumnata*: e.g.—ground colour, *O. dilutata*, dingy brown-grey, *O. christyi*, clear grey or straw-colour, *O. autumnata*, silver-grey (this distinction is clearly seen in Irish specimens of *O. christyi*, but not in those from the south of England); outer line, *O. dilutata*, often curved inwards to touch central spot, *O. christyi*, curved or obtusely-angled outside central spot, *O. autumnata*, bent at a right angle outside central spot. Mr. Prout has pointed out to me another characteristic of *O. christyi*, viz., the arrangement of the dots on the margin of the hindwings. In *O. dilutata* they are uniform along the whole margin; in *O. christyi* they are most conspicuous as three pairs of dots towards the tornal end of the margin, the apical portion being often almost plain. In this respect also *O. christyi* resembles *O. autumnata*, but the character is not constant, as a few of the most distinctly marked *O. christyi* have the dots along the whole margin.

VARIATION.—*O. christyi* varies in ground colour, and intensity and position of the transverse lines. The pale grey is, sometimes in the male, generally in the female, tinged with straw-colour. At Epping a form occurs in which the whole of the wing area has the appearance of having been washed over with a brownish tinge, the transverse lines being sometimes partially blurred. This form also occurs occasionally at Enniskillen. It does not merely represent the extreme limit of gradual divergence from the type in the direction of infuscation, for in that case we should find it less common than the less extreme forms;

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on the contrary, it represents a distinct type round which the individuals tend to group themselves, the intermediate forms between it and the type being less common. I propose to name it *ab. oblita* (n. ab.), which may be described as:—

Ab. oblita, n. ab.—*Alis anticis haud paulo obscurioribus, quasi linearum transversarum colore oblitis.*

As regards intensity of the transverse lines; in the male they are usually rather faint, especially that portion of the outer line nearest the central spot, and, in some specimens, they are so faint that they can only be traced on the costa, central nervure, and inner margin. In the opposite direction of variation, the transverse lines, though never very dark, are often distinctly traceable through their whole length. In the female, the transverse lines are usually very distinct, and grouped into conspicuous transverse bars. Some prettily marked Enniskillen specimens have the ground colour quite pale and the bars very dark and distinct. As regards position, the bars tend to approximate to each other. This form of variation is shown in its incipient stage on the nervures near the inner margin, but, occasionally the two bars entirely coalesce and swallow up the pale median area and central spot, producing a form which corresponds with *O. dilutata* *ab. latifasciata*, Prout. I have one male specimen which combines these three tendencies of variation, darkening of the ground colour and approximation and intensification of the transverse bars, the result being a light brown ground colour with darker brown broad median band. Another specimen has a narrow median bar including the central spot, and bounded by a lighter area on each side, as if the encroachment of the light areas had compelled the two bars to retreat towards each other till ultimately they coincided on what ought to be the pale median area.

SEXUAL DIMORPHISM.—At Enniskillen, there is a great difference between the sexes, the markings being more conspicuous in the most faintly marked females than in the most distinctly marked males, and much more conspicuous than in the Rannoch females represented in *Entom.*, xxxii., pl. ii. In *ab. oblita* the male has a decidedly blurred appearance, but, in the female, if the ground colour is dark, the markings are darker, and still distinct. I have, however, one female, a very small captured specimen, which strikingly resembles the male in markings—pale grey, with transverse lines hardly visible except on margins and nervures. In *ab. oblita* at Epping, to judge from the few specimens I have seen, the female preserves the outlines of the bars distinct in spite of the darkened ground colour. At Rannoch, the female more nearly resembles the male, the transverse lines being not very dark, and sometimes blurred as in the male. I have also two rather indistinctly marked females from Oban.

LARVA.—I cannot distinguish the larva from that of *O. dilutata*. There is the green form without dark markings, and the red or purple form with hardly any suggestion of green, and there are all the intermediate forms, and these may all occur in the same brood. I once thought I had discovered that the dark markings in *O. christyi*, where they occurred, were always smoky-black and not red. I am now sure that this is not so, for I have had many red-marked *O. christyi* larvæ, but I still think that the black-marked form is commoner in *O. christyi* than in *O. dilutata*.

FOODPLANTS AND HABITAT.—*O. christyi* is a woodland species, but appears to be very fastidious in its choice of habitat. At Enniskillen I know of two localities for it; in one it seems to be attached to beech, and in the other to beech and elm. Mr. E. A. Cockayne has beaten the larva from elm at Rannoch (*Ent.*, xxxix., p. 55). Mr. Prout speaks of its attachment to birch. I have bred a few from supposed *O. autumnata* larvæ taken on elm and willow (and possibly birch), but these may have been stragglers from the neighbouring beeches. In another place I once took four specimens, very late in the season, on fir-trunks and branches. I do not think this indicates any attachment to fir, since many species, including *O. autumnata* (and *O. filigrammaria*), seem to regard fir-trunks, when available, as an eligible resting-place. Probably the specimens were stragglers from some colony hard by, the headquarters of which I have not yet discovered. I should put down beech and elm as the favourite foods, with alder, birch and willow as occasional substitutes. I frequently rear the larvæ from the egg on hawthorn, but have never taken them wild on either oak or hawthorn.

LOCALITIES.—*O. christyi* was first named from specimens taken by Mr. W. M. Christy, at Rannoch, where it appears to be common. I have specimens from the neighbourhood of Oban. In Ireland it is common, but very local, near Enniskillen, and Mr. Kane has it from Killarney and Sligo (*Ent.*, xxxiv., p. 85) and from Tullamore (King's Co.) (*teste* Mr. Prout). Mr. Prout has specimens from Epping Forest, and has seen others from Surrey and Sussex, from various parts of Germany, and from Prague. Probably when it comes to be recognised it will be found to be very generally distributed.

SPECIFIC DISTINCTNESS.—As already stated, the evidence for the specific distinctness of *O. christyi* falls under three heads: (1) *Difference in markings in the imago*.—This is not very striking. Most of the males might easily pass muster in a series of *O. dilutata* as only slight casual aberrations. The most striking characteristic, the wide curve of the outer line round the central spot, is indistinct or absent in some males, owing to the faintness of the transverse lines. Nevertheless, I think that after a season's acquaintance with the species in its natural haunts, and breeding it from the egg, one may begin to feel fairly confident of being able to distinguish it, provided the specimens are fresh. Certainly, I would rather have to sort out a box of *O. christyi* and *O. dilutata*, than a box of *Cidaria truncata* and *C. immanata*, or of *Anthrocera lonicerae* and *A. trifolii*. About the females there is not much difficulty, for the transverse lines are nearly always distinct, and the curve of the outer line round the central spot is easily observed. The form of the female with the bars united might possibly escape detection if it occurred singly, though even then I think the clearness of its ground colour and the arrangement of the lines would cause suspicion. (2) *Extreme localisation*.—Of this I have already spoken, under the heading of habitat. My acquaintance with *O. christyi* dates from the year 1900. In that year I was sending some of my Enniskillen Oporabias to Mr. Prout; among them was one which had come out among my *O. autumnata* from larvæ beaten from alder, and which, I supposed, must be *O. autumnata*, though a peculiar form; also three captured specimens, which I had at first passed over as *O. dilutata*, but which, on closer examination, seemed almost as

near to *O. autumnata* as to *O. dilutata*. Mr. Prout pronounced all these four specimens to be *O. christyi*. Fortunately, I remembered the exact spot where I had captured the three specimens—a row of beeches near a lake in a private demesne near Enniskillen. The bred specimen came out among larvæ beaten from alders on the margin of the same lake. The following autumn I tried the beeches, disturbing the moths by day from the lower branches. I soon found I was in the right place, for the great majority were *O. christyi*, with only a sprinkling of *O. dilutata*. Further experience extended the locality somewhat, but also showed its limits. Some solitary beeches on rising ground adjacent to the original locality produced *O. christyi*. A continuation of the row of beeches produced a few *O. christyi* late in the season of 1904, though previously the specimens taken in this place had all been *O. dilutata* (I think these *O. christyi* must have been stragglers, which, late in the season, had wandered away from their headquarters). I have bred a few *O. christyi* in different seasons from supposed *O. autumnata* larvæ, taken near the lake above mentioned; in some cases these have been detected in the larval state by their smoky black markings. Larvæ beaten from the same beeches have produced more *O. christyi* than *O. dilutata*: and a few larvæ from sallows near the lake have produced all three species, *O. christyi*, *O. dilutata* and *O. autumnata*. A few elms growing in the same neighbourhood have produced chiefly *O. christyi*, in both larval and imaginal states. Hawthorn and oak in the immediate vicinity of the *O. christyi* ground have never produced anything but *O. dilutata*. For several seasons, the locality described above was the only one in which I could find *O. christyi* with any certainty. In October, 1905, however, I tried another locality—a similar row of beeches in the same demesne. I soon found that it was common there, and, in the course of three or four visits, I beat out from these beeches about 40 specimens, of which only one was *O. dilutata*, and all the rest *O. christyi*. The above facts are sufficient to show the extreme local isolation of *O. christyi*. To summarise the argument, *O. christyi* occurs constantly in two areas, the first not more than a quarter of a mile in length, the second less. A few specimens taken at a distance from these areas indicate a probable third locality. Except in these three places, I have never found a single *O. christyi*, though I have been working for *O. dilutata* and *O. autumnata* all over the district. (It may here be remarked that whereas *O. christyi* and *O. autumnata* confine themselves very strictly to their special areas, *O. dilutata* is almost ubiquitous, but seems to be partially ousted by the other species from their special areas. There is always a chance of its turning up among *O. christyi* and *O. autumnata*, but it is not common.) (3) *Fidelity to type*.—This argument is so conclusive that a very brief statement of it will suffice, *O. christyi* breeds absolutely true. I have reared some eight or ten broods *ex ovo*, both from captured females and from bred females paired in captivity, and from these I have not bred a single specimen of *O. dilutata*. I have also reared some broods of *O. dilutata* and have never found *O. christyi* among them.

HYBRIDISM.—*O. christyi* pairs readily with *O. dilutata* in confinement, and the progeny are fertile. I have obtained both pairings, ♂ *christyi* × ♀ *dilutata* and ♂ *dilutata* × ♀ *christyi*. Some of the offspring might pass for *O. christyi*, and some for *O. dilutata*, but most of them partake about equally of the external characters of both.

They exhibit all the tendencies to variation which occur in the two species. I do not think *O. dilutata* and *O. christyi* ever pair in a state of nature. In the few doubtful specimens which I have taken at large, the difficulty in determining the species has seemed to be due merely to their bad condition. I have failed in a few attempts to pair *O. christyi* and *O. autumnata*.

Trumpet-hairs on the pupa of *Chrysophanus virgaureae* var. *miegii* (with plate).

By DR. T. A. CHAPMAN.

These figures of the hairs of *Chrysophanus virgaureae* are from a pupa of the var. *miegii*, reared from the egg by Mr. Hugh Main, from eggs I brought from Spain. The special hairs might, most properly, in this instance, be called "umbrella" hairs. They are, as usual, most numerous near the spiracles and towards the latter segments, but appear to exist over most of the abdominal region. The photograph by Mr. F. N. Clark is from the pupa, undisturbed, and the hairs, taken in profile without any squeezing, twisting, or distortion from mounting in any way. It shows well the long narrow pedicel and the flat umbrella-like top. The form, like an umbrella or mushroom, seems to include a lower surface spreading out from the stalk, and a separate dome-like top, the latter studded with raised points, but I have considerable doubt whether this is so, and I think the top is really centrally depressed, and that it is, in fact, merely the upper side of what, on the other view of the structure, I have called the lower surface. They appear to be 0.06mm. in height, and nearly the same in diameter. The other figure is from a drawing from a specimen mounted on a slide, the whole of the difference between the two figures is not due to distortion in mounting, but hairs were selected for drawing, which showed more variation in size and outline. They show better than the other figures, the form and distribution of the surface spicules, and also confirm the idea that the structure is really of "trumpet" form, and that there is no top apart from the expansion of the sides of the hair. The drawing shows the relation, or rather want of relation, of the origin of the hairs to the fine network of ribbing, and the knobs at their points of intersection already noted in other species.

Success to Entomology.*

Before actually dealing with the subject of the toast I should like to ask the members of the Leicestershire Society two questions, (1) What has entomology done for you since I was last in Leicester? (2) What have you done for entomology? I take it that entomology has done much for you, that it has taken you out of yourselves, made you happier men, that it has been the medicine that has taken off the hurry and worry of everyday life, that it has provided the mental food that has satisfied and balanced your physical state, for we have it on excellent authority that "man doth not live by bread alone," that, in short, you

* Report of a speech made at the Annual Dinner of the Leicestershire Entomological Society, when Mr. G. B. Dixon, F.E.S., proposed the toast of "Success to Entomology," and called upon Mr. Tutt to reply to the same. Mr. Tutt's speech is here given.

and I are the better for having been entomologists, better in health, better in mind, better in an adjustment of the things of this world in their proper perspective, for, after all, this is really the factor that goes for much in an intellectual hobby, *viz.*, the levelling up, as it were, of the mental faculties to compete against the strain and stress of everyday life. Such was, no doubt, the view of Wordsworth, when he wrote—

“ If thou art worn and hard beset
With sorrow that thou would'st forget,
If thou would'st learn a lesson, that will keep
Thy heart from fainting, and thy soul from sleep,
Go to the woods and hills, no tears
Dim the sweet look that nature wears.”

But this after all is only the beginning of entomology. The mind like the grosser appetite grows with what it feeds on. The mental position of the child is not that of the youth, nor that of the youth that of the mature man. We have a certain temperament or we should not become entomologists. Do we advance along the line our temperament has marked out for us or do we fall back? There is no such thing as standing still; in every branch of scientific study we must either go on or fall back.

Scientific study! Yes, that is the evolutionary outcome of entomology as a hobby well done. The desire to know, the desire to discover, to pierce the hitherto unknown, to bring into one's immediate surroundings the mental atmosphere of pleasure in knowledge, in discovery, in settling and solving hitherto unsettled and unsolved facts of nature, in impregnating as it were those similarly constituted to oneself with the feeling that this after all makes life worth living, that man, indeed, must have mental as well as physical food. The suggestion, therefore, is after all, that something shall come out of entomology, something that we ourselves gain in the pleasure of getting, something that the world at large gains from our work, for he alone truly lives who does his best work for himself and others. These, I take it, are among the factors that have changed hobbyists into scientific men, that have indeed led all our scientific men along the paths of discovery—love of work for its own sake, a desire to do this work as well as it can possibly be done.

Fifty years ago the collection and orderly arrangement of insects were considered to be largely the be-all and end-all of entomological science. Many a man in those days got his F.R.S. on work of this description. With the advent of Darwinism the science of entomology underwent a tremendous change; the biological outlook became so enlarged, the problems for solution so varied, that biologists turned round to see what practical means could be adopted, what experiments could be made, to test, and prove or disprove, the theories advanced to account for the phenomena that were being investigated, and it was soon found that insects afforded the best means of accumulating facts bearing on many intricate biological problems, not only because they were easy to manipulate, but because the rapidity of their development enabled one to obtain an accumulation of facts in a minimum of time. Hence biological entomology has taken a high, and deservedly high, place in the scientific world; but its exponents on really scientific lines have been few. It is, indeed, marvellous that so few of the well-

educated, intellectual, men who have patronised entomology, have not worked along paths, in which, whilst getting a maximum of pleasure for their work, they would, at the same time, be pushing to its utmost capacity, the science that should be the natural logical outcome of their labours. This is the ideal, perhaps, yet it is strange so few reach it; it is quite certain that more could. Men now-a-days have not time. What a scathing sarcasm on this is the fact that these same men who excuse themselves thus, chortle with satisfaction, when, as men of the world, they advise their friends that, if one wants a job done, it must be given to a busy man. It does not pay, wails another, and the old cry rings in one's ears—Man shall not live by bread alone. I wish to drive home to my friends here the logical conclusion of their work, work in the field, work at home, *viz.*, that the proper record of their observation and study, pushes on the wheels of knowledge, and, therefore, of science, and that the failure to do this leaves them, perhaps, with a feeling pleasurable to themselves, still a selfish pleasure in which none but themselves can have a share. I do not wish to depreciate this self-satisfaction which, indeed, is necessary to the true inward craving of the naturalist. He must still desire, when at work, freedom from interruption, the—

“ Mossy cell,
Where he may sit and rightly spell,
Of every star that heaven doth shew,
And every herb that sips the dew.”

To be of use to science, we want largely the temperament of the hermit, but this nowadays is not enough; we also want the knowledge of the work done by our fellow men, and the more we find our heaven in the one, the more certainly shall we unselfishly appreciate to the full the blessings of the other. For, after all, and in spite of this, man is by instinct a gregarious animal, and the blessings conferred on us by societies like this cannot be gainsaid; at meetings like this we recognise to the full our humanity in spite of our work; it girds us for greater achievement and deeper mentality.

There are, however, two classes of people who puzzle me beyond words, when one is considering the advance of any scientific subject, entomology not excepted. One is represented by the man who, with little time (or little capacity, for usually the terms are convertible or synonymous), fancies that no one should go ahead faster than himself. Such are everywhere, they gird at the detail of observations, at the rapid increase of facts, at the change of a name, at the presentation of a fresh view of their subject. Life is too short to stop for them, they must be left behind. The other is the class that goes ahead so fast that its members lose all sense of proportion of their own work, and publish their crude ideas, because they cannot wait to clear away the facts from the verbiage, and are too busy to strip the results of their observations from the mixed mental medley that has accompanied the observations. For some little time past, the *Transactions* of our leading Entomological Society has not been altogether free from these crudities—doubtful facts, hazy generalisations, will o' the wisp figments of the imagination, superficial as they are wordy. Against this sort of scientific entomology we have to defend ourselves, or estimate it carefully at its proper value. It is also a sign of the times, in certain high quarters to see in the ethics of insects, a symbol of the ethics of the human, and in the

æsthetic instincts of the butterfly, signs of the æsthetic instincts of man. It leads somewhere one supposes, but truly where I know not.

But, after all, the biological possibilities of entomology, stripped of all these extraneous frills and furbelows, are at each man's hands, and entomology still remains the fair handmaiden of biological science, the science by which, some day, we hope to know more about ourselves. The airy clouds must not be allowed to hide the figure within, nor to be mistaken for that figure. Each of us must try to push the sum of knowledge a little bit forward, recognising fully at the same time, however, how little in the course of a human life each one of us can do; yet certain that each can leave behind some message that those who come after us may know that he has lived worthily, usefully and well, free from petty jealousies, and with a whole-hearted desire to learn the truth, to hand on the truth.

Such I take it are some of the possibilities of entomological science. We may not all be a Réaumur, Linné, Latreille or Darwin. We may all follow in their footsteps if we never reach their high estate. Let each one see to it that he does what he can; helps all he can. And if, really, the mentality of a man is such that it soars no further than the serene simple-minded pleasure of childhood; if, with increasing years he never attains or wishes to attain the mental power of youth or mature age, there is much to be said for him. He can still—

"Wander away and away,
With nature the dear old nurse,
And she'll sing to him night and day,
The songs of the universe;
And whenever the way seems long,
Or the heart begins to fail,
She'll sing a more wonderful song,
Or tell a more marvellous tale."

Entomological Scraps from a Lepidopterist's Note-book during a month's sojourn in the North of Scotland in the Summer of 1905.

By JOHN E. GARDNER.

Compelled to give up the use of the microscope, I can take no part in the solution of problems bearing on minute details of structure, etc., which our entomologists are at present revelling in. I envy their revels; but here I am, obliged to own myself—a "mere collector." So be kind, Mr. Editor, and consign this scrap to the waste-paper basket, if you think there are none other of my genus, who love collecting as a pastime and are all the better for it, who admire the insects and delight in making such observations as can be made with no other assistance than a pair of wide-opened eyes. The evening of July 27th, 1905, found my two lady companions at King's Cross, settling themselves, their very humble servant, and other impedimenta, in a corridor compartment, thoughtfully reserved for our sole use. Somewhat worn-out with plenty of work in town and not too much rest, after a prolonged and refreshing sleep of 14 hours, only disturbed by an occasional invitation from my companions to wake up and admire the glorious views on the Highland railway, I arrived in Forres as fit as a fiddle on the morning of the 28th. Only one thought was worrying me, I was without my chum, and felt that my entomological experience and brain was 600 miles away, working in another corner of our glorious island.

A hasty attention to the inner man, a rapid extrication of entomological outfit and we were off for our first exploration. No *Erebia aethiops* (*blandina*) and a sunny day! Nothing but a few *Hypsipetes sordidata* and *Eupithecia tenuiata*. In the evening too, nothing to fill a collector with enthusiasm; *Leucania impura*, *L. lithargyria*, *Charaëas graminis* and other commoners with Eupithecias, including *E. ab. oxydata* at flowers; and, at sugar, more commoners in *Xylophasia monoglypha*, *Triphaena pronuba*, *Apamea didyma*, *Noctua baia*, *Graphiphora augur*, *Aplecta nebulosa*, and *Miana strigilis*. Still these were in plenty, and, in this particular, it was scarcely like the experiences of 1902 on the same ground, when my friend and I were delighted to take, on one memorable night, *Apamea didyma*, *Graphiphora augur* and two *Xylophasia monoglypha*—the best evening in three weeks' stay as far as sugar went.

But, in 1902, from August 5th to August 22nd, *Plusia bractea* was plentiful at flowers; these scraps will not record a single *P. bractea* in 1905 (July 28th to August 25th). Forres is an exceptionally exasperating place, judging from my own experience and that of friends better qualified to speak than I am; still it has occasional pleasant surprises. What one expects is seldom taken, but something else turns up to gladden the eye. By-the-bye, sober Scotchmen will advise one not to go to Scotland in odd years for certain insects, or in even years for others. Southerners seem to find collecting at Forres usually odd; but, in my very different experiences in 1902 and 1905, the Scot may well see a corroboration of his even and odd idea.

Other collectors had been to Forres and apparently gone away disappointed. What shall I do? Shall I slip back to the far south? The morning of the 29th, when a cycle ride to the Culbin Sands gave me nothing but one black *Apamea didyma* with *Charaëas graminis* hanging intoxicated on the roadside ragwort was not promising. I had hoped to disturb *Triphaena subsequa* and *Actebia praecox* from the clumps of overhanging marram grass on the sandhills, but saw neither, though several visits were made. I wonder if there are more extensive sandhills than these round our coasts. I have seen none. Particularly weird they are too; by optical delusion they appear much higher than they really are, while a flock of sea-gulls settled provoked the expression of surprise, "What are those horses and humans doing in this out-of-the-world spot?" The nervous man and the man of imagination who knows the tales of these hills should not alone venture to cross them by night. Still on several nights (August 1st-15th) the rush-blossom down in the hollows furnished me with a goodly number of fresh *Agrotis cursoria*, *A. tritici*, and *A. restigialis* (*valligera*) in fine variety, while sugar on August 15th, at the edge of the sandhills, produced *Cosmia paleacea*, *Noctua dahlii*, *Dyschorista suspecta*, etc. The cycle was my sole companion on most of these visits, five miles' lonely walk after a hard night's work not being sufficiently alluring. The cycle is a great acquisition at Forres.

Sugar at Forres on the 29th attracted my first *Noctua depuncta* (I began to think Forres would suit me) and in increasing numbers this insect came till I find, under date August 23rd, "*N. depuncta* present in abundance, though many now getting worn." *Leucania conigera* was on, and so were *L. impura*, *L. pallens*, *Apamea didyma*, *Noctua xanthographa* (fine black forms), *Graphiphora augur*, *Xylophasia monoglypha*, *Triphaena pronuba*, *T. ianthina*, and other pests which

continued during my stay, while fine forms of *T. comes* tempted one to take more than a slow setter could manage. So, varying forms of *T. comes* were taken and supplied with a pot of jam, in order to obtain ova for forcing during the dull months of winter. *Noctua umbrosa* and *Chariclea umbra* seemed to prefer ragwort, while forms of *Hypsipetes sordidata* and *Cidaria immanata* made a pretence of settling on the treacle trees. A night stroll inland on the 30th showed *Chariclea umbra*, *Noctua umbrosa* and *Miana literosa* with *Eupithecia subfulvata* busy at flowers, while *Ellopia prosapiaria*, *Melanippe montanata*, and *Larentia olivata* were on the wing.

On July 31st, *Erebia aethiops (blandina)* was on the wing in numbers in the Altire Woods, and a strip of rough ground between wood and road on the way to Dunphail was alive with this butterfly. Common Geometers—*Larentia olivata*, *L. caesiata*, *Hypsipetes sordidata*, *Larentia didymata*, *Ellopia prosapiaria*, and *Campptogramma bilineata* were readily disturbed. From this date dusking amongst the alders or shaking trees by day generally produced aberrations of *Melanthia bicolorata*, viz., *plumbata* and some other very attractive forms.

An entomologist from a neighbouring county, coming to spend the Bank Holiday week-end at Forres, the monotony of collecting alone was broken. Together we climbed the giant spruce-trees in the Altires, for the cones containing larvæ of *Eupithecia togata*. The experience that my chum and I had in 1902 was repeated. We could find no small cone-bearing spruces, nor trees near the open, that swept the ground with cone-covered branches. So we were compelled to attack the giants growing thickly together, tall as church spires, with cones in plenty, but only at the very top. This is capital collecting for the ambitious; with luck and pluck, one arrives at last where only squirrels, crossbills, *Eupithecia togata*, and *Coccyx strobilella* have been before. Now clasp the trunk, which has become very delicate, with both legs and one wrist, and while reaching all round for the cones with the free hand, keep your weight as nearly to the centre as possible. Do not trouble to labour at the cones where frass is not seen protruding, and if the whole green top snaps off, why then—you will never collect *E. togata* again. With raw wrists, scratched faces, disarranged clothing, covered with grime and resin, a very few trees safely circumvented, and we are ready to flop down on the cool, soft moss, too interested in our own comfort to notice that we are crushing the "Lady's tresses," which grows so luxuriantly here. [Philistines deep down in the moss, think:—Lucky we were once bird-nesters. Glad we are not yet too old to climb a good one. Grateful to those who do the indoor donkey work, who furnish us with "Practical hints," and every possible information, and expect nothing from us but an occasional locality, date, or comparison, leaving us all our leisure for real enjoyment. Shame that we are not ashamed to enjoy ourselves while others are doing so much for posterity. Chacun à son goût.] This climbing experience was repeated two or three times during the month, and became my measure of improving physical fitness. On August 7th, *Citria fulvago* and ab. *flavescens*, with intermediates, appeared at treacle, and continued to the end of my sojourn. Next day, was made one of the several visits to the Findhorn sand-hills, where the same insects were taken, as at the Culbins, with the addition of one or two *Agrotis agathina*. Again no *Triphaena subsequa*, no *Actebia praecox*.

My Scotch friend has gone; but a day or two later an entomologist from Middlesborough arrived, and for a fortnight we were David and Jonathan. On the 9th, *Cosmia paleacea*, *Noctua dahlia* and *Amphipyra tragopogonis* come to swell the crowd at sugar, while *Dyschorista suspecta* on the 11th, and *Hydroecia micacea* and *Calymnia trapezina* on the 12th, join the convivial party; Geometers, including *Melanthia* var. *plumbata* and *Cidaria immanata* are sipping with their heavier comrades, one fine large dark ♀ *M.* var. *plumbata* being specially noticeable. From the 13th, *Polia chi* was to be found on trunks and walls, and the stone ladies and gentlemen attached to the beautiful ruins of Elgin cathedral seemed specially attractive to this insect. *Halia vararia* was also seen about in the evening. On the 14th, *Hydroecia nictitans* appeared at sugar with *Luperina testacea*, and the first and only *Plusia chrysitis*. A drive inland on the 16th, took us to a wood where *Cidaria populata* appeared in all grades of variation, while the *Hypsipetessordidata* here were interesting forms. An earlier visit would have found both insects in better condition. Sugar, on the 16th, introduced *Citria flavago* and *Cleoceris viminalis*. A fine fresh *Aporophylla nigra*, and a couple of *Noctua glareosa* newly out on the 19th, were followed by *Hadena protea* and *Anchocelis litura* on the 21st. During the whole period, insects came freely to sugar.

We did very little work among the larvæ; there was too much weather to make beating or sweeping an agreeable occupation. Spruce-cones infested with *Eupithecia togata* and *Coccyx strobilella* were plentiful for those who cared for the collecting; larvæ of *Chariclea umbra*, of all sizes, as usual, were on rest-harrow, while the imago was to be seen at flowers; and *Galeopsis tetrahit* furnished larvæ of *Emmelesia alchemillata* to the patient. The peculiar crowding together of species could scarcely fail to strike one accustomed to the more leisurely succession in the home counties.

The difference between the collecting in 1902 and in 1905, was very marked. In 1902, the *Plusias* were represented by many *Plusia bractea*, *P. chrysitis* and *P. pulchrina* at flowers. In 1905, one *P. chrysitis* at sugar was the only representative. Many other insects taken in 1905, did not show in 1902, and *vice versa*. Nearly all the insects common to the two years were taken in 1902 at flowers, in 1905 at sugar. In 1902, I took no *Noctua depuncta* (my companion took two), no *Cosmia paleacea*, no *Noctua dahlia*. In 1905, these insects were extremely common.

The Lepidoptera of the Central Spanish Sierras (*with plate*).

By W. G. SHELDON, F.E.S.

(Concluded from vol. xviii., p. 60.)

We started at 4 a.m. on July 25th for Albarracin (see *Ent. Record*, xiv., pl. iii, for map of district), arriving on the afternoon of the next day. Passing through Madrid, we had several hours to spare in the middle of the day, which we intended to spend in seeing the picture galleries. The natives, however, thought otherwise, and we found all the exhibitions closed, and the people having their noonday sleep. The temperature in the shade was somewhere on the wrong side of 100°, and the streets were deserted. The only recourse appeared to

be to go to the public park, lie on a seat, and take a siesta also. We noticed in the public gardens great quantities of *Dryas pandora*, which were certainly more abundant here than we saw it elsewhere in Spain. The picturesquely situated and quaint old town of Albarracin, is one of the best known, by repute, of all Spanish localities for butterflies—though, probably, but few have actually seen it—for Canon Zapater and Herr Korb have explored the district for many years, and the result of their work is embodied in their *Catalogo de los Lepidopteros de la Provincia de Teruel*. In this list the number of species of Rhopalocera given as occurring is 110, to which I can add one, *Thymelicus acteon*, of which I obtained one example at Puerto de la Losillo. We collected at Albarracin from July 27th to August 5th, and found very good quarters with Señor Jose Narro, who has accommodated most of the few lepidopterists who have visited the district, and I should strongly recommend anyone intending to follow in our footsteps, to arrange to stay with him. We found both Señor and Señora Narro most obliging and anxious to make us comfortable, and as Señor Narro knows the haunts of most of the butterflies occurring in the district, his assistance in this respect alone is most valuable. I may mention here that everything in the houses in this part of Spain is most scrupulously clean, the people very polite, hospitable and obliging, and the charges seem ridiculously low to us. This is, of course, owing to the scarcity of money, and the consequent low price of all items of living. The staple industry of the district is agriculture, and the standard rate of pay for a day's work in the fields, sunrise to sunset, is, in the case of a man, one peseta, or about 7½d., in the case of a woman, half a peseta, or less than 4d. The difficult meal for an Englishman in Spain, is breakfast. A Spaniard's idea of this is, a small cup of thick chocolate, about a sixth of a pint, drunk without milk, and as a solid, a small sweetcake or biscuit. This did not apply at La Granja, where everything, so far as living is concerned, is much the same as in France; but at Albarracin, we were warned by Dr. Chapman what to expect, and, accordingly, we took a supply of tea and cocoa from home, and, in passing through Madrid, laid in a supply of tinned butter, milk, jams, potted meats, etc., and with a spirit lamp I had, we arranged to get our own breakfasts. This arrangement is infinitely preferable to depending upon one's host, who does not understand our ideas on the point, and it is quite impossible to make him grasp them if you do not speak his language fluently. It is also impossible to obtain either butter or cows' milk, or the provisions we took with us, in the district. We were agreeably surprised to find Miss Fountaine staying at Albarracin for the summer, and we were able to do some collecting together. We were also fortunate in making the acquaintance of an English gentleman, Mr. J. S. Gibson, who was staying there, and who was most kind to us; he was able to give me much information respecting the history of the interesting old town, and also most kindly assisted us by interpreting our wishes to the natives, none of whom spoke anything but Spanish.

The most prolific locality near Albarracin, is down the gorge of the Guadalaviar, some three miles below the town; unfortunately, this is not altogether a desirable locality, for one has to walk nearly this distance down the hot road, before any ground worth working is

reached, then this part of the valley is absolutely without springs, and, consequently, one has to carry one's supply of drinking water in the knapsack, and this is usually exhausted long before you wish to return. It is true there is plenty of water in the river, but this is quite unsuitable for drinking according to our ideas, though the natives think differently, many of them filling their vessels in the river *below* the town, in preference to the splendid springs which well up there out of the rock; they say the river water has more taste, and judging from what one sees put in at Albarracin, no doubt they are right. Almost the first butterfly we took down this gorge was the fine *Satyrus priouri*, occurring only in Europe in the Albarracin district, and the magnificent female form, *uhagoni*, which, I believe, is not known elsewhere; the type was abundant, in good condition, and easily captured, and of the var. *uhagoni* we soon obtained all we required; with these were flying *Satyrus jidia*, a small form, with undersides not so bright as French specimens, and approaching the northern African form; *S. statilius* var. *allionia*, likewise a small form; *S. alcyone*, *S. circe*, *Hipparchia semele*, *Pontia daplidice*, and *Colias edusa*. It was a new experience with me to see flying on the same ground *Gonopteryx rhamnii* and *G. cleopatra*, *Melitaea phoebe* var. *oecitanica*; fine *M. didyma*, with very distinct red females; *Dryas pandora*, amongst a bed of thistles, down by the river; *Dryas paphia* var. *immaculata*, settled on brambles, *Erinophela jurtina* var. *hispulla*, with remarkably ochreous undersides, and *Pararge megeera*; *Coenonympha dorus* was in swarms, *Epinephele ida* and *E. pasiphae* had been common, but were nearly over; *E. tithonus* was still in good order and plentiful; *Polyommatus escheri* and *P. bellargus* getting over; the striking albino var. *nivescens* of *P. hylas*, had been abundant, but was getting worn; *P. corydon* var. *hispana*, common, and in good condition, with one specimen of var. *corydonius*; *P. admetus* abundant, and with a certain proportion of the form *rippertii* amongst them; *Pyrgus proto* and *Erynnis alceae* were abundant and fresh, and with these flew a form of *Hesperia alveus*.

We walked several times up to the Puerto de la Losillo, amongst the hills, some four or five miles from Albarracin, there we found *Argynnis adippe* var. *chlorodippe* and *A. aglaia* abundant, with numerous females; *Satyrus actaea*, not infrequent, a small form with the underside not so strongly marked as Digne specimens; with this were flying plenty of *S. briseis*, and *S. alcyone*; *Melanargia iapygia* var. *cleante* and *M. lachesis* were in plenty, and var. *catalauea* occurred; *Polyommatus hylas* var. *nivescens*, was here in much better condition than in the Guadalaviar gorge, but it was past its best, and I had to work hard to get a few decent examples. I understand from Miss Fontaine that, at the end of June, and in early July, it had been abundant, and that she, with ourselves, had only seen this form of the species in the district. Of *Parnassius apollo* I only found two examples, neither of them good, and of *Brenthis hecate*, only one specimen was netted, evidently it was over. Just before we left Albarracin, *Colias hyale* became common at Losillo; I had not seen it elsewhere in Spain during our visit. One or two examples each of *Papilio machaon* and *P. podalirius* var. *feisthamelii* were seen, or netted, but we were evidently between the broods.

I collected one day in what is known locally as the "Vega." This

is a valley, the first large one to the left of the road, about a mile below the town. There is a certain amount of wood and bush in the lower portion of this valley, and I found here *Epinephele ida*, *Satyrus statilinus* var. *allionia*, and *Pyrgus proto* much more plentifully than in any other locality. Higher up, the valley divides into two gorges; by taking the left one, and climbing the hill at the right side of it to avoid the precipices, which here block the way, you come in due course to the higher portion of the gorge, where a fair number of specimens can be obtained. Here *Satyrus actaea* was abundant, *Polyommatus damon* also, and I obtained one or two good *P. hylas* var. *nivescens*, and other species. There is in this ravine a beautiful spring of water.

One of the most difficult species to obtain in the district is *Erebia zapateri*, which, of course, is not to be found elsewhere, it occurs at Puerto de la Losillo, and more plentifully in the Bronchales district, some twenty miles to the northwest. The difficulty consists chiefly in hitting off the time of emergence, without either making a very long stay, or missing most of the other desirable species occurring in the district. *E. zapateri* appears in some years as early as July 20th, in others, not until well on in August, and always from a fortnight to three weeks later than the majority of other species one wishes to obtain. Thus, to make sure of getting everything, one ought to devote the whole of July and the first half of August to the task, and this is not always, or usually, convenient.* We left *E. zapateri* as long as possible, for the season was described to us by the natives as a very late one. We had to leave for home August 10th, and accordingly arranged with Señor Narro to take us in a donkey cart—the only conveyance available—to Bronchales on the 7th, and to show us the best ground to work; we were here confronted with a difficulty which afforded us anxious consideration. It appears that Bronchales has attained some note of late years on account of its mineral springs, the inhabitants of the neighbouring towns, including Valencia, resorting thither in summer to drink the waters, and we were informed, that, in all probability, rooms could not be obtained, but that we might get a share of a common room; and that it was the custom for visitors to each take with them a sack; this sack was filled at Bronchales, by your host, with straw, and then placed with the head to the wall, in a large room, in which you slept, in common with from twelve to twenty other people, each one on his sack. This was embarrassing, not to say impossible, from our point of view, for, though the Spaniard of these parts is cleanly in his person, his ideas of ventilation are not what we have been accustomed to. He simply stops up any crevice or opening in his bedroom with the idea of excluding the flies, certainly a great nuisance in these regions, and, of course, thereby prevents any circulation of air, and what the atmosphere of the rooms, it was suggested we might be fortunate enough to share, was like, can be imagined, but one would hardly care to try the conditions; fortunately we were spared this experience, for, on enquiring if we could not obtain accom-

* The plate, which is from a snapshot, was taken from what was described to us as the best ground for the species, and, at any rate, it was abundant there. *Erebia zapateri* flies in the clearings in the foreground, accompanied by *Parnassius apollo*. Bronchales is over the hill in the centre of the picture. There is a wonderful view in the background, over a great extent of parched-up plain, with a sierra showing on the horizon, which, I suppose, would be in the neighbourhood of Calatayna.

modation at some adjoining village, we were told that possibly we might, at Noguera, some four miles on the Albarracin side of Bronchales. Señor Narro was lucky enough to manage this for us, but it may not fall to the lot of future pilgrims to Bronchales to be so fortunate. I should, therefore, strongly suggest to them the desirability of not omitting to take their sacks. At Noguera we were accommodated at a farm, the house was, for the district, a good one, and new, but the arrangements were somewhat quaint. The ground floor, as is usual in the neighbourhood, consisted of a stable, fowlhouse, etc.; our quarters were on the first floor, and consisted of two rooms, leading out of each other. The front room had a door opening to a balcony for admission of air and light—there was no such thing as a square of glass in the village—this room had a bed at the rear, and the front portion was used for meals and as a sitting, or rather setting, room. The other room was entirely without window or fireplace, and its only opening was a door leading to the front room; it was also furnished with a bed, and what was more unusual, the walls were festooned with hams and sides of bacon, which gave out a powerful odour. However, it was much better than the sack business, and we were duly thankful, especially when we were presented with the bill. I cannot exactly say how much per head it worked out at, because the board and lodging of the donkey was included, and I do not know on what basis this was calculated, but the total charge for board and lodging three men and the aforesaid donkey, came to a little less than five shillings per diem.

We left Albarracin on August 7th, at 4 a.m., arriving at Noguera shortly before noon; during this afternoon we worked along a path over the hill at the back of the village, leading to a large and wide valley beyond, which ran to the west of it; for the first two miles or so the path traversed thickets of cistus, of many acres in extent; after passing these, we got to the pine forest with which most of the neighbouring mountains are clothed. In the pine-wood we came across several of the magnificent local form of *Parnassius apollo*, *Aporia crataegi* was also frequent, of large size, and easily taken for *P. apollo* on the wing. The wood swarmed with Argynnids—*A. adippe* var. *chlorodippe* and *A. aglaia*, and I took here the only *Dryas paphia* var. *valezina* I saw in Spain. Our best discovery, however, was the lovely *Polyommatus corydon* var. *corydonius*. Dr. Chapman, with ourselves, had found this rare at Albarracin. In walking through the cistus thickets, we had each netted odd specimens, but, in crossing the valley just at the entrance to the pine-wood, Mr. Tylecote came to an open flowery slope, simply swarming with this lovely form, they were literally in hundreds, and one could catch half-a-dozen at one sweep of the net. *P. var. corydonius* is easily discernible from the type in flight, it then appears very near in tint to *P. bellargus*. On this day we did not see *Erebia zapateri*.

The next morning, August 8th, we were up betimes, and, under the guidance of Señor Narro, made for a mountain midway between Noguera and Bronchales; we began to think that after all we should not see the much desired Erebiid, but our fears were groundless, for, before even we got on the mountain my friend netted a fine male, this was about 8.30 a.m.; we did not see any more for an hour or so, when several turned up. There was, thereafter, no particular scarcity, at any rate we obtained about two dozen fine specimens each during

the day; one only of my captures being a female. We again came across *Parnassius apollo*, this time in some numbers, and both sexes. Amongst other species I captured a female example of *Melitaea parthenie* var. *varia*. The usual Argynnids were abundant, and Señor Narro found a larva of *Graellsia isabellae* feeding upon pine. This fine Attacid, for which Bronchales is famous, was formerly very common there, but it has since become scarce, and he informed me he had not seen one previously for several years.

On the 9th, we had to leave for Albarracin in the afternoon. During the morning we worked the same ground as on the previous day, we soon obtained as many ♂ *Erebia zapateri* as we desired, and I succeeded in finding two more females. I also found three larvæ of *Graellsia isabellae*, a specimen of *Brenthis hecate*, and some more *Parnassius apollo*. *Erebia zapateri* was this year abnormally late, it certainly was not out at Losillo on August 5th, though Miss Fountaine found it there on the 8th. All the specimens we saw at Bronchales were in perfect condition, and I do not think any had emerged previous to August 7th. *E. zapater* has been said to have a preference for *Arctostaphylos uva-ursi*, which it is suggested is its foodplant. I do not think this is the case, at any rate, most of the specimens I took were flying in grassy clearings in the pine forest, and I should infer that the foodplant, like that of so many if not all of the genus, is a species of grass.

August 12th found us back again on the old ground at Guéthary. The species we found there on our previous visit were either gone or going, all the *Enodia dryas* were now females, and very few of them were good. *Coenonympha oedipus* and *Heteropterus morphheus* were quite over, except for an odd worn example or two of each. A second brood of *Melitaea cinaria* was coming out and flying with a second brood of *Brenthis selene* and *B. dia*, of *Hipparchia arethusa* a few females only were worth taking. Second broods of *Everes argiades* and *Lampides boeticus* were in evidence, the latter of small size. Does *E. argiades* feed upon *Erica*? I saw a female apparently ovipositing on this plant, although I could not find the ova. *Epinephele tithonus* was in swarms, and I secured an example with a bleached superior wing amongst them. Only two *Colias edusa* were seen, but one was a fine fresh ab. *helice*. I saw one worn *Dryas pandora*. I left for home on August 13th, arriving on the following day.

The typical form of *Acronycta leporina*.—Does the ab. *bradyporina* Tr.=ab. *melanocephala*, Mansb.?

By A. M. COCHRANE.

In a recent number of *The Entomologist*, Mr. W. Mansbridge (1) described a new (!) aberration of *Acronycta leporina*; (2) made some general remarks on the variation of this species.

Of this species there are, according to Mr. Tutt (*British Noctuae*, etc., i., pp. 14-15), two distinct races occurring in Britain: (1) A white form, the typical "miller," Linné's type, described as "alis albis, punctis nigris ramosis." It was described by the late Rev. Canon Smith, as occurring at Marlow, and as being "quite white, veritable millers." It is also Cooke's Loch Laggan form, "beautifully white,

with the characteristic marks dark." (2) A grey form described (*op. cit.*) as very much suffused, with scarcely any trace of the white colour which characterises the type, the colour of the anterior wings of a dark uniform grey, the black markings of necessity less pronounced," etc. This is the form which Prest says "occurs at York, all of the var. *bradyporina*;" Dobrée (*teste* Tutt) says that this form occurs throughout the East Riding, and Mr. Tutt notices it from Essex and the New Forest; whilst Cooke (*teste* Tutt) records it from Liscard, a locality not far removed from Liverpool; it is further the form that Newman figures, and refers to var. *bradyporina*, St. (*British Moths*, p. 251, fig. 2). It is, one supposes, also the lower insect photographed by Mr. Main, and badly reproduced, to illustrate Mr. Mansbridge's remarks (*Ent.*, xxxviii., fig., p. 289).

The actual range of these two forms in the British Isles must be remarkably patchy; it never seems to have been worked out, but, from Cooke's remarks (*suprà*), and specimens under examination, one would suppose that the grey form must occur over the greater part of the Lancashire and Cheshire district under consideration, although Mr. Mansbridge asserts that "the typical insect occurs everywhere in North Cheshire and South Lancashire where birch is found, but does not seem to be abundant in any of its localities, among which may be mentioned Delamere Forest, woods near Hale Bank, Knowsley Park, and the mosses between Prescott and Ormskirk;" yet this must include the district where Nicholas Cooke obtained the "grey" form; it is this form that he contrasts with the white Scotch (Laggan) form; and it is surely this quasi-"local type" that (in one of its palest forms) Mr. Mansbridge figures and describes. It is also quite true that it "is scarcely darker or more irrorated with black than specimens from other parts of England," *e.g.*, Essex and the New Forest (*teste* Tutt), but surely var. (or "ab." *in sens. strict.*) *melanocephala* is a suffused form of this grey race, with which, indeed, Mr. Mansbridge indirectly shows it to be connected by intermediates.

It has already been noted that Newman calls this grey form *bradyporina*, Stephs., whence no doubt the name obtained general currency in Britain, and Staudinger in his *Catalog*, 2nd ed., p. 77, quotes it as *bradyporina*, Tr. (non Hb.) and diagnoses it as "alis anterioribus grisescentibus," and gives as its habitat "north Germany," etc. Mr. Tutt, following out the popular idea, and Staudinger's lead in this matter, includes all the specimens of the grey race under the name *bradyporina*, Tr. So far our knowledge is clear, but now that Mr. Mansbridge has selected an extreme example of the grey form for special treatment, and named it, I wish to ask whether this extreme form is not really *bradyporina*, Tr., and whether the race itself ought not to be called var. *grisea*.

Mr. Mansbridge describes his aberration thus :

Differs from the type* as follows: Forewings in both sexes strikingly suffused with fuscous, and with all the normal markings intensified; thorax black, abdomen blackish, not so dark as the thorax; hindwings as in the type†.

Treitschke describes (*Die Schmett. von Europa*, v., pt. 1, p. 9) *bradyporina* as follows:

* We must assume this to mean Mr. Mansbridge's type, *i.e.*, the grey form, not the Linnean type which he seems not to know, nor to have looked up the description.

† The hindwings in the Linnean type are almost pure white.

The head and thorax dirty white, mixed with many grey-black hairs; the antennæ much blacker, the usual white powdering almost entirely absent; the abdomen darker grey; the forewings covered with numberless dark fuscous scales. The markings vary considerably, but beyond the more or less distinct serrated line towards the outer margin, the powdering forms a darker band, extending to the black and white fringe, which is likewise suffused with deep fuscous atoms.

Treitschke's short Latin diagnosis, "the forewings irrorated with fuscous and with black ramose markings and spots," appears to be almost Mr. Mansbridge's own description, and when his further note that "the thorax is dirty-whitish, mixed with abundant grey-black hairs and the abdomen deep grey," is also considered, one is driven to the conclusion that Treitschke's description of *bradyporina* tallies much better with the representation of the new aberration (*Ent.*, xxxviii., p. 290, fig. 1) than with the grey race, var. *grisea* (*suprà*) = *bradyporina*, Stphs. (*teste* Newman), represented *op. cit.*, fig. 2. The fact that Mr. Mansbridge's specimen, having a "black thorax," is named "*melanocephala*" may also be noted.

I do not pretend to any deep knowledge of the subject, but that so eminent an entomologist as Mr. Mansbridge should fail to focus the Linnæan type, and fail also to refer to the readily obtainable literature on the subject, before describing a new aberration of a well-known species puzzles me much.

[Since the above was written, Mr. Mansbridge has corrected his note to the following extent: "I should have pointed out that the form of *A. leporina* met with in Lancashire and Cheshire is referable to var. *bradyporina*, Tr. In calling it the 'local type,' I quite overlooked the above fact. We do not get the typical *leporina*, in which the ground colour is pure white with scarcely any black dusting. The variety *melanocephala* is quite distinct, and not to be confounded with *bradyporina*, the most striking difference between them being the black thorax, and darker coloration of the former" (*Ent.*, xxxix., p. 19). It will be seen that Mr. Mansbridge here, by implication, corrects the statement that "the typical insect occurs everywhere in North Cheshire and South Lancashire," etc., but it does not touch the point of my suggestion, *viz.*, that if the darker examples of the grey race are to be separated, then they will have to be called *bradyporina*, Tr. (= *melanocephala*, Mansb.), and the race must be called var. *grisea*, n. var.—A.M.C.]

Some Forests in Anhalt.

By M. GILLMER.

Many British lepidopterists seek their specimens in Scandinavia, Spain, Italy, the mountains of France, Switzerland, Austria, and even farther afield. Few appear to come to this part of Germany, in spite of the prolific nature of the hunting-grounds, the cheapness of living, and the ease with which lodgings may be obtained. It is with the view of attracting British lepidopterists that I send herewith an account of the principal entomological hunting-grounds in Anhalt, lepidoptera and coleoptera both being abundant. The localities which have the best reputation are as follows:—

(1) "KLEIN ZERBSTER BUSCH"—the forest near the village Klein-Zerbst (district Cöthen). (2) "OBER- UND UNTERBUSCH"—the Upper and Lower Forest situated on both sides of the turnpike-road from Aken to Dessau, near the river Elbe. (3) "KÜHNHAUER FORST"—the

forest near the village Kühnau, situated on the above-named turnpike-road. (4) "MOSIGKAUER HAIDE" = "DESSAUER HAIDE" = "LINGENAUER HAIDE"—the great forest between Dessau, the capital of Anhalt, and the two villages Mosigkau and Lingenau (Dessau district). (5) "DIEBZIGER BUSCH"—the forest near the village Diebzig (district Cöthen). (6) "LÖDDERITZER FORST"—the forest near the village Lödderitz, belonging to the kingdom of Prussia (province Saxony), and extending to the river Elbe.

Except the Upper and Lower Forest, and the forest near Lödderitz, which belong to the kingdom of Prussia (province Saxony), the other named forests belong to the duchy of Anhalt; they are either forests of the state or private forests belonging to the duke. One is not allowed to enter them without a license from the ducal hunting office. The eastern part of the "Mosigkauer Haide" belongs to the inundation region of the river Mulde; the rest of the forest is pretty dry, but it contains many drinking-places for red and black game, and numerous glades (here named "*Hutungen*") timbered with many isolated large old trees (especially oaks). The northern part of the "Mosigkauer Haide," in earlier times being wettish, has been now drained by the drainage-works of Dessau. The forest is composed of oaks and pines in particular, yet there are also numerous beeches and birches. One finds many extremely prolific places for moths, but for these one must stay in the villages of Kochstedt, or Törten, or Lingenau. The forest of Kühnau and the forest of Klein-Zerbst are similar to, but smaller than, the last described. The forest of Diebzig is crossed by the brook Taube, and, in some places, the old bed is well marked. The Upper and Lower Forest, the last of which extends along the river Elbe, the first on the other side of the turnpike-road, are more natural and wild than the forests of Anhalt. Above all, the fallen wood is much less cleared up than in Anhalt; great and small branches cover the ground. Occasionally the lower woodlands of the Lower Forest are flooded by the high-water of the river Elbe, and for this reason there are no ants in it. Oaks and elms, with willow, aspen, alder, ash, birch, etc., form the principal part of this forest. Large meadows and ridings ("*Schneissen*") pass through it. There is no interference with the entomologist in it. The Upper Forest is never flooded by the water of the river Elbe; its ground is more dry, and the principal part of it is composed of pine, but there are some thickets and plantations of oaks and alders. This forest also contains several water-meadows (here named "*Lachen*"). All these forests provide excellent sport for lepidopterists and coleopterists. It is easy to find lodgings everywhere. If further information should be desired, a note should be sent to me at 4 Elisabethstrasse, Cöthen, Anhalt, Germany.

Coleophora lixella.

By HENRY J. TURNER, F.E.S.

COLEOPHORA LIXELLA.—To Mr. Eustace Bankes I am again indebted for his kindness in making me acquainted with another local species, for, on April 21st, 1904, he sent a small batch of larvæ of the grass-feeding *C. lixella*, which he had procured for me in the Isle of Purbeck. He noted that they were at that time of very various sizes, and that they were in no way particular about the kind of grass upon which

they fed. They were found feeding on various stunted species of grass which were growing on the exposed chalk hillside. For packing for the post, *Dactylis glomerata* was used, and upon that they were feeding as well. The food usually given in the books is *Holcus lanatus*, of which some was sent in the tin box. Examples of the larva were given to Mr. Sich, and he tells me that they fed readily on the very common *Poa annua* as well as *Anthoxanthum odoratum*. Mr. Sich also called my attention to the fact that the larva of this species had four pairs of abdominal claspers like *C. caespitiella*. The larvæ, which I had in my glass-topped observation boxes, were extremely restless, seldom remaining long on the food, although it was frequently renewed. About the beginning of May, I noticed one larva had fastened its case lengthways along the edge of a blade of grass, the mouth opening being securely closed up, no doubt on account of the recumbent position exposing the contained larva too much. A slit had been made along the case, and the larva was in the act of fastening the cuticle of the inner portion of the leaf outside the gap it had made. The two edges of the gap were fastened down on the cuticle, the outside of the cuticle becoming the inside of the case. The whole case thus enlarged in diameter was afterwards cut out, but, for a day or two, the ends remained very irregular, from the, as yet ill-formed, new mouth and anal opening, and from the projection beyond of the irregular ends of the piece, I was going to say inserted, but I should rather say placed on the gap. By May 21st, one was beginning to pupate, and by May 30th, many had pupated, but some were still feeding very slowly. Although great care and supervision was taken, I did not rear one; a good proportion died, or were destroyed by ichneumons, while those which did pupate were not strong enough to go through the last and greatest series of metamorphoses. On the occasion of the South London Entomological Society's Field Meeting at Reigate, this year, June 24th, 1905, Mr. Sich met with examples of the imago. On that outing, I was unable to collect, but the following week I went again to Reigate and managed to capture several imagines in good condition. Neither of us have succeeded in obtaining ova.

On the protective taste of pupa of *Papilio (Laertias) philenor*.

By CECIL FLOERSHEIM, B.A., F.Z.S., F.E.S.

That *Papilio philenor* is protected by its taste from insectivorous birds in its imaginal state, is, I believe, well known. It is one of the *Aristolochia*-feeding butterflies, and, according to Weismann, is imitated on account of its inedibility by the black variety of the female of *Papilio turnus*. Other sexually dimorphic Papilios, such as *Papilio asterias* (whose representatives further north are alike in the general coloration of both sexes) have probably become so for the same reason. An experience of mine with the pupa of *P. philenor*, this autumn, makes me think that the protective taste of the species may extend to this period of the insect's existence also. On leaving the country for London, early in October, I placed thirty-one pupæ of *Papilio asterias*, and twenty-nine of *Papilio philenor*, in one of the special cages which I have had constructed for keeping pupæ in out-of-doors. This I suspended from the roof of my butterfly-house, about four feet from

the ground, and about three from the roof, whose covering had been removed for the winter. The sides of my butterfly-house were, however, still entirely covered with gauze and wire netting, and the door was securely fastened with a padlock, so that no one, except the gardener, who had the key, could enter during my absence. Before leaving, I had covered the suspended cage with threads of black cotton, at intervals of about two inches apart, and, as a further precaution, put brown paper over all the openings (there are openings for the imagines to emerge from), with the exception of one, which I left with only the black thread over it, as I had a specimen of *Vanessa io* hibernating in the cage which I wished to leave free to escape. On returning to the country for a few days, late in November, I examined the cage. The brown paper and black thread were seemingly undisturbed, but the hibernating *V. io*, and all the pupæ of *Papilio asterias*, with the exception of two, had disappeared. These latter were hidden under the pupæ of *Papilio philenor*, which were quite untouched. The cage is three feet from any bush or tree, and is suspended by single strands of steel wire, in addition to this, it has an overhanging roof with projecting eaves like a miniature Swiss chalet, and flat sides, so that I do not think it possible for my unknown enemy to have been a mouse, which at first I thought likely. My gardener, who was as surprised as I at the disappearance of the pupæ, says that he had seen gray tits inside my butterfly-house, and I have no doubt that these were the culprits. I examined the *P. philenor* to see whether they show any marks of birds' beaks, but could find none. With regard to insect enemies, I have found that *Papilio philenor* enjoys no immunity. Predaceous beetles belonging to the *Carabidae* attack and devour its larvæ, and also its pupæ before the chitinous envelope of the latter has hardened. In one instance, I found even a pupa which had been exposed for some days to the air, the victim of an attack of this kind.

VARIATION.

VARIATION OF *POLIA CHI*.—I was much interested in Mr. Harrison's note on the variation of *Polia chi*, Linn. I quite agree with him as to Nenthead, Cumberland, producing light specimens. The great Carlisle locality, Barrock Fell, very much resembles the latter locality, and is a very bleak place. I have seen some hundreds of specimens on this ground sitting on walls and loose pieces of quarried stones, and all were of the light form. *Bryophila perla*, also, is very light in this locality. In August, 1896, I spent about a week in the Birtley district, and took a great many specimens of *P. chi* ab. *olivacea* and ab. *suffusa*. I did not notice the light form at all, except at Windynook, Felling-on-Tyne. At Chester-le-Street I saw hundreds of specimens of *P. ab. suffusa*, and also a number of *P. ab. olivacea*. The latter were in the proportion of about one in every four. All were taken on a moss-grown wall running towards Newcastle-on-Tyne. At Windynook, the type and ab. *suffusa* were in about equal proportion, but, curiously enough, my darkest forms came from here. One ♀ was quite black, with a few greyish speckles on the forewings. The body was also black, but lighter between the segments. The dark aberrations are very scarce in Cumberland. I have taken four ab. *suffusa*, all in the Brampton district, where Mr. Harrison says only the type occurs. I

knew a locality in Carlisle which produced a few dark aberrations, but it has been since built on, and I know of no other Cumberland locality where any dark forms occur.—G. WILKINSON, 52, Bromley Street, Workington. *March 19th, 1906.*

NOTES ON COLLECTING, Etc.

QUERY RE THE HYBERNATION OF ARGYNNIS NIOBE, LINN.—Are any of your readers able to tell me whether *Argynnis niobe* hibernates in the egg or larval stage, and, if as an egg, when it hatches, or, if as a larva, when it recommences to feed?—M. GILLMER, 4, Elisabethstrasse, Cöthen, Anhalt, Germany. *March 17th, 1906.*

DOUBTFUL RECORD CONCERNING THE OVIPOSITION AND TIME OF HATCHING OF THE EGG OF PARNASSIUS APOLLO.—I have just noted (*Entom.*, xxxix., p. 85) a statement by Mr. G. H. Gurney that (1) a ♀ *Parnassius apollo* laid an egg on a plant of saxifrage at his feet (at Kalpetran, in the Visp Valley, in July, 1905), and that (2) another ♀ from the same locality laid a quantity of fertile eggs which successfully hatched in due course. These facts are, it seems to me, exceedingly important, the egg-laying of *P. apollo*, and the probable use of the abdominal pouches thereanent having been the subject of more than one note during the past few years, in the magazines, and, secondly, the inference that the eggs of *P. apollo* obtained hatched some time say in 1905 (at any rate some date before the writing of the article which was published on February 1st). One wishes for the observations of entomologists on both the following questions. (1) Are the eggs laid on plants of saxifrage? (2) Can eggs of *Parnassius apollo* be made to hatch, say before mid-January, anywhere in confinement? Such records as these are unsettling to one's mind.—J. W. TUTT.

NOTES ON A VISIT TO ARNSIDE.—I spent a few days in July last (from the 15th to 20th) in this interesting locality, and, although my work was almost confined to searching trunks, etc., by day, and dusking in the evening; yet a fair number of species were taken, among which were the following: In the pine woods on the Knott, *Macaria liturata* on the trunks and twigs; on some rough stony ground just below, *Melanippe galiata* and *Gnophos obscuraria* were disturbed, and *Anaitis plagiata* were taken plentifully, mostly sitting on twigs of juniper, with their wings partly wrapped round the twig. At dusk, in the same place, *Eupithecia sobrinata* were common. Dusking in the lanes produced *Acidalia incanaria*, *Eupithecia subfulvata* and *Axylia putris*, and in one of them, *Hellinsia osteodactyla* and *Adkinia bipunctidactyla* were taken, the former plentifully, but very local, the latter only two. During the day *Polyommatus astrarche* were common, but worn. At the "Fairy Steps," *Satyrus semele* were plentiful, and odd specimens of *Chrysophanus phlaeas* and *Zephyrus quercus* were seen. On the walls, *Nudaria mundana* occurred. A search was made for *Asthena blomeraria*, but it was apparently over (I had previously taken it on June 24th). Of larvæ, only a few *Eupithecia renosata* and *Dianthoecia carpophaga* were taken, on both *Silene inflata* and *S. maritima*, and an odd specimen of *Pharetra rumicis*. WITHERSLACK.—A run over to Witherslack on the 18th, produced *Plebeius aegon* in plenty, with the ♀s much suffused with blue; *Selidosema plumaria (ericetaria)* numerous, but rather *passé*; and

a few each of *Nemeophila plantaginis*, *Carsia imbutata*, *Coenonympha typhon* var. *rothliebii* (WORN), *Ebulea crocealis*, *Phibalocera quercana* and *Crambus culmellus*.—W. G. CLUTTEN, 132, Coal Clough Lane, Burnley. *March 25th, 1906.*

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

THE FOODPLANT OF *MELITÆA MATURNA*.—In answer to Mr. W. H. St. Quintin's enquiry (*antea*, p. 80), I am able to inform him that eggs of *Melitæa matura* laid upon the underside of the leaves of ash (*Fraxinus excelsior*) emerged on June 16th. The larvæ were placed on an ash-plant, when they spun small silken webs, gnawed the epidermis from the leaves, so that only the framework remained; they then attacked a fresh leaf, continuing to eat in the same manner. On examining the bush, on which they were feeding, on August 29th, they seemed to have disappeared, but after a little search, they were discovered collected near the root of the bush, and hidden under the grass there. They were then about half-grown, and hibernated in this manner.—M. GILLMER, Anhalt, Cöthen. *March 17th, 1906.*

COLEOPTERA.

CARIDA AFFINIS, Pk., AN ADDITION TO THE BRITISH LIST.—I have just had the pleasure of reading the admirable vice-presidential address delivered by Mr. Donisthorpe before the Lancashire and Cheshire Entomological Society in December last. I notice that in the list he gives of the additions made in 1905 to our coleopterous fauna, there is a record of the capture of *Carida affinis*, Pk., by Colonel Yerbury, at Aviemore, as I cannot find any notice of this interesting capture in any of our entomological journals, I think it is desirable to draw attention to it, in the hope that coleopterists working in the Highlands this summer may again turn it up.—T. HUDSON BEARE, F.E.S., 10, Regent Terrace, Edinburgh. *March 16th, 1906.*

NOTES ON SCOTTISH COLEOPTERA.—A three months' absence from home during my trip with the British Association in South and East Africa, cut down my collecting in 1905 to very small limits, but the following captures are worth putting on record: On May 6th, at Hawthornden, the following were swept off herbage in the glen of the Esk—*Clinocara tetratoma*, Th., *Trypodendron domesticum*, L., *Phytobius 4-tuberculatus*, F., and *Eusphalerum primulae*, Steph. On May 13th, at Gorsbridge, I beat off birches and willows—*Coeliodes quercus*, F., *Phytobius 4-tuberculatus*, F., and *Malthodes fibulatus*, Kies. On June 6th, *Grypidius equiseti*, F., was swept sparingly off a clump of *Equisetum* growing under a hedge near Linlithgow.—IBID.

SOCIETIES.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*March 19th, 1906.*—MICRO-LEPIDOPTERA OF THE LIVERPOOL DISTRICT.—Mr. Mansbridge read a paper on this subject, dealing, amongst other species, with (1) *Myelois ceratoniae*, its ab. *pryerella*, and an intermediate form; these had been bred from larvæ found in dates purchased in Liverpool. (2) *Dioryctria abietella*, a very dark form captured in Delamere Forest. (3) *Peronea permutana*, bred from Wallasey larvæ. SEMASIA WÖBERIANA.

—A series bred by Mr. G. L. Cox, from larvæ found in cherry-bark at Oxtou. EXOTIC COCKROACHES.—Mr. E. J. B. Sopp, *Nyctibora holosericea* and *Panchlora virescens*, from the ship canal docks at Manchester.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*March 6th, 1906.*—EXHIBITS: *HEMITHEA ÆSTIVARIA (STRIGATA)* from Japan, which were considerably larger than European forms; *THALERA FIMBRIALIS* from central France and Spain, by Mr. L. B. Prout. *HELIOPHOBUS HISPIDUS* taken at sugar and at rest, Torquay, September, 1905, by Mr. V. E. Shaw. Paper: The Rev. C. R. N. Burrows read a paper on *HEMITHEA ÆSTIVARIA (STRIGATA)*, chiefly devoted to a detailed description of the young larva, from which it appeared that this species forms a connecting link between *Geometra papilionaria* and the clothing species *Phorodesma smaragdaria* and *Comibaena pustulata*. *March 20th, 1906.*—EXHIBITS: *PYRAMEIS KERSHAWI*, from Australia, Mr. J. A. Clark. *NONAGRIA DISSOLUTA* and VAR. *ARUNDINETA*, from the Barrett collection, labelled *N. NEURICA*, Hb., Norfolk, Mr. H. M. Edelsten. *ACRONICTA TRIDENS* and *A. PSI*, by Dr. T. A. Chapman, Messrs Bell, Mera, Prout, Riches and Burrows. The series of the first named species from Mrs. Bazett's collection, shown by Dr. Chapman, were pronounced by him to be all *A. psi*, and the series of both species from the Barrett collection, shown as well by Dr. Chapman, also showed some confusion of the two species. The specimens of *A. tridens*, bred by Mr. Burrows at Mucking, were said by Dr. Chapman to be among the darkest he had seen. Paper: Dr. T. A. Chapman read a paper on the "Differentiation of *Acronicta tridens* and *A. psi* in the imaginal stage," in which he stated that the only absolute proof of different identity lay in the dissimilarity of the male genitalia. There were many superficial differences, but all proved unstable, and it was impossible to define any character, or combination of characters, which would enable entomologists to separate the two insects, unless they had specially studied the species. To the trained eye, however, these differences prove almost infallible guides.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*March 17th, 1906.*—EXHIBITS: *MICRODON LATIFRONS*, Lw.—A rare Dipteron taken in the New Forest, June, 1905, Mr. H. W. Andrews. *GYNOPTERYX GLADIARIA*, Guen.—A South American Geometrid, variable series, Mr. L. B. Prout. *PRODENIA LITTORALIS*, Boisd.—The specimen emerged July 16th, 1905, in a breeding-cage, kept for the reception of larvæ found in the neighbourhood, by Major R. B. Robertson, at Boscombe, Hants., shown by Prof. R. Meldola. The species has been twice previously recorded in England, first by Mr. Boden, as a larva feeding in an imported tomato (*Ent. Record*, vol. ii., p. 167), and secondly, by Mr. Gregson, the larva being found in the market-place at Barnsley (*Ent. Record*, vol. iv., p. 20). *ARGYNNIS NIOBE* VAR. *ERIS*.—From the Pyrenees, Cevennes, and the South Tyrolese Mountains, by Mr. H. Rowland-Brown, who remarked that, whereas this and other Argynnis from the mountainous regions of Central France, showed a tendency to maintain constant pale forms, those from the Pyrenees, are generally more lightly coloured, while the high Alpine forms of Central Europe, incline to melanism. MIGRATION OF LEPIDOPTERA.—Mr. H. Rowland-Brown, for Mr. C. O. Waterhouse, read a note on this subject, extracted from the *Madras Journal of Literature and Science*, for 1886-87,

respecting the power of butterflies to fly against a very strong wind. REST ATTITUDES IN BUTTERFLIES.—Dr. G. B. Longstaff read a paper on this subject, illustrated by specimens arranged upon suitable backgrounds. Dr. Dixey pointed out that Dr. Longstaff's observations demonstrated the fact that there were at least six hours of daylight in which butterflies rest, and are exposed to their enemies. Dr. T. A. Chapman read a paper on "Observations on the LIFE-HISTORY OF *BUCKLERIA PALUDUM*, Zell."—*March 21st, 1906.* EXHIBITS: MALE EXAMPLES OF THE PIERINE GENUS *ERONIA* WITH THE CORRESPONDING FEMALES.—Dr. F. A. Dixey drew attention to the extreme diversity shown by the females in these closely allied species. He ascribed this to the fact that in every instance the female had been diverted from the ordinary aspect of the group by the operation of mimicry either Müllerian or Batesian. *EMMELESIA UNIFASCIATA*.—Two specimens which emerged in August last, from pupæ, which had lain over since the autumn of 1900, Mr. R. Adkin. Of some fifty larvæ, which went to earth then, ten moths emerged in 1901, eleven in 1902, two in 1903, five in 1904, and the two exhibited in 1905. PROGRESSIVE MELANISM OF *HASTULA HYERANA* IN THE RIVIERA.—Dr. T. A. Chapman read a paper on this subject. Mr. G. T. Porritt pointed out that in this case, the tendency could scarcely be attributed to carbon deposits engendered by a smoky atmosphere, while it was a well-known fact that, in some of the most marked cases of melanism observed in Yorkshire, the dark forms of the species, such as *Acronycta menyanthidis*, were found in localities unaffected by smoke.

CURRENT NOTES.

The *Thirty-Sixth Annual Report of the Entomological Society of Ontario, 1905*, is just to hand, and contains a variety of information, more especially referring to economic entomology. Of those not relating to this particular phase of the subject "Butterfly-collecting in Canada," by Mrs. Nicholl, interests us most, whilst "The Entomological record for 1905," a retrospect of the year's work, by Dr. J. Fletcher, makes also interesting reading. This contains, among other references to the literature of the year, a short criticism of Hampson's *Cat. of the Lep. Phalaenæ in the British Museum*, vol. v., containing, Dr. Fletcher says, "the classification of the *Hadeninae* as he (Hampson) understands it," and concerning which the critic notes that "Many species recognised in our lists are included as synonyms of other species; possibly larger series of specimens would enable the eminent author to change his judgment on some of these," and then he drives home the never too oft-repeated warning that "the specific limits of many insects can only be decided after careful breeding from the egg," a little item that our museum lumpers never seem to understand. The Rev. T. W. Fyles indulges in a rosy retrospect of the marvellously advanced state of entomology in Britain in the "forties" and "fifties" of last century. Here, evidently, comparison with its backward state in the Dominion, at that time, must have much influenced the writer's judgment, and certainly to us, who are, as it were, more directly concerned with that state, it would appear that distance has lent a wonderful enchantment to the view. There is much interesting reading and information for

the general entomologist in this volume. We should like, however, to suggest that it is nearly time some of the blocks used to illustrate this issue were burned.

So much interest, both of a scientific and personal character, attached to the dispersal of a collection like that of the late Mr. C. G. Barrett, that we were not surprised to find a fairly large company at Stevens' rooms on March 13th, when the British Macro-lepidoptera were sold. Both private and trade-buyers appeared to be well represented. There seems to be a gradual, but decided increase in the purchases made at Stevens' by dealers. We apologise for the word, which carries to many people a flavour not at all applicable to some of the persons to whom we refer. There must be a large outlet for the insects so bought. It is also the case that trade-buyers purchase the more expensive lots more freely, not always we imagine on commission. The time is still, however, we hope, measurably distant when insect sales will fall into the hands of a ring as so often occurs with books. The prices were fairly high on Tuesday, March 13th, nearly 22000 specimens brought about £245, or nearly 3d. a specimen. The rarities brought full prices, though sometimes looking otherwise, *e.g.*, *Pontia daplidice* for 12s. was really dear, when the specimen was merely a rag; *Chrysophanus dispar*, three to five guineas for a more or less imperfect specimen; *Laelia coenosa*, four specimens for 18s.; two good ones, however, realising 47s. 6d.; three wretched *Agrotis subrosea*, 30s.; and so on. The collection was remarkable as having some representatives of nearly all our rarer species. We may note a few of the lots: Remarkable aberration of *Chrysophanus phlaeas*, 65s.; *Nomialles acis*, 3 for 75s., 4 for 40s.; *Lycaena arion*, 6 for 20s.; a black *Limenitis sibylla*, in shocking condition, 30s.; *Aglais urticae*, aberration, 120s.; *Euvanessa antiopa*, 42s.; *Syrichthus alveus*, 2 for 40s.; *Hyles euphorbiae*, 45s.; *Nola centonalis*, 10 for 42s.; a black *Arctia caja*, 55s.; *Gastropacha ilicifolia*, 16s., 21s. and 26s. each; *Drepana sicula*, 3 for 50s.; *Notodonta bicolora*, 20s.; *Cuspidia alni* (10) and *Hyboma strigosa* (5), for 21s., 21s., 22s., 24s., the *strigosa* being the attraction; *Crymodes exulis*, 3 for 70s.; *Aplecta nebulosa*, 2 black, 21s.; *Luperina barrettii*, poor to bad, 3 lots of 3 each, 45s., 55s., 16s.; *Nonagria sparganii*, lots of 4, 18s. to 32s. 6d.; *Synia muscolosa*, 1, 21s.; *Leucania favicolor*, 20s. to 24s. each; *Xylina conformis*, 30s. to 32s. 6d. for 4; *Cucullia gnaphalii*, 14s.; *Heliothis scutosa*, 22s.; 2 *Cleora viduaria*, 40s.; hybrid *Amphidasys strataria* × *betularia*, 22s.; *Abraxas grossulariata* ab. *varleyata*, 1, 31s. 6d.; *Sterrhua sacraria*, 16s.; *Phibalapteryx polygrammata*, 22s. (for 5).

It seemed like old times to be at an exhibition of the South London Entomological Society again. From our first visit in 1886, when it was held in the little room at Denman Street, to 1906, in the fine room (for this purpose) at Hibernia Chambers is a far cry, bridged over, however, by the fact, that that genial and popular supporter of the Society, Mr. R. Adkin, was, on both occasions, President; Mr. Adkin having reached, as it were, this year his Presidential majority. Many old friendships were renewed and many new ones made; and we trust that the Society will benefit by an increased roll-call. There can be no doubt that the new members will work all the better for being in touch with such a Society.

The exhibitions were, as usual, of the most varied kind. The Hemiptera of Mr. West gained universal admiration, and the Lepidoptera

exhibited by various members were also most interesting. (No doubt a special report of these will be forthcoming.) Photomicrography (Messrs. F. N. Clark and A. E. Tonge) and ordinary photography applied to entomological subjects (Mr. H. Main) were very conspicuous by the excellence of the work shown. Microscopes (Mr. W. West and others), living ants and bees (Mr. Edwards), and other items added considerably to the interest of the evening's entertainment. A series of excellent lantern lectures must not pass unmentioned.

We should be exceedingly glad if any of our readers can give us, before the end of April, or in early May, actual observations on the habits of the imagines of the common species *Hesperia malvae* and *Nisoniades tages*; also any information regarding any habitats for them, either in the British Isles or abroad. We particularly want details referring to the habits of the imagines—(1) When newly-emerged; (2) when flying in the sun; (3) resting-habits when sunning; (4) resting-habits in dull weather; (5) resting-habits when settling down for the night; (6) flowers and plants chosen for resting purposes; (7) habits when pairing and when *in copulâ*. Any details based on actual observation will be extremely valuable. So also will any made through the season on any of our native blues, coppers and hair-streaks.

Part 6 of *A Natural History of the British Butterflies*, etc., was published on March 15th. The completion of the chapter on "The external structure of the butterfly larva," contains many interesting facts relating to the changes in their armature, secretory glands, etc. The systematic portion of this part completes the study of *Urbicola comma*, and commences that of *Cyclopides palaemon*, dealing with its "Synonymy," "Imago," "Sexual dimorphism," "Variation" [a most interesting chapter on the variation of the species (1) in the British Isles, (2) throughout Europe and Asia, (3) in North America], "Egg-laying," "Ovum," "Habits of larva," "Ontogeny of larva," "Larva," etc. The next part will contain the completion of *C. palaemon* (with a full list of localities, dates, etc.); and a consideration of the second subfamily, the *Hesperiniæ*, with an account of the genus *Hesperia* and the species *Hesperia malvae*.

The Rev. C. R. N. Burrows, of "The Vicarage," Mucking, Stanford-le-Hope, writes that he will be deeply obliged for any particulars about *Nemoria viridata*, the species of "Emerald moths" which next occupies his attention. Details as to localities, variation, habits, foodplants, will be most acceptable, as also ova, larvæ and pupæ. He would also value ova of the more local *Acidalias*, for comparison with the *Geometrinae* in that stage, and also as larvæ. Those of our readers who are already familiar with Mr. Burrows' masterly accounts of *Phorodesma smaragdaria*, *P. bajularia*, *Geometra papilionaria*, etc., will, we are sure, give all possible help to complete the series.

On the evening of March 24th, a few friends were invited by Mr. A. Harrison to spend an entomological afternoon and social evening at "Delamere," Grove Road, South Woodford. The guests were received by Mrs. Harrison and Mrs. Main, and a very enjoyable afternoon was spent examining the splendid library and combined collection of Messrs. A. Harrison and Hugh Main. Among other friends present were Messrs. R. Adkin, F. N. Clark, T. W. Hall, W. J. Kaye, Rayward, R. South, H. J. Turner and J. W. Tutt. Supper

was served at 7 p.m., after which was much informal entomological discussion. The party did not disperse till after 10 p.m.

The sale of the collection of the late Mr. W. F. Urwick at Messrs. J. C. Stevens' salerooms, on Tuesday, March 27th, was notable for one or two high prices. A banded male *Dryas paphia*, £8; a dark female, £10 10s.; and an extraordinary hermaphrodite, £13; an ab. of *Vanessa io*, £4 10s.; two aberrations of *Argynnis aglaia*, £9; *Euvanessa antiopa*, £3; a black *Limenitis sibylla*, £4 5s.; *Agrotis subrosea*, 37s. 6d. and £2 5s. each; two *Crymodes exulis*, £5 10s.; other aberrations brought good prices. With some curious exceptions there seemed a tendency for low prices to be given for specimens of species that are almost certainly immigrants, especially if the condition was poor, as *Phryxus livornica*, 8s., *Hippotion celerio*, 15s., *Issoria lathonia*, 6s., *Deiopeia pulchella*, 16s., *Catocala fraxini*, 18s., *Hadena satura*, *Micra ostrina*, *M. parva*, *M. paula*, *Chariclea delphinii*, *Cloantha perspicillaris*, went at about continental prices, possibly with reason. We may note two *Cleora viduaria*, 22s., 24s.; *Chrysophanus dispar*, £2 2s., £4, £4 10s., £5, £5 10s.; an ab. of *Melitaea aurinia*, £3; five *Bryophila impar*, 18s.; four *Tapinostola concolor*, 18s.

Mr. Barrett's collection of African lepidoptera was also sold, undivided, for 34 guineas. His British Pyralides and Alucitides in 33 lots, for £22 17s. Amongst these, one *Botys lupulinalis*, 30s.; two *B. repandalis*, 40s.; one *Myelois cirrigerella* (and others), 24s.; *Epischnia banksiella* (five), *Cateremna terebrella*, twenty (and others), 35s.; *Nephopteryx abietella* (twelve), and *N. splendidella*, twelve (and others), 45s.

The charm of Gilbert White's *Natural History of Selborne** lies in the old-world flavour of the letters and the fidelity of the observations on the scenery and the natural objects that came within his purview. The actual facts recorded as such are of much less importance than the style of the writer, and their scientific accuracy than the particular point of view from which they were noted. The alteration, therefore, in the sequence of this new edition in which one can readily turn up all that the old master wrote on birds, molluscs, insects, plants, etc., takes off a deal of the pleasure found in reading the original, and, although useful in its way, we doubt whether the scientific value, if any, is really enhanced. To those, however, who require such a book, we can recommend this as a careful and accurate work.

* Gilbert White's *Natural History of Selborne*, Naturalists' edition, classified by Charles Mosley. London: Elliot Stock, 62, Paternoster Row, E.C.

Hyères—Les Iles d'Or.

Islands of gold—high battlements of light,

Dreaming on sapphire seas, amid a haze

Diaphanous. Beneath my feet a maze

Of gemmed mosaic, where the cistus white

Shows the earth with limpid chrysolite;

Hedges of rosemary, and upland ways

Thick set with lavender; warm rocks ablaze

With red valerian; and, flashing bright

Among the black-branched ilex, butterflies

Sulphur and scarlet-robed, by poets named

"The Glory of Provence." With such fair dreams

I charm my solitude that darkest seems

Here in our England, when, 'neath sullen skies,

Spring on the threshold lingers all ashamed.—H. R.-B.

(From "*Preludes and Symphonies*.")

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EXCHANGES.—*The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of address" is open free to subscribers so far as there is space available.*

WANTED, for photographing, fertile ova of *P. brassicæ*, *Daplidice*, *Sinapis*, *Hyale*, *Edusa*, *Euphrosyne*, *Latona*, *Polychloros*, *Cardui*, *Rubi*, *C-album*, etc., also fullfed larvæ and pupæ of British butterflies. Will be returned uninjured if so desired, or payment made at current prices.—*A. E. Tonge, Aincroft, Rigate, Surrey.*

WANTED COLEOPHORIDS.—Cases and larvæ, particularly those of the *palliatella* group, with pistol-shaped cases. Any cases found during March and April, would be particularly acceptable, as very little is known of the wintering cases. Records of captures and localities are also of use. I shall be pleased to do what I can in return.—*Hy. J. Turner, 98, Drakefell Road, New Cross, London, S.E.*

Desiderata.—Cicindelidæ (Tiger Beetles) of the entire globe desired, in exchange for insects of North America. I offer many of our rarest species in first-class condition.—*H. F. Wickham, State University, Iowa City, Iowa, U.S.A.*

WANTED.—British and European Tortricids, especially those species credited to both Europe and America in Meyrick's *Handbook* and Staudinger and Rebel's *Catalog*, pinned and set in English style acceptable. Will make liberal returns in any family of North American Lepidoptera named or other orders unnamed.—*W. D. Kearfott, 114, Liberty Street, New York City, U.S.A.*

EXCHANGE.—I am desirous of obtaining butterflies from the Malayan Archipelago, and the Pacific Islands. For such I offer perfect diurnals from North and South America, North American Coleoptera.—*Levi W. Mengel, Boys' High School, Reading, Pa., U.S.A.*

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WANTED.—Parasites from British Coleoptera. Beetles infested with *Gordius*. Any material will be gratefully acknowledged.—*H. St. J. K. Donisthorpe, 58, Kensington Mansions, S.W.*

PARASITICAL DIPTERA WANTED.—Will lepidopterists who may breed any dipterous parasites from larvæ or pupæ kindly forward such as they do not require to me? If so I shall be greatly obliged.—*C. J. Wainwright, 2, Handsworth Wood Road, Handsworth, Staffs.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. May 2nd, June 6th.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial

Street, E., Mondays, at 8 p.m. Meetings:—May 7th, Exhibition. Field Meetings: April 29th, Chingford (10.13 a.m., Liverpool St.).

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. April 26th, "Mosses," Mr. W J. Lucas; May 10th, Lantern Slide Exhibition; May 24th, Collecting Notes; May 26th, Field Meeting at Wisley (L.S.W.R.); June 14th, Exhibition.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. April 24th; May 8th, "An Entomological Holiday in North Cornwall," by L. Sabine. May 22nd, "The Life and Work of Linné," L. B. Prout. May 12th, Excursion to Toothill, near Ongar. June 2nd-4th, Excursion to Lyndhurst.

Lancashire and Cheshire Entomological Society.—Royal Institution, Liverpool. April 16th. Field Meeting, June 16th, to Prestatyn. Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained.

Birmingham Entomological Society, Norwich Union Chambers, Congreve Street, at 8 p.m. April 30th, May 31st.

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Parts I, II, III, IV, V, VI & VII
OF
A NATURAL HISTORY
OF THE
BRITISH BUTTERFLIES

Their World-wide Variation and Geographical Distribution.

(A Text-book for Students and Collectors.)

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

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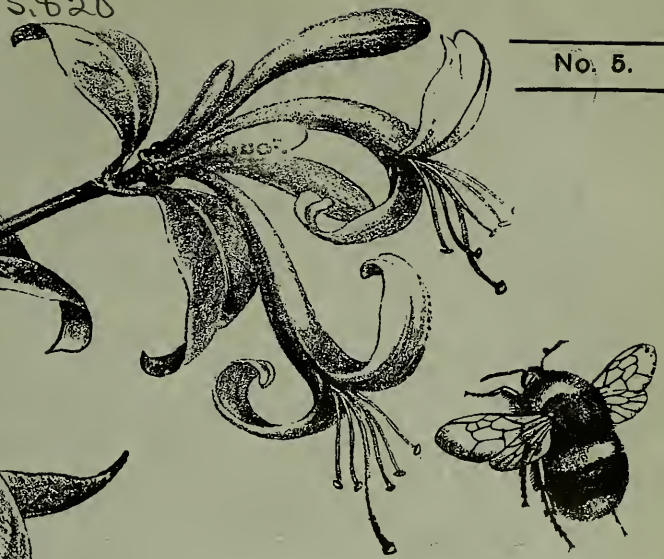
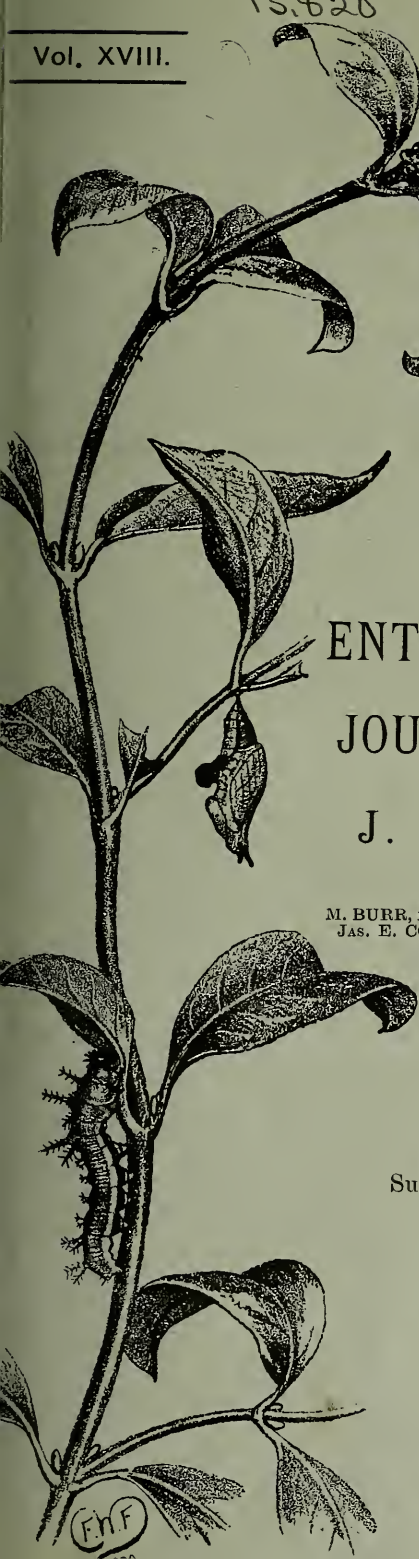
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Butterfly-collecting in Switzerland.

By (REV.) A. MILES MOSS, M.A.,

The butterflies of Switzerland, during the month of July last year, again engrossed my attention; records were made in three different centres, and some 112 species came under observation. In addition, many Heterocera were also noted for the first time. My first chaplaincy was at Kleine Scheidegg, in the Bernese Oberland, situated at an elevation of nearly 7000ft. at the foot of the mighty Jungfrau, and 35 minutes' walk from the Eiger glacier. Reaching Berne on the morning of June 28th, 1905, my observations, as on former occasions, commenced through the window of the railway carriage, whence I noticed a white willow bush largely stripped of its leaves, with apparently some black objects amongst the denuded stems; the train, however, sped by too swiftly to determine whether they were larvæ of *Euvanessa antiopa*. Interlaken was reached about 1 p.m., and, changing, another train carried me to Lauterbrunnen, and yet a third trundled me up the steep cog-railed incline to Wengen, in time for tea. Here I soon turned up many former acquaintances among the lepidoptera, though I am of opinion that the district is hardly as prolific as the Rhone valley and its vicinities. By July 13th, I find from my notes that I had observed 64 species, and many of them in comparative abundance. *Parnassius apollo* and *Papilio machaon* were both common, and one specimen of *P. podalirius* was netted on the road between Zweilütschinen and Grindelwald. *Aporia crataegi* was very abundant, and it was interesting to watch the females depositing their citron-coloured eggs in little upright clusters upon the leaves of sloe and hawthorn scrub. The three common whites were present, and half-a-dozen very acceptable *P. var. bryoniae* were obtained. *Euchloë cardamines* and *Leptosia sinapis* were also present, and one specimen of *Anthocharis simplonia* was seen flying over the moraine by the Eiger glacier. Four larvæ (now healthy pupæ awaiting the return of spring) of *A. simplonia* were taken, feeding on some cruciferous weed at the side of a lane, whilst the species was afterwards observed on the wing between Brigue and Bérisal. All the four species of *Colias*—*phicomone*, *palaeno*, *hyale*, and *edusa* were observed; *hyale*, as usual, being the most abundant. *Gonopteryx rhamni*, too, was seen sparingly. Then, amongst the fritillaries, the following occurred in greater or less abundance—*Dryas paphia*, *Argynnis aglaia*, *A. adippe*, *A. niobe*, *Brenthis euphrosyne*, *B. amathusia*, *Melitæa cinxia*, *M. athalia*, and *M. dictyina*. In this, as in other families, the paucity of the number of species recorded must not, of course, be interpreted as excluding the presence of many others, which quite as certainly occur in the same locality, though, may be, at an earlier or later date in the season. Among the Vanessids were noticed isolated specimens of *Pyrameis cardui*, *P. atalanta*, two or three very worn hibernated specimens of *Euvanessa antiopa*, *Vanessa io*, *Aglais urticae*, *Eugonia polychloros*, and *Polygonia c-album*. No Limenitids or Apaturids were seen, though these turned up in strong force at Les Avants, where I spent the latter part of my holiday. Among the Satyrids were noted *Pararge maera*, *P. egeria*, *Epinephele ianira*, *Enodia hyperanthus*, *Coenonympha iphis*, *C. satyrion*, and *C. pamphilus*. In the genus *Erebia*—*melampus*, *oeme*, *stygne*, *ligea*, *aethiops*, *goante*, *gorge*, *tyndarus*, *lappona*, and, of course, *Melanargia galatea*, in

MAY 15TH, 1906.

profusion. The Coppers were only represented by an abundance of *Chrysophanus hippothoë*, and a couple of worn *C. dorilis*. The Blues included *Lycaena arion*, *Cupido minima*, *Nomiades semiargus*, *Polyommatus corydon*, *P. bellargus*, *P. hylas*, *P. alexis*, *P. astrarche*, and *Plebeius aegon*, and a few specimens of *Callophrys rubi*, and the Skippers included *Nisoniades tages*, *Augiades sylvanus*, *Adopaea flava (thauwas)*, and a few worn *Cyclopides palaemon*. Towards the end of my short stay I found a nest of small *Euvanessa antiopa* larvæ on a willow-tree in the valley near Lauterbrunnen, but not before my restless curiosity had compelled me to return to Berne to see what it was that had stripped that bush by the line side. The journey was made on July 4th, the hottest day that summer, I believe, culminating in a thunder-storm, and I spent rather over seven hours *en route*, and, what is more, I went armed with a ladies' hat-box of large size—a delightful patent-folding thing—which should carry home the prize, when obtained, without crush or injury. I began to get nervous as we approached the town, fearing that the day's quest would come to nothing. However, planting myself at the carriage window, I watched and waited, and once more the stripped boughs were quickly scanned as the train sped by, and once more black objects were detected, but, to my dismay, a small bird was fluttering in their very midst. The line curved from here in a complete semicircle, and another mile brought us to a standstill in Berne station. At a chemist's shop I bought some oil of geranium, which I rubbed over my face to keep the flies off, but which, owing to the excessive heat of the sun caused me, not only to shine, but to smart! I then crossed the great bridge over the river, and made my way with all speed through the town in the direction which I knew must sooner or later bring me to the railway line; and to make a long story short I hit the spot at once, and my efforts were rewarded. There was the white willow bush, or all that was left of it, and there were twenty-seven magnificent full-sized *E. antiopa* larvæ, black as coal, with vermilion spots on the back and red legs, eating voraciously, and moving about with electric rapidity, their movements being accentuated by the heat and brilliance of the day. The hat-box was soon opened out, the bough snipped, and in ten minutes I was marching back to the town to refresh the inner man at the nearest beer-garden, and as proud as "Punch." In the light of subsequent experience I feel that this expenditure of time and trouble has been fully justified by the result, for not only was I able, there and then, with the aid of another obliging chemist, to blow and preserve a larva before the train started for the return journey, but I thereby acquired absolutely fullfed larvæ, which hung themselves up for pupation almost immediately, and emerged as fine full-sized specimens. This is always a difficulty with the Vanessids (especially marked in the case of *Eugonia polychloros*) when reared for any length of time in captivity; the imagines being rich enough in colour, but puny and small in expanse of wing. There were two electric arc lamps in front of the hotel at Wengen, capable of being lowered, and these, of course, offered great attraction to the moths after dark. Amongst these were *Hyloicus pinastri*, *Hyles euphorbiae*, *Theretra porcellus*, and many common Noctuids and Geometrids. Several *H. pinastri* were found by day on the trunks of spruce-fir, and one *Sphinx ligustri*, freshly emerged, on a post in the garden. The following were also taken or observed in the neighbour-

hood:—*Hemaris bombylifformis* and *H. fuciformis* (larvæ), several Anthrocerid species—*Setina aurita* (with var. *ramosa*), *Arctia plantaginis* (with var. *hospita*), *Spilosoma urticae*, *Hepialus humuli* and *H. hectus*, *Dasychira fascelina*, *Malacosoma franconica* (larvæ), *Cerura vinula* and *C. furcula* (larvæ), *Notodonta dromedarius*, *Lophopteryx camelina*, *Clostera reclusa* (larvæ), *Acronycta myricae* and *A. menyanthidis* (on posts among heather), *Noctua glareosa* (larvæ), *Calocampa exoleta* (larvæ), *Anarta cordigera*, and other Noctuids. In the Geometrids—*Abraxas sylvata*, *Pericallia syringaria* (pupæ), *Angerona prunaria*, *Venilia macularia*, *Boarmia repandata*, *Gnophos obfuscata*, *Scoria lineata*, *Cidaria silaceata*, and many other species. At Interlaken I again took *Hyloicus pinastris* on spruce and Scotch fir trunks, also *Zeuzera pyrina* on a lamp, a single specimen of *Urbicola comma*, the larvæ of *Earias chlorana*, and one *Lymantria monacha*. During my stay here I found the isolation of the Kleine Sheidegg more than I cared for, so, for the fortnight, I took up my quarters at the Hotel Victoria, Wengen, at an elevation of about 4000ft., and within easy reach of Lauterbrunnen and Mürren.

Having exchanged my chaplaincy for that of Les Avants, I left Wengen on July 13th and travelled, *via* Speiz, on the lake of Thun, and Zweisimmen, by the newly-opened electric railway (known as Montreux-Oberland-Bernois) through some of the most delightful scenery. Les Avants is situated on the slope above Montreux, and commands a charming view of Lac Lemman and the entrance to the Rhone Valley. Here I stayed for the better part of three weeks, and, though the district had been more or less explored on previous occasions, I was fortunate in procuring quite a number of species hitherto unnoticed. The railway embankments, with their masses of bramble and *Eupatorium cannabinum*, were especially productive, and here it was that I took for the first time a nice but short series of the pretty *Coenonympha arcania*. Another new and most acceptable addition was made in the discovery of some half-dozen gloriously fresh *Satyrus circe*. These were sometimes seen flitting over a recently mown hay-field, but were more often observed behaving like the Emperor family, and settling on the leaves of trees high above one's head. These grassy slopes culminated in a long ridge called Cubly, plentifully clothed with poplar. Here, as I had dared to anticipate, I was fortunate enough to secure my one specimen—a large and handsomely marked female—of *Limenitis populi*. This also behaved like *Apatura iris*, and it was some time before I could induce her to leave her lofty perch and fly within range of the net. A favourite hunting-ground was the Valley of Tinere, approached by walking along the lake for a mile or so beyond the Castle of Chillon. This was, *par excellence*, the abode of *Apatura iris*, *Limenitis camilla* and *L. sibylla*, and here I saw var. *valesina* of *Dryas paphia*. A couple of miles up the valley, a natural ride or clearing had been made through the trees by the descent of an avalanche of snow, which had carried all before it, and lay there almost completely covered with stones and mud, the broken fragments of trees and *débris* of all sorts. One or two saplings, a sycamore, an elm, and a few willow-bushes had managed just to retain their hold, but had been sadly broken and bent by the impact into a horizontal position about six feet from the ground. This had caused the sap to exude in many places, which proved, especially in the case of the sycamore, an unfailling

attraction to many butterflies, and most of all to *Apatura iris*. For once it appeared to have lost its predilection for high and inaccessible branches; and it almost entirely discarded the bad meat which was laid in proximity as an additional bait. My third haunt was the famous road between Aigle and Sépey. It was dreadfully dusty, and subject almost in its entire length to an unrestricted blaze of sunshine, which latter fact has, doubtless, much to do with its abundance of insect life. Not only was *Papilio podalirius* common on the wing here, but I was successful for the first time in discovering more than a dozen of its larvæ on the dust sprinkled sloe-bushes at the road-side. *Issoria lathonia* turned up, together with *Brenthis ino*, *B. dia* and *Melitæa didyma*. *Apatura ilia* is taken close by, but I failed to detect it, though search was made on several occasions. Among the Satyrids, a specimen of *Pararge hœra* was seen but missed; *P. megera*, a few; *P. achine*, plentiful, but worn; *Satyrus alcyone* and *S. cordula*, common. Among the Lycænids, *Plebeius aegon*, *P. argus* and *Cyaniris argiolus*, *Zephyrus quercus*, *Thecla ilicis* and *T. spini*; and among the Skippers, *Spilothyrus lavateræ*, *Pyrgus sao*, *Thymelicus acteon* and *Adopæa lineola*, together with several of the genus *Hesperia*, whose specific identity I will not venture to pronounce. Among the more prominent species of Heterocera noted in this district were the following: *Manduca atropos* (two larvæ on potato both stung by flies); many handsome larvæ in various stages of growth of *Hyles euphorbiæ* on *Euphorbia cyparissias*, growing by the roadside. Several imagines of *Thaumas respertilio* at honeysuckle flowers, and quantities of *Sesia stellatarum*. Also *Callimorpha dominula*, a few; and many beautiful fresh and lively specimens of *C. hera*, which were more easily disturbed than caught, as they dashed out from herbage and rocks. These rocks bordering the Aigle Road were especially productive of *Porthetria dispar* in all stages; also *Grammodes algiva*: and here a specimen of *Polyphaenis sericata* was seen, but evaded capture. Near the hotel at Les Avants, more *Acronycta myricæ* were taken, and also *Cucullia lactuacæ*, *Plusia modesta*, and one specimen of the rare *Catephia alchymista* on a post. Perhaps the most striking species amongst the Geometrids observed was *Gnophos furrata*. My holiday closed with a hurried, but distinctly remunerative, expedition over the Simplon Pass. Taking train up the Rhone Valley to Brigue, on the morning of Thursday, July 27th, I walked as far as the Simplon Culm, where I spent the night at the Hotel Belle Vue; proceeded next morning over the Pass, through Simplon village to Gondo and Iselle on the frontier of Italy, returning to the Belle Vue late at night, and then back first thing next morning to be in time for Sunday duty. It was almost too much to have attempted in the short time at one's disposal; but, though the walk was inordinately long, hot and fatiguing, the scenery was simply gorgeous, infinite in its variety, wild, rugged and grand beyond description; and, as for its wealth of butterflies and general entomological interest, it quite surpasses everything in my previous experience. In the neighbourhood of Bérisal, I had the good fortune to make the acquaintance of the Rev. George Wheeler, who put me on to the scent of several rare and local species, and was afterwards kind enough to show me his splendid collection at Territet. Having occupied so much space already, I feel that I must now confine myself merely to the enumeration, in the briefest manner possible, of those species observed, well nigh on two dozen, not having

been previously noted. The additional *Erebias* on the Pass were represented by *Erebia melampus*, *epiphron*, an abundance of *Erebia tyndarus* and *E. euryale*, and one specimen of *E. mnestra*. The Blues by *Lycaena arion* var. *obscura* (worn), *Polyommatus donzelii*, *P. escheri*, *P. eros*, *P. orbitulus*, *P. baton*, and, at Iselle, *P. orion*. I learnt from Mr. Wheeler that I was just too late for *Plebeius lycidas*. The Coppers constituted a very attractive feature, in the shape of magnificently large and brilliantly coloured specimens of *Chrysophanus virgaureae*, *C. var. gordius* and *C. dorilis*, all at Iselle, and one large and dark, though somewhat worn specimen taken near Simplon, which I presume to be *C. hippothoë* var. *eurybia*. The Skippers, amongst others, afforded *Urbicola comma*, *Adopaea lineola*, and one beautifully streaked aberration of *Pyrgus sao* on the slope between Bérissal and Brigue. Here too, *Epinephele lycaon* was taken in company with *E. ianira* and freshly-emerged *Issoria lathonia*. The roadside yielded *Satyrus alcyone*, *S. cordula* and *Hipparchia semele*. Other species noted in the neighbourhood of Iselle were *Coenonympha arcania* var. *philea*, a dark-banded aberration of *Melanargia galatea*, *Melitaea phoebe* (large and varied) and *Thecla w-album*, besides several Heterocera, including *Anthrocera ephialtes* var. *coronillae*, *Syntomis phegea*, from which I obtained ova (now healthy fullgrown larvæ), *Setina aurita* var. *ramosa*, *Cleogene lutearia*, more larvæ of *Hyles euphorbiae*, the larvæ of *Plusia gutta* on yarrow, and many others, which I was unable to name or which have slipped my memory. I live in great hopes of being able to explore this prolific region with greater composure and less rush another season.

Trumpet-hairs on full-grown larva of *Urbicola comma* (with plate).

By DR. T. A. CHAPMAN.

These photographs are somewhat marred by the circumstance that the skin (cast at pupal moult) from which they were taken was far from perfectly spread out, and the consequent wrinkles or folds are conspicuous. The skin-points are present over nearly the whole field in both photographs. Two spiracles are seen with their screens formed by processes stretching inwards from the margins; in both the withdrawn tracheal membranes appear, and beside the spiracle in each case is indicated the valve at the inner opening of the spiracle. In each case the bundle of tracheal tubes from the preceding spiracles is more conspicuous below the spiracle shown than that proceeding from the spiracle itself. The lenticle shown presents the usual resemblance to a spiracle, it also shows a feature common in those of this larva, *viz.*, a finger-like process extending from the margin into the lumen of the lenticle. In some cases there are several such processes reaching towards the centre, one might suppose in an attempt to resemble the screen processes of the spiracle proper. The opening of the lenticle is filled in by a membrane dotted with fine points. Near the lenticle is a hair that is nearly of ordinary form, this may, perhaps, be tubercle iii, but such hairs are so rare on the larva that they cannot be assigned to tubercles, except very hypothetically. The trumpet-hairs, varying in the figures from 0.03mm. to 0.06mm. in length (slightly longer in some other situations), have very obvious conical bases. They expand slightly upward, and terminate by a slight contraction (usually) at the spiculated mouth.

Perhaps the most important point to note about them is their occurrence in the last instar. In *Hesperia proto* and *Nisoniades tages* only ordinary hairs are found in the last instar, though in the latter species trumpet-hairs occur earlier, whilst in *Thymelicus acteon* hairs are practically absent. In *Hesperia malvae* most of the hairs are ordinary looking, but slightly expanded and bifid at the tips, a not uncommon form of hair, but clearly tending slightly in the direction of "trumpet" structure.

Spanish forms of *Polyommatus corydon*.

By W. G. SHELDON, F.E.S.

One of the most interesting species occurring in the Albarracin district is *Polyommatus corydon*. Zapater and Korb's list gives the following forms and remarks respecting abundance: "*Corydon* type, common; var. *albicans*, rare; var. *corydonius*, not rare; var. *hispana*, not very common." Dr. Chapman says (*Ent. Record*, vol. xiv., p. 119) that "he only took var. *corydonius* and var. *hispana*, and that no intermediate specimens were observed." This observation does not agree with my experience. I found in the Guadalaviar Valley, *hispana*, common, two or three *corydon* type, undistinguishable from my Surrey, Dauphiny and Swiss specimens, and one example of var. *corydonius*. At Losillo, again var. *hispana* was common, and one or two specimens of *corydon* type were netted each day, and the series brought back from that locality contains intermediates between the type and var. *hispana*. At Noguera, neither *corydon* type nor var. *hispana* were seen, but only var. *corydonius*, with a purple tinge, and certain examples of as dark a blue as those, but without the purple tinge, that is to say the same blue as *corydon* type, but much stronger in tint; I thus get the following forms:

1. An almost white form = var. *hispana*.
2. Intermediates between var. *hispana* and *corydon* type.
3. *Corydon* type.
4. A form with the tint of blue as in *corydon* type, but much deeper and stronger = intermediate between *corydon* type and var. *corydonius*.
5. *Corydonius* type, resembling specimens in the British Museum, so labelled, and taken in Asia Minor, but with purple tint not so pronounced.

I take it that either the species has changed in the numbers of specimens of its different forms, since the days when Zapater and Korb made their observations, or that they confused them, for *corydon* type is now certainly not common, as stated by them, whilst var. *hispana* which they describe as not very common, is now most certainly abundant, in fact, by far the most abundant form found at Albarracin.

Notes on *Coleophora solitariella*, *C. pyrrehulipennella*, *C. laricella*, and *C. albitarsella*.

By HENRY J. TURNER, F.E.S.

COLEOPHORA SOLITARIELLA.—While searching along one of the few remaining lanes to the south of Lewisham, the lanes and hunting-grounds sacred to the memory of Stainton, Douglas, and MacLachlan, I met with this species on May 8th, 1904, feeding on *Stellaria holostea* in a very sheltered position, below bushes and undergrowth, which were beneath trees. Of the 17 cases found, all but one were small,

much smaller than two I had received on April 30th from Chiswick, per Mr. Sich. Some of the cases were only just enlarged after hibernation. The one large case was, from its weather-worn appearance, a case of last year from which an imago had, no doubt, emerged. When young, the cases of this species are very slender and delicate, and the anal opening is often, more or less, indefinite in shape and make. The older portions of the case, that part which formed the shelter in the winter, can readily be noted, as it shows the dirty white of the weather's influence, but there is never any yellow in its coloration. One of the cases found showed clear evidence of being slit down the back and very narrow pieces put in, the older portion of the case instead of lying in two adjoining patches, was divided by this new addition, down the middle of the back as well as down the middle of the lower side. This was a most unusual occurrence, as only in *C. laricella* had I seen any deviation from the rule of enlargements being made along the centre of the lower surface. I find my notes do not contain detailed remarks as to the larval plates, but only that the armature on the back of the mesothoracic segment is divided into four plates. During the field meeting of the South London Entomological Society, held on May 14th, 1904, at Ashted, Surrey, I came across a very large colony of this species, and took a considerable number. They were extremely restless, and since I obtained no imagines from them, most of them dying or producing ichneumons, the whole of them must have been unhealthy from parasitic attacks. I would venture to ask if it is usual for larvæ, whose internals are irritated by the presence of parasites, to be rendered restless? It certainly seems the case with the Coleophorids, most of which are extremely restless and also particularly subject to the attacks of parasites, both dipterous and hymenopterous. With this batch of cases I was able to confirm what I had noted a few days previously in the Lewisham larvæ with regard to the enlargement being made along the back. When the cases are enlarged, the bulk of the enlargement takes place along the lower side, around the mouth opening and at the anal end, at which last a considerable lengthening often takes place. A moderate constriction is noticed in all cases just before the commencement of the base of the valves of the anal opening, and, unless the skill of the larva allows for this during the insertion of the strip on the lower side, there is a want of symmetry near this constriction on the outside, and possibly an inconvenience on that part inside. In two or three cases, where this occurred, an additional slit was made along the back from just below the base of the valves to about halfway along, and, in this, a new piece was inserted. I believe Mr. Sich called my attention to this some time ago, but, at that time, I felt positive that enlargements never took place along the back, and the matter dropped. Although I watched these larvæ closely I was never fortunate enough to see one of them in the act of enlarging its case, I frequently saw them finishing the mouth or anal opening, but never saw a case actually slit open for an insertion. On May 17th, I noted several of the smaller cases were only 2-valved, while typical ones were 3-valved, with the valves all very well-developed and appressed strongly at their edges. In my notes I ask the question, "Is the case enlarged along two lines of the underside?" There often appears to be light streaks, more or less fine with a wide darker stripe between, the darker mid area being nearly of the same tint as the older material of the case. The enlargement

at the mouth opening, besides the enlargement in circumference, never consists of more than a few very narrow rings around the margin. On June 4th, during the same Society's Field Meeting at Bookham, I met with a few cases on the Common, some of which were small. These were, apparently, also ichneumonid, for no imagines were produced.

COLEOPHORA PYRRHULIPENNELLA.—Of this species several friends have given me cases with larvæ. Mr. Main, from the New Forest, on April 30th; Mr. West, from Shirley, on May 5th, and from Oxshott, on June 5th; this last was a very small case. On June 22nd, two of these larvæ were still feeding, but by the 24th all were quiescent. The larvæ apparently did not pupate successfully, probably the fact was that they suffered from absence of fresh food on several occasions, as heath is a somewhat difficult plant for me to readily obtain. I did not breed a single one. Nor was I much more fortunate in 1902, when I swept some forty cases on Horsell Common, Woking, as only one larva successfully reached the imago stage. The one I exhibit emerged in mid-July.

COLEOPHORA LARICELLA.—This species is probably the commonest of the whole genus, and of considerable economic importance, in that it exists in countless numbers in many larch plantations, where its ravages in the needles may be readily observed. No doubt, in many places, it so injures the chlorophyll-bearing parts of the trees that a very considerable check is put to their growth. Wherever I have met with larch trees, there I have found the little pest, so that it is almost invidious to give any locality. My knowledge of the larva of this species begins with the winter, during which it hibernates in a thin, elongated dark case at the axil of the spurs which bear the bundles of needles. Probably the blackish colour of the case is due to weathering. Later on, when the larva recommences to feed, it goes to the tip, or near the tip, of a needle, and begins to mine. The question is, how does it do this? The winter-case is left in the axil, and the larva must either (1) come out of the anal end of its case, crawl down outside on to the stem, ascend the twig and a needle, commence to mine, and gradually bury itself in its mine. All this must be done without a case, and by a larva, too, it must be remembered, which does not possess abdominal claspers sufficiently well-developed to be of any service. Or, (2) as an alternative, the larva must mine in the bark of the stem and twig until it reaches a needle, up which it mines, and from which it eventually makes its first spring case. So far we have no evidence which is the true solution, or even whether either is probable.

Mr. Bankes sent me a few larvæ on May 5th, 1904, and I noted that all of them had already assumed their first spring case, and some had increased its size by a clumsy addition. The larvæ chiefly attack the tips of the needles, rendering them thin and papery, so that they flutter about in the wind. Cases are frequently met with at the base of the needles squeezed closely into the middle of a bundle. After a few days' retirement in this position they move out and recommence feeding; probably this is simply a place of refuge during the change of skin. When they are ready to pupate they retire in just the same way, and their metamorphosis takes place there. I noted on May 11th that most of the cases sent me by Mr. Bankes had the anal end open, without any valves, just as if cut off with a pair of scissors. These had probably been enlarged, and the extremity had to be properly

finished, but it was curious that all should be in exactly the same state, and that such an opportunity should be afforded to parasites to insert their ovipositors.

On May 13th, I found a number of cases on a larch in Kew Gardens, and noted among them (1) the first new spring cases made from a portion of a needle hollowed out and the ends formed, one for a mouth, and the other valved for the extrusion of excretory matter; (2) the ordinary light brown cases bulged at the middle, and (3) dark brown, dirty-looking scale-like cases which were being enlarged by the addition of a portion of cuticle. What seemed strange was the existence of two forms of case, one of uniform structure, texture, colour, etc. (not an early spring case), and the other a dirty weathered case, with signs of additions more or less irregular, whereas the former had no signs of additions, and yet both were of about the same size. When the larva of this species has to enlarge its case, it affixes one side lengthways on a needle, generally on the inner or upper surface. Then it proceeds to mine under the case, slit the case on the lower side, and fit the cuticle into the space made. This portion is frequently longer than the old case, and overlaps for a time till the larva has filled up the space to the ends and finished off mouth and anal openings. The method of enlargement is most curious in this, that the upper side of the case becomes the lower after the addition, and the mouth-opening slopes the reverse way. The addition is made along the lower side to start with, but when the mouth is formed its direction of slope is reversed. When the larva is ready to pupate, the anal end of the case lies open, and remains so that one can readily see the pupa and extract it easily. Most of the larvæ I had pupated in mid-May. At Amersham, on May 23rd, I found most of the larvæ had pupated, and a few imagines were sunning themselves on the needles. At the same time I met with several cases at large, with very plain evidences of the reversal of the direction of the mouth opening, which had taken place on enlargement. On referring to cases taken elsewhere, the same peculiarity was noticed. My imagines emerged at the end of May and beginning of June. On May 31st, two specimens paired. They were first noticed at 7 a.m. and remained so until 12.30 p.m. On the following day the fresh needles were examined with a glass, and about a dozen ova were counted. These were comparable with Noctuid ova. They were undoubtedly "upright" eggs, with the micropyle at the top, and ribbed vertically with thirteen or fourteen bold ribs running from micropyle to base. On the high dry ground at the top of Purley Downs, on June 11th, I saw many traces of the depredations of the larvæ, but the imagines were over, whilst, on June 19th, at Amersham, a few imagines were still to be noticed, but in a very worn condition.

COLEOPHORA ALBITARSELLA.—On May 4th, 1904, Mr. Eustace Bankes sent me larvæ of still another species, *C. albitarsella*, with which I had had only a very slight acquaintance. Some years ago I took cases of this species in the old lanes just south of Lewisham, where Stainton found such treasures, now, alas! gone for ever, sacrificed to bricks and mortar. Those I took fed on ground ivy, but the larvæ sent me by Mr. Bankes were found on marjoram, in the Isle of Portland. This form of marjoram was of hard stunted growth, as if it had a difficulty in getting sustenance in a hard and dry soil. Yet the larvæ seemed

to like it, for they would only just nibble a little at the luscious well-grown leaves with which I supplied them, and fed with avidity whenever I met with any considerably dried-up plants. When the larvæ were received I noted that many of the cases were very small, and all much smaller than the examples found near London on ground-ivy, which were nearly, or quite, of full size. The latter, too, were much blacker than the cases of the marjoram-fed larvæ, which were brown. Closer examination showed that the cases were covered with hairs, so that they had a hoary appearance. When I have previously met with this species I had only very casually looked at the case, and assumed, really without any reason, except the generally smooth black appearance of the case, that it was composed wholly of silk. That this, however, was not so, was most apparent from the cases made by the marjoram feeders. The white, hoary appearance is wholly due to the abundant hairs attached to the cuticle of the leaf, from which the case is made or enlarged. However, in confinement, these cases frequently assume a smooth appearance, because other larvæ bite off all these cuticle hairs. The lighter colour of the cases of the marjoram feeders is due to the cuticle, when dead, becoming a lighter brown than does the cuticle of ground-ivy leaves. There are also lighter edges to the anal flaps, and the keel on the lower side is also of a light brown. The brown of the main portion of the case is made darker by the deposit of very dark blackish material inside the case, which darkening, in the ground-ivy feeders, shows through, and has more effect than in the marjoram feeders. All the enlargements are made in a most clever manner, so that it is very difficult to see where the new portion is joined to the old, and the case has a very uniform appearance throughout. However, I did see slovenly larvæ, which only roughly enlarged their habitations, but probably they were weak, ill-nourished, because they would only eat of the hard coarse kind of marjoram referred to above. When a larva wishes to enlarge its case, it fixes it, not on the surface of a leaf, but on the edge, so that the back keel is in a straight line with the margin. Then it commences to mine, and, having eaten out an area sufficiently for its purpose, it bites off the portion of leaf, fastens it up where necessary, and walks off to finish its task. Thus one side of the leaf piece, forms one side of the case, and the other the other side; and whatever difference there may be in the upper- and undersides of the leaf used, is apparent in the completed case. The description of the larva made reads as follows:—

The colour of the plates of the head and prothorax is light brown. The second thoracic segment has two black plates separated from front to back by a narrow suture and pointed exteriorly. The metathorax is very similar, but the plates are slightly smaller, and the suture between is wider. All three segments have small black plates on the sides, those on the mesothorax being slightly the largest.

I saw one larva on May 23rd, cut himself off after enlargement. The back, near the head, was first severed, then it worked along the lower side from both ends alternately towards the middle. As soon as it was ready, the mouth end was fastened securely with silk, while the rest of the cutting off and closing up was carried out. All but one larva finished feeding by May 30th, and imagines were bred at the beginning of July.

Swiss Lepidoptera in 1905.

By DOUGLAS H. PEARSON.

The Rhone Valley has many attractive side shows, and the one which drew us in 1905, was Arolla. June 20th, found us at Loèche, where we stayed at the "Hôtel Poste et Couronne," and anyone in search of bad food, indifferent accommodation, and an entire lack of sanitation, can here be satisfied. The rough hill-side within a quarter of a mile of the back of the town, seems to be excellent collecting-ground, and had our quarters been more comfortable, I should have liked to have spent more time there. I managed to take two *Pyrgus sao*, *Hesperia carthami*, single specimens of *Erynnis lakaterae*, *E. althaeae*, *Brenthis daphne*, and *B. ino*, a few *Melitaea didyma*, and a solitary specimen of *Cyclopides palaemon*. Is there any locality where this species flies freely as it does in England? The three specimens I possess represent three different seasons, and I have never been able to find more than the one individual. On June 21st, we walked down to Sierre through the Pfywald, but did not meet with anything of note, beyond some exceptionally large *Plebeius aegon*, probably from want of knowledge of the locality, but it struck us as being distinctly warm. The next day was spent between Leuk and Leukerbad, and produced *Melitaea phoebe*, *Nisoniades tages*, *Pyrgus sao* (1), *Hipparchia semele*, *Polyommatus astrarache*, *Arctia villica* (1). On the 24th, we went down to Sierre and drove up to Evolène, where the meadows were full of good things, and we took among others, *Melitaea phoebe*, *M. cinxia*, *M. didyma*, *M. dictynna* (including some very dwarf forms), *Brenthis dia*, *Lycaena arion*, *L. alcon* (1), *Nomiades cyllarus* (1), and *N. semiargus*. *Parnassius apollo* was on the wing, and we also saw the larvæ, but did not meet with *P. delius*. It was here that we had the pleasure of meeting three brethren of the net, Messrs. Simes, Robbins and Austin, and spent some very pleasant hours in their company. The walk from Evolène to Arolla was quite unproductive, as the day was dull and windy, and this dull weather prevailed more or less for several days, but when we left on July 5th, several fresh things were added to the bag. In the meadows round the hotel, *Polyommatus eumedon* was fairly plentiful, and in good condition, a few *Chrysophanus dorilis* were taken, while *Anthocharis simplonia* was just coming out, but generally required a chase, owing to the strong wind. *Parnassius delius* was also just appearing, and we managed to take one or two each day, and, in the flat meadows near the river, I took *Polyommatus pheretes* for the first time, and one specimen of the brown female. *Eneis aello* was taken on the way to Lac de Lucel, and also near the Plan de Bertol, but was not plentiful. It was evidently too early for most of the Erebias, the only plentiful species being *Erebia lappona*. One or two *E. gorge* were taken near the Plan de Bertol, and two *E. ceto* in the meadows, three *E. alecto* on the way to the Pas des Chèvres, but no others were seen. Thousands of larvæ of *Anthrocera exulans* were feeding on *Dryas octopetala*, between the hotel and the foot of the glacier, and were pupating on the underside of loose stones, as many as seven or eight being sometimes under one stone, and I managed to breed a small series. *Brenthis pales* was taken in the meadows, but did not appear to be variable, and with them several *Pieris callidice*, which I had not previously seen so low down. Most of the *P. napi*

were of var. *bryoniae*, and one specimen was exceptionally dark and richly marked. *Coenonympha satyrion* was also plentiful, and I was surprised to take two *Callophrys rubi* in perfectly fresh condition. One day was spent in an expedition up La Rousette (10,700ft.), but the weather was bad and nothing fresh was seen or taken. The flowers, however, were very interesting, and in one place we walked over large sheets of *Ranunculus glacialis*, while the gentians and sulphur anemones were in profusion. We expected to find many fresh things out on our return to Evolène, but nothing was out—not even the sun—and after a day and a half of steady downpour, in which we walked to Haudères, where we met M. Morel, the coleopterist, we struck camp and took train for Paris, thus ending another pleasant little holiday among the Swiss butterflies.

Collecting Lepidoptera in Syria in 1905.

By P. P. GRAVES.

In the early summer of 1905 my good fortune again led me to Syria, and, though I had much else to do, the days I was able to devote to collecting were by no means wasted. On May 10th I had a day at Jaffa in the fields near the Nahr el Awaj, a pretty mill-stream that runs into the sea a few miles north of the town. Here *Pieris rapae* and *Pontia daphidice*, both rather worn as a rule, swarmed, but I saw little else but odd specimens of *Lampides boeticus*, *Polyommatus icarus*, and *Chrysophanus phlaeas*, and a few *Pieris brassicae*, flying in gardens near the town. *Sesia stellatarum* and *Phryxus livornica* were caught and noted, and on the 12th I was at Beyrout, and trained to the Nahr el Kelb, hoping for better spoil. The sirocco was beginning to blow, and the season was, as far as I can judge from a comparison of my dates with those recorded by Mrs. Nicholl, decidedly late. I took a short series of *Epinephele jurtina* var. *telmessia*, a fine *Melanargia titea*, which species appeared to be just emerging, a fresh male *Parnara mathias*, and a few fresh *Erynnis alceae*, inclining towards the southern form. *Pontia daphidice*, *Colias edusa*, *Pyrameis cardui*, *Polygonia egea*, *Syrichthus orbifer*, and one *Chilades trochilus*, were also noted. The next three days were roasting, and I spent them mostly indoors, visiting the Museum of the Beyrout College, where Professor and Mrs. Day gave me most interesting information as to the lepidoptera of the Lebanon, and running after insects only one afternoon, when I drove up to Ascyra, some 1800 feet above sea-level, and brought back nothing but a short series of *Thymelicus acteon* and a very large and handsome female of *Epinephele* var. *telmessia*. On the railway journey to Damascus, I saw insects galore, and, on the afternoon of the 18th, collected on the wooded railway-banks at Dumar. Here I took *Aporia crataegi*, large and not uncommon, and, on a dry bank covered with flowering crucifers, a couple of ♀ *Anthocharis belemia* var. *glauce*, slightly worn and much more yellow on the underside of the hindwings than most Egyptian specimens. *P. daphidice* swarmed, in poor condition, however, and *Thais cerisyi*, which I took for the first time, had seen its best days. The Lycænids were not exciting—*Chrysophanus phlaeas*, *Polyommatus icarus*, and a solitary *P. astrarche* were all I noted, but *Syrichthus orbifer* was not infrequent, and in excellent condition, and I took a single excellent specimen of the very local *S. poygei*. The

dry and open banks were far the best for insects, the woods containing little or nothing but *Aporia crataegi*.

The next week was taken up with a railway trip to Ma'an, the then rail-head of the Hedjaz railway. Here I saw nothing but stones and red-hot rocks, but, in the cornfields of the Haurau plain, *Pyrameis cardui*, *Melitaea didyma*, *Issoria lathonia*, *Pontia daplidice*, and a *Melanargia*, were flying. The country might repay a collector, and Ammān (Rabbath-Ammon), where there are bushes and water in plenty at a height of 3000 feet, looked good hunting-ground, though I only saw *Satyrus telephassa* there. Then came 80 miles of steppe, not unlike the Maryut steppe, west of Alexandria, with *Pontia daplidice* and *Satyrus telephassa* swarming, and these two species persisted in the scrub of the hot ravines of the black stone wilderness south of the Dead Sea, at Jurf el Derwish, some 30 miles north of Ma'an. I say *P. daplidice* with a little doubt, since I suspect that, in the rocky desert, *P. glauconome* occurs. It abounds in the Sinai, and some of the whites I saw in the wadis had the rapid tearing flight of *P. glauconome*. Still, as *P. daplidice* occurs, though very rarely near Helouan, in the same sort of country, 15 miles south-east of Cairo, I have really no right to assume that these whites belonged to any other species. On my return, several black and white burnet-looking moths entered the carriage in the early dawn at Ezraa, Hauran. This species occurs at Niha, where I took a bad specimen, and is, I am informed, *Syntomis phegea*.

After my return to Damascus I visited Zebedani, and was able to commence operations at 10.30 a.m. in bright but cool weather. The town lies in a plain some 3000 feet above sea-level. Through the plain, which is full of orchards and gardens, runs the Barada. The mountains, highest on the eastern side, run up very sheerly, culminating in steep cliffs and screes above Bludan. Between Zebedani and Bludan, a village some 1800 feet above the valley, are shady lanes and small copses, and, nearer the village, open cornfields and banks covered with thistles and various spiky and aromatic plants. The railway-banks were my first hunting-ground, and I there took some fine and very large *Dryas pandora*, a single *Argynnis niobe* var. *eris*, and a specimen of *Papilio podalirius* var. *virgatus*. *Chrysophanus phlaeas* was not uncommon. I took the type and a very dark specimen very near *g. a. eleus*. *Thais cerisyi* (type and var. *deyrollei*), *Aporia crataegi*, *S. orbifer*, and a few *Hesperia malvae* var. *melotis* were noted, with one or two *S. telephassa*, six *Limenitis camilla*, and worn *Melitaea phoebe*, *Issoria lathonia*, *Pontia daplidice*, and *Polyommatus icarus*. I also took a few hairstreaks, a form of *Thecla spini*, but was rather surprised at the comparative rarity of Lycænids. The bushy lanes on the lower slopes produced nothing new, but, in the cornfields, I found *Melitaea didyma* approaching var. *turanica* out in numbers, though most were worn, more *Melitaea phoebe*, *Erynnis althaeae*, and a fine *Syrichthus tessellum* var. *nomas*. *M. phoebe* was clearly over, as were *Polyommatus astrarche* and *Pontia daplidice*. On my return I picked up a damaged *Nisoniades marloji*, and near the station got a very worn *P. baton* var. *clara*. Just before getting into the train I saw what was either *Gonepteryx rhamni* or *G. farinosa* flying about the station, but could not test which it really was. I failed to see several species noted by Mrs. Nicholl at Zebedani, and imagine that I was, in some cases, too early.

At Baalbek I made two excursions, one to a point some 5000 feet above sea-level, on the mountains east of the town, the other to the Niha valley, on the eastern slope of the Lebanon. I started on the first trip in windy, cloudy weather, without great expectations, but did not do so badly as I expected, the sun coming out after midday. I took one or two *Melanargia titea* var. *titania*, which was just appearing above the town, and a ♀ *Rusticus loewii*. Then, in a little hollow full of green corn and weeds, I took *R. nicholli*, fresh and brightly spotted with red, a beautiful fresh specimen of *P. baton* var. *clara*, with silvery-white underside and heavy spotting, and a good ♂ *Dryas pandora*. After leaving the hollow, I followed an uninteresting path up the hill till I reached a series of stony cornfields where insects abounded. *Thais cerisyi* was common with *Aporia crataegi*, *Melitaea didyma* var. *neera* approaching var. *turanica*, *M. phoebe*, and *Issoria lathonia*, both worn, plenty of *Syrichthus orbifer*, and, of the Lycaenids, *Thecla spini* not numerous, and suffering from the wind, *Chrysophanus phlaeas* and a fair number of *Rusticus nicholli* and *Polyommatus icarus*. I noted that the ♀s of the last-named, which I took this year in Syria, were in many cases suffused at the base, and near the orange marginal spots of the posterior wings, with greyish-blue. My July specimens from Ain Zahalta showed no blue at all in the ♀s. Of other captures I noted single *Syrichthus tessellum* var. *nomas*, *Leptosia duponcheli*, just out, and *Erynnis althaeae*.

Niha was far less stony than the ground I worked above Baalbek. The foothills were chalk, smooth and fairly green, and the dry water-courses and patches of corn and clover held plenty of insects, though I missed *Chrysophanus ochimus*, *C. asabinus*, and *Thecla myrtale*, taken there by Mrs. Nicholl. Of the other butterflies, I took much the same species as at Baalbek; ♀s of *Plebeius nicholli* were not yet out, and one *P. isaurica*, ♂, was my only new blue. Skippers were common, mostly *S. orbifer*, with a few worn *Hesperia malvae* var. *melotis*. The *Melanargia* was again *M. titea* var. *titania*, while *Melitaea didyma* was very close to var. *turanica* indeed. Had I had more time I might have taken more species, still, I did not do badly, and on my return to Baalbek, picked up *Adopaea lineola* in the B'kaa plain. Next day I went up by rail to Ain Sofar, having picked up a good few moths, mainly Geometers, by exposing a candle in my bedroom window at Cook's Hotel, Baalbek.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from vol. xviii., p. 68.)

GENUS VI: CALOPTENUS, Burmeister.

A single species.

1. CALOPTENUS ITALICUS, Linn.

A stout reddish grasshopper; the ♀ twice as big as ♂; elytra and wings fully developed; anal segment of ♂ very large, and cerci extremely long; wings pink. In var. *marginellus*, Serv., the pronotum marked with longitudinal white bands. In var. *uattenwyliana*, Pantel (*icterica*, Brunner), the body stouter, pronotum more or less gibbous at sides, rounded posteriorly, the lateral carinae curved outwards;

elytra shorter than the abdomen, and longer hind femora. In var. *sicula*, Burm., wings entirely clear (the var. *icterica*, Serv., is based on a bad specimen, and cannot stand; the form described by Brunner under that name corresponds with the var. *wattenwyliana*, Pantel). Length of body, 15mm.-22mm. ♂, 23mm.-24mm. ♀; of pronotum, 3mm.-4.5mm. ♂, 5mm.-7mm. ♀; of elytra, 12mm.-19mm. ♂, 18mm.-28mm. ♀; of posterior femora, 10mm.-12mm. ♂, 15mm.-20mm. ♀ (the var. *wattenwyliana* attains 23mm. in ♂, 34mm. in ♀).

Common in southern Europe. In France, very common in the centre and south; it is noted from Paris, Fontainebleau, Vosges, Lyon. In Germany it is recorded by Rudow from Mecklenburg. It is common in north Italy and throughout Spain. It has been taken at Torgny in south Luxembourg; in Switzerland at Rheinau, Lagern, Glattfelden, Domleschg. The var. *wattenwyliana* is found in Spain at Madrid, Uclès, Seville, Cordoba and Malaga. The colour is excessively variable.

GENUS VII: PARACALOPTENUS, Bolivar.

Differs from the preceding in the abbreviated organs of flight, and truncate hind border of pronotum.

1. PARACALOPTENUS BRUNNERI, Stål.

Dark brown; wings absent; elytra lobiform. Length of body, 14mm.-22mm. ♂, 20mm.-38mm. ♀; of pronotum, 3mm.-4.6mm. ♂, 5mm.-8.2mm. ♀; of elytra, 2mm.-4mm. ♂, 4mm.-8mm. ♀.

Strictly speaking a Balkan insect, but found also in Spain at Barcelona, and Montseny in Catalonia, and at Jaca, and Collsacabra: also in Sardinia. In France it is very rare, but has been found at Canigou in July and August.

GENUS VIII: THISOICETRUS, Brunner.

Characterised by the number of spines on the outer row of hind tibiæ, and by the frontal keel of equal breadth throughout its length, though somewhat narrower towards the epistoma; the cerci of the male are compressed and bent downwards.

TABLE OF SPECIES.

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|---|----------------------|
| 1. Pronotum with a dark band on dorsum, of equal breadth throughout metazona, and with lateral carinæ very distinct in prozona, straight, or faintly bowed outwards. Infraanal plate of ♂ obtuse. | 1. LITTORALIS, Ramb. |
| 1.1. Pronotum with dark band broadened from in front backwards; lateral carinæ hardly perceptible and bowed inwards in prozona; infraanal plate of ♂ terminated by two obtuse tubercles | 1. ADSPERSUS, Redt. |

1. THISOICETRUS LITTORALIS, Rambur.

Length of body, 21mm.-27mm. ♂, 37mm. ♀; of pronotum, 4mm.-5.2mm. ♂, 7.8mm. ♀; of elytra, 17mm.-24mm. ♂, 30mm. ♀.

On sandy places by the sea in Spain—Malaga, Valencia, Barcelona.

2. THISOICETRUS ADSPERSUS, Redtenbacher.

Length of body, 18mm.-19mm. ♂, 25mm.-30mm. ♀; of pronotum, 3.5mm. ♂, 5mm.-6mm. ♀; of elytra, 15mm.-15mm. ♂; 20mm.-25mm. ♀.

First discovered in Turkestan, and since found at Cartagena in Spain.

GENUS IX: EUPREPOCNEMIS, Fieber.

Allied to preceding genus, but with fewer spines on outer row of posterior tibiæ; frontal keel gradually broadened towards the epistoma; cerci of ♂ conical at the base, slightly compressed, and bent down towards the apex.

1. EUPREPOCNEMIS FLORANS, Charpentier.

Length of body, 26mm.-29mm. ♂, 34mm.-39mm. ♀; of pronotum, 5mm.-6mm. ♂, 6.5mm.-7.5mm. ♀; of elytra, 21mm.-25mm. ♂, 26mm.-31mm. ♀.

Occurs in the southern half of Spain, at Cadiz, Gibraltar, Malaga, Majorca. Also in Sicily, at Messina.

GENUS XI: TROPIDOPOLA, Burm.

This genus was placed by Brunner as a distinct family, the *Opomalidae*, which he has since fused with the *Acridiodea*. It is characterised by the cylindrical pointed form; the pronotum is almost entirely cylindrical.

1. TROPIDOPOLA CYLINDRICA, Marsh.

Uniform pinkish-red. Length of body, 29mm.-32mm. ♂, 37mm.-42mm. ♀; of pronotum, 5mm.-5.5mm. ♂, 6.8mm.-7mm. ♀; of elytra, 19mm.-22mm. ♂, 26mm.-29mm. ♀; of posterior femora, 12mm.-13.8mm. ♂, 16.5mm.-17mm. ♀.

Occurs in a few localities in the extreme south of Spain; also in the Balearic islands in Minorca, and in Sicily.

FAMILY VI: TETTIGIDÆ.

The members of this family are not likely to be confused with any others; the uniform small size, brownish colour, absence of pad between the claws of the tarsi, and the remarkably developed pronotum, which is produced far back over the body, all distinguish the group.

The elytra are very short, lateral, squamiform and coriaceous.

TABLE OF GENERA.

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| 1. Vertex angular; as seen from above, broader than the eye, and seen from the side, projecting beyond the eyes | 1. TETTIX, Charp. |
| 1.1. Vertex truncate; seen from above, narrower than the eye, seen from the side, not projecting beyond the eyes | 2. PARATETTIX, Bol. |

GENUS I: TETTIX, Charpentier.

TABLE OF SPECIES.

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|---|------------------------|
| 1. Dorsal carinæ broken in the middle; pronotum short, and wings long generally (by variety, both long) | 1. DEPRESSUS, Brisout. |
| 1.1. Dorsal carina unbroken. | |
| 2. Pronotum strongly tectiform. | |
| 3. Posterior femora long; antennæ moderately thick, segments somewhat elongated. (Pronotum short, wings very short; spots of pronotum nearly obsolete.) | 2. KIEFFERI, Saulcy. |
| 3.3. Posterior femora shorter, antennæ thicker, segments shorter. | |
| 4. Pronotum rugose, with central keel high and very strongly compressed; anterior femora with borders undulated | 3. NOBREI, Bol. |

- 4.4. Pronotum smooth, with central keel much less elevated.
5. Antennæ thick, segments short; spots of pronotum oblique 4. KRAUSSI, Sauley.
- 5.5. Antennæ slender, segments long (spot of pronotum in transverse triangle) 5. BIPUNCTATUS, L.
- 2.2. Pronotum flat or slightly tectiform.
3. First segment of posterior tarsi with the pads rounded on lower margin, the 3rd pad not longer than either of first two (edges of all femora undulate) 6. TURKI, Krauss.
- 3.3. First segment of posterior tarsi straight on lower margin, 3rd pad as long as 1 and 2 together.
4. Anterior femora with borders straight, unbroken.
5. Apex of vertex broad, prominent between the eyes; hinder borders of pronotum not raised up at edges 7. SUBULATUS, L.
- 5.5. Apex of vertex broad, but little prominent between the eyes; hinder part of pronotum raised at the edges in a little keel 8. BOLIVARI, Sauley.
- 4.4. Anterior femora with borders undulate
5. Large; inhabits north Europe 9. FULIGINOSUS, Zett.
- 5.5. Small; inhabits south Europe 10. CEPEROI, Bol.

1. TETIX DEPRESSUS, Brisout.

Easily known by the very rugose pronotum, impressed on each side at the shoulders, with the central keel roundly elevated in front half, then subsinuate; the posterior produced part varies in length considerably; when extremely long, *i.e.*, reaching half way down the posterior tibiæ, it forms the variety *acuminatus*, Bris., in which the wings are also long, though normally short. All femora with undulate keels. Length of body, 8mm. ♂, 9mm.-10mm. ♀; of pronotum, 8mm. ♂, 9mm.-14mm. ♀.

Throughout the coasts of the Mediterranean. In France, it is very common in Provence and Languedoc, nearly all the year round; the var. *acuminatus* occurs with the type but less frequently. It is found throughout Spain and Portugal. Brisout records it as far north as Paris, and Rudow, doubtless in error, in Thuringia and Mecklenburg.

A Study of the Generic names of the British Lycænides and their close allies.

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

In 1896, when I wrote the little book *British Butterflies* (Gill & Sons, Warwick Lane, E.C.), I had to consider the generic terms in use, and, with only a superficial search into the various names usually accepted and their application to the divisions required, I concluded it advisable to use certain names for certain genera, stating (*Ent. Rec.*, vii., pp. 219-220) my reasons for the choice of those selected in the RURALIDES (LYCÆNIDES) and later, giving (*op. cit.*, pp. 300-301) a tabulation of the names proposed to be used throughout the work *British Butterflies*.

But the writing of a more or less advanced standard text-book was another matter, and a consideration of the generic (and specific) synonymy became a serious business. Instead of making a study of the whole of the genera ever proposed for British butterflies at one time,

I concluded that it would lead to greater accuracy to deal with each group separately, and to pay no attention to the work of any previous students in this direction, until my own studies *de novo* were completed, when a general collation ought to lead to fairly conclusive results.

On these lines I have worked out the generic synonymy of the "Skippers," so far as it related to the Palæartic species, and showed, historically, their effective types, in *A Natural History of the British Butterflies*, pt. i., pp. 84-85, the mode of type fixation being based on the automatic rules of the "Merton code." This study will no doubt be in the hands of most entomologists interested in British butterflies. The question of the generic names to be used in the RURALIDES (LYCÆNIDES), and the fixation of their types, has been a very serious matter, but close study for the last twelve months has led me to certain conclusions. As most of these conclusions will probably be accepted, and come into general use, by the students of our British butterflies, it has been deemed advisable to publish the same independently in this magazine, so that all lepidopterists may have a chance of knowing, if they care, why the names are used in preference to others. Besides, it always gives a chance to the "heathen to blaspheme," and to keep their entomological interests (commencing with the butterflies and ending with the Noctuas) alive, as well as suggesting something fresh to grumble about, and truly, to enjoy life, a grumble is sometimes an absolute necessity. That being so, I offer the following, to students and grumblers alike, as an attempt *de novo* to work out honestly the genera of our European RURALIDES, sorrowing that *Thecla*, *Zephyrus*, *Nemeobius*, and other loved names appear to have to go by the board, and trusting that anyone who has studied the literature, and has a logical conclusion to offer in place of any one of those published, will please let me have it privately without delay, so that due consideration may be given thereto before I publish the parts of *A Natural History of the British Lepidoptera* containing our studies of the "Blues," "Coppers," "Hairstreaks," and "*Lucina*." I need not say that I shall hold myself greatly obliged to any entomologist who satisfactorily proves any of the following facts to be erroneous, or any of the conclusions to be historically wrong.

[1758] 1780. PLEBEIUS, [Linné,] Kluk.—First used in generic sense by Kluk in 1780. Heterotypical. Crotch, in 1872, erroneously states that Cuvier, in 1799, fixed *argus* as type, but Cuvier does not use the name generically. Besides Crotch's indication, Kirby, in 1896, fixed the type as *argus* (*argyrognomon*).

[1758] 1781. RURALIS, [Linné,] Barbut.—Heterotypical in its use by Linné. Type fixed as *betulae* by Barbut in 1781.

1801. CUPIDO, Schrank.—Heterotypical. Type fixed in 1870, by Kirby as *alsus* (which, he says, is included in Schrank's *puer* as ♀ of that species). Schrank's ♂ *puer* is a tailed species = *argides*. *Alsus* (= *minima*) accepted as type by Tutt, in 1896.

1804. POLYOMMATUS, Latreille.—Genus founded independently to cover exactly the same ground as *Cupido*. Type fixed in 1804 as *argus* (= *icarus*) by Latreille. Confirmed by Latreille in 1817 as *icarus*, with reference to Hübner, figs. 292-4.

1806. RUSTICUS, Hübner.—Created solely for *argus*, Hb. (*argyrognomon*), which is therefore the type. Falls before *Plebeius*, [Linné,] Kluk.

1807. THECLA, Fabricius.—Heterotypical. Type fixed in 1821 by Swainson as *betulae*, Linn. Confirmed by Curtis in 1829, and by Westwood in 1840. Falls therefore as a synonym of *Ruralis*, [Linné,] Barbut.

1807. LYCÆNA, Fabricius.—Heterotypical, containing "blues" and "coppers." Restricted by Latreille in 1809 to the untailed "blues," and by Oken in 1816 to the "blues." Type fixed in 1824 by Curtis as *phlaeas*, but this action *ultra vires* in face of previous restriction. Type fixed in 1838 as *arian* by Thon.

1816. ZEPHYRUS, Dalman.—Type fixed by Dalman as *betulae*, therefore falls as a synonym of *Thecla*, Fab., and *Ruralis*, [Linné,] Barbut.

1816. AUROTIS, Dalman.—Dalman's section of *Zephyrus* containing *betulae*, therefore falls as a synonym of *Zephyrus*, Dalm., *Thecla*, Fab., and *Ruralis*, [Linné,] Barbut.

1816. HEODES, Dalman.—Only *virgaureae* cited in the generic synopsis (p. 63), therefore this is the type.

1816. CYANIRIS, Dalman.—Only *argianus* (= *semiargus*) cited in the generic synopsis (p. 63), therefore this is the type.

1817. ARICIA, R. L.—Created for Ochsenheimer's fam. A, the "blues." Used by Herrich-Schäffer in 1839 for *agestis* (*astrarche*), which must, therefore, be taken as the type.

1817. CHRYSOPTERA, Zincken.—Created for Ochsenheimer's fam. 8 and fam. 9, "coppers" and "hairstreaks." *Virgaureae* should be taken as the type, this being the species of which the larva was best known to Schiffermüller and Ochsenheimer, both of whom use the larval characters in their diagnosis of the section. Falls as a synonym of *Heodes*, Dalm.

1818 *circa*. HAMEARIS, Hübner.—Heterotypical. Type designated *lucina* by Curtis in 1830, confirmed by Westwood in 1840.

1818 *circa*. NOMIADES, Hübner.—Heterotypical. Restricted by Stephens in 1835 to *acis*, *alsus*, *aleon* and *arion*. Type fixed in 1873 by Scudder as *semiargus* (*acis*). Therefore falls as a synonym of *Cyaniris*, Dalman.

1818 *circa*. AGRIADES, Hübner.—Heterotypical. Restricted by Stephens in 1835 to *argiolus*, *corydon*, *adonis*, *alexis*, *agestis*, *doryllas* and *icarius*. Doubtfully restricted further in 1858 by Kirby to *corydon* and *astrarche* (*agestis*). Stephens' restriction renders Scudder's action, in 1875, of fixing *orbitulus* as type, *ultra vires*. We would suggest *corydon* as type.

1818 *circa*. LYCÆIDES, Hübner.—Contains *argus* (*argyrognomon*) the type of Hübner's genus *Rusticus*, of which it is therefore a synonym. Falls also before *Plebeius*.

1818 *circa*. EVERES, Hübner.—Created for *amyntas* (*argiades*) and its var. *polysperchon*. *Argiades* is therefore the type.

1818 *circa*. LAMPIDES, Hübner.—Heterotypical. Used in 1869 by Newman for *boeticus*. Confirmed by Kirby in 1896.

1818 *circa*. CHRYSOPHANUS, Hübner.—Heterotypical. Restricted in 1841 by Westwood to *phlaeas*, *hippotohœ* and *virgaureae*. Type fixed in 1875 by Scudder as *hippotohœ*.

1818 *circa*. SCOLITANTIDES, Hübner.—Created for *battus*, Hb. (*orion*, Pall.), and *hylas*, Hb. (*baton*, Bergs.). Type fixed in 1896 by Kirby as *orion*.

1818 *circa*. THESTOR, Hübner.—Erected for *protumnus* and *ballus*. Restricted by Lederer in 1857 to *ballus*, excluding *protumnus*; *ballus* therefore becomes type. Used also thus in 1861 by Staudinger.

1818 *circa*. LYCUS, Hübner.—Type fixed in 1835 by Stephens as *rubi*, but the name preoccupied from 1787 (in Coleoptera).

1818 *circa*. BITHYS, Hübner.—Heterotypical. Restricted in 1835 by Stephens to *quercus*, and confirmed by him in 1850; this is, therefore, the type.

1818 *circa*. STRYMON, Hübner.—Heterotypical. Restricted in 1835 by Stephens to *pruni*, *betulae*, *w-album* and *spini*. Scudder's action, therefore, in 1872, in fixing *titus* as type is *ultra vires*. We would suggest *pruni* as type.

1820. CALLOPHRYS, Billberg.—Type fixed in 1875 as *rubi* by Scudder.

1827. NEMEOBIUS, Stephens.—Created for *lucina*, sole species and therefore type. Falls as a synonym of *Hamearis*.

1828. PITHECOPS, Horsfield.—Heterotypical. Horsfield described *hylax* at length, citing also *alsus*, *lysimon*, *pheretes* and *damon*. We consider *hylax* Horsfield's type.

1839. TOMARES, Rambur.—Created for *ballus*; sole species and therefore type. Falls as a synonym of *Thestor*, Hb.

1858. LÆOSOPIS, Rambur.—Created for *roboris*; sole species and therefore type.

1881. ZIZERA, Moore.—Type fixed by Moore as *minima*, therefore falls as a synonym of *Cupido*.

Two genera will apparently be wanted to complete are study of the group. For these we suggest:—

CELASTRINA, n. gen.—Type *argiolus*.

RUMICIA, n. gen.—Type *phlaeas*.

We are greatly indebted to Mr. Prout for his kindness in going over and checking these names with the literature on which they are based, and which will be published in due course in the *The Natural History of British Butterflies*. The names, therefore, we at present propose to use for our British species (we make no note here of the grouping) are as follows:—

<i>Aricia agestis.</i>	<i>Lampides boeticus.</i>
<i>Polyommatus icarus.</i>	<i>Chrysophanus dispar.</i>
<i>Agriades coridon.</i>	<i>Rumiccia phlaeas.</i>
<i>bellargus.</i>	<i>Callophrys rubi.</i>
<i>Cyaniris semiargus.</i>	<i>Ruralis betulae.</i>
<i>Cupido minima.</i>	<i>Bithys quercus.</i>
<i>Lycaena arion.</i>	<i>Strymon pruni.</i>
<i>Plebeius argus.</i>	<i>w-album.</i>
<i>Everes argiades.</i>	<i>Hamearis lucina.</i>
<i>Celastrina argiolus.</i>	

A new hybrid *Nyssia*: *Nyssia hybr. merana*.

By REV. C. R. N. BURROWS.

By a fortunate experiment undertaken in the spring of last year, Mr. A. W. Mera succeeded in pairing a ♂ *Nyssia zonaria* with a ♀ *N. lapponaria*. The eggs proving fertile, he naturally took special care of the progeny, and was rewarded by the emergence, this spring, of several magnificent specimens of both sexes. As he presented the first male to me, I feel myself more or less called upon to publish the account of the new insect.

The male presents the appearance of a dark suffused *N. zonaria*, thus following the rule of resembling the parent of the same sex. There is an entire absence of the orange costal streak on the forewing, so distinct in *N. lapponaria*. The wings are not transparent, but well scaled, perhaps a trifle whiter than in *N. zonaria*. The subterminal line is completely different from that of the male parent, in which it is distinct, unbroken, and direct. In the hybrid the line is distinct enough, but wavy, following the female parent, *N. lapponaria*. The central lines enclose a darker shade, striking enough, but I have seen *N. zonaria* which approach it closely in this way. The hindwings do not show the marginal shade which is so distinct in *N. zonaria*, but are crossed by two dark lines, only indistinctly marked in *N. lapponaria*.

The female hybrid is entirely without the series of orange spots on the central line peculiar to *N. lapponaria*, the female parent, and is also without the transverse bands of the male parent. The rudimentary wings are perhaps a trifle more developed than in *N. zonaria*, and about the same as in the case of the female parent. The down upon the abdomen is not very different from that of the female *N. lapponaria*.

I would suggest that this insect should be called *Nyssia hybrid merana*.

[As bearing on this matter we have, in *British Lepidoptera*, vol. v., p. 30 (a volume which we hope to get published now at an early date),

a summarised account of two allied hybrids, *Biston* hybr. *PILZII*, Standfuss (*Ent. Zeits. Guben.*, iv., pp. 142-3, v., pp. 109-110; *Handbuch*, etc., pl. iii., figs. 1-2), and *Nyssia* hybr. *HÜNNI*, Oberthür (*Bull. Soc. Ent. France*, 1897, pl. i., ii., and 1900, p. 274, pl. i). The former with the parentage *hirtarius* ♂ × *pomonarius* ♀, the latter *pomonarius* ♂ × *hirtarius* ♀. The crossing of these allied species, one of which has a winged and the other an apterous female, has produced most interesting results. We are very pleased to know that Mr. Mera has extended our knowledge of the possibilities of hybridisation in this group of Geometrid moths.—Ed.]

COLEOPTERA.

Hydrochus nitidicollis, Muls., a species new to Britain.

By H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

On April 13th last, when searching for *Gnypeta coerulea*, with Mr. Keys, in the river Meavy, at Yelverton, I noticed a *Hydrochus*, which I did not recognise. Mr. Keys told me he had never taken a specimen of that genus there before, and we eventually took four specimens. On my return home I found it to be *Hydrochus nitidicollis*, a species new to Britain. There is a specimen of this species in the general collection of the Natural History Museum, so I was able to confirm my determination of it. It is interesting taking it in running water, as our other four species are all found in stagnant pools, etc. Mr. Keys writes that he has been since I was there, and has taken two more specimens. It is evidently very scarce. The following is a translation of Ganglbauer's description of the insect: "It agrees tolerably, in the shape of the body, with *carinatus*, from which it is easily distinguished not only by the not (or only slightly stronger) raised third interstices, but also by the less deep and closer together punctures of the striæ of the elytra. Above of a lighter or darker bronze colour; head and thorax often metallic-green, or blue-green; the elytra often with purple reflection; the antennæ rust-red with blackish club; the palpi yellow with a black tip to the last joint, or quite dark; the legs yellow-red or brown-red, the knees and the tips of the tarsal claws, or the whole tibiæ and tarsi, black. Head and thorax less deeply, and not so closely, punctured as in *carinatus*. The thorax about as broad as the head, and about as long as broad, contracted behind, with tolerably deep impressions. The elytra much less punctured than in *angustatus*, with similar dug-out, punctured striæ, the third interstice not, or only slightly, keeled, the fifth, seventh and ninth distinctly raised in blunt keels; the keels of the seventh almost interrupted by an impression. Length, 2.2mm.-2.5mm. Central and south of France." In two of my specimens the head and thorax are of a beautiful metallic blue-green, and the elytra are purplish, the third, however, is black. In all three the palpi are quite dark. This is a very pretty and interesting addition to our list of coleoptera.

COLEOPTERA AT YELVERTON.—The following species were taken at the same time as the new *Hydrochus* described above, which will show what a very fine locality this is. *Gnypeta coerulea*, which was discovered here by Mr. Keys some years ago, *Trogophloeus arcuatus*, *Henicocerus exculp-*

tus, *Elmis paralleloepidus*, *Hydraena riparia*, *H. gracilis*, and *H. atricapilla*, *Helophorus arvernicus* and *Limnebius truncatellus*, all came up in the waternet, or out of moss from boulders, and *Hydroporus septentrionalis*, *H. rivalis* and *Deronectes latus* were fished out of the river.—H. ST. J. K. DONISTHORPE. April 26th, 1906.

STENUS KESENWETTERI, ROS., AT SUNNINGDALE.—I was fortunate enough to take this rare species, perhaps the most sought after of all our *Steni*, out of *Sphagnum*, when at Sunningdale, in April.—IBID.

NOTE ON KILLING AND SETTING COLEOPTERA.—Beetles like *Throscus* and *Trachys* are generally found very difficult to set if killed by ordinary methods until left for a long time in laurel with the attendant risks. I have found the following plan most efficacious. Put the living beetle into a very small collecting tube, block it up at the end with a piece of paper, put another wad of paper in the tube and then insert a drop of ether on a piece of cotton wool, cork up and leave in the dark for five minutes, then take the insect out. Its legs and antennæ will be found extended and soft, and it can be set on card with gum tragacanth without any difficulty. Cut out the card and replace it, with the insect on it, in the tube with the ether and a piece of laurel. Examine and adjust the legs (if necessary) after half-an-hour or so, then replace and leave until there can be no question that the insect is dead. Care is necessary not to wet the insect with the spirit, as the two wads of paper above advised are to prevent the insect touching the spirit. Ether as a means of killing is a useful adjunct to the ordinary modes. Insects killed with it extend their legs and palpi instead of retracting them as they do when cyanide or laurel is used, and this applies even to those insects that retract their legs when killed in boiling water. They can be set at once, or kept in laurel, while insects killed in boiling water must be set at once, and cannot be kept. It is especially useful for very delicate insects which are to be set at once, and for those species that cannot be properly set when boiling water is used.—A. J. CHITTY, M.A., 27, Hereford Square, S.W. April 10th, 1906.

COLEOPTERA IN THE HIGHLANDS.—I spent a week or two in Scotland during the early part of last summer, and making Kingussie a centre, worked the surrounding district, including a day or two at Pitlochry on my way back. Kingussie is the place *par excellence* for turning stones, but the weather was cold and results were not so good. Among a number of commoner things *Calathus rostratus*, *Pterostichus lepidus*, *Amara consularis*, *A. communis*, *Calathus micropterus*, *Corymbites cupreus* var. *aeruginosus*, *Otiorhynchus blandus*, and *Erihrinus aethiops*, came to hand. Professor Hudson Beare was kind enough to indicate the locality for *Miscodera arctica*, but I was not fortunate enough to find it. Beating Scotch fir and shaking loppings of the same produced several useful and good things, including *Sericosomus brunneus*, *Podabrus alpinus*, *Ancistronycha abdominalis*, *Corymbites impressus*, *Telephorus obscurus*, *Rhagonycha elongata*, *Rhagium bifasciatum*, *Pogonochaerus fasciculatus*, *Tetratoma ancora*, *Salpingus castaneus*, *Rhinomacrus attelaboides*, *Otiorhynchus septentrionis*, *Hylobius abietis*, *Pissodes pini*, *P. notatus*, and *Maydalis phlegmatica*. *Mysia oblongoguttata* was in great abundance. Beating alders on the banks of the river Tromie resulted in a nice series of *Melasoma aeneum*, three or four *Anoplus roboris*, and as many *Anthonomus conspersus*, a rather good thing, on

mountain-ash. *Bembidii* were plentiful on the banks of the Spey, including *Bembidium doris*, *B. decorum*, *B. nitidulum*, *B. bipunctatum*, *B. punctulatum*, *B. prasinum*, *B. paludosum*, also *Geodromicus nigrita*, *Lesteva sharpi*, *L. pubescens*, and *Cryptohypnus dermestoides*, both type and var. Old fir-stumps produced *Thanasimus fornicarius*, *Agathidium nigripenne*, *A. rotundatum*, *A. nigrinum*, *Liodes glabra*, *Ips quadripustulata*, *Pityophagus ferrugineus*, *Rhizophagus cribratus*, *R. depressus*, *R. parallelocollis*, *R. ferrugineus*, *R. dispar*. In moss were found *Bradycellus placidus*, *B. cognatus*, *Otiorynchus ovatus*, *O. muscorum*, and *Byrrus dorsalis*. Among the water-beetles, which were not numerous, were *Hydroporus davisii*, *H. tristis*, *H. umbrosus*, *H. morio*, *H. vittula*, *H. obscurus*, *Agabus congener*, *A. femoralis*, *A. arcticus*, *Rhantus bistratus*, *Parnus auriculatus*, *Elmis volkmari*, and *E. parallelopipedus*. Sweeping and general collecting accounted for *Dascillus cervinus*, *Helodes marginatus*, *Aseum striatum*, *Pachyta cerambyciformis*, *Apion fuscirostre*, *A. ononis*, *A. spenci*, *A. gyllenhalii*, *Tropiphorus tomentosus*, *Barynotus schönherri*, *B. elevatus*, *Deporaus megacephalus*, *Anthonomus varians*, *Orchestes scutellaris*, *Tychius venustus*, *Phytobius quadrituberculatus*, and *Silpha nigrita*. There are still a number of small things and a box of Staphs that I have been unable to go through yet, owing to absence from home for some time. In reference to *Anoplus roboris*, mentioned above, this insect may be readily separated from *A. plantaris* by the fact of the thorax being coriaceous between the punctures, a character not mentioned in the descriptions, and one which appears to be somewhat overlooked generally. The reticulation of the thorax, or elytra, when it occurs, seems to be quite constant; in *Philonthus*, for instance, it is often useful to confirm a doubtful species, the markings taking a variety of forms in this genus. *Xantholinus linearis* may be at once separated from *X. longiventris*, *Bembidium doris* from its allied species, and many others in the same way.—W. BEVINS, Hallsford Villa, Ongar, Essex. April 26th, 1906.

DROMIUS AGILIS AB. BIMACULATUS, DJ.—Whilst setting, recently, some rather belated material from the New Forest—a remnant of last year's collecting—I found a well-marked example of this form, which was lately recorded by Mr. Donisthorpe for the first time as British.—J. R. LE B. TOMLIN, M.A., West Malvern. April 26th, 1906.

NOTES ON COLLECTING, Etc.

THE EARLIEST BRITISH RECORD FOR HESPERIA MALVÆ IN 1906.—*Hesperia malvæ* ♂ was found here yesterday afternoon, April 25th, at rest on blossom of wild hyacinth within border of wood. It was the first one seen this year.—J. F. BIRD, Tintern, Monmouthshire. April 26th, 1906.

EARLY DATES FOR BRITISH BUTTERFLIES.—On April 11th I saw a specimen of *Pieris rapae* on Westcombe Hill. The following day several in the neighbourhood of Grove Park and Chislehurst. On April 15th a ♂ *Cyaniris argiolus* in the grounds by Cockington Church, another on April 21st near Torquay Station. Several *Pieris rapae* were seen at Torquay and Paignton on April 14th and 15th, and again on the 20th, when an *Anticlea badiata* fluttered out of a hedge in the afternoon at Cockington; a ♀ *Vanessa io* and a ♂ *Gonepteryx rhamni* at Cockington, on April 15th; a specimen of

Aglais urticae and a doubtful *Polygonia c-album* at Paignton, on the morning of the 14th. The bitterly cold winds, however, from the 16th-17th, prevented anything getting on the move.—J. W. TUTT.

HEMARIS TITYUS OR H. FUCIFORMIS IN APRIL.—A cousin of mine, whilst working in her garden, at Effingham, a few miles from Guildford, on April 16th, saw two specimens of either *Hemaris tityus* or *H. fuciformis* feeding on the wing quite close to her. Is not this very early for either of these species to be on the wing here in England? —CECIL FLÄRSHEIM, Pennyhill Park, Bagshot, Surrey. April 28th, 1906.

PUPARIUM OF PHLOGOPHORA EMPYREA.—In *Practical Hints*, part iii, p. 45, it is stated that larvæ of *Phlogophora empyrea* "form a cocoon of a rather open network of silk under the upper leaves of this plant" (i.e., *Ranunculus repens*). I have had 60 larvæ of this species, from ova obtained last November, feeding on *R. repens*, and, of these, about half have gone down into the cocoa-nut fibre and spun a cocoon, a brittle one, like that made by most Noctuid larvæ. The other larvæ are still feeding. They refused to touch *R. ficaria* at any stage. I am only sending this note to show that the larval habits appear to vary somewhat under different conditions, in confinement, when they set about making their cocoons for the purpose of pupation.—ERNEST A. ROGERS, Kabul House, Teignmouth. May 1st, 1906.

URGENT APPEAL FOR ZEPHYRID EGGS.—It seems very strange that, with the large number of accurate observers scattered through the British Isles, it should be so difficult to obtain material for describing the initial stages of several of our more ordinary Diurni. Our enthusiastic and enterprising editor is making rapid progress with the publication of his new exhaustive work on "British Butterflies," which will, I doubt not, form the chief work of reference for many years to come. It seems very extraordinary, therefore, that no one, so far, has been able to supply him with eggs of so common an insect as the "purple hairstreak" (*Zephyrus quercus*), and that only empty eggshells of its close ally, *Z. betulæ*, have, so far, been forthcoming. A few years ago I induced females of *Thecla w-album* to lay freely when sleeved out in the sun on a growing wych-elm, and last year a friend of mine in Northants obtained ova of *Thecla pruni* by confining females on a living bush of blackthorn. Now I freely confess that I have failed year after year with *Z. quercus*, the egg of which is quite unknown to me, and has, I think, never been described. Still, I live among this species, and hope every year to solve the riddle. *Z. betulæ*, on the contrary, is very scarce in this neighbourhood, and it is only by making a journey of five miles that I occasionally succeed in beating a few larvæ. They are at all times so scarce that one larva an hour is the average result of this strenuous exercise. I have only once come across an imago in a state of nature, and that was many years ago. But, as the "brown hairstreak" is not uncommon in the west, especially in Devonshire, and sometimes abounds in our larger midland woods, I hereby make a sincere appeal to some leisured entomologist who lives in such a neighbourhood to make a special effort to obtain eggs of *betulæ* this season. Pairing bred specimens in confinement is, I imagine, almost hopeless, but he has three other courses open to him: he may either catch a female and sleeve her in the sun on blackthorn, or he may watch her in a state of nature till

she elects to oviposit, or he may search for the eggs in winter on the bare blackthorn branches. He may be surprised to hear that the last of these three methods is perhaps the most likely to be successful, as not many years ago I saw, in the possession of a friend, something like a hundred eggs of *betulae* thus obtained in a western county. My friend who had them, found that they were extremely easy to rear, and most of them eventually produced perfect insects.—REV. G. H. RAYNOR, M.A., Hazeleigh Rectory, Maldon, Essex. *May 3rd, 1906.* A small larva of *Z. quercus* and of *Z. betulae* would be very useful also.—ED.]

SCARCITY OF EARLY LEPIDOPTERA.—On May 5th, I went to Reigate, in order to look up two or three matters entomological. One could not but be struck, however, by the fewness of both species and specimens observed. Only a single *Nisoniades tages* was noticed, a single *Callophrys rubi*, two *Pieris rapae*, one *P. napi*, one *Gonepteryx rhanni*, one *Ematurga atomaria*, and two or three micros. It was a lovely day, and, as far as weather was concerned, should have proved satisfactory, although it got colder towards the end of the afternoon. On April 30th, at Woking, the results were equally poor; I only took larvæ of *Coleophora pyrrhulipennella* and *C. juncicolella*, with a few larvæ of *Anarta myrtilli* on heath.—H. J. TURNER, F.E.S., 98, Drakefell Road, New Cross, S.E. *May 6th, 1906.*

EARLY SPECIMENS OF HESPERIA MALVÆ.—I have to note to-day that I took four specimens of *H. malvæ* at Hazeleigh, and saw one or two more. This is the earliest date I have ever recorded for the species, May 9th, 1905, being the next earliest.—(REV.) G. H. RAYNOR, M.A., Hazeleigh Rectory, Maldon. *May 5th, 1906.*

PAIRING OF CLOSTERA CURTULA.—A ♀ *Clostera curtula* emerged on May 2nd, and I at once placed her with a ♂ in a sleeve out-of-doors, but no pairing took place till May 5th. It then occurred during daytime. I cannot say exactly at what hour, but I found them *in cop.* at 6 p.m., and they separated soon after 7 p.m. Another ♀ was busy ovipositing at the latter hour, when it was still broad daylight.—PERCY C. REID, Feering Bury, Kelvedon. *May 6th, 1906.*

HABITS OF ♀ HESPERIA MALVÆ WHEN EGG-LAYING.—On May 3rd, in the Esterel, near St. Raphael, I saw a ♀ *H. malvæ* ovipositing. Her flight was very different from that of the species when disporting itself in the sun. She flew very leisurely in short curves, for only a foot or two, before alighting again. The plant selected was a *Potentilla* with cinquefoil leaves, most of the little plants had only two leaves; she settled on one of these, and on two occasions seemed to find the positions, for some reason, unsatisfactory, but, on two others, being apparently satisfied, she backed a little, and then, being partially on the edge of a leaflet, curved her abdomen under it and deposited an egg; from settling until she was off again taking about 20, or possibly 30, seconds. After laying the second egg she seemed to want a rest, and flew off less than a foot and settled on the bare soil, to bask in the sun in the usual way. The eggs are in both cases close to the edge of the leaflet, about halfway along it, in one case on the central, in the other on the second, leaflet. The leaves are very small, and the leaflets hardly half-an-inch long.—T. A. CHAPMAN, M.D., Grand Hotel, Ste.-Maxime-sur-Mer, Var, France. *May 3rd, 1906.* [It is very unfortunate that this note was received just too late to include in our paragraph of the "egg-laying" of

this species in part 8 of *A Natural History of the British Butterflies*. Perhaps it will be easiest to cut this out and paste it on a piece of paper and insert as a slip opposite the place in which we should have liked it to have appeared.—ED.]

EARLY POLYOMMATUS CORYDON, ETC., AT STE-MAXIME-SUR-MER.—The weather here is calmer and warmer now, but with a thin layer of cloud. I found all butterflies much rarer than in previous years; things are rare that are normally common, and usually abundant things are barely common. As exceptions, *Pieris brassicæ* swarms, and *Polyommatus corydon* is plentiful in one very restricted spot. *Thais cassandra* is all over the place, but only occurs singly, and nearly all are now much worn.—IBID.

WHERE DOES PORRITIA GALACTODACTYLA HYBERNATE?—The fact that the larva of *Porritia galactodactyla* hibernates as a comparatively small larva is well known, but the further fact that its foodplant, burdock, dies down in winter, has always made the exact position it was likely to take up during the winter, rather problematical, nor do any observations on the point appear to have been recorded. It may, therefore, be advisable to note that, whilst Mr. Foreman and myself were entomologising at Cuxton to-day, we found the small larvæ of this species attached to the half-decayed fibres of the main stem of a plant of burdock, but under the outer skin, which was less decayed. There was no trace of green leaves, nor had the main bud broken at all through the crown of the plant.—J. OVENDEN, Strood, Kent. February 28th, 1906.

CURRENT NOTES.

Herr Jacobs, of Wiesbaden, describes and figures (*Iris*, xviii., pp. 321-327, pl. ix., figs. 1-4) a new hybrid in the *Sphingides*—*Choerocampa* hybr. *pernoldi*, the result of a crossing obtained in captivity by Herr Carl Pernold, of Vienna, between ♂ *Eumorpha elpenor* and ♀ *Hyles euphorbiæ*. Ten specimens were bred, all being males; two are figured, together with the adult larva and the pupa.

Professor Rebel points out (*Verh. zool.-bot. Ges. Wien.*, lvi., p. 5) that the form of *Endrosa irrorella*, which has been generally known as var. *freyeri* (var. *c* of Zeller, *Stett. Ent. Zeit.*, xxix., p. 35) is not the true *freyeri* of Nickerl. Dr. O. Nickerl has sent to Vienna, for exhibition, one of his father's types from the Glockner, and this shows that var. to be "minor, alis elongatis, pallide vitellinis, ant. subtus nigricantibus, punctis elongatis aut confluentibus," agreeing, therefore, with Nickerl's original description and Freyer's figure. For the other form (Zeller's var. *c*) Rebel proposes the new name var. *nickerli*, quoting Zeller's diagnosis: "Al. ant. pallide vitellinis (subtus præter margines nigricantibus), punctis seriei transversæ primæ et secundæ elongatis, obsolescentibus."

We wish to draw the attention of hymenopterists to a most important paper recently issued, viz., "A study of the wings of the *Tenthredinoidea*, a superfamily of Hymenoptera," by A. D. MacGillivray (Published at the Government Printing Office, Washington, U.S.A.). The author appears to obtain important taxonomic results from the phylogenetic study of the wing-structures. It is a paper that should be in the hands of all our scientific hymenopterists.

Mr. H. Main, of Almondale, Buckingham Road, South Woodford, Essex, who is kindly photographing the larvæ, pupæ and imagines (in natural resting-position) of British butterflies for our work, *A Natural History of British Butterflies*, particularly desires living imagines, larvæ and pupæ of the skippers. (He has photographs of the larva and pupa of *Nisoniades tages*, pupa of *Hesperia malvae*, and larva of *Angiades sylvanus*.) Although the "skippers" are most important just at present, the larvæ, pupæ and living imagines of the "coppers," "blues" and "hairstreaks" are hardly less so.

Now that the letterpress of the "Skippers" is finished in the new work, *A Natural History of the British Butterflies*, those entomologists who have helped us with information will be able to pass judgment on the use made of it. We should be particularly pleased if our readers will make observations this spring and summer on the habits of any Blues and Hairstreaks that come within their purview, particularly as to resting and flying habits in the daytime, pairing habits, egg-laying habits, sleeping habits, etc. We shall be very much obliged for lists of localities, actual dates of appearance (especially earliest and latest in a particular locality), etc. Practically, nothing definitely is known of the distribution of our commonest species in some of the counties, particularly in Scotland, Wales and Ireland.

We would also again remind our British lepidopterists that, although we have now possibly got well ahead of continental knowledge of most of the "plumes" that inhabit Britain, we are still practically without information of the lifehistories of some of the British Oxyptilids, viz., *Oxyptilus distans*, *O. pilosellæ*, and *O. parvidactyla*. Mr. Sich started well on the last-named in 1905, obtaining eggs laid on *Hieracia*, and making descriptions of the mining larvæ up to hybernation, but, so far, spring larvæ are not forthcoming, nor have eggs or larvæ of *O. distans* and *O. pilosellæ* been found in Britain at all. We trust our British lepidopterists will be able to at least obtain eggs of these species in 1906, or that some of our continental friends will be able to help us.

At the meeting of the British Association, to be held this year at York (August 1st-8th), it is proposed that there shall be an exhibition of British lepidoptera, illustrating melanism. The organising committee of the zoological section invite those who are willing to take part to communicate with L. Doncaster, Zoological Laboratory, Cambridge, stating the species and number of specimens which they are prepared to send. It is hoped that a paper on melanism will be read at the meeting by Mr. G. T. Porritt, of Huddersfield, and that it will be followed by a discussion.

We have just had the pleasure of looking through what appears to be an excellent paper "Lepidopterologische Temperatur-Experimente mit besonderer Berücksichtigung der Flügelschuppen," by Harry Federley, published in the *Festschrift für Palmén*, no. 16, 1905. Students of variation should not miss this.

Dr. N. H. Joy adds (*Ent. Mo. Mag.*) *Euplectus tomlini*, n. sp., to the British list of coleoptera, sixteen examples having been taken in February last from an old starling's nest, and others subsequently bred. Reitter believes the species to be new to science and suggests *E. punctatus*, Muls., and *E. karsteni* as its nearest allies.

Dr. Chapman notes the receipt, from Mr. H. Murray, of Carnforth, Lancashire, of larvæ of the North American Arctiid, *Pyrrharcia*

isabellae, which he had taken in his immediate neighbourhood. As Mr. Murray has before captured the larva, Dr. Chapman suggests that it must be an established species. We await the breeding of the imagines with interest.

Mr. Claude Morley adds *Bracon abscessor*, Nees, to the British list, on the strength of a single ♀ specimen swept at Horning Fen, on July 15th, 1901.

The Rev. W. J. Wingate (*Ent. Mo. Mag.*) records *Phora nigricornis*, Egg., *P. nudipalpis*, Beck., and *P. ruficornis*, Mg., as new to the British list, he also describes *Phora papillata*, n. sp., from specimens taken at Bishop Auckland.

Parts 8 and 9 of *A Natural History of the British Butterflies* are published together this month, and carry us almost to the end of our study of the "Skippers." The lifehistories of *Hesperia malvae* and *Nisoniades tages* are, thanks to Dr. Chapman and Mr. Sich, particularly complete; nothing but the most superficial information having been hitherto available about either of them. A long chapter on the "Connection between ants and butterfly larvæ," in the preliminary part of these numbers, will no doubt be found of great interest. Part 10 will contain a chapter on "Carnivorous butterfly larvæ," being a summary of our knowledge of the habits of those Lycænid larvæ that feed entirely on aphides, mealy-bugs, etc.

SOCIETIES.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*April 3rd, 1906.*—EXHIBITS.—HYBERNIA LEUCOPHÆARIA—from Richmond Park, including two melanic specimens, and very dark NYSSIA HISPIDARIA from the same locality, Mr. E. A. Cockayne. ANTHROCERA FILIPENDULÆ.—Cocoon spun upon a hawthorn twig, two feet above the ground, Mr. G. G. C. Hodgson. ANTICLEA BADIATA.—A series bred from ova from Surbiton. The emergence extended from February 1st to March 22nd, 1906, although the larvæ pupated almost simultaneously, Mr. W. J. Kaye. NYSSIA ZONARIA × N. LAPPONARIA HYBRIDS.—Males and females of this hybrid, exhibited by Mr. A. W. Mera. Several pairings of the hybrids had been attempted, but no ova resulted, although the females went through the actions of oviposition. "A CONTRIBUTION TO THE STUDY OF THE MICRO-LEPIDOPTEROUS FAUNA OF THE LONDON DISTRICT."—Mr. A. Sich read a paper on this subject, and laid before the Society a preliminary list of the Micro-lepidoptera of southwest London. *April 17th.*—EXHIBITS.—PARARGE EGERIA.—Third brood, bred August, 1904, and their descendants, which passed the winter in the pupal stage, and emerged in March and April, 1905, Mr. C. P. Pickett. CALLIMORPHA DOMINULA.—Larvæ, from Kingsdown, Kent, where the exhibitor had also found the larvæ of PORTHESIA CHRYSORRHŒA to be plentiful, Mr. T. H. Hamling.

SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*April 12th, 1906.*—BREEDING MELANIPPE FLUCTUATA.—Mr. R. Adkin exhibited a bred series of *M. fluctuata* from Wantage, with the parent ♀. The latter was large and strongly marked, while the progeny were small and very ordinary looking. ABERRATIONS OF CRAMBUS TRISTELLUS.—Mr. R. Adkin also exhibited specimens of *C. tristellus*—(1) An almost albino form from Pembroke. (2) Dark form from Perth. (2) With two transverse lines from Orkney.

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EXCHANGES.—The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of address" is open free to subscribers so far as there is space available.

Duplicates.—Ova: *Obliquaria (rufata)*, *Abruptaria*. Larvæ: *Scolopacina*.—V. E. Shaw, 20, Salisbury Road, Bexley, Kent.

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CHANGE OF ADDRESS.—*Mr. F. Merrifield to 14, Clifton Terrace, Brighton.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. June 6th, October 3rd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. May 24th, Exhibition. May 26th, Field Meeting at Wisley, L.S.W.R. June 14th, Exhibition. June 16th, Field Meeting, Box Hill, S.E.R. June 28th, "Collecting Notes." June 30th, Field Meeting, Leith Hill, L.B.S.C.R.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. May 22nd, "The Life and Work of Linné," L. B. Prout. May 12th, Excursion to Toothill, near Ongar. June 2nd-4th, Excursion to Lyndhurst. June 4th, to Shere (London Bridge, L.B.S.C.R., 9:25 a.m.).

Lancashire and Cheshire Entomological Society.—Royal Institution, Liverpool. Field Meeting, June 16th, to Prestatyn. Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained.

Birmingham Entomological Society, Norwich Union Chambers, Congreve Street, at 8 p.m. May 31st, June 26th, October 16th.

The South-Eastern Union of Scientific Societies.—Annual Congress: Eastbourne, June 6th-9th, 1906. President: F. Darwin, Esq., LL.D., F.R.S. For programme of Papers, Excursions, etc., apply to Rev. R. Ashington Bullen, "The Locks," Hurstpierpoint, Sussex. All members of Natural History Societies may become Associates during the period that the Congress lasts.

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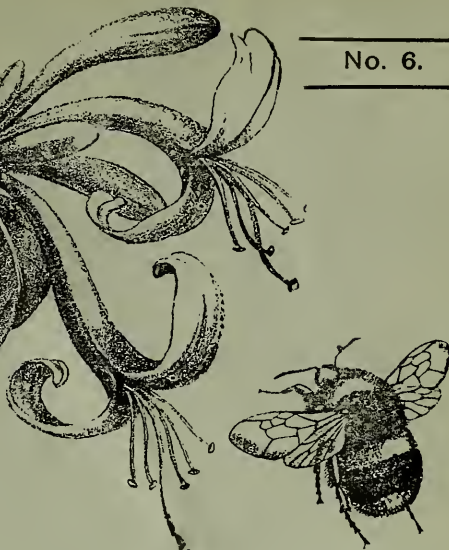
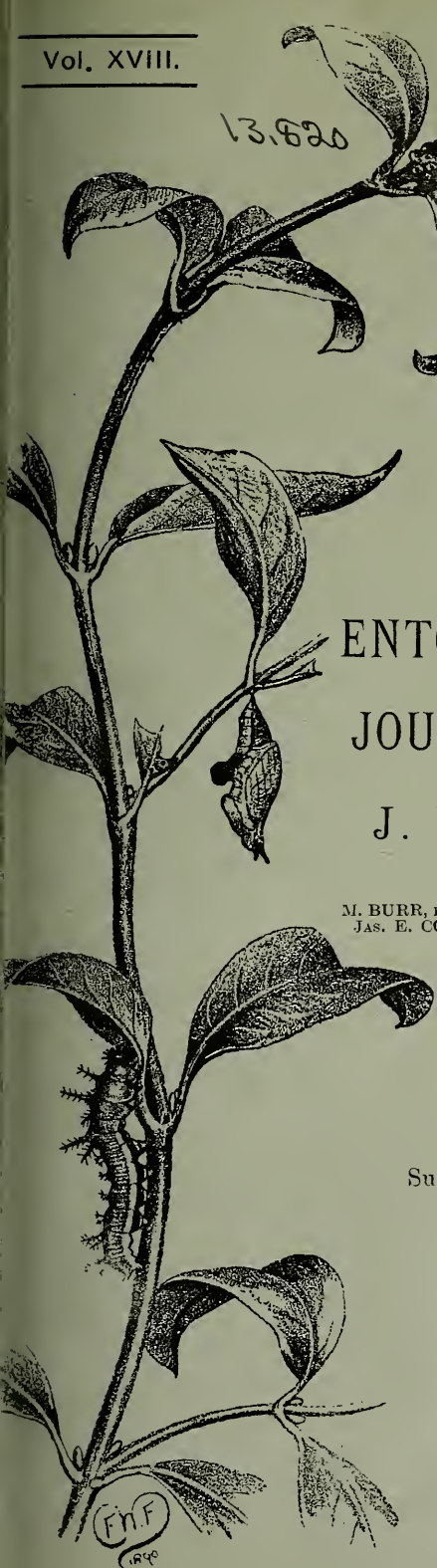
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To be obtained from J. HERBERT TUTT, 119, Westcombe Hill, Blackheath, S.E.

The Lepidoptera of the southeastern district of London.

By WILLIAM WEST.

[FORE-WORD.—The exigencies of building operations have completely altered suburban London during the last half-century, and many of the best known entomological localities of the London district, in the days of the *Entomologist's Weekly Intelligencer*, are now covered closely with bricks and mortar, whilst the environment of the places has been so completely altered, that it is difficult to conjure up even a faint picture of the places as they were, what still appears to be, a very short time ago. In no part of London have the changes been greater, perhaps, than in the southeastern district. In 1878, Greenwich was still, in a measure, cut off from New Cross, Charlton was an isolated village, Plumstead was yet in babyhood, and the country around was still country in the best sense. Westcombe Park was unopened, and only a single pathway led through it. The old West Combe House was still the solitary building therein, and Westcombe Hill contained a dairy-farm and six houses, whilst its hawthorn hedges and mighty elm-trees were the glory of the district. *Thecla quercus* and *Euchloe cardamines* were not infrequent, and, as for moths, possibly one-fourth of the British micro-fauna was obtainable in the vicinity. Since then, the "Park" has disappeared, whilst within the last ten years the Hither Green district, the entomological "heaven" of Stainton, has disappeared, and we, who live on the ground rendered classic by being the homeland of Stephens and Curtis, Stainton and Douglas, McLachlan and Darwin, Jenner-Weir and Harrison-Weir, can now only fight for "open spaces," and hope that some day we shall not be quite so badly off as the Old Kent Road, or Bermondsey. The gradual, but mighty, change leads one to wonder whether, some day, the entomologists of the future will be inclined to doubt the records of the work done in what must now even seem such impossible places. When we assert that we preferred to spend a summer holiday at home, to entomologise on Greenwich Marshes, knowing that the insects to be obtained there were oftentimes better than from far-distant places with excellent entomological reputations, we shall scarce be believed. When we say that a hundred *Leucania straminea* could be easily netted in a single evening, and hundreds of others be seen, that *Calamia phragmitidis* was too common to be captured, that the sugar-patches were covered with *Agrotis nigricans*, *A. pta*, *A. ypsilon*, *Hydroecia nictitans*, and a fair sprinkling of *Mamestra abjecta*, and that all the usual local marsh insects were to be had for the asking, whilst Shooter's Hill Woods still held most of the fauna to be found at Darenth or Chattenden, what need was there to go further afield for specimens and material for study, so long as these were not exhausted? Now the face of these places is wholly altered; London—close, thick, impenetrable—is everywhere, Ichabod is written in gloomy characters, entomologically, over all our old haunts, and one now has to go further afield to fare worse, and to live largely on the recollections of the departed glories of Greenwich, Blackheath, and the neighbourhood. Chats with Messrs. Bower, Fenn, A. H. Jones, and others, who knew the district well, are an occasional luxurious sadness, and to hear our old friend, Mr. William West, descant on what the district was, even twenty years before we knew it, fires the ardour of youth, and makes

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us long to have it all back again, if only for just a little while. As a result of one of our talks, we urged Mr. West to give us, from his well-kept notes, a summarised record of his captures in the London district, and although he put forward the unsatisfactory item that he had lost his notes on the *Tineina*, of the lifehistories of certain groups of which he was (and as an old friend and follower of Stainton, should have been) an acknowledged master, we were able to persuade him into writing up the remainder, and we are now able to present them to our readers. We have advised him not to delete those localities lying just outside our area, believing that the time may come when they will be also valuable as records of what has been rather than what is. The details mentioned are all made from first-hand observation, and are, in no sense, an attempt to make a complete list of the lepidopterous fauna of the southeastern district of London. To those interested in our London entomological fauna we have no doubt they will prove of the greatest interest.—Ed.]

DIURNI.—*Pieris brassicae*, *P. napi*, *P. rapae*.—Bred from larvæ, abundant everywhere in the district. *Euchloë cardamines*.—Kidbrook Lane, Burnt Ash (on April 20th, 1863, I captured 26, the majority were taken between 8 and 9 a.m., the remainder about noon); I have also taken it at Southend, Lewisham, Loughton, Dartford, Beckenham, Woodside, and Headly Lane. *Gonopteryx rhanni*.—Lee, Lewisham, Kidbrook Lane, Shooter's Hill, Riddlesdown, and Dartford. *Colias edusa*.—June to October, in 1877, at the following places—Croydon, Greenwich, Lee, Lewisham, Dartford, and Brockley, on the railway banks. *C. hyale*.—July, 1868, abundant in meadows in Burnt Ash Lane, Lee; some taken off grass whilst drying their wings at 8 a.m.; also at Brockley on the railway banks. *Dryas paphia*.—June 25th, 1865, in West Wood, Shooter's Hill, adjoining the Crown Woods, since grubbed up and destroyed; it was a very pretty wood extending to Black Fen, Sideup. *Argynnis aglaia*.—June, 1865, Darenth Wood; Box Hill, 1876. *Brenthis euphrosyne*.—Southend, Lewisham, Darenth, West Wickham, Shooter's Hill, and Loughton. *B. selene*.—Loughton and Shooter's Hill. *Polygona c-album*.—Flying along a hedge near Swanscombe Wood, in 1868. *Aglais urticae*.—Kidbrook Lane, Lewisham, Greenwich, Lee, and other places. *Eugonia polychloros*.—On sugared trees in Darenth Wood; larvæ at Beckenham, on elm; Kidbrook Lane. *Vanessa io*.—Larvæ taken in June, imagines bred during July; Kidbrook Lane, Burnt Ash Lane, Lewisham, Brockley, and many other places. I think it well to note the change that has taken place in the neighbourhood of Burnt Ash Lane, Lee, as regards this species; I have not seen larvæ for years, yet, during the month of June, 30 years ago, had I been asked for a brood of larvæ, or half a dozen broods, I could have put my hands on them, in this neighbourhood. *Pyrameis cardui*.—Greenwich Marshes, Brockley, Burnt Ash, and Lewisham; larvæ taken in abundance on nettles and thistles from June to October, 1868; the larvæ taken in October, changed to pupæ, and lay through part of the winter, during which, however, they died off. *P. atalanta*.—Larvæ from June to October; Lee, Lewisham, Shooter's Hill, Loughton, and Croydon; it was also very common on Blackheath, on the stunted nettles that grew in the pits. *Pararge egeria*.—May and August; Loughton and Shooter's Hill. *P. megera*.—I have taken it May, August and October; Kidbrook, Lee,

Lewisham, Dartford, and Shooter's Hill. *Hipparchia semele*.—Riddlesdown and Box Hill. *Epinephele janira*.—Lee, Lewisham, Plumstead, Blackheath, and many other places. *E. tithonus*.—Shooter's Hill, Lewisham, Lee, Blackheath, and other places. *Enodia hyperanthus*.—West Wood, Shooter's Hill, Darenth, and Swanscombe Woods. *Coenonympha pamphilus*.—Everywhere. *Callophrys rubi*.—Caterham, Boxhill. *Bithys quercus*.—West Wickham, Darenth Wood. At West Wood, Shooter's Hill, fullfed larvæ were found June 20th, and imagines appeared July 4th. *Strymon w-album*.—Larvæ, June 16th, on wych elm, West Wickham, also Dartford. *Ruralis betulæ*.—Larvæ, June 6th, fullfed on blackthorn, at Loughton. *Rumicia phlaeas*.—May 11th, 1862, July 27th, 1862, October 4th, 1862, at Brockley, on the bank of the Brighton railway; also at many other places. *Plebeius aegon*.—July 24th, at Loughton, Crown Woods on Shooter's Hill. *Polyommatus alexis*.—Very abundant at Brockley, and at many other places, where I could pick them off the broom at rest in the evening. *Agriades bellargus*.—June 4th, 1870, and August 28th, until September 6th, 1870, at Caterham; I have seen it on the road to Darenth. *A. corydon*.—At Caterham and Box Hill; also solitary specimens on the railway banks at Brockley. *Celastrina argiolus*.—During April on Blackheath; and in July on the road to Darenth; also at West Wickham and Buckhurst Hill. *Cupido minima*.—June 2nd, 1876, at Caterham. *Hesperia malvæ*.—Darenth Wood and Box Hill; also at West Wood and Crown Woods, on Shooter's Hill. *Nisoniades tages*.—During May on Box Hill, Swanscombe, Shooter's Hill, and Caterham. *Augiades sylvanus*.—Brockley, Plumstead, Greenwich Marshes, Lee, and Lewisham. *Urbicola comma*.—Box Hill. *Adopaea flava*.—Caterham, Lee, Brockley, and Plumstead.

SPHINGIDES.—*Smerinthus ocellata*.—May larvæ; during July, on willows and sallows on railway bank at Brockley; also at Lee, Lewisham, and on Greenwich Marshes. *Amorpha populi*.—May; larvæ during July on poplars; Lee, Greenwich, and many other places. *Mimastilia*.—Larvæ on elms in Greenwich Park; on lime at Lee, and Lewisham, etc. *Manduca atropos*.—Bred in October and May from pupæ dug up in potato-fields; Kidbrook Lane, in August, 1866. *Agrilus convolvuli*.—Brockley railway bank, in 1868, at rest; also at rest on trunk of a chestnut-tree in Greenwich Park, 1870; captured in a garden on the wing in Greenwich, 1873. *Sphinx ligustri*.—Larvæ common on privet; Lee, Lewisham, and Greenwich; on ash in Headley Lane. *Phryxus livornica*.—Taken at rest on machine in the workshop of J. Penn and Sons, Greenwich, in 1880. *Theretra porcellus*.—Croydon; larvæ, July, 1873. *Eumorphia elpenor*.—Plumstead Marshes; larvæ, July, 1870. *Sesia stellatarum*.—Darenth Wood; very common on Blackheath, July 1865, flying round the walls and fences like so many swallows; in the early morning they were to be taken on the fences. *Hemaris fuciformis*.—West Wood, in May, 1866; Darenth Wood, May, 1875, and West Wickham.

ÆGERIDES.—*Ægeria myopiformis*.—Bred several from a branch of an apple-tree that had blown down, Greenwich; I captured several drying their wings at 6 p.m., in 1872, on trunks of apple trees at Lewisham.

(To be continued.)

Butterfly Collecting in the Tyrol (with plates).

By E. E. BENTALL.

Being desirous of breaking what is to me new ground, I determined to try what a part of the Austrian Tyrol would produce entomologically. Intending to go the last week in June, I was delayed a fortnight, and left on July 7th for Innsbruck, this delay probably making me too late for many species. Innsbruck is well situated, 1800ft. above the sea, in a valley running east and west, and shut in on the north by a high precipitous range of mountains, which did not look promising entomologically. On the south, the mountains rise more gradually, and the valley leading to the Brenner Pass gave promise of good country. On the 10th, we drove to the Stefans Brucke at the entrance to the Wip Thal, and on to Schönberg. The day was disappointing, as, with the exception of numerous *Dryas paphia*, and *Eptinophle jurtina*, we only met with a few *Pararge hiera*, and a single *Polygonia c-album*. I saw, however, several butterflies I believe to have been *Limenitis populi*, but they refused to be caught. On the 11th, we took the funicular railway to Igls, a village above the Wip Thal to the east, and about 3000ft. high. The Iglar Hof is a good hotel, and beautifully situated at the entrance to large woods. We had two days and a half hunting, the rest of our time there being wet. The bag at Igls consisted of *Adopaea lineola*, *Hesperia abrens* var. *cirsii*, *Chrysophanus virgaureae*, *Cupidominima*, *Polyommatus icarus*, *P. astrarche*, *Argynnis aglaia*, *A. adippe* var. *cleodora*, *A. niobe*, *Issoria lathonia*, *Brenthis dia*, *Melitaea parthenie*, *M. dictynna*, *Polygonia c-album*, *Pararge hiera*, *Hipparchia semele*, *Erebia ligea*, *E. aethiops*, *E. goante*, and *Dryas paphia*. There was nothing plentiful except *Dryas paphia*, the other Argynnid species, and *Erebia ligea*. I also saw here two or three *Limenitis populi*. After a visit to Munich, we went on July 20th, to Salzburg, and, on the next day, we went up the Gaisberg by rail, a height of 4200ft. It is well-wooded, and the day being fine, I hoped for luck. I found butterflies fairly plentiful near the top of the mountain, and, in fact, the whole of the species given in the list to this place were caught at or near the top; on walking down the mountain, butterflies became more scarce, until none but *Dryas paphia* were to be seen. The full list captured included *Chrysophanus hippothoë*, *Nomiades semiargus*, *Lycaena arion*, *Polyommatus hylas*, *Argynnis adippe* var. *cleodora*, *Issoria lathonia*, *Melitaea parthenie*, and var. *varia*, *M. athalia*, *Aglais urticae*, *Pararge hiera*, *Erebia aethiops*, *E. ligea*, *E. nerie*, *Coenonympha iphis*, *Melanargia galatea*. On the 22nd, we drove to Grossmain, some ten miles from Salzburg, and stopping on the way, we caught some worn *Lycaena alcon*, some *Enodia dryas*, which were plentiful at one spot only, and some *Coenonympha typhon*, also worn. *Adopaea lineola*, *A. flava*, *Chrysophanus dorilis*, *Lycaena alcon*, *L. arion* var. *obscura*, *Cupido minima*, *Cyaniris argiolus*, *Enodia dryas*, *Coenonympha typhon*, and *Melanargia galatea*. On the 23rd, we drove to Bechtesgaden, but it was rather wet, so no butterflies were to be seen. It is a lovely drive, and well worth the time it takes. Bechtesgaden is a most lovely place, and should be a good collecting-ground, but the variety of species I found there was not large, probably due to the lateness in the month, and, perhaps, to the season having been rather early. About half an hour's lovely walk to the north of the town brings one to very good ground, and there I found a good supply

of *Coenonympha tiphon* var. *philoxenus*. Up a hill a little further, the Erebias—*E. ligea*, *nerine*, *aethiops* and ab. *violacea*, were fairly plentiful. To the south, the mountain called Forderbrand (3790ft.), has a carriage-road up to it, and is a famous place to get a view over the valley of the Konigs-see. There was nothing to catch going up, but, once at the top, it was not so bad. We caught some fine specimens of *Erebia pronoe*, of very pronounced mauve or purple tint on the underside, in which they differ from those I have caught in France, which have no purple, but are plain grey. There were some *Melitæas* about, but all worn, and there were no blues. I may say here that I found the blues very badly represented all over the district; there were very few species to be found. The Argynnids and the Erebias were the only butterflies to be seen in any numbers anywhere. At Bechtesgaden, on July 26th and 27th, I captured the following species: *Polyommatus corydon*, *Leptosia sinapis* ab. *erysimi*, *Argynnis aglaia*, *A. adippe*, *A. niobe*, *Melitæa dictynna*, *Coenonympha tiphon* var. *philoxenus*, *C. arcania*, *Erebia ligea*, *E. nerine*, *E. aethiops* and ab. *violacea*, *Melitæa parthenie* var. *varia*. Whilst at Fordebrand, on July 28th, I recorded *Pamphila comma*, *Adopæa flava*, *Hesperia alveus* var. *cirsii*, *Argynnis adippe*, *A. niobe*, *A. aglaia*, *Brenthis amathusia*, *Melitæa parthenie*, *M. athalia*, *Erebia nerine*, *E. aethiops*, *E. pronoe*, and *E. ligea*. On the 29th, we returned to Innsbruck, and the following day we went to Fulpmess by electric rail, a place some distance towards the Brenner Pass. Here we found nothing much except *Dryas paphia* ab. *valesina*, *Argynnis niobe* and *A. aglaia*. We left for France on August 1st.

The Lepidoptera of Bedford Park, Chiswick.

By J. C. DOLLMAN, F.E.S.

The following list of macro-lepidoptera, taken between 1893 and 1902, in Bedford Park, Chiswick, may prove interesting to those lepidopterists interested in the fauna of the London district. Several, of course, must be considered as more or less occasional visitors, but the list, on the whole, of the sedentary species, appears to be a good one. DIURNI: *Pieris brassicae*, common; *P. rapae*, common; *P. napi*, common; *Colias edusa*, seen once; *Gonepteryx rhamni*, occasionally; *Aglais urticae*, common; *Pyrameis atalanta*, common; *P. cardui*, seen once; *Epinephela janira*, occasionally; *Coenonympha pamphilus*, common; *Chrysophanus phlaeas*, fairly common; *Polyommatus icarus*, common; *Cyaniris argiulus*, common, larvæ found and imagines bred. SPHINGIDES: *Sphinx ligustri*, formerly; *Smerinthus ocellata*, common; *Amorpha populi*, common; *Mimas tiliae*, common; *Sesia stellatarum*, occasionally. ÆGERIIDES: *Trochilium crabroniformis*, formerly; *Egeria tipuliformis*, fairly common; *Æ. myopaeformis*, fairly common. ARCTIIDES: *Arctia caja*, occasionally; *Spilosoma lubricipeda*, common; *Spilosoma menthastris*, common. HEPIALIDES: *Hepialus humuli*, common; *H. sylvinus*, once; *H. lupulinus*, common; *H. hectus*, fairly common. COSSIDES: *Cossus ligniperda*, common. ZEUZERIDES: *Zeuzera aesculi*, occasionally. LYMANTRIIDES: *Porthesia similis*, common; *Orgyia antiqua*, common. PLATYPTERYGIDES: *Cilia spinula*, occasionally. DICRANURIDES: *Cerura bifida*, occasionally; *Dicranura vinula*, common. NOTODONTIDES: *Phalera bucephala*, common. CYMATOPHORIDES: *Thyatira aëraea*, once. NOCTUIDES: *Triaena psi*, common; *Apatela aceris*, fairly

common; *Cuspidia megacephala*, common; *Leucania conigera*, fairly common; *Axylia putris*, occasionally; *Xylina lithoxylea*, fairly common; *X. monoglypha*, common; *Dipterygia pinastri*, common; *Mamestra brassicae*, common; *M. persicariae*, common; *Apamea basilinea*, fairly common; *A. ophiogramma*, once; *A. oculatea*, common; *Miana strigilis*, common; *Grammesia trilinea*, once, 1889; *Caradrina morpheus*, occasionally; *C. quadripunctata*, common; *Agrotis puta*, once, 1898; *A. segetum*, common; *A. exclamatoris*, common; *Graphiphora augur*, larvae found and imagines bred 1899; *Noctua xanthographa*, common; *Triphaena pronuba*, very common; *T. comes*, fairly common; *Amphipyra tragopogonis*, common; *Naenia typica*, common; *Anhocelis pistacina*, occasionally; *A. litura*, once; *Orrhodia vaccinii*, fairly common; *Mellinia circellaris*, a few times; *Calymnia affinis*, once, 1899; *Hecatera serena*, once, 1899; *Euplexia lucipara*, common; *Brotolomia meticulosa*, common; *Hadena chenopodii*, common; *H. oleracea*, common; *Xylocampa lithoriza*, once, 1899; *Cucullia umbratica*, a few times; *Abrostola urticae*, a few times; *H. triplasia*, a few times; *Plusia gamma*, common; *Catoceala nupta*, common. DELTOIDES: *Hyppena rostralis*, occasionally; *H. proboscidalis*, occasionally. GEOMETRIDES: *Urapteryx sambucaria*, common; *Rumia crataegata*, common; *Ennomos angularia*, imagines twice and larvae; *Biston hirtaria*, common; *Amphidasys betularia*, occasionally; *Hemerophila abruptaria*, common; *Boarmia rhomboidaria*, common; *Comibaena bajularia*, once, not of recent years; *Acidalia incanaria*, common; *A. aversata*, common; *Cabera pusaria*, common; *Abraxas grossulariata*, common; *Hybernia defoliaria*, occasionally; *Eupithecia centaureata*, *E. subnotata*, *E. rulyata*, *Melanippe bicolorata*, *M. rivata*, *M. subtristata*, *M. fluctuata*, fairly common; *Coremia ferrugata*, once; *Campptogramma bilineata*, common, *Pelivya comitata*, fairly common.

The named forms of *Acronicta leporina*, Linn.

By LOUIS B. PROUT, F.E.S.

Miss A. M. Cochrane, in some notes on the variation of this species (*antèa*, pp. 100-102), makes the suggestion that var. ("or ab., *in sens. strict.*," as she justly observes) *melanocephala*, Mansbr., is = var. *bradyporina*, Tr. This has constrained me to look into the matter, and I find she has "failed to focus" the Treitschkeian type, just as did Mr. Mansbridge, at first, to focus the Linnean. What makes this the more remarkable is that she has quoted parts of Treitschke's diagnosis and description, though leaving out some crucial points. As nothing but confusion can result from the attempt to unsettle the correct work of Newman, Staudinger, Tutt and others, I need not apologise for setting the matter straight at once, and I am sure Miss Cochrane will pardon me, since she confessedly does "not pretend to any deep knowledge of the subject."

Treitschke's Latin diagnosis of *bradyporina* is "*Acronycta alis albidis†; anticis fusco irroratis, punctis nigris, ramosis*" (*Schmett. Eur.*, v., pt. 1, p. 9, not "91," as cited by Tutt, *Brit. Noct.*, i., p. 14; Tutt quotes accurately excepting the punctuation). Mansbridge's *melanocephala* has the "forewings strikingly suffused with fuscous."

† The italics in this paragraph are mine.—L.B.P.

Treitschke's German description makes "head and thorax dirty white, mixed with many black-grey (not 'grey-black') hairs." Mansbridge emphasises the *black* thorax of his new form. Treitschke says that the markings of *bradyporina* are subject to manifold variation, only emphasises the dusting behind the second line (thus rather suggesting an alliance with ab. *semivirga*, Tutt), and above all (though Miss Cochrane overlooks this altogether) cites as figures of *bradyporina*, the following: Hübner, fig. 16 (with hardly more dusting than typical *leporina*); Fuessly, *Mag.*, ii., pl. 1 (fig. 3), a worthless figure, dirty brownish, probably discoloured; Engramelle, vi., pl. cexvi., fig. 296, a similar and equally worthless figure; Sepp, i., pl. xxiii., fig. 6, 7, good figures of tolerably pale "*bradyporina*," auctt.—fig. 6 being near ab. *semivirga*, 7 more normal. Finally, the darkest continental specimens with which literature deals, and which are represented in our national collection, belong to the form which has always been known as *bradyporina*, from which Mr. Mansbridge expressly differentiates *melanocephala*, and there is not a shred of evidence that the melanic (or half-melanic) forms are known abroad.

Miss Cochrane's new name of "var. *grisea*" is, however, required after all, for the name *bradyporina* was first published by Hübner for the *white* form, *i.e.*, strictly synonymous, as Treitschke recognised, with *leporina*, Linn., and the later author had no right to apply it to a different form.

The correct synonymy (abridged) is as follows:—

1. *Leporina*, Linn., Hb., 15, ?16; *bradyporina*, Hb., 570, 571 (alis albis, punctis nigris ramosis).

1a. ab. *bimaculosa*, Maassen (tota alba, punctis duobus nigris)—only slightly more extreme than the type.

1b. ab. *semivirga*, Tutt (alba, margine externo late griseo).

2. var. *grisea*, Cochrane, *Ent. Rec.*, xviii., p. 101; ? **leporina*, Hb., 16 (non 15); **bradyporina*, Tr. (non Hb.) (alis anticis fusco irroratis).

2a. ab. *melanocephala*, Mansbr., *Ent.*, xxxviii., p. 289; **bradyporina*, Cochrane (non Hb., nec Tr.) (alis anticis dense fusco suffusis; thorace nigro).

3. var. *leporella*, Stgr.; *cineracea*, Graes. (alis anticis cinereo-albidis, indistincte signatis).

Variation of *Acrionicta leporina*. The critics criticised.

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

For the last fifteen years so little work at the Noctuides has been done by British lepidopterists, and so many other entomological interests have continuously occurred to me, that it is rather exciting to find oneself interested again in the variation of so well-known a species as *Acrionicta leporina*, and I was somewhat astounded to see myself pulled up so gently, yet certainly, by Miss Cochrane (*antea*, pp. 100-102). Her note has led me to read carefully Mr. Mansbridge's remarks (*Entom.*, xxxviii., p. 289), the facts of her own interesting article (*antea*, pp. 100-102), Mr. Prout's note (published in this number of the *Entom. Record*), and lastly, Mr. Mansbridge's note (*Entom.*, xxxix., p. 115).

A careful consideration of Mr. Mansbridge's note (*Entom.*, xxxviii., pp. 289-290) leads one to the undoubted conclusion that Miss Cochrane's criticism is absolutely just, that he had not made a single

* "Invalid, as not containing the type of the conception" (Wlsglm. and Drnt.).

first hand reference to the literature, and that the general trend of his remarks on the variation of the species was inaccurate and unreliable, nor are these conclusions really modified by his supplementary after-note (*Entom.*, xxxix., p. 19).

The point raised in Miss Cochrane's interesting article, discussed by Mr. Prout, put in a nutshell, is this: Is the grey form of *A. leporina*, as known in Britain, the var. *bradyporina*, Tr.? Is the suffused grey form *melanocephala*, Mansb., practically *bradyporina*, Tr., and only separable therefrom by the black thorax? Miss Cochrane selects (*pace* Mr. Prout) the essentials of Treitschke's description for comparison, and clearly shows (1) that Treitschke's was a member of the grey race (which she calls *grisea*), (2) that it was not a pure or uniform grey form, but one in which (a) the markings vary considerably, (b) powdering is excessive, and (c) developed into a darker transverse band between the serrated line and the outer margin.

Mr. Prout considers that Miss Cochrane leaves out certain crucial parts of Treitschke's description by which she fails to focus the Treitschkian type. He quotes (apparently as crucial) neglected details. (1) The short Latin diagnosis (which Miss Cochrane did not leave out, but quoted in English, and) which appears to me not to bear on the point she raises, which has its origin in the detailed description following. (2) The reference to other authors made by Treitschke, which suggests that he was willing to include (*teste* Prout) in the general variation of *bradyporina*, specimens varying from "examples with scarcely more dusting than typical *leporina*" to "dirty-brownish." When one carefully considers the value (!) of these references, as set forth by Mr. Prout, and their want of uniformity, one can only follow Miss Cochrane and neglect them as being valueless for the purpose of fixation of the form described, and one must rely absolutely on the description. One point in Mr. Prout's criticism, in my opinion, settles the matter in favour of Miss Cochrane's contention, *viz.*, that Treitschke's description of *bradyporina* "suggests an alliance with *ab. semivirga*, Tutt." This clinches the matter. *Bradyporina*, Tr., is *not* the uniform grey form; it is a banded form. It bears to the uniform grey race (= var. *grisea*, Cochrane) something of the same relationship that *ab. semivirga*, Tutt, bears to the type. Mr. Prout's remark concerning "the darkest continental specimens with which literature deals, and which are represented in our national collection," etc., is surely quite beside the mark, in the face of Treitschke's description. One might, a little time since, have argued similarly on *Phaëtra rumicis*, *P. menyanthidis*, and even *Amphidasyus betularia*, and would, of course, have been hopelessly at fault. So far as Mr. Mansbridge's aberration stands, the only fixed character in which we can separate it from Treitschke's description is the "black thorax," and the aberration must stand or fall on this character. Into the question of the alteration of names, as suggested by Mr. Prout, I dare not enter.

This morning (May 4th, 1906), a note from Mr. Mansbridge, purporting to be a criticism of "Mr. A. M. Cochrane's notice in the 'Entomological Record'" (a new title for our magazine!!) comes to hand (*Entom.*, xxxix., p. 115). This simply begs the whole question. To say that Miss Cochrane "wishes to set aside the prior claim of Treitschke to the name *bradyporina* for our grey form of *leporina*," etc., is—putting it mildly—great nonsense. The writer wishes to set aside

no "prior claim," but simply and correctly points out that Treitschke's description does not agree with the uniform grey form to which we apply it. Mr. Mansbridge further says that she wishes "to set aside in a breath the authority of Treitschke, Hübner and Staudinger, on the continent, and Stephens and Tutt, in this country," a statement that suggests that Mr. Mansbridge has not appreciated at all Miss Cochrane's article. She has quoted Treitschke's description, and made a suggestion that I, among others, misused his name, to which I freely and humbly plead guilty. His reference to Hübner shows that Mr. Mansbridge still fails to grasp the situation. (What has Hübner done to the subject except duplicate the name of the type?). I am sure Miss Cochrane, like myself, is most conservative in upholding the "authority of Treitschke, Hübner, Standinger, Stephens and Tutt," and as she does not deal with their "authority," but with the application of a certain name, made by some of them, to certain specimens of a certain species, one wonders what it all means, and I dare say she holds herself quite unmoved as to what the "strict systematists will say to such an attack on the law of priority," considering that, so far as I understand the matter, she has made none. Treitschke's description of *bradyporina* shows clearly that it is materially different from the form so long known here as *bradyporina*, and that is the important point of her note, as I understand it. Whether Mr. Mansbridge's *melanocephala* stands to science as the form of *bradyporina* with a "black thorax," or not, is an item that matters nothing; what does matter, is that Treitschke's *bradyporina* was a suffused and banded form like Mr. Mansbridge's, and not uniform grey like the specimens we have so long mis-called *bradyporina*, and, as to "entomologists agreeing with Mr. Tutt's acceptance of *bradyporina* for the greyish form we most frequently get in England," I hope beyond all things, that when Mr. Tutt has made a mistake, lepidopterists will not go on perpetuating the mistake simply because he (!) made it.

One cannot conclude without referring to the really melanic specimen of this species described and figured by Mr. A. J. Willsdon (*Entom.*, xxxix., p. 98), and reared in June, 1905, from an Essex larva. Such an aberration as this, with its black forewings, and white cilia, its black thorax, grey-black-ringed abdomen, and typical white hindwings, really might be called ab. *nigra*, and no one question the advisability thereof, but perhaps it has already been named.

Collecting in Syria: Ain Zahalta in May-June, 1905.

By P. P. GRAVES.

On arriving at Ain Sofar, I walked over to Ain Zahalta to make my arrangements there, and next day went by mule to the village. I saw a *Papilio*, which I now believe was *P. alexanor*, and, on the way, noted worn *Melitaea phoebe* and a few *M. trivialis* close to var. *persea*, and took *Nomiades cyllarus* var. *aeruginosa* which was unluckily past its best. Near the Sofar tunnel I noted *L. sinapis* and took a poor ♀ of *Plebeius nicholli*. My experiences at Zahalta between May 31st and June 8th, were very different from those of July in the previous year. Then the slopes leading from the village down to the stream—Wadi Safa—had been most productive as far as numbers were concerned, while my best insects were taken near the top of the Zahalta end of the Jebel Barouk

range at 6500ft.-7500ft. This year, at the end of May, and in the last days of June, I took little on the lower ground, but found the lower slopes of the mountains, very poorly off for butterflies in July, 1904, perhaps more productive than even the summits.

To deal first with the lower ground, except *Polyommatus icarus*, worn *Syrichthus orbifer*, and fresh *Melanargia titea* var. *teneates*, nothing was common. *Satyrus telephassa* ♀s occurred in small numbers. I imagine that there are two broods of this fine Satyrid. *Chrysophanus phlaeas* and *Adopaea flava* (*thauamas*) were to be found now and then. The pines gave me more *C. phlaeas*, one or two *Carcharodus altheae*, *Thecla spini*, and, on June 8th, one *Satyrus pelopea*. *Dryas pandora*, and an occasional *Thais cerisyi*, *Papilio podalirius* and *Gonepteryx cleopatra* var. *taurica*, were also noted with the inevitable *Polygonia egea*.

I made one expedition to the cedars on the mountain-top on May 30th, starting in dull misty weather from the village at 6 a.m. I reached the opening of the ravine leading up to the cedars without getting anything but an ochre-yellow Geometrid—that looked like *Coenonympha pamphilus* in flight, and was most abundant—a burnet species, and odd specimens of *Polyommatus icarus* and *Thecla ilicis*. I had just finished my climb when it finally cleared, and, in the cedar hollow, I put in about two hours' collecting and climbing. I took there plenty of *Melitaea didyma*, including a curiously heavily-spotted ♀ with four parallel rows of thick black spots on the pale forewings, any number of *Thais cerisyi*, nearly all males, and *Chrysophanus phlaeas*. *Syrichthus orbifer* was rare, and *S. malrae* var. *melotis*, rarer. The Satyrids were only represented by *Pararge moera*, *P. megera*, and one or two *Coenonympha pamphilus*. I saw no Pierids, but *Pieris rapae* and *Pontia daplidice*, neither *Anthocharis charltonia* nor *Euchloë damone* turning up, *Colias edusa* was of course expected. The Lycænids were not out in great numbers. I got one ♂ *Polyommatus isaurica*, and one ♂ *Plebeius nicholli*, the latter was not properly out, with plenty of *Polyommatus icarus*, worn, and a few of the beautiful *Nomiades antiochena* which is said to be a var. of *semiargus*, but bears not the slightest likeness to the *semiargus* I remember taking in the Grisons. The development of the reddish-orange markings so beautifully shown in this species is noticeable in several other blues taken in Syria, e.g., *Plebeius nicholli*, *Polyommatus icarus* and *P. astrarche*. In the last two, the reddish band of spots on the underside of the hindwings is always pronounced, and *P. anteros* var. *crassipuncta* shows dull orange or red-brown marginal spots on the underside, thus differing greatly from the type as usually figured.

I took *Carcharodus altheae* and saw *Nisoniades marloyi* on the rocks above the cedars, and, after climbing to the summit, where nothing was out and snow still lay, descended to the hollow, where I netted what seemed to be a *Myrmeleon* imago, and proved to be a most disreputable ♀ of *Doritis apollinus*. I then descended the steep northwest slope of the Jebel, taking a fine pair of *Polyommatus anteros* var. *crassipuncta*, in cop., and two ♂ *Parnassius mnemosyne*, till I reached the continuation of the track which passes the entrance of the ravine leading up to the cedars, and goes northeast to Kabr Elias near Zahleh. The track ran through pasture and mountain-meadows where the corn was about a foot high, walled in on the north side by a low stony ridge, on the south by the Jebel Barouk's steep slopes. I here took *Polyommatus*

amanda, and worn *Nomiades cyllarus* var. *aeruginosa*, *Syrichthus tessellum* var. *nomas* and *S. malvae* var. *melotis*, and found *Plebeius nicholli* out, and beginning to get worn—no ♀s to be found. Going back towards Ain Zahalta, I picked up *Melitaea trivialis*, two or three *Aporia crataegi*—the first time according to Mrs. Day that it has been taken on the west side of the Lebanon—and more *Parnassius mnemosyne*, all of the var. *nubilosa*. At the entrance to the valley, and in sight of Ain Zahalta—in fact, a bare 25 minutes from the nearest houses, I saw a fine *Papilio* flying up and down the track. Twice it swerved and went off as I approached, the third time was lucky, and I was rejoicing over a fine ♀ of *Papilio alexanor*, the bands on the forewings dusted with deep blue, evidently the form known as var. *orientalis* (or is it var. *maccabaeus*?).

Despite some cloudy weather I managed to get two mornings more on the Kabr Elias or Zahleh track (I was assured that it reached both towns), and did very well there. *Satyrus telephassa*, *Gonepteryx cleopatra* var. *taurica* and *Limenitis camilla* were seen, but not taken. Of the Papilionids—*Papilio alexanor* was apparently confined to a few acres at the opening of the gorge, and was not common there; the males seemed over, they were brighter in colour than my two ♀s, but ragged. *Thais cerisyi*, generally more or less of the *deyrollei* form, swarmed. *A. crataegi*, smaller than in the Anti Lebanon or at Niha, was common, as was *Parnassius mnemosyne* var. *nubilosa*. The commonest Lycænid was *Polyommatus amanda*, of which I got a nice series, including two beautiful ♀ aberrations, suffused on the upperside with bright silvery-blue (ab. *argentea*, n. ab.). *Nomiades cyllarus* var. *aeruginosa* and *N. antiochena* were practically over, *Plebeius nicholli* here and there, *Polyommatus icarus* and *P. astrarche* sparingly, the latter very worn. Of other insects I got *Nisoniades marloyi*, which flies rapidly over stony ground on the slopes, and on the edges of cornfields. *Melitaea didyma* occurred, *M. phoebe* and *M. trivialis* were less common and *passé*. No *Melanargia teneates* were yet out. Of the silver fritillaries I took *Dryas pandora*, worn *Issoria lathonia*, and a few small *Argynnis niobe* var. *eris*, just out. *Syrichthus orbifer* had been out some time, and I got no specimens of *S. alveus*, but large and rather pale *Adopaea flava* (*thauamas*) were very common indeed. The collecting ground averaged some 5000ft.-5500ft. above sea level.

My list of butterflies seen or taken between May 11th and June 8th, comprises the following species:—URBICOLIDÆ: *Adopaea lineola*, *A. flava* (*thauamas*), *Thymelicus acteon*, *Parnara mathias*, *Nisoniades marloyi*, *Carcharodus alceae*, *C. althaeae*, *Syrichthus poggei*, *S. tessellum* var. *nomas*, *S. orbifer*, *S. malvae* var. *melotis*. LYCÆNIDÆ: *Chrysophanus thersamon*, *C. phlaeas*, *Nomiades cyllarus* var. *aeruginosa*, *N. antiochena*, *Polyommatus icarus*, *P. amanda*, *P. astrarche*, *P. isaurica*, *P. anteros* var. *crassipuncta*, *P. baton* var. *clara*, *Plebeius nicholli*, *Chilades trochilus*, *Lampides boeticus*, *Thecla spini* and var. *melantho*, *T. acaciae* var. *abdominalis*, *T. ilicis*. PAPILIONIDÆ: *Papilio podalirius*, *P. alexanor* var. *orientalis*, *P. machaon*, *Thais* var. *deyrollei* and type *cerisyi*, *Doritis apollinus*, *Parnassius mnemosyne* var. *nubilosa*. PIERIDIDÆ: *Aporia crataegi*, *Pieris brassicae*, *P. rapae*, *Pontia daphidice*, *Anthocharis belemia*, and var. *glauca*, *Leptidia sinapis*, *L. duponcheli*, *Colias edusa*, *Gonepteryx cleopatra* var. *taurica*, *G. rhamnii* (?)

or var. *farinosa*. NYMPHALIDÆ: *Limenitis camilla*, *Polygonia egea*, *Pyrameis cardui*, *Melitæa didyma* (very variable), *M. phoebe*, *M. trivia*, *Issoria lathonia*, *Dryas pandora*, *Argynnis niobe* var. *eris*, *Melanargia titea* with var. *teneates* and var. *titania*, *Satyrus telephassa*, *S. pelopea* *Epinephele* var. *telmessia*, *Coenonympha pamphilus*, *Pararge maera*, *P. megaera*. Altogether 59 species, 20 of which were not taken by me in July, 1904.

[ERRATA.—Page 124, line 14 from bottom, for “*Ascyra*” read “*Areya*.” Page 126, line 7, delete “and a ♀ *R. loewii*”; it turned out to be the ♀ of *R. nicholli*. Page 126, line 16, after “*Thecla spini*” add “and *Thecla acaciae* var. *abdominalis*.”—P.P.G.]

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from vol. xviii., p. 129).

2. TETRIX KIEFFERI, Sauley.

According to Azam, this species is characterised by the strongly tectiform pronotum, long posterior femora, moderately thick antennæ, with somewhat elongated segments, short pronotum and wings, and usual absence of spots on the sides of the pronotum. A variety is known with long pronotum and fully developed wings.*

According to Azam, found on flinty soils in Brittany, Hautes-Pyrénées, Sologne, and the Vosges. Also the macropterous form from Saint-Aignan and Sologne. The same author speaks of a variety *gavoysi*, which is smaller in size, with slightly shorter antennal segments, occurring in a few localities in the south of France in damp places, in March and June, at Mont Alaric and in Provence. It is a doubtful species.

3. TETRIX NOBREI, Bolivar.

Allied to the common *T. bipunctatus*, which it resembles in every respect, except that the pronotum is more rugose, the central keel higher and more strongly compressed, and the anterior femora have the edges undulated. Length of body, 9mm. ♂ and ♀; of pronotum, 9.5mm. ♂ and ♀; of posterior femora, 6mm. ♂ and ♀.

It occurs in Portugal, at Leça and in the Serra de Vallonjo; in Spain, in the Picos de Europa, Montseny in Catalonia, and the Sierra de Guara, in Aragon.

4. TETRIX KRAUSSI, Sauley.

Closely allied to the common *T. bipunctatus*, but antennæ stouter, segments shorter, and the lateral spots of the pronotum oblique. Normally short-winged, with short pronotum, but sometimes specimens are found with long wings and pronotum. Length of body, 7mm.-7.5mm. ♂, 8.5mm.-9mm. ♀; of pronotum, 6.5mm. ♂, 8mm.-8.5mm. ♀. A doubtful species.

Found in France at Wavrille, near Damvilliers, at Bitche, in the Alps of Dauphiné, and the Hautes-Pyrénées.

* I have been unable to obtain the dimensions of this and some others of the species described by de Sauley, but they are all very nearly the same size as *T. bipunctatus*.

5. *TETTIX BIPUNCTATUS*, L.

Stout in build; dark brown, or whitish, with sometimes yellowish, but usually with blackish or dark brown, marks; on each side of pronotum is a transverse, triangular, black spot; pronotum with central keel raised into a crest, but not so long as in other species, the hinder part not attaining the hinder knees; wings of ♂ equal to pronotum, of ♀ much shorter; anterior and middle femora with edges subundulate; hinder femora stout, with sharp, but not undulated, edges; first segment of hinder tarsi with pulvilli rounded on under margin, the third pulvillus as long as the first two together. Excessively variable in colouring. Length of body, 7.5mm. ♂, 9mm.-10.5mm. ♀; of pronotum, 8mm. ♂, 8.5mm.-11.5mm. ♀.

The larva, in which the pronotum is simpler, has been described as a distinct species, under the name *schranski*, Fieb. The innumerable colour varieties have also been regarded as distinct species by the older authors. A fully-winged form has been taken in France at Dole, in the Jura, and in Provence.

Common in central and northern Europe, Lapland, Norway, Holland, and Belgium; common nearly everywhere in England, and extremely so in France, as in all Spain and Portugal. In Alps, up to an elevation of 10000 feet; also in Italy. It extends also through East Europe, Asia Minor, Siberia, and the Amur.

6. *TETTIX TURKI*, Krauss.

Pronotum flat or slightly tectiform; first segment of posterior tarsi with pads rounded underneath, the third pad not longer than either of the first two; edges of all femora undulated; pronotum slightly surpassing hinder knees, but slightly rugose; wings shorter than pronotum. Length of body, 7mm.-8mm. ♂, 9mm.-10mm. ♀; of pronotum, 9mm. ♂, 10mm.-13mm. ♀.

Azam describes a var. *saulcyi*, with long pronotum and wings, which appears to be the French form.

First found on the sandy banks of the Danube, near Vienna, Hinterstein, Algaü, and since taken in France at Digne, on the sands of the Bleone, and at Chabrières, on the sands of the Asse, in the Basses-Alpes. Found also in Servia.

7. *TETTIX SUBULATUS*, L.

Slender and graceful; dark or variegated, the spots of the pronotum sometimes absent; pronotum flattened, the central carinæ hardly elevated, slightly swollen at the base, produced backwards very straight and long, easily surpassing the hinder knees; wings as long as pronotum, very broad and ample; all femora with sharp, but not undulated, edges; first segment of posterior tarsi with pads straight underneath, the third equal to the first two together. Length of body, 7mm.-8mm. ♂, 9.8mm.-10mm. ♀; of pronotum, 7.5mm.-12mm. ♂, 9.8mm.-14mm. ♀.

Azam speaks of a var. *sahlbergi*, Saulcy, with short wings and pronotum, recorded from Reims, Metz, the Basses-Alpes, and Var. Like *T. bipunctatus*, this species is very variable in colour, occurring chiefly in the spring, and hibernating in the larval stage.

In damp places in central Europe, but less common than *T. bipunctatus*, except in the south, where it is commoner; in France, it is

common everywhere, especially in the north, the Alps and Pyrenees; in England, somewhat local, but recorded from Radley, near Oxford, Dormans in Surrey, Folkestone Warren, Newquay, in Cornwall; in Spain, common everywhere, except, perhaps, the extreme north.

8. *TETRIX BOLIVARI*, Sauley.

Differs from the above in the less prominent vertex, and edges of hinder borders of pronotum raised into a little keel.

A doubtful species, recorded from Azam, Aude, Dieuze, Lorraine, and the Basses-Alpes, in wet fields.

9. *TETRIX FULIGINOSUS*, Zetterstedt.

Larger; dark, with black spots; pronotum somewhat flat, with a black triangular band on each side; central crest gibbous, near base, but elsewhere slightly elevated, the hinder part easily surpassing posterior knees; all femora with undulated keels; hinder femora with four black spots above; first segment of posterior tarsi with pads quite straight underneath, the third pad longer than the first two together. Length of body, 11mm. ♀; of pronotum, 15mm. ♀.

Only the female appears to be known of this rare species, which is distinguished, among other things, by its size. It occurs at Alten in Norway, and Umeå and Torneå in Lapland, also in Siberia.

10. *TETRIX CEPEROI*, Bolívar.

Allied to *T. subulatus*, but the anterior femora have the edges undulated. Length of body, 6mm.-9mm. ♂ and ♀; of pronotum, 8mm.-10mm. ♂ and ♀.

Southern Spain; according to Azam, fairly common in France; Basses-Alpes and Var, Ille-et-Vilaine, Sologne, and the Loire-Inférieure, Metz.

GENUS II: *PARATETRIX*, Bolívar.

Distinguished from *Tettix* by the narrower vertex, which is not produced between the eyes. One European species.

1. *PARATETRIX MERIDIONALIS*, Rambur.

Pronotum rather flattened, the crest distinctly gibbous, abruptly depressed in front, the hinder part easily surpassing hinder knees; wings very ample; all femora, especially the middle pair, with undulated edges. Length of body, 6.5mm. ♂, 11mm. ♀; of pronotum, 10mm. ♂, 13.5mm. ♀.

Common in southern Europe; in France, the imago is met with nearly all the year round in the south, generally in swampy places; all Portugal and all Spain; Corsica, and in eastern Europe and the Caucasus.

Letting in the City.—Some Notes on the Rhopalocera of the London District.

By ALFRED SICH, F.E.S.

These notes do not, as the title may suggest, refer to the letting of property in the City of London, but to the gradual invasion by the greatest city in the world of the land immediately surrounding it, whereby the Fauna and Flora which existed under more or less rural conditions is slowly driven further afield. Living as I have done for

some years in a parish just outside London, which, happily, until a few years ago, was neglected by the speculative builder, and which retained in certain parts, almost wild corners, longer than most of the surrounding parishes, I have had some opportunities of watching the gradual dispersal of the Fauna and Flora, caused by the encroachment of bricks and mortar into the meadows, scraps of woods, and odd bits of no-man's land, where wild life used to flourish.

By a reference to the old writers on British lepidoptera, we shall learn that the number, both of species and of individuals, occurring round London in former times, was greatly in excess of what it was in the earliest times now remembered by living entomologists; and most of us, too, can remember when certain species were much more abundant than they are now.

In very early times, up till the end of the twelfth century, there were extensive forests round the then small City of London (Fitz-Stephen's Survey). After that date, the forests were gradually cleared and turned into meadow-land. The probably still larger extent of heath-land seems to have remained in its primitive condition till a much later period, possibly owing to its less fertile nature.

As the great city grew larger the population required more food, and the meadow-lands were ploughed up and laid out as market-gardens, and then gradually, as the city spread out in all directions, the market-gardens were taken over by the builder, and shops and houses were erected. This was roughly the process by which the once wild country was invaded by the city, and has ultimately become acres of streets and houses (see *Flora of Middlesex*, Trimen and Dyer, 1869).

When the forests were cleared odd bits of them were left standing here and there, and to these, those butterflies which delight in sylvan conditions, must have been restricted; in these spots they, or many of them, remained till entomologically historical times. Thus Albin (1720) mentions *Zephyrus betulae* as being rare in the larval state in Hornsey Wood. Harris (*Aurelian*, p. 7, 1766), speaking of *Apatura iris*, says "these flies are found in the greatest plenty at Combe Wood, near Kingston-upon-Thames." *Thecla quercus* commonly taken at oak in Honour Wood, near Peckham (p. 21), and *Nemeobius lucina* "in plenty at Combe Wood" (p. 57). Lewin (*Papilios of Great Britain*, p. 18, 1795) says of *Limenitis sibylla*, "an inhabitant of every patch of wood in England." Again speaking of *Melitaea athalia* (*op. cit.*, p. 32) he says "common some years in June," and quotes Wilkes as finding the larva in Tottenham Wood.

All these species, as well as *Leptidia sinapis*, and all our species of *Argynnis*, as we used to call them, except *lathonia*, which seems always to have been of rare occurrence, doubtless were abundant in what is now the London district, till the forests were cleared, after that they became confined to certain strongholds, which, as land became of greater value, were more and more diminished in size, till either they became too small to hold the butterflies, or too isolated to allow of the arrival of any fresh settlers, and so the then living races died out by various accidents. The famous Epping Forest was never so completely isolated, and remained fairly extensive, and those are, no doubt, two reasons why the forest-haunting butterflies have lingered so long in its recesses. Mr. Main informs me that *Z. betulae* is still

to be obtained, but appears to be getting scarcer. As already mentioned, the forests became meadow-lands; the meadows were, no doubt, enclosed by large hedges, and there were lanes and roads between them. This type of country, no doubt, supplied conditions suitable to such species as *Gonepteryx rhamni*, *Aphantopus hyperanthus*, *Zephyrus betulae*, *Thecla w-album* and *Callophrys rubi*, remnants of the forest species; while butterflies like *Pieris napi* and *Euchlœe cardamines* were in their element. The odd corners of the meadows and roadsides, or the less frequented lanes, gave opportunities of existence to *Pararge megaera*, *Coenonympha pamphilus*, *Polygonia c-album*, *Vanessa io*, *Aglais urticae*, *Rumicia phlaeas*, *Polyommatus icarus*, *Adopaea flavia*, *Argiades sylvanus*, *Hesperia malvae* and *Nisoniades tages*. The butterfly, however, which, above all others flourished at this period, was *Epinephele jurtina*.

But the inevitable city kept extending its borders and passing more traffic along the roads. The farmer, as living became more expensive, had to get all he could out of his land, so the hedges were cut down to a minimum, and the grass mown down right up to the hedge every season. Later on, even the hedge-banks in the lanes were annually trimmed, and so the waste corners became less and less. The forest species, except *Gonepteryx rhamni*, all disappeared, and they were followed by the Skippers, and finally by *Pararge megaera*.

Things, however, were not destined to stop here for many years, and bit after bit of the meadow was ploughed up and cultivated, until the grass-lands had been turned into market-garden grounds, covered to a great extent during summer with rows of cabbages. We have now entered, so to speak, on the *Pieris* period, when *P. rapae* is really the predominant butterfly. *P. napi*, which has been existing all the time, firstly, as an inhabitant of the borders of woods, and then of the hedge-rows, still continues, but is far outnumbered by *P. rapae*, which has made the cabbage its home. Nettles still flourish in waste corners where *Aglais urticae* still breeds, and visits the flowers in gardens; *Vanessa io*, and, in some years, *Engonia polychloros*, may also be seen on the flower-beds, where *Rumicia phlaeas* and *Polyommatus icarus* also disport themselves. *Coenonympha pamphilus* may also still be seen where the grass grows, and an odd *Epinephele jurtina* will still haunt an uncultivated spot, though its day is really over. The holly-trees in the private gardens, and the ivy on the tops of the brick walls, still offer hospitality to *Celastrina argiolus*, and *Gonepteryx rhamni* in its long flights may still pass over the district.

But the days of the butterflies are numbered, for the insatiable city still spreads out in all directions, not so swiftly, but not less destructive in its course than the lava from Mount Vesuvius. At last the builder takes possession of the land, and then, for a time, all is chaos. The very ground is dug up and trampled on, and the lepidoptera, in whatever stage they may be at the time, find no means of existence under such conditions. But *P. rapae* is not yet finally driven forth. In a year or two the inhabitants of the cottages just built grow nasturtiums in their gardens, and *P. rapae* again finds a suitable pabulum, and crawls up the cottage walls to pupate.

Once more the inexorable city moves, and the builder pulls down the cottages and erects shops, without any sort of garden, and thus the city is finally let into the country, and the place knows the *Rhopalocera*

no more. It must not be forgotten that a very large extent of the heath land before mentioned still existed up to the end of the eighteenth century, about the time when the meadows were becoming market-gardens. From these heaths and commons, no doubt, the butterfly fauna of the meadows and market-gardens was often replenished, and but for this open land it would have vanished much sooner. Probably *Plebeius argus* (*aegon*) was an early inhabitant of the heaths, and *Melitaea aurinia* of the damper portions, both of these finding their last home, near London, in Epping Forest (Newman, *Brit. Butts.*, pp. 42 and 121). *Urbicula comma* also probably made its home here in the early days, but there are no recent records for the district. *Polygonia c-album*, which was abundant in many places round London (Stainton, *Manual*, p. 40, and Newman, *Brit. Butts.*, p. 51), seems to have finally vanished from the district with unaccountable rapidity.

I have left the mention of *Pieris brassicae*, *Pyrameis cardui*, and *P. atalanta* till the last, as these three species, and possibly *Pieris rapae* as well, are not so much affected by the alterations of conditions as those butterflies which have real British races. These three species appear to be so continually replenished by flights from the continent to our shores that they may be observed almost anywhere in the years of their abundance. *Euranessa antiopa* was probably never a real British insect. The old Aurelians were just as pleased to see it as we are now, but apparently a good deal more surprised when they did so.

A puzzling group of Eupitheciids.

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

I have recently been interested in a group of Eupitheciids, which are certainly very closely allied, very similar in their general appearance in the imaginal state, and which comprise the insects known as *Eupithecia fraxinata*, *E. innotata*, and *E. tamarisciata*. So closely alike are the imagines that, in Staudinger and Rebel's *Catalog*, 3rd ed., they are treated as one species, and their synonymy is detailed as follows:—

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| <i>Innotata</i> , Hufn., "Berl. Mag.," iv., p. 616 (1769); Kn., "Btr.," i., p. 22, pl. i., figs. 7-9; Hb., 441-2; Tr., vi., 2, 124; Dup., viii., 204, 8; Gn., ii., 331; Crewe, "Ann.," 1863, p. 117; Snell., "Tijds.," 1866, p. 129, pl. v., f. 6; Bhtsch., "Wien. Ent. Z.," 1882, p. 163, 1884, p. 296; (-aria), H.-Sch., 274 ab?; iii., p. 119, 128. | Eur. c. et m. (exc. Cat. et It. c.); Scand. m.; Fen.; Pont.; Arm.; Hyrc.; Alt.; Ili. (v. ?); Amur. |
| a. var. <i>tamarisciata</i> , Frr., 192, 1a-e; ii., p. 153; Gn., ii., p. 332; Mill., "Ic.," iii., p. 110; Dietze, "Stett. Ent. Zeit.," 1874, p. 209, 1875, p. 241. — Minor plerumque obscurior magis unicolor plumbeo-grisea. | Germ. m. (oc.); Ter.; Helv.; Ped.; Gal.; Maur.; Tarb.; Iss.-K. |
| β. var. <i>fraxinata</i> , Crewe, "Ann.," 1863, 116-7; Dietze, "Stett. e. Zeit.," 1870, p. 337, 1872, 198, t. i., fig. 18, 1875, 69, 239; Mill., "Ic.," iii., p. 111. <i>Innotata</i> , Crewe, "Ann.," 1861, 136. <i>Suspectata</i> , "Stett. e. Zeit.," 1871, p. 210. — A var. præc. tantum larvæ alimento distinguenda sec. Stdgr. | Angl.; Germ. c. oc.; Austro-Hung.; etc. |

When *E. fraxinata*, the "ash" species, was first discovered in England, it was referred to *E. innotata*, the "artemisias" species, but Crewe, later, bred both insects, and differentiated them in the *Ent. Ann.*, 1863, pp. 116-121. Here we find most careful descriptions of the larvæ and imagines of the two species, more or less comparative, the latter by Professor Westwood, the former by himself. There appear

to be considerable differences in the larvæ and pupæ. Crewe adds (*op. cit.*, p. 121) that "the larva of *E. tamarisciata*, Fr., Guenée, p. 332, seems somewhat to resemble that of *E. innotata*. Since this was written we appear to have got little or no further.

I was much astonished, some three or four years ago, when corresponding with the late Mr. P. B. Mason respecting these insects, to find that he was inclined to agree with the continental dictum so far, at least, as *Eupithecia fraxinata* and *E. innotata* are concerned, but I pointed out to him that the continental opinion and British opinion were equally untrustworthy, because the first-named species was scarcely known to the continental entomologists, whilst the latter was scarcely known to British lepidopterists, and I suggested further, that, till the two insects had been reared side by side, I, for one, should consider them as abundantly distinct, the conditions of their environment, their habits, and their foodplants being so entirely different. At the same time, I suggested that the possibility of *E. innotata* and *E. tamarisciata* being the same species was a matter on which the German entomologists ought to be able to give a decided opinion, since both species were well-known to them, and should be comparatively easily compared; however, such material as I had been able to examine led me to suppose that it was quite possible that the two insects were distinct, and that careful comparison in the early stages would give some points of difference that would help to substantiate the minor details of difference observable in the imagines.

Barrett treats the two species we get in Britain as distinct, and rightly so in my opinion, but still some comparative studies ought to be made by those who are in a position to rear both species, and it would be well if those who are conversant with the larva on *Artemisia maritima* (and *A. vulgaris*) would attempt to make the necessary observations and comparisons with that on *Fraxinus excelsior* during the coming season.

[It is a remarkable coincidence that, just after I had prepared this note for publication, I met, at the Natural History Museum, South Kensington, Mr. Holmes, of Sevenoaks, who had two specimens of an *Eupithecia* bred, amongst several others, by his wife, from larvæ taken in Cornwall last year on tamarisk, and which one had little difficulty in referring to *E. tamarisciata*, a form, or species, not hitherto recorded from Britain. It behoves British entomologists, therefore, to bestir themselves, and prove or disprove the specific identity of these insects. In our opinion we have here three British species, whilst Staudinger's *Catalog* suggests that they are but one as shown by the synonymy quoted *suprà*.]

HEMIPTERA.

ANEURUS LÆVIS, FAB., FROM THE NORTH OF ENGLAND.—Whilst at a field meeting of the Vale of Derwent Naturalists' Field Club, held in Chopwell to-day, I found the very flat- and curious-looking Hemipteron, *Aneurus lævis*, Fab., in extraordinary profusion beneath the rather loose bark of a fallen oak. They occurred, huddled together, beneath the bark on one side of the tree for nearly the whole length of the fallen trunk, and were mostly mature, though a few of the larval and nymph forms were taken for examination. *Aneurus* apparently poses

as a southern species in Britain, and it, therefore, seems advisable to record its capture in north Durham.—RICHARD S. BAGNALL, Winlaton. May 12th, 1906.

VARIATION.

AMPHIDASYS AB. DOUBLEDAYARIA AT FRINDSBURY.—A female *Amphidasys* ab. *doubledayaria* was captured on May 20th, in the garden of the Rev. A. Day, at Frindsbury, near Strood, Kent. It is the first example of this form ever observed in this district, closely as it has been worked for the last 35 years. The garden is situated in the neighbourhood of extensive coke-ovens, cement works, a large railway station and extensive engine-sheds; the quantity of smoke produced in the immediate neighbourhood having been largely increased during the last few years owing to the development of the cement industry. I know of no one having reared, from ova or larvæ, in confinement, this special form, in the district.—J. OVENDEN, Frindsbury Road, Strood, Kent. May 21st, 1906.

COLEOPTERA.

LOMECHUSA STRUMOSA, F., AS A BRITISH INSECT.—The only records of the capture of this beautiful beetle in Britain are—one specimen taken by Sir Hans Sloane, on Hampstead Heath, in 1710; a second captured by Dr. Leach, while travelling in the mail-coach between Cheltenham and Gloucester! Both these specimens are in the South Kensington Museum. It is a far cry to the reign of Queen Anne, and the beetle has been struck out of all our lists altogether since 1866, when Crotch included it in his doubtful species; and it is not mentioned in Fowler, except to say that the genus comes very near to *Atemeles*. On May 25th, I took a specimen at Woking, with its host, the fine ant *Formica sanguinea*, and further search at the same place to-day (29th) produced six more, one of which I unfortunately cut in two. It is not necessary to give the description of *Lomechusa* here, as there is nothing else that can be mistaken for it. It is like a gigantic *Atemeles*, and has beautiful patches of golden hair on the abdomen, and also on the femora. Being a true ant guest, it is fed and licked by its host. It also devours their brood. The history of the capture of the first of my specimens is as follows:—Whilst staying at Woking with Mr. Saunders, Mr. Morice came out collecting with me, and I asked him if he knew of any nests of *Formica sanguinea*. He said "no," but, that no doubt we could find some; he found a nest under an old boot, which produced nothing, and a little further away he pointed out an ant running about, we saw several others, and, after some considerable search, I found two nests near each other, and took the specimen whilst investigating one of them, the second nest produced the other six to-day. I may mention that *Dinarda dentata* was not uncommon in both nests.—HORACE DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W. May 29th, 1906.

NOTE ON SOME MYRMECOPHILOUS BEETLES FROM THE NORTHUMBERLAND AND DURHAM DISTRICT.—After reading Mr. Donisthorpe's most interesting vice-presidential address to the Lancashire and Cheshire Entomological Society, on the Myrmecophilous Coleoptera of Great Britain, I

naturally felt a desire to learn more about them first-hand, and during the Easter holidays I managed to spend a few hours with our busy friend *Formica rufa*. In the extensive Tynedale pine-woods *F. rufa* is seen in great abundance, their hills, sometimes, approaching four feet in height. I had no sieve, and worked by taking a handful from where the ants were thickest, placing it on a waterproof sheet and then, after disposing of the ants in the best manner possible, I lay down and examined the refuse thus obtained. As it was a warm day there was scarcely a spot free from ants, some dragging beetles (such as *Pterostichus*, *Philonthus*, etc.), and others laden with flies, caterpillars, etc. These ants seemed to take a lively interest in running round my collar, down my neck, and up my sleeves, and there were many met a premature death by drowning when I washed myself that night. Altogether, the afternoon's collecting was little better than a night-mare, but it was a compensation to take several additions to our county's fauna, such additions being herein denoted by an asterisk. The following occurred at Corbridge-on-Tyne, Northumberland:—
 **Oxyptoda formiceticola*, Märk., **O. haemorrhoea*, Sahl., both fairly common; **Thiasophila angulata*, Er., **Notothecta flavipes*, Gr., and **N. anceps*, Er., were rather scarce, whilst the tiny **Ptilium myrmecophilum*, All., and **Homalota parallela*, Man., were perhaps the commonest beetles found, though they both seem local, the *Homalota* being apparently a northern species. A nice series of both **Quedius brevis*, Er., and **Leptacinus formicetorum*, Märk., were taken, and also a single example of *Othius myrmecophilus*, Kies. I had recently taken *Oxyptoda haemorrhoea* and the *Othius* in the Derwent Valley unassociated with ants. Just upon train time, the capture of a few **Monotoma conicicollis*, Aub., and a single **Myrmex piceus*, Pk., completed the ants'-nest work for the day. Interesting captures were made in many other orders, flies, worms, spiders, wood-lice, centipedes, etc.; one of the most interesting to us being that of the very rare ant **Formicoxenus nitidulus*, Nyl., which occurred in all the hills examined. To-day, *Formica rufa* was met with in Chopwell woods, in the county of Durham, but as it was almost dusk before a nest was found, little was done. Of the above mentioned species, *Oxyptoda formiceticola*, *O. haemorrhoea*, *Thiasophila angulata*, *Notothecta anceps*, *Homalota parallela*, *Leptacinus formicetorum*, *Ptilium myrmecophilum* and *Monotoma conicicollis* occurred; a solitary *Clythra quadripunctata*, L., was found crawling out of a nest, and from refuse taken home for examination I was glad to find a single **Monotoma formicetorum*, Th. At both Corbridge and Chopwell, several examples of a small *Tachyporus* (*T. brunneus*, F.) were found running in and out amongst the ants. From these notes, it is evident that the myrmecophilous fauna of the two districts mentioned will prove to be very similar to each other.—
 RICHARD B. BAGNALL, Winlaton-on-Tyne. May 12th, 1906.

COLEOPTERA AT WHITSTABLE. - Saturday, March 17th, was such a beautiful morning that, being able to get away from town, I sent round to my friend, Mr. Donisthorpe, to suggest a visit to Whitstable, to try what insects the rubbish left by the high tide of the previous Wednesday would produce. I was joined by him, and we left by the 10.45 train. It was apparent, on reaching Faversham, that the area of collecting would be small. We noticed, however, one meadow (eligible building-ground) which was still flooded, and which had s

nice fringe of rubbish round the inside margin, and, on leaving the train at 12.20, we at once proceeded to collect there. Beetles were numerous, and flying about in the hot sunshine. Indeed they were difficult to pick up from the sheet, and still more difficult to detect. Mr. Donisthorpe's ready knowledge of the insects in the field saved us from overlooking several of the better insects, which seem worthy of being recorded, many of them not having been taken at Whitstable for a considerable time. Indeed, nothing but a flood would have enabled us to find those now captured, as they had evidently been washed out of the adjoining shingle, as well as from the field, on the margin of which we were collecting. Most of them were sifted on the spot, but a small bag of roughly sifted material, which was more carefully sifted at Huntingfield subsequently, helped to swell the number of specimens, though it added no new species. On a second visit paid by me a fortnight later, most of the insects occurred again, but the drought that then ensued seemed to render any further captures unlikely, and I have not since visited the spot. After collecting at this spot, Mr. Donisthorpe and I walked back to Faversham, but we found little by the way. There was a large deposit at one spot, and here I got a single *Diglossa*, but that was the only addition. The brightness of the day had departed, and beetles had ceased to fly. The list of our more interesting captures is appended: *Limnaeum nigropiceum*, Marsh, *Lionychus quadrillum*, Duft. (three specimens), *Trechus lapidosus*, Daws, *Metabletus truncatellus*, L., and *M. obscuropunctatus*, Duft., *Ochthebius margipallens*, Lat., *Sipalia testacea*, Bris., *Calodera aethiops*,* Gr., *Myrmecophora uvida*, Er., and *M. sulcata*, Kies, *Heterothops binotata*, Gr., *Xantholinus tricolor*, F., *Achenium humile*, Nic., *Stenus solutus*,* Er., *Scopaeus trichomi*, Kol., *Trogophloeus corticinus*, Gr., *Oxytelus insecatus*, Gr., *Agathidium marginatum*, Stm., *Ptenidium punctatum*, Gyll., *Atomaria gutta*, Steph., *A. nigriventris*, Steph., *A. linearis*, *Throscus obtusus*, Curt., and *Oxyomus porcatus*, F. Of other insects a Proctotrypid, *Goniozus claripennis*, taken once before by me at Deal, and two ants, *Ponera punctatissima*, one ♀ and one ♂, and workers of *Myrmeana latreillei*, may be mentioned.—ARTHUR J. CHITTY, 27, Hereford Square, S.W. May 15th, 1906.

NOTES ON COLLECTING, Etc.

EARLY APPEARANCE OF *HESPERIA MALVÆ* AND *CALLOPHRYS RUBI*.—I can add to the records of first appearances for 1906 (*antea*, pp. 135, 137), that, on Easter Tuesday (April 17th) I saw, on the undercliff, near Ventnor, one specimen of each of the above-named butterflies; both, as might be expected, were in beautiful condition.—LOUIS B. PROUT. May 16th, 1906.

EARLY APPEARANCE OF *NISONIADES TAGES*.—The first *Nisionades tages* seen here this year was on the 12th inst. at blossoms of *Nepeta glechoma*.—J. F. BIRD, Tintern. May 16th, 1906.

RANDOM NOTES ON LEPIDOPTERA.—As I am devoting practically the whole of my scanty leisure just now to obtaining photomicrographs of the ova of all the British butterflies, and life-size photographs of their subsequent stages, I have been unable to do more than a very little towards adding specimens to my cabinet of late; but having had rather more success than usual with one or two small lots, a few rough notes

on them may not be without interest: Five ova of *Eupithecia irriguata*, received from Mr. Lyle, of Brockenhurst, April 29th, 1905, hatched May 14th, and the larvæ fed up well on oak, attaining a length of $1\frac{1}{8}$ inches and pupated in moss by June 13th; five imagines emerged April 13th-17th last. Twelve ova of *Callimorpha dominula*, received July 22nd, 1905, from Mr. C. J. Watkins, Painswick, Gloucester, hatched August 4th, and were fed on plum; laid up for hybernation in October, and passed the winter in a muslin sleeve, in the loft at the top of the house, without any attention whatever. The atmosphere in this loft is decidedly damp in winter, as there is a window at each end which is left open all the year round for ventilation. In the summer the heat of the sun on the roof sends the temperature above 80°F. at times, and makes a good forcing-house, but dries everything up in no time. About March 12th I took the larvæ out of the sleeve, and put them in a breeding-cage with some twigs of an early species of *Prunus*, used in this neighbourhood for garden hedges, and which is in leaf, in sheltered places, very often by January 31st. They began eating almost at once, and have never looked back, being now just about ready for pupation. Small batch of *Arctia villica* ova received June 17th, 1905, from Mr. H. E. Winser, Cranleigh, hatched June 23rd, and fed on willow, plum, groundsel, and dandelion, hybernated in the "loft" before mentioned, in a sleeve tied over a flowerpot containing a chrysanthemum plant. I watered this at fairly long intervals during the winter to keep it alive, and found the larvæ apparently quite happy under the leaves, but found no traces of their having attempted to eat it. They did not "wake up" till nearly the end of March, but then fed up very rapidly on dandelion, groundsel, and *Prunus*, and are mostly now in the last stadium. I did not lose a single larva till last week, but others have now started dying off in some numbers, from an unexplained cause, when laid up for the last moult. *Aporophyla australis*, of which I had a large number of ova, laid in confinement by a ♀ which was brought from Lewes, by Mr. Wightman, of Redhill, on September 14th, 1905, has proved quite a failure. The ova hatched from October 15th, a few at a time, and were nearly all put out in the garden on October 22nd, sleeved over pots of growing grass for the winter, being then about $\frac{1}{2}$ in. long. These I brought in on February 26th, 1906, but could not find a single larva in any of them. About fifteen larvæ which I kept indoors in a fireless room never properly hybernated, but nibbled blades of grass, at intervals, all the winter. They scarcely began to grow till the middle of February, when the largest was $\frac{1}{2}$ in. in length, and then died off one by one, until only four were left. These fed well on grass and dandelion, and three have now pupated successfully.—A. E. TONGE, Aincroft, Reigate. May 11th, 1906.

EUPITHECIA CONSIGNATA IN HAYLING ISLAND.—I was lucky enough to find a ♀ *Eupithecia consignata* on the 25th inst., resting on the trunk of a small hawthorn by the roadside, at Hayling Island. I exhibited it at the South London Meeting the same evening to make absolutely certain of its identity, and am now keeping her for ova.—ALFRED E. TONGE, Aincroft, Reigate. May 26th, 1906.

AGRIUS CONVULVULI NEAR READING.—On May 4th, a freshly-killed ♀ example of *Agrius convulvuli* was brought to me. This insect was

picked up by a boy at Twyford, and betrays the usual amount of damage suffered by moths taken under similar circumstances. One forewing is slit and both wings are rubbed, the body plumage is good. My object in recording this find is to elicit information, as September is the month we associate with *Agrius convolvuli*. Can this moth be a survival of last year's British emergence, or can it have arrived from some southern continental station, or is it possible it can have emerged now from pupa bred here during the autumn of 1905?—J. CLARKE, Reading. *May 27th*, 1906. [This is a most interesting record. Concerning it, reference may be made to *The Natural History of the British Lepidoptera*, iv., p. 343 (Syme's note on a spring emergence; pp. 375 *et seq.* (records of specimens taken during emigration); p. 377 (Powell's experience in breeding spring imagines); pp. 377-378 (the records of spring immigrants arriving in the British Islands in June and early July); pp. 386 *et seq.* (capture of examples on June 2nd, 1901, at Portland), etc. If this is to be a "*convolvuli*" year, every early record will be of importance.—ED.]

DIMORPHA VERSICOLORA AND STAUROPUS FAGI NEAR READING.—*Dimorpha versicolora* was out on April 13th, males coming to, and pairing with, bred females. Ova of this species excluded on the above date, are to-day (*May 27th*) hatching out. On the 24th inst. I found my first *Stauropus fagi*, sitting, according to its habit, on the trunk of a small beech-tree.—IBID.

THE ARRIVAL OF PLUSIA GAMMA.—Yesterday, *May 28th*, I took one of two specimens of this insect, which were flying rather leisurely in the bright sunshine. To-day the species is simply swarming here, the clover fields being alive with the insects. The specimens are not by any means in their first beauty, but the fringes are not badly injured, nor are the thoraces much worn. The form is grey, without trace of red. I imagine that the beautiful weather has encouraged an emigration from foreign parts, and hope that similar conditions may induce other wanderers to visit our islands during this year.—(REV.) C. R. N. BURROWS, Mucking. *May 29th*, 1906.

CURRENT NOTES.

At the conversazione of the Royal Society, held on *May 9th*, at Burlington House, we noticed, amongst others, the following entomologists present—Messrs. Austin, H. Rowland-Brown, A. J. Chitty, J. Collin, H. St. J. Donisthorpe, H. Druce, F. Enock, A. H. Jones, W. J. Lucas, F. Merrifield, B. W. Neave, and Edward Saunders, Professors T. Hudson Beare, E. B. Poulton and Dr. Dixey. There were no exhibits directly connected with entomology with the exception of "Berlese's apparatus for capturing minute insects and arachnids," exhibited by Mr. Cecil Warburton, which attracted much attention from the entomologists present. This consisted of a hollow inverted metal cone surrounded by a water-jacket. A wire-gauze tray, carrying moss or other material, rests on the open base of the cone. When the water in the jacket is raised to a temperature of about 70° C., all the creatures living in the moss descend, and, finding the sides of the cone too hot for a footing, fall into the vessel arranged beneath to receive them: it is necessary that the apical angle of the cone should be small.

One of the least satisfactorily known of the *Saturnia* hybrids, so far, has been *Saturnia* hybr. *hybrida* (*spini* ♂ × *pavonia* ♀), which, for a long time, rested only on the evidence of captured wild specimens, and had not been bred, and we have suggested (*Nat. Hist. Brit. Lep.*, iii., p. 297) the desirability of making certain of the hybrid by experimental crossing of the two species. Frings (*Societas Entom.*, vol. xxi., p. 25) gives an account of the rearing of crosses of *Saturnia hybrida* ♂ × *pavonia* ♀, which would suggest that the ♂ hybrid parent, *S. hybrida*, has also been obtained in confinement. Is this so?

A meeting of the Entomological Club was held on the evening of May 18th, at "Wellfield," Lingards Road, Lewisham, when Mr. R. Adkin was the host. The guests were received by Mr. and Mrs. Adkin, and a pleasant evening was spent in Mr. Adkin's library, among his books and insects. Many well-known entomologists were present, and when supper was served, at 8 p.m., the following members and friends, amongst others, sat down—Dr. T. A. Chapman, Messrs. J. E. Collin, W. J. Distant, H. St. J. K. Donisthorpe, A. Harrison, A. H. Jones, H. Main, G. T. Porritt, E. J. Smith, R. South, J. W. Tutt, G. H. Verrall, etc. After supper, the members of the Club transacted a considerable amount of business, after which informal discussion of matters entomological occupied the time till somewhat after 11 p.m., when the guests took leave of their host and hostess.

The *Proceedings of the South London Entomological and Natural History Society** for 1905, has just come to hand, this year in advance of that of the sister society. It is an interesting volume with the usual variety of papers, very well reported Proceedings, and, above all things, a first class index, so that one can use the contents for further work. The illustrations are particularly well done, and Mr. Adkin's paper on "Seal Chart," and his plan of the district, should be of the greatest use to naturalists in general (and entomologists in particular). The Presidential Address (pp. 55-68), by Mr. Hugh Main, is a thoughtful and useful essay, and the plate of melanic *Aplecta nebulosa* is exceedingly good; whilst of the other papers, Mr. F. N. Clark's "Practical Hints on the Manipulation of the Microscope and a description of its parts," will prove of the greatest use to all those who are interested in working out the biological branches of our science, and the details as to the making of exact measurements will be sure to be well appreciated. The other papers are, "Our British Plume Moths," by J. W. Tutt; "On the lengthened period of the pupal stage in sundry species of Lepidoptera," by R. Adkin, F.E.S.; "Echinoderms," by W. Manger, F.E.S.; "The genus *Eurymus* (*Colias*) with special reference to *E. eurytheme*," by H. J. Turner, F.E.S.; "Random Notes on the Entomology of the lowlands of Oahu (Hawaiian) Islands," by G. D. Kirkaldy, F.E.S.; "Mendel's Law of Heredity," by D. J. Scourfield, F.R.M.S.; "Report of the Seal Chart Field Meeting," by R. Adkin, F.E.S.; "Report of the Field Meeting at Reigate," by H. J. Turner, F.E.S.; "Report of the Field Meeting held at Clandon," by W. J. Kaye, F.E.S.; "Report of the Field Meeting held at Chislehurst," by Mr. F. B. Carr; "Report of the Fungus foray," by E. Step, F.L.S.

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EXCHANGES.—*The use of this column for the offer of " Duplicates " and " Desiderata " and " Changes of address " is open free to subscribers so far as there is space available.*

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MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. October 3rd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. June 16th, Coulsdon, 2.20 p.m., London Bridge, S.E.R.; June 24th, Loughton, 9.45 a.m., Liverpool Street; June 30th, Abbey Wood, 2.32 p.m., Cannon Street; July 8th, Bromley, 9.51 a.m., Ludgate Hill.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. June 14th, Exhibition. June 16th, Field Meeting, Box Hill, S.E.R. June 28th, "Collecting Notes." June 30th, Field Meeting, Leith Hill, L.B.S.C.R. July 12th, Exhibits; July 14th, Field Meeting, Clandon, L.S.W.R.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. June 23rd, Wormley, Liverpool Street, 3 p.m.; June 26th, Special Exhibition of Lycænidæ.

Lancashire and Cheshire Entomological Society.—Royal Institution, Liverpool. Field Meeting, June 16th, to Prestatyn. Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained.

Birmingham Entomological Society, Norwich Union Chambers, Congreve Street, at 8 p.m. June 25th, October 15th.

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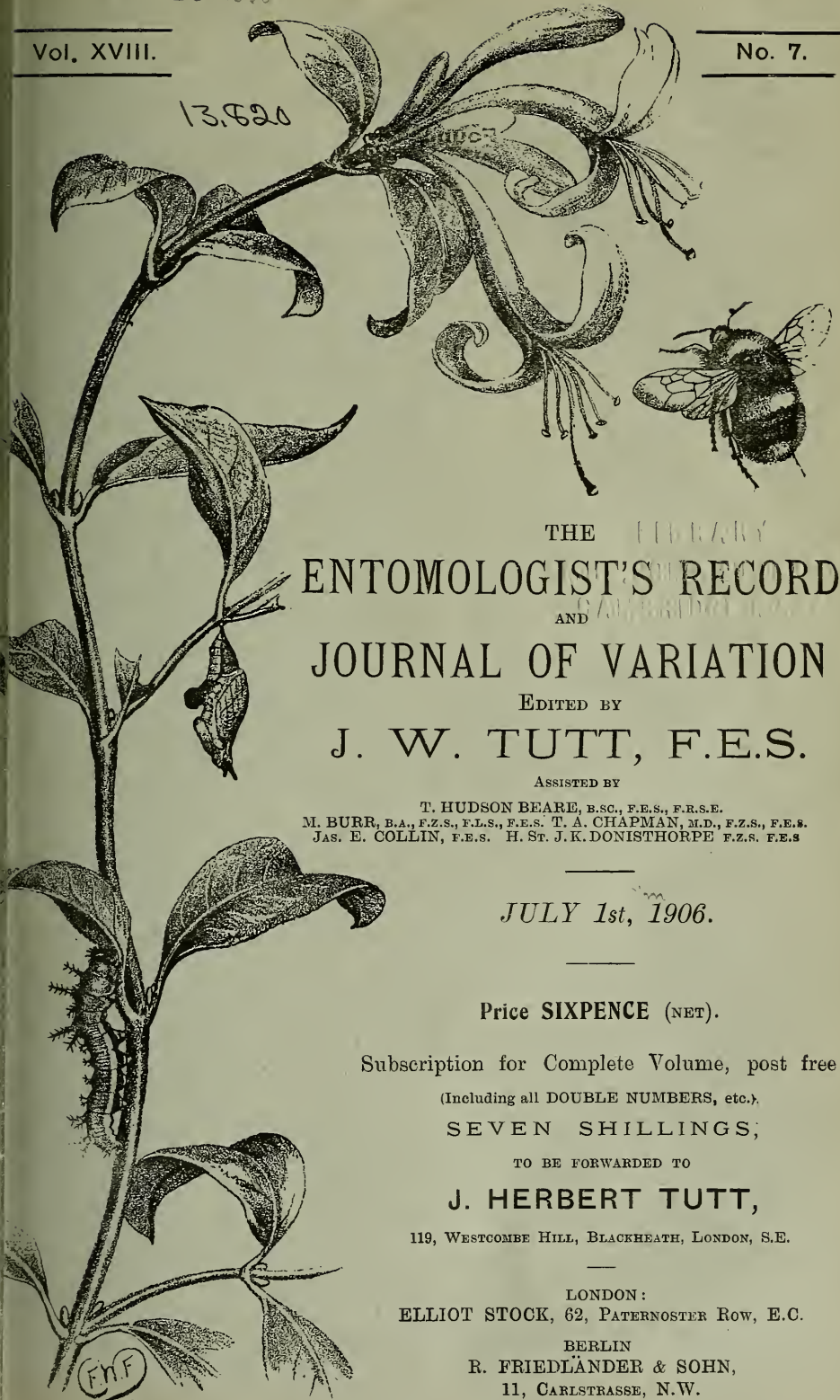
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To be obtained from J. HERBERT TUTT, 119, Westcombe Hill, Blackheath, S.E.

Collective Inquiry as to Progressive Melanism in Lepidoptera.

SUMMARY OF EVIDENCE PREPARED BY L. DONCASTER.

It is well-known to collectors that dark varieties of several common moths have recently come into existence, and that, in several species, they have, within living memory, largely increased in frequency, sometimes almost, or quite, superseding the lighter types in certain localities. Such an evolutionary change obviously possesses features of great scientific interest, and, had the process been carefully watched from the beginning, information of extraordinary value could have been obtained. Though that opportunity has been, in great measure, lost, the transformation is still going on, and, in the hope of recording its progress, the Evolution Committee of the Royal Society instituted a collective inquiry, in the year 1900. Circulars were addressed to collectors all over England, and a few to persons abroad. It was the object of these inquiries to awaken interest in the matter, and to obtain, as far as possible, an approximate record of the present state of the affected population in the various districts, which might serve as a point of departure for future comparisons. Questions were also asked respecting any changes witnessed within the recorder's own memory.

The northern midlands of England and the metropolitan area are well-known to be the regions most affected by the change, and, respecting these districts, much information has been elicited. With regard to unaffected districts precise statements would, in view of future possibilities, be of value, but it has been difficult to obtain records of this class, doubtless on account of the smaller interest attaching to negative experience.

To ensure greater accuracy of description, a coloured plate was issued to those willing to take part in the enquiry, exhibiting the more important variations from the respective types. The specimens there represented were very kindly lent by Mr. W. H. B. Fletcher for the purpose. The species represented on the plate were: *Odontopera bidentata*, *Hemerophila abruptaria*, *Hybernia progemmaria* (*marginaria*), *Eupithecia rectangulata*, *Phigalia pilosaria*, *Amphidasys betularia*, *Boarmia repandata*, *Boarmia rhomboidaria*, *Acidalia aversata*, *Venusia cambrica*, *Acronycta psi*, *Xylophasia polyodon* (*monoglypha*), *Miana strigilis*, *Polia chi*, and *Aplecta nebulosa*.

Since the inquiry was instituted, the volume of Barrett's *Lepidoptera*, dealing with the *Geometridae*—the family most conspicuously affected—has been published. A large mass of facts bearing on the problem is therein contained, and, in the summary which follows, Barrett's collection of evidence has been freely incorporated with that resulting from the committee's enquiry.

Though the evidence is somewhat meagre in amount, and falls far short of that which might be obtained by further efforts, it seemed well to no longer delay publication of a summary, in the hope that the attention of collectors may be more attracted to the great interest of the problem.

One of the questions raised by the facts, relates to the degree of suddenness with which the transformation is effected. It might *a priori* be possible for a general melanism to come about in one of two ways. Either the population, as a whole, might gradually and progressively become darker, or dark individuals and dark strains.

JULY 1ST, 1906.

might appear, and, by increasing in abundance, succeed in replacing the type to a greater or less extent. On this point the evidence differs considerably in the respective species, and no answer generally applicable to all can be made.

In considering the problem of the causation of such evolutionary change, it is necessary to distinguish carefully between the cause, in the strict sense, which leads to the appearance of the variations, and the circumstances, which, by favouring these variations, have enabled them to persist, and may thus, in a secondary sense, be spoken of as causes of the change of type. Though from the simultaneity of the appearance of similar varieties in so many distinct species, it is difficult to resist the conclusion that some of these effects are due to a definite cause, it was not anticipated that, in the absence of any clue, the present inquiry would succeed in elucidating this part of the problem.

There was, however, some hope that the evidence would throw light on the circumstances which have contributed to the persistence of the melanics. The fact that, in so many cases, the progress of the change has taken place chiefly in or near manufacturing centres, naturally suggests a relation of cause and effect, and the circumstance that, after their appearance on the continent, these forms have especially established themselves in the neighbourhood of Crefeld, the "black country" of Germany, supports the same conclusion. As appears from the details, it nevertheless is not possible to press this deduction very closely, for, in several instances, melanics have become prevalent in quite rural localities. Moreover, even granting the connection between urban conditions and melanism, the further inference that the success of the melanics is to be ascribed to their protective coloration remains very doubtful. Though having a certain plausibility, this suggestion is extremely difficult to apply in detail, and, for the present, we are scarcely entitled to go beyond the general conclusion, that, in some unknown way, the change from rural to urban conditions has contributed to the predominance of melanic forms.

Summaries are given below of the records received with regard to the respective species.

ODONTOPERA BIDENTATA.—Melanic forms are taken in Scotland, the northern counties of England, Yorkshire, Lancashire, and Ireland, isolated specimens further south. Quite black specimens occur in the West Riding (Huddersfield, etc.). According to Barrett, in different localities the darkening takes different forms, *e.g.*, smooth, smoky-black in Lancashire, darkening especially outside the second transverse line in Ireland. Forres, moderately dark (Hewett). Wigtownshire, quite light, few; intermediates more frequent, dark, with strong markings, few (Gordon). Newcastle, typical brown form prevalent, about 20% suffused, some with markings barely visible; larvæ generally nearly black (Nicholson). Sunderland, typical brown form, rather dark, but little variation (Brady). Hartlepool, generally light, a few dark, and a local banded race exists (Robson). Huddersfield, 45 years ago, light prevalent, now rather dark brown is commonest, not infrequently suffused with black, occasionally nearly black (Mozley). Wakefield, unicolorous black occurs; Hull, dark occurs (Hewett). Manchester, pale to black, medium prevalent (Kearcy). Cheshire, light prevalent, medium common, dark less common (Arkle). Worksop (Alderson), Sledmere (Hewett), Furness (Morgan), Midland and southern counties

(Prideaux, Fenn, Raynor, etc.), only light and medium recorded, except occasional suffused specimens from Derby (Hill), Walsall (See), and Farnborough (Hewitt).

HEMEROPHILA ABRUPTARIA.—In the north of England the species is not common. Records from Durham (Robson), Yorkshire (Hewett), Lincoln (Raynor), Norfolk (Atmore, Pitman), Notts (Addison), Cambs (Farren), Sussex (Christy), Surrey, Bristol (Prideaux), and Stafford (Woodforde), mention only the light form. The dark variety is characteristic of London and its suburbs; it has also been recorded from the New Forest (Sequeira), but is probably very rare there. In London it is much less common than the type (Harris, Fenn, Quail). When crossed with the type intermediates are not produced, but the results suggest that the dark form is a Mendelian dominant. Mr. Harris got the following results. First cross gave 11 light, 9 dark. Two of these darks paired together, gave 39 dark, 18 light. Of these—

- (1) Dark ♀ × dark ♂ gave 67 all dark.
- (2) Light ♀ × light ♂ gave 18 all light.
- (3) Light ♀ × dark ♂ gave 23 dark, 6 light.
- (4) Dark ♀ × light ♂ gave 33 dark, 15 light.

Also Mr. T. H. Hamling (*Trans. City of London Ent. Soc.*, 1905, p. 5):—

- (1) Dark ♀ × light ♂ gave 9 light, 11 dark.
- (2) Light ♀ × dark ♂ gave 8 light, 8 dark.
- (3) Dark ♀ × dark ♂ gave 17 light, 48 dark.
- (4) Light ♀ × light ♂ gave 18 light, 1 dark.

BOARMIA REPANDATA.—Very variable. In the south of England and midlands a light brown form seems prevalent; in the south, South Wales, and more rarely in the north, the banded var. *conversaria* occurs. In the north of Ireland, Scotland, and especially in the Scottish Islands, a grey variety is prevalent. In the north of England specimens are found darker than in the south, and a black form now occurs, and seems to be spreading; it appeared first in south Yorkshire. Huddersfield, black first recorded in 1888; in 1900, 20-25% black with or without white line, remainder brown. Probably became gradually darker (Porritt). Rotherham, Sheffield, black or very dark now prevalent, has increased in the last fifteen years (Brady, Doncaster, Hall). York, very dark and black absent (1900, Hewett). Durham and Northumberland, brown and dark with distinct markings, prevalent; very dark and black rare; *conversaria* formerly common, now rare (Robson, Brady, Rosie). Chester, Delamere (Arkle, Collins), Market Drayton, medium prevalent, but dark and black (less black than darkest Yorkshire specimens), not uncommon. At Market Drayton darker forms are prevalent in fir-woods nearer Potteries; type form prevalent in oak-woods, further west (Woodforde). Black specimens are recorded from the Furness district (Morgan), Saltburn, Galway (Dillon), dark, but not black, from Gloucestershire (Davis), Wigtownshire (Gordon), Linlithgow (Hewett), Kent, London (Hewett, Mera). Returns from midlands, East Anglia, and most of the southern counties mention only light to medium; var. *conversaria* from Durham (Robson); Swansea (Robertson), Bristol (Prideaux), Cornwall, New Forest (Ogden).

BOARMIA RHOMBOIDARIA.—In the south, except London, the prevalent

form is light brown, varying to a rather darker tint. According to Barrett the smoky form was first described from London, about 1870; it now occurs at Birmingham and other large towns, and is prevalent in south Yorkshire. A coal-black form is recently recorded from Norwich, and a rather less dark variety from Scotland and Cannock Chase. Durham, Northumberland, medium prevalent, light scarce, very dark prevalent at Newcastle, and a dark form occurs at Durham (Robson, Rosie). Chester, Delamere, medium prevalent, very dark fairly common (Arkle). Sheffield, rather dark, no great variation (Brady, Doncaster). Midlands and southern counties, light brown generally prevalent, tending to grey in chalky districts, rather dark from Reigate, Bristol, Ashdown Forest (Prideaux), and occasional rather dark specimens from Kent and Gloucestershire (Hewett, Davis). Norwich, occasional quite black ♂ (Pitman). Berlin, rather dark form now commoner than light, appeared some twelve years ago (Kloos).

HYBERNIA PROGEMMARIA (MARGINARIA).—The typical light form is characteristic of the south of England, a rather darker reddish-brown form is found in Ireland, Scotland, and is prevalent in the north of England; it occurs also around London, in Gloucestershire, Bristol, etc. A uniform smoky variety appeared in south Yorkshire less than 40 years ago, it has become commoner, and is spreading to the neighbouring counties. Only light and medium are recorded from Kent, Sussex, Surrey, Berks, Devon, Hereford, Norwich, Suffolk, most of Scotland. Dark occurs occasionally in Essex (Harwood), Cambridgeshire (Farren), fully dark appeared at Lynn between 1900 and 1904 (Baker). Huddersfield, rather light, medium, dark, all abundant; 40 years ago the rather light form was the only one known, now the dark medium is prevalent, and the very dark form up to 20%. The females are now nearly all fully dark (Porritt). Yorkshire, Sheffield, Cheshire, Liverpool, Chilwell (Notts), medium prevalent, light common, dark not uncommon (Hewett, Doncaster, Arkle, Tait, Pearson). At Sheffield the smoky suffusion has increased greatly in 15-20 years (Doncaster). Durham, Northumberland, light prevalent, formerly commoner; smoky not uncommon, appeared within about 25 years (Robson). At Sunderland a race exists with smoky forewings, but light hindwings (Brady). Smoky form occurs occasionally at Windermere, Lynn, Birmingham, Stroud (Davis), Bristol (Prideaux), it occurs in a small isolated locality at Paisley (Stewart). In districts where the dark forms occur, black females are more abundant than fully dark males. A black female paired with dusky male (from Yorkshire) gave 35 males all dusky in varying degrees, all females dark (Adkin).

(To be continued.)

Butterflies at Rest.

By DR. T. A. CHAPMAN.

Dr. Longstaff has called our attention to the resting attitude of butterflies, and records observations that we all recognise as having made, at some time or other, without knowing it, and certainly without having co-ordinated them, either together or with any general principle. Dr. Longstaff especially directs our attention to the cryptic value of these attitudes, either temporarily, or during the long daily rest of some eighteen hours. The attitudes which have more par-

ticularly attracted my attention are rather what might be called the attitudes when settled, rather than when at rest, *i.e.*, the attitudes assumed for a few seconds, or minutes, during the period of daily activity. That these two series of attitudes are closely related to, and have considerable value in explaining, each other, is no doubt the case. Indeed, the temporary attitude no doubt leads up to, and possibly originates, the true resting attitude. This follows from the circumstance that when the butterfly is temporarily resting a sudden failure of sunshine may necessitate its accepting as, or at any rate changing at once into, the permanent attitude that which it then has. There is nevertheless a certain antithesis between the two attitudes. Dr. Longstaff shows that the prolonged resting attitude has reference principally to effective hiding. I have always regarded the temporary attitude as pointing, on the contrary, to effective display, and especially to securing a maximum solar radiation.

The *Vanessas* illustrate most pointedly the difference of the two attitudes and the obvious connection between them. All the species I know are fond of settling on a road, a stone, a wall, or other bare place; immediately they turn their tails to the sun, and, after a slight flap or two, lay the wings flat on the ground, indeed more than flat, as the head is somewhat raised, and the borders of the wings touch the ground all round—the position that is given to an insect in the good old-fashioned English setting (indeed this setting is probably in reality an attempt to reproduce this butterfly attitude). The insect in this way receives a maximum of sunshine, whether because he finds it grateful and comforting I do not know, but it certainly, by securing a maximum amount of light, gives the colours the greatest brilliance they admit of, and it would be difficult to surpass the display made by a *Pyrameis atalanta*, *Vanessa io*, or *Euvanessa antiopa* so resting. How closely this is related to the prolonged resting attitude is obvious, since it is at once assumed, if the wings be thrown back, as occurs during any temporary passing of a cloud over the sun.

I have taken a recent opportunity of seeing a few butterflies at Hyères, to refresh my recollection on some of these points. *Callophrys rubi* when it settles instantly makes a curious little twist and twinkle. I had never tried to understand what this meant, but I have recently had the opportunity of carefully watching the same movement made by *Thestor ballus*, as well as observing *C. rubi* itself. The movement, which is almost part of the process of settling, places the insect at once, with one side (without preference for either) towards the sun, the wings closed, and the sun vertical to the exposed undersurface; *T. ballus* will settle on the ground, but by preference on some portion of a plant, and *C. rubi* invariably on the leaves of some tree or shrub. Such, at least, was the case at Hyères, where the butterfly was abundant in some places. At Ste. Maxime, however, a little later, where it was equally common, it was rather fond of settling on stones and pathways. I feel confident that this difference of habit in the species at the two localities was real, and not due to any serious defect of observation, though it is possible that occasionally a *C. rubi* on the ground may have been mistaken for *T. ballus*. Had the absence of *T. ballus* at Ste. Maxime anything to do with the different habit of *C. rubi*?

When on the ground *T. ballus* secures no cryptic advantage, but

both species certainly do when on vegetation, though there is also a maximum exposure to the sun as well as a maximum of display. Neither insect ever shows the upper surface when resting, not even the coloured *T. ballus* ♀. The paradox that this attitude secures both the maximum of display and a large amount of cryptic effect, I find difficult to deal with, nor can I form any opinion as to whether the butterfly is more or less conspicuous owing to the special orientation, but certainly one side of the insect secures a vertical exposure to the sun's rays.

Gonepteryx cleopatra, *Colias edusa*, and *C. hyale* frequently orient themselves in the same manner, and none of these ever show the upperside when at rest, whilst the white Pierids seem to orient themselves, when they do so at all, with reference to the direction of the wind, and with no relation to the sun. A good many butterflies rest just like the Vanessas, except that the wings are not strongly deflexed, but slightly raised, of which the Melitæas (e.g., *Melitæa cinxia*), and Hesperias (e.g., *Hesperia malvae*), may be given as examples. The orientation is precisely the same.

The Lepidoptera of the southeastern district of London.

By WILLIAM WEST.

(Continued from vol. xviii., p. 143.)

ÆGERIIDES.—*Æ. formiciformis*.—Plumstead, on osier; 1879. *Æ. ichneumoniformis*.—Captured one specimen sweeping the railway-bank at Lee, in 1877. *Æ. cynipiformis*.—Larvæ and pupæ under bark of oak in Darenth Wood, in June, 1870; two imagines taken in Burnt Ash Lane, at rest on oak-leaves in 1870; also one in Greenwich Park, on the trunk of an elm. *Æ. tipuliformis*.—In my own garden at Greenwich, at rest on currant leaves in 1864, 1866, and 1867.

ZEUZERIDES.—*Zeuzera pyrina*.—Bred from whitethorn, lilac, and apple-trees, at Greenwich.

COSSIDES.—*Cossus cossus*.—Larvæ in an elm in Greenwich Park; in a birch at Shirley, and also in willows at Lee and Lewisham.

HEPIALIDES.—*Hepialus hectus*.—At West Wickham Wood, Shooter's Hill, and also Shirley. *H. lupulinus*.—Lee, Greenwich, Lewisham, and in many other places. *H. sylrinus*.—At Lee, Wickham, and Dartford. *H. humuli*.—Found at Greenwich, Lee, Lewisham, and many other places.

EUCLEIDES.—*Cochlidion limacodes (testudo)*.—West Wood, on Shooter's Hill, in June, 1863, and also found in Swanscombe Wood in 1865.

ADSCITIDES.—*Adscita stacies*.—In Loughton, 1864. *A. geryon*.—Box Hill, 1868. *Anthrocera trifolii*.—Loughton, in a field near "the Owl," 1865. *A. pilipendulæ*.—Box Hill, Lee, Forest Hill; in a field, annually, at the top of Burnt Ash Lane, from 1865.

NOLIDES.—*Nola cucullatella*.—Blackheath, on fences; larvæ on whitethorn, at Kidbrook, Lee, Lewisham, etc.

ARCHIDES.—*Nudaria senex*.—Lee pit, a sallow swamp at the top of Manor Farm. *N. mundana*.—On fences at Blackheath. *Setina irror-ella*.—Caterham, in June, and Box Hill. *Calligenia miniata*.—Darenth Wood, and in West Wood, Shooter's Hill. *Lithosia aureola*.—Darenth Wood. *L. deplana*.—Beating yews at Box Hill, in July and August.

L. lurideola.—Kidbrook Lane and Burnt Ash Lane. *L. rubricollis*.—Shooter's Hill, Darenth Wood, and Box Hill. *Euchelia jacobaeae*.—Brockley, Lee, Lewisham, and many other places. *Arctia caja*.—Larvæ, common everywhere on nettle and dock. *A. villica*.—Larvæ taken at Plumstead and Manor Farm Lane, Lee, on chickweed. *Phragmatobia fuliginosa*.—Bred from eggs laid by ♀ taken at Brockley. *Spilosoma mendica*.—Bred from ♀ taken in Lee on dock. *S. lubricipeda*, *S. menthastri*.—Common everywhere. *S. urticae*.—Larvæ in Plumstead Marshes, on low plants; I captured a perfect insect at rest in my own garden at Lewisham.

LYMANTRIDES.—*Porthesia chrysoorrhoea*.—Bred from larvæ taken at Chattenden. *P. auriflua*.—Larvæ common at Lee on whitethorn. *Leucoma salicis*.—Larvæ taken on poplars at Blackheath. *Dasychira pudibunda*.—Darenth, Lee, Kidbrook, West Wickham, and also Shooter's Hill Woods. *Orgyia gonostigma*.—Bred from larvæ taken at Wimbledon. *O. antiqua*.—Common in all stages everywhere. *Demas coryli*.—Bred from larvæ taken at West Wickham.

LACHNEIDES.—*Trichiura crataegi*.—Bred from larvæ taken at Loughton; imago taken at rest on a wall at Blackheath. *Poecilocampa populi*.—Bred from larvæ taken at West Wickham. *Lachneis lanestrus*.—Bred from larvæ taken on white- and blackthorn at Kidbrook, Burnt Ash Lane, and Dartford Brent; I had six broods at one time, and finished the feeding in a butter-tub, the nest filling it out; some came out the following February, the others lying over; it was four years before they were all out, very few failing, but I turned most of them adrift. *Malacosoma neustria*.—Larvæ very common at Lee. [*M. castrensis*.—Bred from larvæ taken below Gravesend.] *Macrothylacia rubi*.—Bred from larvæ taken on Shooter's Hill in the spring. *Lasio-campa quercus*.—Larvæ taken at Lee and Kidbrook. *Cosmotriche potatoria*.—Larvæ common on grass in Kidbrook Lane and Burnt Ash Lane. *Eutricha quercifolia*.—Bred from larvæ taken at Kidbrook and Dartford on blackthorn.

ATTACIDES.—*Saturnia pavonia*.—Bred from larvæ taken at Plumstead and Shirley.

GEOMETRIDES.—*Urapteryx sambucata*.—Bred from larvæ taken in the winter months by beating ivy; Lee. *Epione apiciaria*.—Lee pit, amongst willows. *Rumia crataegata*.—Lee, Lewisham, and Greenwich. *Venilia maculata*.—West Wickham, Darenth, Shooter's Hill, Loughton, and Lee. *Angerona prunaria*.—Darenth and West Wickham. *Metro-campa margaritata*.—Box Hill, Dartford, Burnt Ash Lane; larvæ at Wickham. *Ellopija prosapiaria*.—Beating pines at West Wickham. *Eurymene dolabraria*.—Darenth and Wickham. *Selenia illunaria*.—Kidbrook, Plumstead, and Burnt Ash Lane; first brood in April, second in August. *S. lunaria*.—Bred from eggs from ♀ taken at Darenth. *S. illustraria*.—Bred from West Wickham. *Odontopera bidentata*.—Larvæ beaten from spruce-fir, and fed-up on the same; West Wickham. *Crocallis elingvaria*.—Kidbrook, Wickham, and Lee. *Ennomos alniaria*.—Blackheath, Lee, and Greenwich. *E. fuscantaria*.—On a fence in Greenwich Park. *E. erosaria*.—Bred from ♀ taken at Blackheath. *E. angularia*.—Lee, Lewisham, and Blackheath. *Himera penmaria*.—Darenth, Wickham, and Blackheath. *Phigalia pilosaria*.—Shooter's Hill Wood, January 4th, 1867; Kidbrook, Lee, and Blackheath. *Nyssia hispidaria*.—Richmond Park. *Biston hirtaria*.

—Bred on lime; occurs throughout the district. *Amphidasys prodromaria*.—Blackheath, on fences; West Wickham and Greenwich Park. *A. betularia*.—Bred on elm and birch; Blackheath, Kidbrook, Lee, and Lewisham. *Hemerophila abruptaria*.—Bred on lilac; it is a very interesting species to breed; the construction of its cocoon is very novel; it is formed on twigs about $\frac{1}{4}$ in. or $\frac{5}{8}$ in. thick, in the angle of a joint, on the underside; the finishing off and colouring is perfect, and requires a practised eye to detect it; it is found throughout the district. *Cleora lichenaria*.—Bred from larvæ taken off the Bishop's fence, Addington, feeding on lichens; larvæ $\frac{3}{4}$ in. long, May 15th, 1875; imagines emerged during July; in 1876, the larvæ were of the same size on April 29th; very easy to feed in a jam-jar, by sprinkling the food with water occasionally; larvæ not very easy to detect the first time of searching, for, when at rest, they stand out and look like parts of the lichens. *Boarmia repandata*.—Bred from oak; Blackheath. *B. rhomboidaria*.—Bred from clematis; Greenwich Park, Lee, etc. *B. abietaria*.—Leith Hill. *B. roboraria*.—West Wood, Shooter's Hill. *B. consortaria*.—Darent and Wickham. *Tephrosia consonaria*.—Wickham, Shooter's Hill, and at Abbey Wood. *T. bistortata*.—Wickham, Shooter's Hill, and also Blackheath. *T. biundularia*.—Wickham and Greenwich Park. *T. eversaria*.—Darent and Abbey Wood. *T. punctularia*.—West Wood and Crown Woods, Shooter's Hill, Wickham. *Gnophos obscurata*.—Box Hill, Caterham, also at Brockley. *Pseudoterpsa cytisaria*.—Larvæ on broom and furze; Shooter's Hill, Blackheath, Lee, Loughton, and Shirley. *Geometra papilionaria*.—Wickham Wood, West Wood, Darent. *G. vernaria*.—Larvæ beaten from clematis in May, 1877; Plumstead. *Iodis lactearia*.—Lee, Lewisham, Greenwich, and many other places. *Phorodesma bajularia*.—West Wickham, Shooter's Hill. *Hemithea thymiaria*.—Bred from whitethorn and birch; Kidbrook and Lee. *Ephyra porata*.—Bred from an oak, May and August; Shooter's Hill. *E. punctaria*.—Darent, West Wickham, Lee, and Kidbrook. *E. trilinearia*.—Loughton, Box Hill; on beech. *E. omicronaria*.—Bred from maple; Darent Wood. *E. pendularia*.—Bred from birch; Darent, Wickham, and Plumstead; the species of this genus are easy to breed, and the pupæ are very pretty little objects. *Asthena luteata*.—Swanscombe, Darent, and West Wood. *A. candidata*.—Lee, Lewisham, Kidbrook, and Shirley. *Eupisteria heparata*.—West Wickham; amongst alders. *Acidalia scutulata*.—Kidbrook, Lee, Dartford. *A. bisetata*.—Kidbrook, Lee, and also Shooter's Hill. *A. trigeminata*.—Darent. *A. rusticata*.—Northfleet. *A. interjectaria*.—Blackheath, Lee, and Lewisham. *A. incanaria*.—Blackheath, Lee, and Lewisham. *A. ornata*.—Box Hill, Caterham. *A. remutata*.—Darent, Shooter's Hill, and Lee. *A. imitaria*.—Kidbrook, also in Burnt Ash Lane. *A. aversata*.—Blackheath, Lee, and Lewisham. *A. emarginata*.—Kidbrook, Lee, and Lewisham. *Timandra amataria*.—Kidbrook and Burnt Ash Lane; first brood taken in May; obtained eggs, and reared a second brood in August; fed on dock; the second brood is smaller than the first, and very much handsomer, the "blood vein" being broader, and flushed into the ground colour. *Cabera pusaria*.—Bred from sallow; Lee pit and Lewisham. *C. var. rotundaria*.—Wickham Wood. *C. exanthemaria*.—Bred from sallow; Lee pit, and also Lewisham. *Corycia temerata*.—Darent Wood and West Wood. *C. taminata*.—Caterham.

Aleucis pictaria.—Loughton. *Macaria notata*.—Wickham Wood and Darenth. *M. liturata*.—Wickham Wood; on pines. *Halia wavararia*.—Bred from larvæ found on currant and gooseberry, at Greenwich, Lee, and many other places. *Strenia clathrata*.—Brockley railway bank to Forest Hill, Box Hill, and Shooter's Hill. *Panagra petraria*.—Darenth, Wickham, and Shooter's Hill. *Numeria pulveraria*.—Bred from ♀ taken at Darenth. *Scodiona belgiaria*.—Bred from larvæ taken at Shirley. *Fidonia atomaria*.—Shirley, Dartford, and Brockley. *F. piniaria*.—Wickham and Dartford. *Minoa euphorbiata*.—Wickham and Dartford. *Aspilates strigillaria*.—Larvæ taken at Shirley. *A. citraria*.—In clover fields at Dartford. *A. gilvaria*.—Box Hill and Caterham.
(To be continued.)

Notes on *Coleophora discordella*, *C. olivaceella* and *C. lineolea*.

By HENRY J. TURNER, F.E.S.

COLEOPHORA DISCORDELLA.—At the same time that Mr. Banks sent me larvæ of *C. albitarsella*, he also forwarded two cases of the present species. These he had found on May 3rd, 1904, in the Isle of Purbeck, feeding on *Lotus corniculatus*. The cases of this species are cornucopia-shaped, with a number of encircling flounces of a much lighter-brown than the ground colour of the case, which is of a blackish-brown. These flounces are irregular in shape, the newest flounce being the addition placed inside the previous one, which is the lighter mouth margin puckered out when the case is enlarged, the new piece being fastened on, a little way inside the rim of the old mouth opening. On May 14th, I had the pleasure of seeing one of the larvæ enlarging its case in this way. The edges of the pieces of leaf used are not stained the deep rich brown of the rest of the case by the larval secretion. On May 15th, the enlargement was completed, the larva cut its case free, and shaped it properly. It then fastened itself on to a stem, but, on the afternoon of May 16th, it moved to a juicy leaf and began to feed. Presumably, a change of skin took place during this 24 hours, which was, however, an extremely short period for a Coleophorid to take for the process. On the lower keel the margins of the added pieces rarely touch, but are adjoined a little way within, compelling the actual edges of the piece to turn out, forming, as it were, a double-bladed keel. This keel is irregular, the two edges being frilled, they are green at first, and soon assume the light brown of dead cuticle, but never take on the black-brown of the ground colour. The small winter-case persists as the anal part of the enlarged case. On May 20th, one of the cases was apparently permanently affixed to a leaf by a quantity of pure white, loose, thread-like substance, the "stopper" probably before pupation. No perfect insect emerged from this one, and the other died before reaching its full development. Further cases were sent me by Mr. C. J. Watkins, of Painswick, Gloucestershire, who took them at the Mumbles, near Swansea; I have also heard of a case being found at Worksop, by Miss Maude Alderson.

COLEOPHORA OLIVACEELLA.—When obtaining the larvæ of *C. solitariella* on *Stellaria holostea*, at Lewisham, I met with one case of this species. It is readily distinguished, being of a bright brown ochreous colour, larger than the case of *C. solitariella*, bulkier, more bulged at the middle, and has a better developed lower keel. This

keel, in *C. olivaceella*, goes very distinctly from just behind the mouth, right up to the suture of the two side valves of the anal opening. There is no back keel, but two very slightly developed ridges rise in a point just at the commencement of the straight portion behind the head-bend, and diverge gradually till they join in the sutures of the side valves, with the third valve of the anal opening. There seemed a tendency for the brown coloration to become streaky longitudinally, but this was obscure, and may have been only an individual characteristic. The mouth was very oblique, which made the case almost prone on the grass leaf. In *C. solitariella*, the case is almost upright to the surface of the grass. On May 16th, I noticed the larva with its head in a hole bitten completely through a blade of grass, and feeding away on the edge without mining, just as if it were an ordinary macro larvæ. By the middle of June it had finished feeding. But later on I found a round hole bitten through the case, a sure sign that a parasite had emerged, instead of the much wished for lepidopteron.

COLEOPHORA LINEOLEA.—A walk down the dusty Bromley Road, below Catford, and a search among the *Ballota nigra* growing alongside under the shelter of the elm bushes and trees, produced plenty of the larva and cases of *C. lineolea*. This species, I may note, is particularly fond of the neighbourhood of very dusty roads, and I met with it in such a situation at Crofton Park, Chatham, and Sanderstead, last year. The following notes were made on the larva:—

The prothoracic segment with a black shield covering the whole of the upper surface. This plate has an irregular margin of brownish all round, showing more prominently along the front edge. A thin pale sutural line down the middle of the back, widening somewhat towards the rear, divides the shield into two plates. The mesothoracic segment has two black plates on the back, separated down the middle of the back by a sutural light line, perceptibly wider than the widest portion of the sutural line on the 1st abdominal segment. These plates are roughly triangular, with the apex outwards, and reaching about half way across the segment. The metathoracic segment has two small circular black plates on each side of the back, somewhat nearer to the centre line than to the outer side of the back. All three segments have a similar equal-sized black plate on the projecting portions of the sides. Those on the mesothorax, which projects somewhat more than the other two, are slightly the larger. Of several larvæ examined, one or two had a small black plate on the outer sides of one or more pairs of the prolegs. The head is light brown, blackish to black towards the sides and back.

On May 21st, I had no *Ballota nigra*, and offered the larvæ *Stachys sylvatica*. This they fed on quite as well, and after that, the larvæ I had, were given both plants. On May 29th, this species was found in the larval state in plenty at Chatham, and Mr. Bacot took some at Broxbourne, on May 30th. Mr. South also reported finding the larva on *Stachys sylvatica*, and, on June, 11th, at Sanderstead, I met with them on the same plant. On June 15th, many of my larvæ were still feeding, but by June 20th, all had spun up for pupation. The emergences occurred in mid-July.

Butterflies in Switzerland in 1905.

By J. N. KEYNES, M.A., D.Sc., F.E.S.

I spent August, 1905, in Switzerland, with my wife and family, the entomological members of the party being my younger son and myself. Our stopping-places were selected to a large extent with reference to their entomological potentialities, and until nearly the end

of our stay the weather was fairly favourable. The season appeared to be rather a late one.

Our first stopping-place was Sierre, and we spent a good part of August 3rd and 4th in the Pfywald. Here we succeeded in finding *Polyommatus meleager*, but it appeared to be getting over, and we secured only seven specimens. The ♂s were all worn, but the ♀s (which were, of course, ab. *steveni*) were in rather better condition. *Everes argiades* var. *coretas*, of which we took five specimens, was also worn. Other captures in the Pfywald, besides the commoner things, were *Carcharodus lavaterae*, *Polyommatus corydon* ab. *obsoleta* (including a specimen which had the discoidal spot on the upperside of the front wing conspicuously ringed with white, with a conspicuous white spot on the upperside of the hindwing also), *Rusticus argyrognomon* ♀ (both type and ab. *brunnea*), *Pontia daplidice* (fairly plentiful), *Leptostia sinapis* var. *diniensis*, and ab. ♀ *erysimi*, *Brenthis dia*, *Satyrus alcyone*, *Enodia dryas* (plentiful, and in good condition), and *Epinephele lycaon*. At Sierre, on these two days, my daughter took *Polyommatus baton* (a single specimen), *Papilio podalirius* (which was plentiful), and *Colias edusa*; and we also took *Carcharodus alceae* (which was new to us).

On August 5th, it rained most of the day, but we took *Erebia stygne* on the road from Brigue to Bérisal. August 6th was again dull, but a number of insects (including *Polyommatus eumedon*, *P. donzelii*, and *Coenonympha arcania* var. *darwiniana*) were taken asleep on flower-heads along the road above Bérisal. On August 7th the weather cleared up, and we walked from Bérisal to the Rosswald. The whole route was swarming with butterflies, and amongst our captures were *Chrysophanus alciphron* var. *gordius*, *Polyommatus donzelii*, *P. escheri*, *P. eros*, *P. orbitulus*, *P. optilete*, *Parnassius apollo* var. *pseudonomion*, *Colias palaeno*, *Melitaea phoebe*, *M. dictynna*, *Erebia pronœ* var. *pitho*, and *Melanargia galatea* ab. ♀ *flava*. We also took an interesting aberration of *Polyommatus damon* ♀, in which the white streak on the hindwing appears conspicuously on the upperside.

On August 8th (another fine day), we walked from Bérisal to Simplon Kulm, getting, however, nothing fresh, except an aberration of *Polyommatus donzelii* ♂, which I have not anywhere seen described, but which seems worthy of note. In this specimen, the usual broad suffused dark border is replaced by a narrow and well-defined black border. I have a good series of *P. donzelii*, and the specimen in question is markedly different from all the rest.

The next day we walked from Simplon Kulm to the moraine of the Kaltwasser Glacier. On the way up we found *Polyommatus optilete* (fairly plentiful, but scattered), *Pontia callidice* (scarce), *Colias phicomone* (abundant), *C. palaeno* (fairly plentiful, but not very easy to capture), *Erebia gorge*, and *E. lappona*. It was noteworthy that the ♂s of *P. optilete* were in perfectly fresh condition, while the ♀s (which were met with quite as frequently as the ♂s) were usually somewhat worn. Our experience of most species has been that the ♂s get over before the ♀s; I do not know whether it is possible that in this case there may have been two overlapping broods. On the moraine itself we managed to secure a good series of *Erebia alecto* var. *glacialis*; this insect was fairly plentiful, but, so far as we could discover, confined to one particular part of the moraine. Some agility and sureness of aim were necessary in effecting the captures, and the

roughness of the moraine made a prolonged chase out of the question.

A visit to Simplon Dorf and the Laquinthal, on August 10th, was a little disappointing, nothing of much interest being taken, except *Chrysophanus virgaureae* ♀ (type); having worked mainly on the north side of the Simplon Pass, we were much more familiar with var. *zermattensis*. We spent August 11th to 14th in making short excursions from Simplon Kulm. Near the Kaltwasser Gallery we found *Polyommatus eros* ♂ s plentiful; amongst our captures was one ab. *obsoleta*, and we took five ♀ s. An aberration of *Nomiades semiargus* was also taken, in which there were two extra spots on the underside of the hindwing, between the discoidal spot and the usual row of spots. In the same neighbourhood, *Parnassius delius* was fairly common, but often worn. Amongst the specimens of this insect that we took, were ab. *inornata*, ab. *aurantiaca*, ab. *alboprivata*, and one or two approaching ab. ♀ *hardwickii*. Other captures were *Erebia mnestra* (three specimens only), *E. pronœ* var. *pitho* (a good series, shewing considerable variation), and a remarkably fine form of *Argynnis niobe* (type) ♀, very dark and beautifully shot with purple. We paid two more visits to the moraine of the Kaltwasser Glacier, but it had turned colder, and *E. alecto* var. *glacialis* was scarcely to be seen. We captured, however, some more *Erebia gorge* and *E. lappona*, and a very pretty aberration of *Polyommatus orbitulus*, having an antemarginal row of white spots on the upperside of the front wing, and corresponding in some other (but not all) respects with ab. *aquilonia*, as described in Mr. Wheeler's book. It is worth noting that, in this district, we met with both the white and yellow forms of *Colias palaeno* ♀. We took one or two specimens with the discoidal spot on the upperside of the front wing hardly perceptible.

The next two days were occupied in moving from Simplon Kulm to Fiesch, where we took a very fine and dark *Parnassius apollo* ♀, and from Fiesch to Binn, the centre of a district famed for its mineralogical treasures, but, so far as I am aware, not very much visited by entomologists. Here we were so fortunate as to meet Mr. A. J. Fison (of Charpigny), the well-known entomologist, who generously placed his knowledge of the locality at our disposal. August 17th was very wet, but on the next day we walked, with Mr. Fison, to the Geisspfad Lakes, and, on the way, took *Parnassius delius*, *Brenthis pales* ab. ♀ *napaea*, *Erebia tyndarus* ab. *caecodromus*, and many commoner species. August 19th to 21st were spent in the Binnenthal, always above Binn. There was a great abundance of insect life in this valley, *Brenthis pales* ab. *napaea* was exceptionally fine as well as abundant. The Lycænids, chiefly *Polyommatus corydon*, with some *damon*, *donzelii*, *orbitulus*, and *hylas*, sat in hundreds on damp patches in the footpaths. If one approached them quietly they did not disturb themselves, and by carefully examining them as they sat many aberrations could be noticed. In this way we took five *P. corydon* ab. *obsoleta*, and two ab. *arcuata*. It was, however, difficult to capture the particular specimens one wanted without capturing some twenty or thirty others at the same time, and, when they were all in the net together, it was no easy matter to single out the right one from amongst the rest. *Chrysophanus virgaureae* ♀ var. *zermattensis* showed great variety in size, ground colour, and markings. Amongst other captures were *Chrysophanus*

alciphron var. *gordius*, *Parnassius apollo* ab. *nevadensis*, *Pieris napi* var. ♀ *bryoniae*, *Melitaea athalia*, *M. dictynna*, *Erebia pronoe* var. *pitho*, and *E. gorge*. *Colias palaeno* was fairly plentiful, but getting over.

Mr. Fison had been staying at Binn since July 14th, and he has very kindly furnished me with some notes on his general observations of Binn as an entomological centre, with permission to publish them. He says that the clusters of butterflies on the paths all through the summer were very remarkable and interesting. Usually, nearly all were Blues of three or four kinds, but often a yellow patch of Skippers would join the company, or a family of *Melitaea athalia*, or *Erebia melampus*. Amongst the Blues taken at Binn were *Polyommatus eros*, *P. donzelii* (abundant), *P. pheretes* (scarce), and *Lycaena alcon*; the specimens of *L. alcon*, which were very fresh, and some of them rather dark, were found above the forest line on July 20th and 22nd; *Parnassius apollo* was not very abundant, but rather well-marked; *P. delius* was quite scarce; four specimens of *Anthocharis simplonia* were taken in July. Early in August, very fresh specimens of *Colias palaeno* were plentiful on the west and north sides of the Stockhorn; the yellow and white forms of the ♀ both occurred. Mr. Fison noted that these ♀s were to be found early in the mornings (say from 9 a.m. or 9.30 a.m.) laying their eggs on *Vaccinium uliginosum* fully an hour before any ♂s appeared; they seemed to continue their egg-laying till 1 p.m. *B. pales* ab. ♀ *napaea* was not abundant until August. About the middle of July, *Melitaea aurinia* var. *merope* was abundant on the higher open pastures east of Imfeld. The specimens were very striking in their unusually black markings, which often covered most of the wings; very dark forms of *M. cynthia* ♂ were also taken. In these the strengthening of the dark colour seemed to correspond with the same feature in var. *merope*, and, perhaps, in the dark ♀s of *B. pales*, and of *A. niobe* (both type and var. *eris*), taken on the north slopes of the Stockhorn. *Melitaea parthenie* var. *varia* was very common in July, and *M. phoebe* (fine and varied in colour) was abundant all through the summer. On the whole, the Binn mountains seemed lacking in Erebias; not many species were met with, and most of those that occurred were scarce. Mr. Fison specially examined the districts where white dolomite rock showed itself, hoping to find *E. flavofasciata*, but in this search he did not meet with success.

On August 22nd, we left Binn for Martigny; on the way down to Fiesch, chiefly in the neighbourhood of Ausser Binn, we took *Chrysophanus dorilis* (plentiful), *C. phlaeas*, *Lycaena arion*, *Thecla spini* (badly worn), and *Dryas paphia* ab. ♀ *ralesina*. Soon after we left Brigue there was an extraordinary storm of wind in the Rhone Valley. We saw many trees blown down, and the hay was blown long distances. The wind was followed by a violent and long-continued thunderstorm, and during the two days we were at Martigny it rained almost without intermission. Our next stay was at Vevey, and we spent the morning of August 25th on Mount Pélérin. Here we took *Satyrus circe*, but in too worn a condition to be worth keeping. We found *Brenthis dia* (including some aberrations with many of the spots on the upperside of the front wings run together), *Melitaea didyma* (the ♀s showing considerable variation in tint), and *M. parthenie* very plentiful; and we met with occasional specimens of *Polyommatus hylas*, *Colias edusa*, *Epinephele jurina* ab. ♀ *pallens* (fine), and *Erebia stygne*. In the after-

noon of August 25th there was more rain, and as the weather seemed temporarily to have broken up, we brought our holiday to an end, so far as entomology was concerned, and moved on to Paris. While at Vevey, we paid a visit to Mr. Wheeler at Territet, and greatly enjoyed seeing his collection of Swiss butterflies. Amongst many beautiful series, the collection of Apaturids (including a number of very fine varieties and aberrations) was, perhaps, the most striking. Our only regret was that the time at our disposal did not allow of our studying, as we should have wished, the varieties of many species which Mr. Wheeler was able to show us, and of which we had previously been able to read descriptions only.

Marasmarcha agrorum var. tuttodactyla, new var. (n. sp.?)

By DR. T. A. CHAPMAN.

In looking over the material of the genus *Marasmarcha*, accumulated by Mr. Tutt and myself, chiefly from English and French localities, the first impression arrived at by a perfunctory survey, was that there was only one European species, viz., *M. lunaedactyla*, of which the other forms were merely varieties. Two or three circumstances, however, point strongly to another conclusion. First, of course, due weight must be given to the consensus of opinion that *M. fauna* and *M. agrorum* are good species; secondly, we find amongst the plumes several cases, as, for instance, in *Amblyptilia cosmodactyla* and *A. punctidactyla*, in which, apparently, trivial differences are adequate to mark specific distinction. The third ground was found on examining the appendages. In *M. lunaedactyla* the clasps each carry two long bristles, curled round in a special circular area, giving a remarkable appearance to the clasp as having a disc or medal let into it.

In *M. fauna* there are the same two bristles, but they are comparatively quite short and straight, and give the clasp a much less special appearance. In *M. agrorum* a third and more remarkable condition is found, viz., the bristles on the right (?) side are much longer than those on the other, and though not restrained in a circle, as in *M. lunaedactyla*, are, nevertheless, curved as compared with the straighter ones of the opposite clasp. This condition is remarkable from this point of view, that the Platyptiline division of the plumes have symmetrical clasps, and are without spines or bristles (except, perhaps, in *Eucnemidophorus rhododactyla*), the other, the Alucitine section, have clasps with spines or bristles, and the two clasps are always asymmetrical. *Marasmarcha* has, on the whole, Platyptiline affinities, and the possession of spines on the clasps is therefore notable, but it is especially to be remarked that, within the genus, there should be two species, and species as to which it is possible to raise the question as to whether they are truly distinct, one with symmetrical (Platyptiline) and the other with asymmetrical (Alucitine) clasps. Having bred *M. fauna* from larva found at Ste. Maxime, I may say that the larva and pupa are extremely close to those of *M. lunaedactyla*. They are paler and more delicate-looking, both usually of a light green, and the pupæ agree structurally in many minute details. I have yet to make a more detailed examination of them, but am not hopeful of discovering any structural distinctions, so that I should, apart from the evidence of

the ancillary appendages, have considered *M. fauna* only a geographical variety of *M. lunaedactyla*.

At present, however, I am more concerned with a plume we took at Courmayeur, in 1894, and which I took at Larche last summer, and of which Mr. Tutt has a long series, taken, in the interval, at various places in Dauphiny and adjacent country, between these northern and southern limits. Until recently we complacently regarded this as a local form of *M. lunaedactyla*, and as it must exist in other collections (being so widespread, and by no means uncommon), although we are not aware that any notes on it exist, the same view is no doubt taken by other entomologists. An examination of the ancillary appendages, however, shows them to agree absolutely with those of *M. agrorum*, and not with those of *M. lunaedactyla*. In facies the insect is intermediate between *M. agrorum* and *M. lunaedactyla*, i. e., it is rather darker than *M. agrorum*, much lighter than *M. lunaedactyla*: rather smaller than *M. lunaedactyla*, but not markedly so. The white markings are larger, especially there is a white shade along the inner margin of the forewing, and the anterior fringe of the hind feather of the forewing is white. The white line, or band, on the lobes of the forewing are quite distinct, in *M. lunaedactyla* they are faintly marked or wanting. The antennal rings are as in *M. agrorum*, not obscure as in *M. lunaedactyla*.

The evidence of the appendages is conclusive that it is distinct from *M. lunaedactyla*, and make it highly probable that it is a form of the species *M. agrorum*. Nevertheless it differs from *M. agrorum* in wing marking and colour more than it does from *M. lunaedactyla* or *M. fauna*, or than they do from each other, so that it is very possible that it may be entitled to specific rank. This possible doubt may or may not be resolved when the early stages of the two forms can be compared together. In the meantime I would indicate it as a variety of *Marasmarca agrorum*, under the name *tuttodactyla*.

Practical Hints relating to the Eupitheciids.*

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

Among our less advanced collectors of lepidoptera, one always finds a certain number asking for information as to the collecting of certain groups, which give them considerable trouble in their early stages. Among these, no group is so repeatedly enquired about as the Eupitheciids, and, although we have already written, on an average, some four to six "practical hints," in our book on this subject, concerning each of the British species, there seems to be no reason why a couple of independent hints about each species, one relating to the larva, and one to the imago, should not find place in our pages. We therefore propose giving a few short hints on this genus, in the direction indicated, for the use of our younger readers, and trust that they may be found of some service in enabling them to obtain for themselves most of our British species.

The short, thick, sluggish larva of *Eupithecia togata* is to be found from July to September, in the cones of spruce-fir, feeding between

* For further "Hints," see *Practical Hints for the Field Lepidopterist*, I, II, and III.

the scales of the cone upon the unripe seeds at their bases, extruding its excrement from the burrows in the cone, so that affected cones are readily known. When young it is said to hollow out the buds.

The imago of *Eupithecia togata* is on the wing in May and June; sitting by day on the branches of large spruce-fir trees, from which it may sometimes be dislodged; it is also reported to hide among the lichens on these trees; its usual time of flight, however, is in the evening, about the trees on which the larvæ have fed.

The short and thick larvæ of *Eupithecia venosata* are to be found from June till early August in the seed-heads of *Silene inflata*, *S. maritima*, and *Lychnis dioica*, and their allies, feeding, within the capsules, on the seeds, and throwing out their frass much in the manner of the larvæ of certain Dianthœiids.

The imagines of *Eupithecia venosata* hide by day among the herbage close to their foodplants, *Silene inflata*, *Silene maritima*, etc., in May and June; they are very sluggish in their habits, and, if disturbed, crawl more satisfactorily out of sight; they are, therefore, rarely obtained by searching in this way. Their natural flight is at dusk, when they may sometimes be freely taken on the wing flying over their foodplants.

The long slender larva of *Eupithecia consignata* feeds during late May and June, on the blossoms and leaves of apple; reported also from whitethorn, raspberry, and blackthorn.

The imago of *Eupithecia consignata* is to be found in April and May, usually in orchards, keeping apparently to the upper branches of the apple-trees for rest; also found occasionally on the stems of hawthorn bushes; rarely seen in the daytime, and, although the species flies at dark about the foodplant, is rarely obtained. Imagines have been attracted to lamps in the neighbourhood of their habitat.

The larva of *Eupithecia extensaria* feeds from the end of July to September on the blossoms and leaves of *Artemisia maritima*, chiefly by night, being hidden during the day among the leaves and blossoms of the flowering-spike where it exhibits a remarkable resemblance to the buds or stems of the *Artemisia* flowers. In confinement the larvæ will feed well on southernwood, *Artemisia abrotanum*.

The imago of *Eupithecia extensaria* hides during the daytime, in June and July, among its foodplants, and, if disturbed, flies a short distance to hide in a similar place, its natural time of flight being at dusk or at night.

The larva of *Eupithecia pulchellata* is to be found throughout July and August in the blossoms of foxglove (*Digitalis purpurea*), fastening the tips thereof with silk, each blossom then resembling a bud just ready to unfold. The larva clears the inside of the flower, and enters a new one through a hole at the side.

The imago of *Eupithecia pulchellata* emerges towards the end of May, and continues throughout June; it is very sluggish during the day, sitting on, or near, its foodplant, but flies freely at dusk over the plants, and can then be readily captured.

The short, thick larva of *Eupithecia linariata* is to be found in August and September in the flowers of the common yellow toadflax, *Linaria vulgaris*, feeding on the stamens and pistil. It has also been observed feeding in the flowers of *Antirrhinum*, the common garden snapdragon.

The imago of *Eupithecia linariata* is to be found in May and

June, resting in the well-known Eupitheciid manner, on any flat object near the foodplant, or hidden among the latter. It is rarely to be disturbed during the daytime, and is not at all frequently seen at dusk, when the species is on the wing, among its foodplant. Altogether, in this stage, it is a rather retiring insect.

The long slender larva of *Eupithecia centaureata* feeds from July to September on a variety of foodplants, of which the flowers of *Senecio jacobaea*, *Solidago virgaurea*, and *Eupatorium cannabinum* appear to be the most usual, although the species of ragwort, yarrow, knapweed, scabious, *Pimpinella saxifraga*, etc., have been recorded. One of the easiest modes of collecting the larvæ is to beat the flowers against the side of an umbrella, when the larvæ fall in, usually with those of two or three other species.

The imago of *Eupithecia centaureata* may be found throughout the summer (partially double-brooded) resting on fences, walls, etc., in the neighbourhood of woods and gardens, as well as on the stems and leaves of plants, the white wings making it conspicuous. In the evening it flies over the flowers that will serve its larva for food, and is particularly attracted by light.

The larva of *Eupithecia succenturiata* is found in September and October on *Artemisia vulgaris*, feeding at night on the upper surface of the leaves; it has also been reported upon *A. maritima* and tansy. In the daytime it hides away among the dead leaves at the bottom of the plant.

The imago of *Eupithecia succenturiata* is to be found in July and August, but during the day hides most successfully among its foodplant; at dusk, however, it flies about the clumps of *Artemisia*, and after dark may be found with a lantern, crawling about the leaves thereof.

The larva of *Eupithecia subfulvata* is to be found in September and October on *Achillea millefolium*, on the flowers, seeds, and leaves of which it feeds, chiefly by night; during the day it rests usually along the midrib of a leaf, or along a stem, upon which its colour well protects it. It has also been reported upon *Tanacetum vulgare*, and in confinement will eat garden chrysanthemum.

The imago of *Eupithecia subfulvata* is to be found in July and August, it is on the wing at dusk, and may, a little later, by the aid of a lantern, be found flying around, or settled upon the leaves of flowers of ragwort. It is rarely to be disturbed during the day, although occasionally to be seen resting on a paling or other object adjacent to its foodplant. It occasionally comes to light.

The long, slender, and variably coloured larva of *Eupithecia subumbrata* feeds from July to September on the flowers of a variety of plants, of which *Apargia hispida*, *Crepis taraxifolia*, *Scabiosa*, *Centaurea*, *Solidago*, *Globularia*, *Gentiana*, *Jasione*, *Origanum*, *Hypericum*, *Chrysanthemum*, *Euphrasia*, *Campanula*, *Pimpinella*, and others, have been recorded.

The imago of *Eupithecia subumbrata* is on the wing in June; hides by day among the bushes on the outskirts of woods bordering downs, etc., from which it may readily be beaten in the afternoon. At dusk it flies fairly actively, and is to be found on flowery banks, in rough fields, on the borders of heaths, as well as the chalk-downs, on which it is fairly abundant in Kent.

The long slender larva of *Eupithecia irriguata* is to be found in May and June on oak, more rarely on beech, making its cocoon under bark or moss on the trunk of a tree.

The imago of *Eupithecia irriguata*, at the end of April and throughout May, sits during the daytime on the branches or trunk of an oak-tree (more rarely on a fence close to oak woods), from which it can be readily disturbed. Its usual time of flight is at dusk, but its habit of flying about large trees makes it very difficult to capture at that time.

The larva of *Eupithecia pusillata* is to be beaten from trees of spruce-fir, in June and early July; sometimes in considerable numbers.

The imago of *Eupithecia pusillata* rests by day, in May and June, upon the branches of spruce-fir, from which it may be readily disturbed by the beating-stick; its natural time of flight is in the late evening, towards night.

The long slender larva of *Eupithecia nanata* is to be found in June and July, and again in August and September, on *Calluna vulgaris*, feeding on both flowers and leaves. It is usually swept when working for larvæ of the heath-feeding species.

The imago of *Eupithecia nanata* is to be found from April to June, and again in August and September, on heaths and mosses, hiding by day among the heather, but it is a restless species, easily disturbed, and taking flight as one walks through the herbage; at dusk it flies freely.

(To be continued.)

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from vol. xviii., p. 129).

DIVISION III: LOCUSTODEA.

This large division falls naturally into a considerable number of families, some of which are very extensive, but several are not represented in Europe.

The division is characterised by the long setaceous antennæ, by the long exserted ovipositor of the female, by the four segmented tarsi, by the auditory apparatus situated in the anterior tibiæ (as also in the *Gryllodea* or crickets), and by the form of the elytra and stridulating apparatus; this latter is situated in the anal angle of the elytra, which is modified in the male, and the stridulation is produced by the friction of these modified parts; in certain groups, as in the *Ephippigeridae*, the female also is able to stridulate, but, as a rule, we find the female possessed of ordinary elytra. The neuration of the elytra is less developed than in the preceding division, and offers few characters of systematic value; the most important part is the anal or axillary area, which forms the stridulation organ of the males.

In the female, the axillary vein, or *vena plicata*, consists of two straight veins, of which the anterior one is usually fused with the dividing vein, but, in the male, this simple arrangement is quite altered, and is different in the two elytra. In the left elytron, which, in repose, covers the anal part of the right elytron, there is a strong and thick vein near the base, which is seen to be strongly denticulated when examined under a microscope; near this vein, and parallel with

it, is a second weaker vein, which is curved strongly, so that a smooth area is enclosed; on the right elytron, the first strong vein is not seen, and the area enclosed by the second vein consists of a perfectly smooth, clear, transparent spot, like a piece of mica. This membrane acts as the fiddle, while the upper elytron is the bow, when the insects stridulate. Frequently the elytra are so abbreviated that only this chirping organ is left, as in *Olythoscelis*, *Leptophyes*, *Poecilimon*, etc.; when this is the case the elytra of the females are reduced to mere small lateral flaps; in the *Ephippigeridae*, however, the elytra consist of the stridulating organ only, in both sexes.

The wings themselves are similar to those of the *Acridioidea*. The sternal plates are free, and their form often offers important and useful characters. In the head, the form, shape, and relative size of the tubercle between the eyes is important.

Perhaps the most important generic characters are afforded by the legs; the anterior coxæ generally have a spine, the absence of which characterise the *Phaneropteridae*.

The number and arrangement of the spines on the femora and tibiæ are important. The shape of the tympanum on the anterior tibiæ is a useful character; this tympanum may be of three forms, as follows:—

1. Open, "tympanum apertum," as in *Meconema* and many *Phaneropteridae*.
2. Shell-shaped, or "tympanum conchatum," as in *Tylopsis*.
3. Cleft-shaped, or "tympanum clausum," as in most genera.

The tibiæ themselves may be cylindrical or compressed and sulcate. The number of the apical spines on the tibiæ is a very important character in this group.

The tarsi are always four segmented; in the *Stenopelmatidae* they are laterally compressed, but, in other families, they are depressed, and usually sulcate at the sides, except in the *Phaneropteridae*. In the *Decticinae*, the first segment of the posterior tarsi has also a pair of free lobes, called "plantulæ." The genital apparatus affords also good characters; in the male we have the supra-anal plate of various forms, and the cerci also are very varied; the subgenital lamina sometimes offers good characters, as also does the shape of the ovipositor of the female, which is always exerted and compressed, but either straight, ensiform, or falcate, strongly bowed, or gently curved.

The ova are deposited by means of the long ovipositor in cracks in grass, shrubs, trees, etc. and are laid separately, and not in oothecæ.

The larvæ appear to undergo at least six stages. In general form they resemble the imagines, but the colours are often different, and nearly always brighter; the beginning of the ovipositor distinguishes the female larva at an early stage; the organs of flight are wanting, but appear as lateral flaps in the nymph stage.

Some groups are purely vegetable feeders, as the *Phaneropteridae*, but others are voracious carnivores, as the *Sagidae*, *Decticinae*, etc., while the *Ephippigeridae* seem to eat animal or vegetable food indifferently.

Their habits are very varied, but they prefer shrubs and bushes to grass; they are often found in beds of nettles; hedgerows are favourite haunts for the strong and active *Decticinae*; the *Locustinae* generally sit and chirp in thickets or nettle beds; the smaller *Phaneropteridae* crawl about in long grass, the *Ephippigeridae* sit and chirp in dense thickets, whilst many of the *Decticinae* frequent the densest jungle.

Many kinds, as *Locusta*, *Olythoscelis*, etc., are nocturnal or semi-nocturnal; the *Stenopelmatidae* live in caves or holes in wood.

TABLE OF FAMILIES.

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|---|--------------------|
| 1. Tarsi depressed. | |
| 2. First and second tarsal segments smooth at the sides; (prosternum unarmed; elytra and wings abbreviated or well-developed; generally green, fragile insects; ovipositor generally rather short and strongly curved; posterior tibiæ with two apical spines underneath) | 1. PHANEROPTERIDÆ. |
| 2.2. First and second tarsal segments sulcate at sides. | |
| 3. Tympanum of anterior tibiæ "apertum"; (delicate small green insects; ♂ with no stridulating organ) | 2. MECONEMIDÆ. |
| 3.3. Tympanum cleft-shaped, "clausum." | |
| 4. Hinder tibiæ with an apical spine above, on each side. | |
| 5. Anterior tibiæ smooth, not sulcate at sides; fastigium of vertex prominent, distinctly separated from the frons by a sulcus; (in European species, prosternum with two spines; frons strongly inclined; green insects) | 3. CONOCEPHALIDÆ. |
| 5.5. Anterior tibiæ with a sulcus down each side. | |
| 6. First segment of posterior tarsi with no free plantulæ; prosternum with two spines; (large stout insects, the West European species bright green) .. | 4. LOCUSTIDÆ. |
| 6.6. First segment of posterior tarsi furnished with a pair of free plantulæ; (usually strong and active insects, grey or brown in colour) .. | 5. DECTICIDÆ. |
| 4.4. Hinder tibiæ with no apical spine above on the outer margin, with two spines beneath, except in the genus <i>Pycnogaster</i> , where there are four. | |
| 5. Vertex broad, rounded; antennæ widely separated | 6. EPHIPPIGERIDÆ. |
| 5.5. Vertex sharp, acute, antennæ not widely separated, almost contiguous at base | 7. SAGIDÆ. |
| 1.1. Tarsi compressed | 8. STENOPELMATIDÆ. |

FAMILY I: PHANEROPTERIDÆ.

This is a very extensive family, including a number of long-legged, delicate, vegetable-feeding, slender grasshoppers; some of the South American forms attain a very large size, but none of the European forms are very big. They live on shrubs and in long grass, and are generally inactive, somewhat ungainly insects; there are a number of genera with the organs of flight abbreviated, so that local forms have been developed; the diversity of species is more noticeable in eastern, than in western, Europe, where the *Ephippigeridae* replace them. The European forms fall naturally into two groups, those with abbreviated elytra and those with well-developed organs of flight.

TABLE OF GENERA.

1. Anterior coxæ unarmed.
2. Pronotum with no sinus humeralis (that is, seen from side, hinder margin oblique, nearly straight); elytra strongly abbreviated; wings none.

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|--|------------------------|
| 3. Meso- and metasternum lobed on posterior border, closing the basal foramina; fastigium of vertex not sulcate, twice as wide as first segment of antennæ | 1. ORPHANIA, Fisch. |
| 3.3. Meso- and metasternum truncate, not lobed posteriorly, leaving foramina exposed; fastigium of vertex generally sulcate, hardly wider than first antennal segment. | |
| 4. Ovipositor falcate, regularly curved, upper margin sinuate, dentate and serrate apically. | |
| 5. Anterior femora not one-and-half times as long as pronotum. | |
| 6. Pronotum with transverse sulcus before the middle, hind margin rounded .. | 2. PECILIMON, Fisch. |
| 6.6. Pronotum with last transverse sulcus behind middle; hinder margin rounded or broadly sinuate | |
| 7. Cerci of ♂ bent down, and crossed below subgenital lamina | 3. BARBITISTES, Charp. |
| 7.7. Cerci ♂ simple, situate above subgenital lamina | 4. ISOPHYA, Brunner. |
| 5.5. Anterior femora twice as long as pronotum | 5. ODONTURA, Ramb. |
| 4.4. Ovipositor short, dilated, broad at base, then strongly compressed, upper border straight, pointed at apex, and very finely serrulate | 6. LEPTOPHYES, Fieb. |
| 2.2. Pronotum with distinct sinus humeralis, that is, seen from side, hinder border strongly sinuate; elytra and wings perfectly developed (large green insects) | 7. ACROMETOPIA, Fieb. |
| 1.1. Anterior coxæ armed with a spine. | |
| 2. Tympanum apertum; anterior tibiæ unarmed (except for apical spine) | 8. PHANEROPTERA, Serv. |
| 2.2. Tympanum conchatum; anterior tibiæ spined above | 9. TYLOPSIS, Fieb. |

GENUS I: ORPHANIA, Fischer.

We have a single species of this genus in western Europe; it is a very large, fat, heavy, apterous, soft insect, almost invariably green in colour, but varying somewhat in size; it should be noted that the hinder border of the side lobes of the pronotum are almost straight, that is, there is no sinuation of a pronounced character; a further generic character is the great width of the frons between the antennæ.

1. ORPHANIA DENTICAUDA, Charp.

Pale green, large and plump; rarely reddish-brown, speckled with darker. Length of body, 32mm.-34mm. ♂, 34mm.-38mm. ♀; of pronotum, 10mm.-12mm. ♂, 10mm.-13mm. ♀; of posterior femora, 19mm.-28mm. ♂, 20mm.-32mm. ♀; of ovipositor, 18mm.-27mm. ♀.

This fine insect is found in nearly all the mountain regions of central and southern Europe. In France, it is common enough in the Vosges, also in the Alps and the Pyrenees; in Württemberg it is numerous at Tübingen; in Switzerland it occurs near Neuchatel and Morges, on the Rochers de Naye and the Waadtlander Alps; in Italy it is recorded from Tuscany. In Austria it is noted from near Vienna, Kahlenberg, Liesing, Maur, Mödling, Gaden, Purkersdorf, Schwarzwau, Gutenstein and Hohenberg. Also in the Tirol.

The variety *lixonensis*, Saulcy, has a furrow on the vertex, and more spines on the anterior tibiæ; it is recorded from Bagnères de Luchon.

(To be continued.)

COLEOPTERA.

TRAP FOR COLEOPTERA.—In the *Ent. Record* for 1901, p. 330, I mention a trap in which I took a dozen specimens of *Villeius dilatatus*. I told all my friends at the time what it consisted of, but for the benefit of other coleopterists who may not have heard of it, I now describe it. The trap is quite simple, it consisted of an ordinary jam-pot buried up to its neck in the ground at the foot of a tree, in which there was a hornet's nest. The jam-pot was charged with a small quantity of ordinary sugaring mixture, which was frequently renewed. The beetles were attracted by this, fell into the jar, and were, of course, unable to get out. [As I am still often asked how I get the beetles out of ants' nests, I refer coleopterists to my notes on collecting the myrmecophilous coleoptera in the *Ent. Mo. Mag.*, 1896, p. 44, where I described the best way to collect such species.]—HORACE DONISTHORPE. *May 20th, 1906.*

SETTING BEETLES KILLED WITH ETHER.—Coleopterists should be very grateful to Mr. Chitty for publishing his method of setting difficult beetles like *Throscus*, etc., by killing with ether (see *Ent. Record, antea*, p. 134). I have tried it with *Throscus* and *Amphotis*, and also with small ants, *Chalcidae*, etc., and find it works most beautifully, the insects can be set at once without any trouble, moreover, it is a nice, clean, easy method of dealing with them.—IBID.

HEMIPTERA.

A SPECIMEN OF CICADETTA MONTANA WANTED BY AN AUSTRALIAN ENTOMOLOGIST.—My nephew, Mr. Howard Ashton, now living in Sydney, is at work on the Cicadas. He is most anxious to obtain a specimen of the New Forest Cicada, *Cicadetta montana*, and would be glad to send in exchange a long series of Australian lepidoptera, or other insects. If any British entomologist can obtain for me a specimen of the same I shall be greatly obliged.—(MISS) ALICE M. PUGH, 42, Osbaldeston Road, Stoke Newington, N.

NOTES ON COLLECTING, Etc.

HYBERNATING STAGE OF ARGYNNIS NIOBE.—In the *Ent. Record* of April last, Mr. Gillmer asks whether *Argynnis niobe* hibernates in the egg or larval state. A female caged at the Riffel Alp, at the end of last July, laid a few ova before she escaped. I found three of them hatching on February 21st last, in a sunny but unheated greenhouse, and I placed them on a plant of violet the same day. On April 19th I could only find one living (but the plant is a leafy one, and there may be others). It seemed healthy, and apparently had moulted twice. I have this larva, and several of *A. elisa*, hatched on February 19th, before me, as I write.—W. H. ST. QUINTIN, F.E.S., 44, Cadogan Square, London, S.W. *May 13th, 1906.*

THE FOODPLANT OF MELITÆA MATURNA.—I am grateful to Mr. Gillmer for his kind reply in answer to my enquiry as to the foodplant of this species. I ought to have stated that my attempts were made with the var. *wolfensbergeri*. My larvæ refused the leaves of *Fraxinus*, but, of course, this tree is absent at the height at which the ova were obtained in the Engadine, above 6000ft., nor could I get them to touch

any of our British scabious, or *Plantago*, amongst the many other plants offered to them.—W. H. ST. QUINTIN.

INFLUENCE OF SOUND ON LEPIDOPTEROUS LARVÆ.—Some years ago I was rearing several kinds of birch-feeding larvæ. Under one bell-glass I kept larvæ of *Drepana falcataria*, *D. lacertinaria*, *Notodonta dromedarius*, *Lophopteryx camelina*, and *Ephyra pendularia*. One day, while removing the glass, I happened to knock it, when only raised about an inch, or so, and still covering the twigs of birch on which were the larvæ, the slight tap making the bell act up to its name, and ring sonorously. The effect on the larvæ was quite amusing, for all, as if by word of command, placed themselves into the mimicking or threatening postures peculiar to each species, and then remained perfectly still, although a second before a good many were feeding or moving about, and others resting in the careless attitudes larvæ sometimes assume when no danger is imminent. I send this note thinking that our insect photographers, or delineators of insect life, may like to experiment with a bell-glass, when dealing with refractory subjects, or wishing to obtain portraits of larvæ in characteristic positions.—J. F. BIRD, The Nurtons, Tintern. May 9th, 1906. [See also, *Natural History of the British Lepidoptera*, i., p. 54, and *Ent. Record*, iv., pp. 240-241.—ED.]

LEPIDOPTERA TAKEN IN ANGLESEA.—It appears to me that the following may be of interest to those who are studying the distribution of our British lepidoptera. My only authority for previous occurrences is Day's *List of Lepidoptera for Cheshire and North Wales counties*. In 1904, I spent August and the earlier part of September at Llanfwrog, which is on the part of the Anglesey coast that faces Holyhead. *Polyommatus icarus* was very common locally, and I also took *Plebeius aeyon* (one); of the "whites," *Pieris napi* was by far the commonest, but I only saw two *P. brassicae*. On August 20th, I took a very battered specimen (male) of *Argynnis aqlaia*, the only previous record being, I believe (in Newman's *Brit. Butterflies*, p. 28), at Beaumaris, the opposite end of the island. *Hipparchia semele* was very common in one locality, on sandhills, on August 17th, but after the 21st it disappeared; *Pyrameis cardui* (one) at Holyhead, I also took a double aberration of *Coenonympha pamphilus*, the upperside being ab. *obsoleta*, and the underside ab. *bipupillata*. Among the moths captured I also took *Peridroma suffusa*, Hb. (= *ypsilon*, Rott.) (one), *Anchocelis lunosa* (fairly common), *A. pistacina* (common), *Melanthia albicillata* (one); all, I believe, first records for the county, and also *Dianthoecia capsicola* (one female), *Bryophila perla* (common), and *Hydroecia micacea* (two), only one previous record. In the winter following a specimen of *Agrius convolvuli* was sent to me, taken in August in Market Square, Carnarvon, and believed to have been brought in from the country in a vegetable cart. Besides these, I can also record an old occurrence of *Manduca atropos* in Anglesey, my father having seen one on a cypress tree at Henblas, in either 1860 or 1861.—M. WYNNE-JONES, 12, Bridge Street, Cambridge. May 20th, 1906.

MIGRATION OF BUTTERFLIES IN BUENOS AYRES.—The season just closing has been a bad one for many insects owing to a persistent drought that lasted four months, but, as usually happens when weather conditions are abnormal, some few species flourished exceedingly. The fine "meadow-brown" we see here—I believe it is *Junonia larinia*—was particularly abundant, and, late in March, was for days apparently

migrating from, roughly, south to north. It was curious, whilst standing at a cross-road near the house, to see them coming, one after another, and sometimes three or four at a time, to cross the roads diagonally, from a large garden fenced by a high wire-net fence, to a rough field on the other side, across which they continued their flight. They pass by hundreds through the city (which is laid out in squares) following the streets from south to north, and I have often noticed that, if diverted into a street running east and west, they rise, and fly over the houses. *P. carye* is always, I believe, to be seen migrating at the proper time of flight for this species, *i.e.*, in the spring, and the direction of flight is then from north to south, *i.e.*, in a direction opposite to that of the autumnal movement of *J. larinia*, described above.—A. F. BAYNE, F.E.S., Gerencia, Ferro Carril del Sud, Buenos Ayres. *May 4th, 1906.*

LEPIDOPTERA ON THE COTESWOLDS.—On June 10th, a very hot morning, I walked to the top of the nearest Cotteswold hill, 800ft. elevation, and, while resting on a very varied vernal carpet of wild flowers, found a pair of *Cupido minima*, *in copulâ*, near my elbow, and a freshly emerged one, with wings just expanded, within arm's reach. A careful search below it discovered its pupa-case, about half-an-inch from the ground (subsoil of Inferior Oolite), and attached to a dead grass stem. This is the first time I have found the pupa-case of this fairly common, but local species, here, hence it gave me great pleasure to see it in its natural condition. The pair *in cop.* I have placed in a roomy box with flowers of its foodplant, kidney vetch, hoping to obtain eggs. As yet, I have only seen one *Polyommatus icarus*, and no *Celastrina argiolus* this spring. *Euchlœ cardamines* seems to be scarcer than in some years. *Aglais urticae* very abundant, and its fullfed larvæ now common, while *Pyrameis cardui*, strongest of fliers, is now in evidence after several years' absence to me, and I think we shall have a "cardui" year. *Adscita geryon* is just out on the flowers of its foodplant, the lovely rockrose. Larvæ of *Nudaria mundana* were not uncommon on an upland *dry stone wall*, and puzzling the novice as to its foodplant! Some species of insects and plants are fully three weeks late this season. I also saw the local pretty *Hamearis lucina*, in its fluttering flight last week.—C. J. WATKINS, F.E.S., Kingsmill House, Painswick, Gloucester. *June 10th, 1906.*

IMMIGRATION OF PYRAMEIS CARDUI.—On June 3rd and 4th, I saw specimens of *Pyrameis cardui* flying swiftly in the streets at Lewisham and Ladywell, one or two others were seen on Paul's Cray Common on the 4th, and another at Ladywell on the 6th. So far as one could tell of insects on the wing, they were rather large examples, and of distinctly pale coloration.—J. W. TUTT, 119, Westcombe Hill, S.E. *June 7th, 1906.*

We are evidently in for a good Vanessid year, for the imagines of *Pyrameis cardui* were swarming at Folkestone on June 4th, whilst the larvæ of *Aglais urticae* abounded at the same time and place. I may add that *Cupido minima*, *Agriades bellargus*, *Polyommatus icarus* and *Aricia astrarche* were all just emerging on this date.—C. J. PICKETT, F.E.S., 99, Dawlish Road, Leyton, Essex. *June 7th, 1905.*

HABITS OF NISONIADES TAGES.—Yesterday was the first day since the 19th that has been sufficiently bright to entice forth butterflies. The morning was very dull, but, by midday, the sun was shining

brightly, and continued to do so nearly all the afternoon. We, therefore, set out about half-past two, to see if we could observe anything further of *Nisoniades tages*, and, on this occasion, went to a large undulating field of rough pasture, above the hillside, where we had made previous observations on the 19th. In spite of a strong wind, we found *N. tages* abundant in several sheltered positions. One of these spots was on the lee-side of a hedge, where a large patch of *Nepeta glechoma* had attracted quite a number. They were also noticed going to two other flowers not mentioned before; these were *Lotus corniculatus* and *Lysimachia nemorum*; buttercups, though plentiful, were shunned entirely. Their flight, we noticed yesterday afternoon, was not so active as when we watched them before, which was in the morning, between 11 a.m. and 1 p.m., and became less so, and shorter, as the evening advanced. In my last letter, I mentioned having seen them raise their wings slightly in hot sunshine, and move them slowly about, keeping the upper wings apart from the under. Yesterday we did not notice any moving their wings about in this manner, but saw that, in bright sunshine, they will raise their wings well up, sometimes nearly making them meet above their backs, but never quite. After 4 o'clock, they commenced to settle frequently on both the green and the old withered seed-heads of plantain, generally choosing the latter, and on the sunny side. Half-an-hour later it became cloudy, and I watched one particularly when it had settled in such a position. When it first alighted it held its wings out flat in the usual manner, but very gradually allowed them to drop backwards until they had assumed the position in which this butterfly holds them during the night. Then the antennæ, which were, up to now, extended out in front, were allowed to drop slowly. Occasionally, the sun would reappear for a moment, and then the butterfly would stretch forward its antennæ and slowly spread its wings out, folding them up again when the sun became obscured. Later on, in the evening, just before dusk, my father and I searched this field carefully to see what the butterflies rest on, and found a dozen or more. Only three were on the green heads of *Plantago lanceolata*, all the rest being on old dried seed-heads, and not a single one on grass. Although they close up their wings on the upper or sunny side of the seed-head, they afterwards change their position and get right underneath, and are not very particular which way they rest, sometimes with their heads towards the stalk, but generally, the other way round, depending on whether the particular plantain stalk is much or little bent over, so that they might sleep with their heads higher than their tails, which, with one solitary exception, they were all doing.—J. F. BIRD, The Nurtons, Tintern, Mon. May 29th, 1906. [This note came just too late to find a place in our *British Butterflies*, pt. 10, so we print it here. We should be glad of notes similar to this on any species of the British "coppers," "blues," and "hairstreaks." Careful field observations of this kind are the greatest desiderata we have at present relating to our butterflies.—ED.]

LEPIDOPTERA AT KINLOCH-RANNOCH.—I spent a week at Kinloch, from May 21st to 28th, but its success, from an entomological point was spoilt by the weather. On the afternoon of my arrival at the Baurannock Hotel it was fine and warm, but, during the night, a change occurred, and the next morning the hills were covered with fresh fallen

snow. This soon melted, but every day, till the 27th, was wet, and generally cold. As to the past, I learned that *Petasia nubeculosa* had been very scarce this season, but *Nyssia lapponaria* had been plentiful, and one collector reported the capture of 200 specimens. If this goes on, an exceedingly localised insect such as this must soon be exterminated. Besides, what any one man can want with 200 specimens surpasses the ordinary individual's comprehension. I found *Cidaria suffumata* in considerable numbers, and, among them, a few very handsome var. *piceata*. *Eupithecia indigata* was very scarce, and *Tephrosia bistortata* even more so. *Fidonia carbonaria* were naturally not much in evidence, owing to the absence of sunshine; but *Anarta cordigera* occurred in fair numbers, and I took one *A. melanopa* on the only bright day we had. One specimen of *Hadena glauca*, at sugar, was all I secured. A very hard day's work resulted in 10 pupæ of *Egeria scoliiformis*, which were very few and far between. Cocoons of *Phragmatobia fuliginosa* and *Saturnia pavonia* occurred sparingly, and, at the end of my visit, the insects were beginning to emerge. Altogether, the results of the trip were meagre, but the scenery and air are always enjoyable, and for anyone in want of a thorough change, I know no place that I can more strongly recommend.—PERCY C. REID, Feering Bury, Kelvedon. *June 1st, 1906.*

NOTES ON EARLY IMMIGRANTS OF PYRAMEIS CARDUI THIS YEAR.—On Saturday, June 2nd, and the succeeding bright days, I noticed several fresh-looking specimens of *Pyrameis cardui* feeding on *Valeriana cernanthus*, in the kitchen garden here. These were, no doubt, early immigrants. The female, which I caught, and let go after examination, proved to have her body full of ova. I have seen no more of the butterflies since June 8th.—CECIL FLOERSHEIM, B.A., Bagshot, Surrey. *June 18th, 1906.*

VARIATION.

ACRONICTA LEPORINA AB. BRADYPORINA, TREITSCHKE.—It appears to me that Mr. Tutt's conclusion *re Acrionicta leporina ab. bradyporina*, Tr., is absolutely sound, and that this aberration is the grey, banded, form. What Staudinger and other German authors consider *bradyporina*, Tr., is the form *grisea*, Cochrane. If the ab. *semivirga*, Tutt, be the white, banded, form, it cannot be identical with ab. *bradyporina*, Tr. It appears to me that *melanocephala*, Mansb., is a somewhat advanced form of *bradyporina*, Tr., in the direction of ab. *niqra*, but certainly ab. *bradyporina*, Tr., is not *grisea*, Cochrane.—M. GILLMER, 4 Elisabethstrasse, Cöthen, Anhalt, Germany. *June 17th, 1906.*

SCIENTIFIC NOTES AND OBSERVATIONS.

EMATURGA ATOMARIA WITH SUPERNUMERARY WINGS.—I think the capture of a ♂ *Ematurga atomaria*, with the left hindwing broken up into three rudimentary winglets, should be recorded. The central winglet is about half the normal size, the other two are just undeveloped hindwings, one with, the other without, normal markings, the last-named being simply plain grey in colour. The specimen was captured on June 4th, 1906, at Folkestone.—C. P. PICKETT, F.E.S., 99, Dawlish Road, Leyton, Essex. *June 7th, 1906.*

REVIEWS AND NOTICES OF BOOKS.

THE BUTTERFLIES OF THE BRITISH ISLES, by Richard South, F.E.S. [200pp., with 127 plates, and 27 figures. Published by F. Warne and Co., Bedford Street, W.C. Price 6s. net.]—One looks carefully through this tastefully arranged little book, and is reminded forcibly of the old Biblical proverb—"Ye cannot serve God and Mammon." It is evident that the writer has done his task exceedingly well, equally evident that the limitations of the task have been determined by the publishers who have to sell the book. The result is an elementary text-book for beginners, pleasantly written, accurate as far as it goes, with almost everything rigidly expunged that makes for anything in the nature of deeper study. Except in comparatively rare instances, even the names of well-known varieties are taboo; the description of the egg, larva and pupa, often occupies less than half of a small page altogether, and the full descriptive matter concerning some of our best-known species, *e.g.*, *Hesperia malvae*, *Nisoniades tages*, etc., occupies little over a small page of letterpress, whilst the longer accounts rarely amount to more than three pages. We therefore, feel inclined to question the publishers' statement that—"in spite of its small size and moderate price—this is the most complete and up-to-date work on the British butterflies." From the writer of this paragraph we should require two definitions (1) What is meant by "most complete"? (2) What is meant by "up-to-date"? And after obtaining these definitions, we should ask him what he knows about existent works on British butterflies. The statement is unfair to the author, because the critic looks for much more than the author has been allowed to give him, and finds much less than he expects. We feel sure that none would be readier than the author to acknowledge that "as the most complete and up-to-date work on British butterflies," the book has no standing whatever. As an exceedingly well-written book for beginners, however, who want to know little, but that little accurately, the book is very well done. So far then the book has very little, if any, claim on advanced lepidopterists. But there is another side to this volume. The publishers say that "pictorially, the volume stands as the most profusely illustrated work on British butterflies." Here we agree with them. The book is, not only profusely, but well, illustrated, and to say that some of the coloured plates fail, is only to state that the three-coloured process is not absolutely perfect. No butterfly book, except those wonderful German productions (with marvellous plates and rubbishy letterpress), can be compared with this in respect to illustration, and, for accuracy, if not for finish, we should place this volume well in line. Some of the coloured plates are really first class, and the black and white are more than passably good. The copied drawings of some of the eggs, larvæ and pupæ, are very well done, others are more or less diagrammatic, particularly with regard to the tubercular structures in the larvæ, and in no wise to be compared with the delightfully real production of *Pararge megeera* on p. 123, but even then, apart from actually photographing each stage separately, an impossible task unless publication were delayed almost indefinitely, the best has evidently been obtained out of the material to hand. For the illustrations, the more advanced lepidopterist must buy this work, and his more advanced knowledge will enable him to make use of those figures of rare aberrations about which the letterpress is sometimes hopelessly silent. Accepting the book for what it is (and not for what the publishers say

it is), we should recommend it to the beginner for its simple and clear text, and to the more advanced worker for the pictures of rare aberrations culled from various sources and well reproduced. It takes a clever man to produce a really good boy's book (and by boys, entomologically, we include those of older growth, who never can, by the nature of things, get beyond this stage); Mr. South and his illustrators can claim to have done it.

CURRENT NOTES.

The collection of British lepidoptera made by the Rev. Joseph Greene was sold at Stevens' salerooms on May 29th, 1906. Most of the specimens were in good condition, though many were rather old. The butterflies sold for £47 8s. 6d., amongst which were two pairs of *Issoria lathonia* at £1 and £1 6s.; *Euranessa antiopa*, 16s.; an aberration of *Vanessa io*, £1 10s.; a black *Limenitis sybilla*, 16s.; a thoroughly Corsican *Aglais ichnusa*, £1 8s.; a fine aberration of *Epinephele ianira*, £4; five *Chrysophanus dispar*, £13 14s.; two *Cyaniris semiargus (acis)*, £5. The Sphingids went for £10 7s., to which a *Phryxus livornica* contributed £1 1s., and a *Hippotion celerio*, £2 2s. The Ægeriids sold for £1 14s. The "Bombyces" for £45 4s. 6d., amongst which were eight *Laelia coenosa*, £3 10s.; eleven *Gastropacha ilicifolia*, £6 15s.; four *Drepana harpagula (sicula)*, £2 15s.; seven *Dicranura bicuspis*, £2 6s.; a specimen of *A. crenata*, noted as one of the three well-authenticated British specimens, £8 10s. The Noctuas realised £51 8s., amongst which may be noted six *Crymodes exilis*, £5 10s.; seven *Agrotis subrosea*, £7 12s.; nine *Dianthoecia barrettii*, in very poor condition, 6s. each; nine *Xylina conformis*, bred, at 7s. each. The Pyrales produced 23s.; the Geometrids, £26 4s., of which we may mention eight *Cleora viduaria*, 34s.; a black *Halia vaularia*, £2; an aberration of *Melanthia albicillata* (with fifty other odd specimens), £3 10s. Then came aberrations of *Arctia caja* and *Abraaxas grossulariata*. Of these, 480 "tigers" sold for £88 17s., of which 37 were *Arctia villica* for £19 16s., individual specimens of *A. villica* producing £4 and £8, and of *A. caja* £6 6s., £11 11s., £7 10s., £1 5s., and so on. One thousand and twenty "gooseberry moths" were valued at £80 2s., single specimens fetching £2 10s., £2 15s., £7 10s., £3, £8 18s. 6d., £1 5s. Lots, of two and three specimens, £5 5s., £2 5s., £6 6s., £2 10s., etc.

The Natural History Society of Northumberland, Durham, and Newcastle-on-Tyne, has long since taken an advanced position with regard to the scientific position of its *Transactions*. One of the latest publications, *A preliminary List of Durham Diptera, with analytical tables*,* by the Rev. J. W. Wingate, is up to the best traditions. Of the 2884 species of British diptera recorded by Verrall in 1901, the author has dealt with 2210, plus some 318 species which have already been found, or which he considers ought to be found, in Britain. Some 626 species have been found in Durham, and, for these, localities, etc., are given. Mr. Wingate says that his list is meant rather for those who are beginning the study than for those who are more advanced, but it is a work for all dipterists, and that must be studied by all, not only for its local, but for its general, value.

* Published by Williams and Norgate, 14, Henrietta Street, Covent Garden, London, W.C. Price 9s.

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EXCHANGES.—*The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of address" is open free to subscribers so far as there is space available.*

Duplicates.—Larvæ: Obliquaria (rufata), Betularia.—V. E. Shaw, 20, Salisbury Road, Bexley, Kent.

WANTED FOR PHOTOGRAPHING.—Fertile ova of Machaon, Aporia crataegi, Hyale, Sinapis, Euphrosyne, Latona, Polychloros, C-album, Sibylla, Iris, Epiphron, Hyperanthus, Typhon, Betula, W-album, T. quereus, Argiades, Semiargus, Arion, Thaumias, also Plexippus, C. dispar (rutilus), Bœtica, and fulfilled larvæ and pupæ of most butterflies in the British list. Will be returned uninjured if desired, or paid for at current prices.—A. E. Tonge, Aincroft, Reigate, Surrey.

WANTED COLEOPHORIDS.—Cases and larvæ, particularly those of the *palliatella* group, with pistol-shaped cases. Any cases found during March and April, would be particularly acceptable, as very little is known of the wintering cases. Records of captures and localities are also of use. I shall be pleased to do what I can in return.—Hy. J. Turner, 98, Drakefell Road, New Cross, London, S.E.

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MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. October 3rd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. July 8th, Bromley, 9.51 a.m., Ludgate Hill; July 22nd, Coudson, 10.25 a.m., Cannon Street; July 28th, Loughton, 2.41 p.m., Liverpool Street.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. July 12th, Exhibition; July 14th, Field Meeting, Clandon, L.S.W.R.; July 26th, Collecting Reports; August 9th, August 23rd.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. (No dates received.)

Lancashire and Cheshire Entomological Society.—Royal Institution, Liverpool Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained. (No dates received.)

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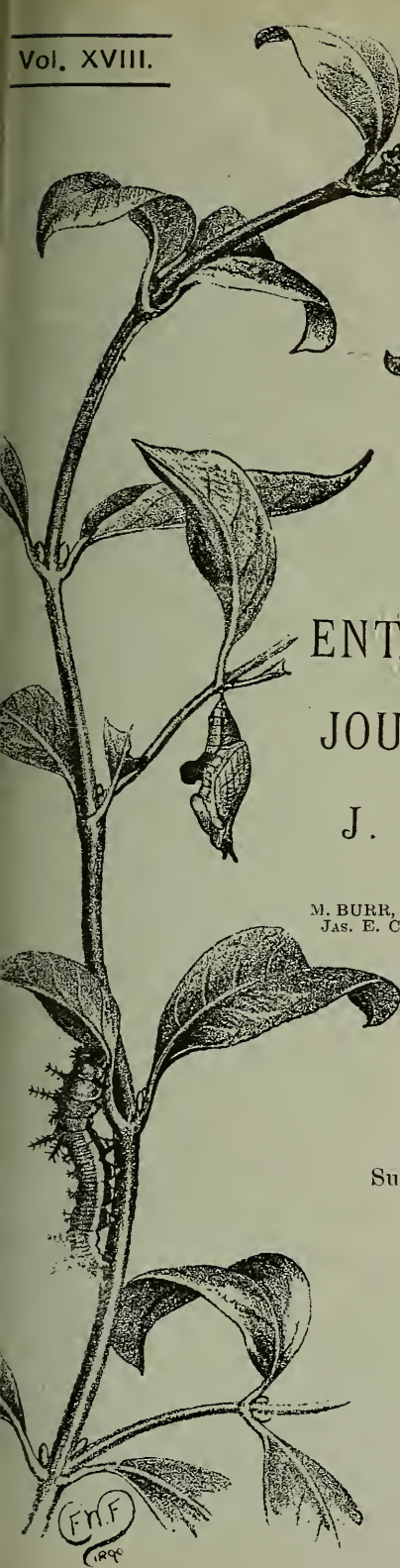
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Photography for Entomologists (*with two plates*).

By FREDERICK NOAD CLARK.

When first I took up this work in connection with entomology, some fifteen years ago, although I could foresee the many applications it would have in every branch of natural history, I did not imagine that it would have been in comparatively so short a time so extensively utilised in our study. At that time photo process work was in its infancy, and the low standard of quality then obtaining was no doubt responsible for a good deal of shortcoming in this respect. It cannot, however, be said that this is the case at the present time, now that photographic reproduction processes have been brought to such a high state of perfection, and are being employed by our best known authorities in every branch of entomology. Some reproductions from drawings and diagrams are excellent in their way, and in many instances are indispensable, but for accuracy of delineation they are not to be compared with the results obtainable by photography. When employed in conjunction with the microscope, as in photomicrography, its advantages in demonstrating the minute structure or anatomy of insects are obvious. Absence of the "personal equation" is also a point that should not be overlooked. In the study of entomology there is no lack of material or scope for the practice of photography.

LOW POWER PHOTOGRAPHY.—By this I mean the photography of those subjects which require but little or no magnification, as in the case when photographing whole insects or large portions of such. These are frequently too large to be included in the field of the low power micro-objective. In such cases we must use the photographic lens and camera. For large insects a good wide angle or short focus lens is necessary, the required magnification being obtained by camera extension. With objects intermediate in size, between the latter and those that are obviously microscopic specimens, I recommend a lens of the "Planar" type. Most opticians now supply lenses of this type, and they are indispensable for photographing such objects as eggs and the larger structures. They are somewhat costly, but in practice are extremely useful when the object is too large for the field of the low power micro-objective. Besides covering a wide field of view, they give splendid marginal definition, and, what is sometimes of even more importance, a "depth of focus" which is quite unattainable with the micro-objective. I have a 3in. lens of this type by Watson & Sons, which enables me to do work that, prior to their introduction, was out of the question. The setting up of the object requires some little skill in order to get the best results. I have in my mind's eye a group of lepidoptera which it is desired to photograph on one plate for reproduction. The insects should be high set with suitably long pins, and pinned on slender pieces of cork about an inch long, which latter are fixed with sealing wax or shellac on a sheet of ground glass. The whole is then photographed by daylight, using a mirror at the back of the ground glass so as to neutralise any shadows cast by the insects, should this be desirable.

PHOTOMICROGRAPHY.—To produce really good work the microscopist must be an expert photographer. Many who are old hands with the microscope, when attempting photomicrography, fail solely on account

JULY 20TH, 1906.

of a want of practical experience in plain photography. I do not, however, minimise the importance of a knowledge of the optical principles involved in the use of the microscope. The usual method of photographing with the microscope is by the employment of an ordinary photographic camera, one having a triple extension for preference. The microscope is brought to the horizontal position, and the upper end of the tube attached to the camera front, at the lens aperture, by two loose inter-fitting flanges, so as to exclude the light. The camera lens is, of course, dispensed with. The object is then illuminated by the direct rays of a lamp exactly in the optical axis of the microscope, a bull's eye condenser being placed between it and the substage condenser. For low and medium power work the microscopic eyepiece is quite unnecessary. Indeed, the camera itself may be dispensed with, the principle being that the microscope and illuminant are screened off from the sensitive plate by means of a box having one side removed and replaced by a dark curtain. The room being dark, takes the place of the camera chamber. The image is focussed on the screen in a plate-holder, which can be adjusted on a sliding base to the required distance from the microscope, this distance depending on the amount of magnification required. The advantages of working in this way are—that a dark slide is unnecessary, and thus any movement after final focussing is obviated; the danger from reflected light is also less. Accurate focussing is not possible on the ground glass screen, on account of the coarseness of its grain, so after roughly focussing the image on the latter, we replace it by a piece of plain glass and focus the aerial image with an ordinary photographic focussing lens. When the degree of magnification required necessitates a long camera extension, we have to focus by means of a rod fixed on the base-board, and attached at its further end by a leather band to the fine adjustment of the microscope. No definite guide here can be given as to the length of exposure, as it depends on the following factors—the objective used, amount of magnification, aperture of diaphragm of substage condenser, character of illuminant, speed of plate, and colour or density of object. A few trial exposures will, however, soon determine this. Hitherto, I have been treating of the photography of transparent objects, but, when dealing with opaque objects, such as eggs, etc., we have to use reflected light. The simplest method of illumination is by means of the bull's eye condenser interposed between the source of light and the surface of the object. The length of exposure is considerably more. As a general rule, when photographing insect preparations, a coloured screen is not required. When these are of a dark chitinous character, the difficulty can usually be surmounted by giving increased exposure with dilute prolonged development. Pyro-soda, with plenty of sulphite, is the developer I recommend. Isochromatic plates are necessary, and they should be "backed."

For purposes of reproduction for book illustration, and for obtaining the maximum amount of detail in the resulting print, I cannot insist too strongly on the use of a glossy paper of the print-out type. Contrast is improved thereby, and it is my experience that the process worker prefers this class of print to the matt bromide and others of this character.

Space will not permit to speak at any length on the preparation of lantern slides, it will be sufficient to remark that $\frac{1}{4}$ plate

negatives should be employed with the object in view of their suitability for making lantern slides therefrom. The process, 'par excellence,' is the dry collodion process, and I have used a home-made collodion emulsion for many years. Plates prepared by this process have a structureless film, and give perfect detail, with a wide range of gradation in the image from clear glass to pure blacks. They have also the merit of cheapness, rapidity of preparation and drying, with permanency of the resulting slide. In most cases, the ordinary method of preparation of objects will be satisfactory, *i.e.*, treatment with liquor potassa, dehydration with alcohol, clearing with oil of cloves or turpentine, and mounting in Canada balsam. A good formula for the latter is—Canada balsam (dried), 2 parts; benzole and turpentine, of each 1 part. For some objects, however, Canada balsam is unsuitable, such as the softer and more colourless insect structures. For these, glycerine, in the form of Farrant's medium, will answer best; for others, such as some scales and wings of lepidoptera, the dry method of mounting is more suitable.

It is desirable to keep an indexed record of the subjects photographed, giving such particulars as—name of specimen, generic and specific, whether male or female, where obtained, how prepared, objective used, amount of magnification in diameters, exposure and date, and other facts that require notice. Such a record is always valuable for reference.

EXPLANATION OF PLATES VIII AND IX: NOTOLOPHUS (ORGYIA) ANTIQUA.

- | | |
|--|--|
| Fig. 1. Male insect, $\frac{2}{3}$ size. | Fig. 7. Cocoons, $\frac{2}{3}$ size. |
| Fig. 2. Female insect depositing eggs, $\frac{2}{3}$ size. | Fig. 8. Pupæ, male and female, $\frac{2}{3}$ size. |
| Fig. 3. Eggs, group on cocoon $\times 1\frac{1}{2}$. | Fig. 9. Rudimentary wings of female, $\times 8$. |
| Fig. 4. Eggs $\times 10$. | Fig. 10. Hairs on larva $\times 10$. |
| Fig. 5. Larva, newly emerged $\times 10$. | Fig. 11. " " " $\times 60$. |
| Fig. 6. Larva, adult on lime leaf, $\frac{2}{3}$ size. | Fig. 12. Proleg of larva $\times 32$. |

NOTE.—Figs. 1, 2, 3, 6, 7, and 8 have been photographed with a wide angle photographic lens. Fig. 4 by reflected light. Figs. 5, 9, 10, 11, and 12 are examples of low power photomicrography.

Catalogue of the Palæarctic Urbicolides.

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

Our study of the Palæarctic "skippers" (*A Natural History of the British Butterflies*, pp. 80-298) has carried us over a considerable amount of ground, and, in conclusion, we have drawn up the following catalogue of the species that are taken within the Palæarctic area, with the addition of some few varieties of the species that we have specially studied, that spread into the Nearctic region. It will be observed that there are many additions to those in Standinger and Rebel's *Catalog*, 3rd ed., 1901, but even so, we are not sure that the list is quite as complete as it should be, for, although we have cut out the species that inhabit western China up to the borders of Thibet, without passing the boundaries of the latter, the general resemblance of some of these species to other outlying Palæarctic forms, makes us doubt whether such should not be rightly included in our list. On the whole, however, we have decided to exclude these, and believe the following will be found a fairly accurate list of the "skippers" inhabiting the Palæarctic region:—

URBICOLIDES.

HESPERIIDÆ.

PHOCIDINÆ.

PHOCIDIDI.

- Orthophœtus, Wats.
omeia, Leech
Capila, Moore
translucida, Leech
Achalarus, Scud.
bifasciatus, Brem.
var. contractus, Leech
simplex, Leech
proximus, Leech
Celænorhinus, Hb.
maculosa, Feld.
consanguinea, Leech
tibetana, Mab.
Daimio, Murr.
tethys, Mén.
var. chinensis, Staud.
sinica, Feld.
diversa, Leech
Satarupa, Moore
nymphalis, Spr.

HESPERIINÆ.

NISONIADIDI.

- Hallia, Tutt
marloyi, Bdv.
pelias, Leech
var. erebus, Grum-Grsh.
Nisoniades, Hb.
tages, Linn.
ab. isabellæ, Lamb.
ab. alcoides, Tutt
ab. transversa, Tutt
ab. variegata, Tutt
ab. brunnea-unicolor, Tutt
ab. brunnea-alcoides, Tutt
ab. brunnea-transversa,
Tutt
ab. brunnea-variegata,
Tutt
ab. unicolor, Frr.
ab. approximata, Lowe
ab. suffusa-alcoides, Tutt
ab. suffusa-transversa,
Tutt
ab. suffusa-variegata, Tutt
ab. fulva, Banks
var. cervantes, Grasl.
ab. clarus, Carad.
var. popoviana, Nordm.
var. sinina, Grum-Grsh.
montanus, Brem.
var. nigrescens, Leech
leechii, Elw. and Edw.

ERYNNIDI.

- Erynnis, Schrk.
alceae, Esp.
var. australis, Zell.
althææ, Hb.
var. bæticus, Rbr.
lavatheræ, Esp.

HESPERIIDI.

- Sloperia, Tutt
poggei, Led.

var. lutulentus, Grum-Grsh.

Muschampia, Tutt
proto, Esp.

var. mohammed, Obth.
leuzææ, Obth.

staudingeri, Spr.

var. plurimacula, Chr.

var. proteus, Staud.

var. prometheus, Grum-Grsh.

Favria, Tutt

tessellum, Hb.

var. nomas, Led.

var. dilutior, Rühl

var. gigas, Brem.

var. kuenlunus, Grum-Grsh.

cribrellum, Evers.

var. obscurior, Staud.

nobilis, Staud.

Hesperia, Fab.

antonia, Spr.

var. gigantea, Staud.

sidæ, Esp.

carthami, Hb.

var. moeschleri, H.-Sch.

var. valesiaca, Rühl

cinaræ, Rbr.

andromedæ, Wallgrn.

centaureæ, Rbr.

serratulæ, Rbr.

ab. tarasoides, Rbr.

var. cæcus, Frr.

var. major, Staud.

var. alveoides, Staud.

cacaliæ, Rbr.

speyeri, Staud.

alveus, Hb.

ab. funginus, Schilde

var. conyzæ, Gn.

var. carlinæ, Rbr.

var. onopordi, Rbr.

var. cirsii, Rbr.

var. iberica, Grum-Grsh.

var. sifanicus, Grum-Grsh.

alpina, Ersch.

var. darwazica, Grum-Grsh.

malvæ, Linn.

ab. albina, Tutt

ab. taras, Bergs.

ab. intermedia, Schilde

ab. zagrabiensis, Grund

ab. fasciata, Tutt

ab. restricta, Tutt

ab. brunnea, Tutt

var. (et ab.) australis, Tutt

var. melotis, Dup.

var. hypoleucos, Led.

var. pyrenaica, Tutt

var. andalusica, Tutt

var. alpina, Tutt

ab. rufa, Tutt

? *var. malvoides*, Elw. and Edw.

Bremeria, Tutt
 bieti, Obth.
 maculatus, Brem.
 var. amurensis, Staud.
 var. tibetanus, Obth.
 var. zona, Mab.
 var. albistriga, Mab.
 var. sinicus, Butl.
 oberthueri, Leech
 Powellia, Tutt
 geron, Wats.
 phlomidis, Hch.-Sch.
 var. jason, Kind.
 orbifer, Hb.
 ab. eucrate, Frr.
 var. tesselloides, Hch.-Sch.
 ab. hilaris, Staud.
 var. lugens, Staud.
 sao, Hb.
 ab. eucrate, Ochs.
 var. therapne, Rbr.
 var. ali, Obth.

URBICOLIDÆ.

AEROMACHINE.

AEROMACHIDI.

Taractrocera, Butl.
 flavoides, Leech
 Ampittia, Moore
 trimacula, Leech
 delailama, Mab.
 Aeromachus, Nicév.
 chinensis, Elw. and Edw.
 piceus, Leech
 inachus, Mén.
 catocyanea, Mab.

CYCLOPIDINÆ.

CYCLOPIDIDI.

AUBERTIA, Obth.
 micio, Obth.
 dieckmanni, Graes.
 var. gemmatus, Leech
 christophi, Grum-Grsh.
 niveomaculatus, Obth.
 flavomaculatus, Obth.
 argyrostigma, Evers.
 Cyclopides, Hb.
 pulchra, Leech
 abax, Obth.
 houangty, Obth.
 silvius, Knoch
 palæmon, Pall.
 ab. aurantia, Tutt
 ab. excessa, Tutt
 ab. restricta, Tutt
 ab. lutea-excessa, Tutt
 ab. lutea-restricta, Tutt
 ab. melicertes, Schultz
 (esperii, Tutt)
 ab. circumcineta, Tutt
 var. (et ab.) albiguttata,
 Chr.

var. mandan, Edw.
 var. mesapano, Scudd.
 var. skada, Edw.

Heteropterus, Dum.
 morpheus, Pall.
 Leptalina, Mab.
 unicolor, Brem.
 ab. ornatus, Brem.
 Dejeania, Obth.
 bicolor, Obth.
 Apostictopterus, Leech
 fuliginosus, Leech

THYMELICINÆ.

THYMELICIDI.

Adopæa, Billberg
 lineola, Ochs.
 ab. pallida, Tutt
 ab. clara, Tutt
 ab. brunnea, Tutt
 ab. suffusa, Tutt
 ab. ludovicicæ, Mab.
 ab. semicolon, Staud.
 ab. intermedia, Tutt
 var. (et ab.) major, Tutt
 ab. major-clara, Tutt
 flava, Brünnich
 ab. pallida, Tutt
 ab. pallida-virescens, Tutt
 ab. suffusa*, Tutt
 ab. suffusa-virescens, Tutt
 ab. reversa, Tutt
 ab. obscura, Tutt
 var. iberica, Tutt
 var. syriaca, Tutt
 var. (et ab.) major, Tutt
 Thymelicus, Hübner
 sylvatica, Brem.
 var. occidentalis, Leech
 hyrax, Led.
 leonina, Butl.
 var. astigmata, Leech
 nervulata, Mab.
 stigma, Staud.
 hamza, Obth.
 christi, Rebel
 acteon, Rott.
 ab. virescens, Tutt
 ab. distincta, Tutt
 ab. obsoleta, Tutt
 ab. clara, Tutt
 ab. extensa, Tutt

URBICOLINÆ.

URBICOLIDI.

Urbicola, [Linn.] Barb.
 comma, Linn.
 ab. clara, Tutt
 ab. intermedia, Tutt
 ab. suffusa, Tutt
 ab. pallidapuncta, Tutt
 ab. extrema, Tutt
 ab. conflua, Tutt
 ab. juncta, Tutt

* Owing to a slip (*Brit. Butts.*, p. 107), *A. flava* ab. *suffusa* is said to be a parallel form with *A. lineola* ab. *suffusa*. This is wrong, as it is parallel with *A. lineola* ab. *brunnea*. It is *A. flava* ab. *obscura* that is parallel with *A. lineola* ab. *suffusa*.

- ab. centripuncta*, Tutt
var. (et ab.) flava, Tutt
var. (et ab.) pallida, Tutt
var. dimila, Moore
var. (et ab.) catena, Heyd.
var. (et ab.) alpina, Bath
var. florinda, Butl.
var. mixta, Alph.
var. manitoba, Scudd.
var. colorado, Scudd.
var. idaho, Edw.
var. oregonia, Edw.
var. nevada, Edw.
var. laurentina, Lyman
var. assiniboia, Lyman
var. manitoboides, Fletch.
var. columbia, Scudd.
var. juba, Scudd.
var. viridis, Edw.
- Augiades, Hb.
 bouddha, Mab.
 similis, Leech
 sylvanoides, Leech
 subhyalina, Brem.
 var. thibetana, Obth.
 sylvanus, Esp.
 ab. paupera, Tutt
 ab. obsoleta, Tutt
 ab. opposita, Tutt
 ab. clara, Tutt
 ab. extensa, Tutt
 ab. juncta, Tutt
 ab. obscura, Tutt
 var. norvegica, Tutt
 var. (et ab.) anatolica, Plötz
- var. hyrcana*, Christ.
 var. (et ab.) venata, Brem.
 var. tochrana, Rühl
 var. (an spec.) faunus, Turati
 ochracea, Brem.
 Halpe, Moore
 lucasii, Mab.
 varia, Murr.
 Padraona, Moore
 darra, Koll.
 Gegenes, Hübn.
 nostradamus, Fab.
 Baoris, Moore
 zelleri, Led.
 ? *thyone*, Leech
 pellucida, Murr.
 jansonis, Butl.
 Parnara, Moore
 bada, Moore
 guttatus, Brem.
 Chapra, Moore
 mathias, Fab.
 alcides, H.-Sch.
 var. ahriman, Chr.
 cœrulescens, Mab.
- ISMENIDÆ.
 ISMENINÆ.
 ISMENIDI.
 Ismene, Swains.
 aquilina, Spr.
 ? *jankowskii*, Obth.
 Hasora, Moore
 anura, Nicéev.
 Rhopalocampta, Wallgrn.
 benjamini, Guér.

The Lepidoptera of the southeastern district of London.

By WILLIAM WEST.

(Continued from p. 173.)

GEOMETRIDES.—*Abraxas grossulariata*.—Bred from all parts on various foodplants; in 1870 I bred about 2000, and obtained one decent aberration; it had the base of the wing up to the yellow line black, beyond that was white, with the usual spots; I have also taken larvæ, entirely black, that had hibernated on tarred fences near black-currant trees. *A. ulmata*.—Abbey Wood; on elm. *Lygdia adustata*.—Kidbrook, Burnt Ash, and also Dartford. *Lomaspilis marginata*.—Dartford, Kidbrook, and Swanscombe. *Pachygnemina hippocastanaria*.—Shirley. *Hybernia rupicaprararia*.—Bred on January 24th from larvæ taken at Kidbrook. *H. leucophaearia*.—Earliest date January 8th, lasting until March 6th; Shooter's Hill. *H. aurantiaria*.—Bred from birch; November 18th, at West Wickham. *H. progemmaria*.—Bred on March 8th; captured at Blackheath and Kidbrook. *H. defoliaria*.—Blackheath, Greenwich, Lee, and Lewisham. *Anisopteryx aescularia*.—Greenwich, Blackheath, and many other places. *Cheimatobia brumata*.—Blackheath, Lee, and other places. *C. boreata*.—West Wickham. *Oporabia dilutata*.—Blackheath, Lee, and also Lewisham. *Larentia didymata*.—Shirley and Shooter's Hill. *L. olivata*.—Wick-

ham, West Wood, and Shooter's Hill. *Emmelesia albulata*.—Loughton. *E. decolorata*.—Darenth and Wickham. *E. unifasciata*.—Bred from larvæ taken at Woodside; its foodplant was very common near the station, it remains in the pupal stage from one to three years. *Eupithecia venosata*.—On fences in Croydon. *E. pulchellata*.—West Wickham, larvæ on foxglove; July in Abbey Wood. *E. centaureata*.—Bred from ragwort; Brockley. *E. succenturiata*.—Brockley. *E. subfulvata*.—Plumstead. *E. subumbrata*.—Bred from larvæ taken on scabious, at Box Hill. *E. plumbeolata*.—Caterham. *E. isogrammata*.—On the road to Darenth. *E. satyrata*.—Box Hill. *E. castigata*.—Wickham; on firs. *E. lariciata*.—Wickham; on firs. *E. virgaureata*.—Plumstead. *E. pusillata*.—Wickham; on spruce, May 24th. *E. nanata*.—Shirley and Plumstead. *E. assimilata*.—Greenwich; on black currant. *E. subciliata*.—Box Hill. *E. dodoneata*.—Kidbrook; by beating hedges. *E. abbreviata*.—West Wickham. *E. exigua*.—Kidbrook and Wickham. *E. sobrinata*.—Caterham and Headley Lane; on juniper. *E. pumilata*.—Kidbrook and Shirley; on fences. *E. coronata*.—Shooter's Hill, Shirley, and also Lee. *E. rectangulata*.—Blackheath; very common on fences, both black and green varieties. *Lobophora viretata*.—Burnt Ash Lane, Lee. *L. lobulata*.—Darenth, West Wood, and Shooter's Hill. *Thera juniperata*.—Bred from juniper; Caterham. *T. variata*.—Shirley and Wickham. *T. firmata*.—Wickham; on firs. *Ypsipetes impluviata*.—On fences at Blackheath, near alders, Catford, and also Wickham. *Y. elutata*.—Larvæ in catkins of willows; Lee, Lewisham, Kidbrook, and many other places. *Melanthia rubiginata*.—Box Hill. *M. albicillata*.—Box Hill, Darenth, and Abbey Wood. *M. ocellata*.—Kidbrook, Burnt Ash Lane, Lee. *Melanippe procellata*.—Box Hill, Croydon, and Dartford. *M. virata*.—Kidbrook, Lee, and Lewisham. *M. sociata*.—Kidbrook, and also Shooter's Hill. *M. montanata*.—Dartford, Wickham, and Abbey Wood. *M. galiata*.—Dartford and Shooter's Hill. *M. fluctuata*.—Blackheath and other places. *Anticlea rubidata* and *A. badiata*.—Very common in Kidbrook Lane amongst rose-bushes; obtained by beating. *A. derivata*.—Loughton, Plumstead. *Coremia propugnata*, *C. ferrugata*, *C. unidentaria*.—Lee, Lewisham, Shooter's Hill, and also Plumstead. *Camptogramma bilineata*.—Everywhere common. *C. fluriata*.—On lamps; Blackheath. *Phibalapteryx tersata*.—Dartford and Plumstead. *P. vitalbata*.—Dartford and Plumstead; on clematis. *Scotosia dubitata*.—On lamps and fences at Blackheath. *S. retulata*.—Dartford. *S. rhannata*.—Fullfed larvæ in June; on blackthorn, at Dartford. *S. certata*.—Very common on fences under barberry-bushes in Blackheath Park; bred numbers very easily from the egg. *Encosmia undulata*.—Leith Hill. *Cidaria picata*.—Loughton, Abbey Wood, Shooter's Hill. *C. corylata*.—Dartford and Wickham. *C. russata*.—Shooter's Hill, Plumstead, Loughton. *C. immanata*.—Shooter's Hill. *C. suffumata*.—Loughton. *C. silaccata*.—Wickham, Dartford. *C. testata*.—Lee pit; amongst willows, common. *C. fulvata*, *C. pyraliata*.—Very common in Kidbrook Lane, Lee, and Burnt Ash Lane. *C. dotata*.—Blackheath. *Pelurga comitata*.—Greenwich Marsh; on *Chenopodium*. *Eubolia mensuraria*.—Brockley, Croydon. *E. palumbaria*.—Loughton, Shooter's Hill. *E. bipunctaria*.—Brockley, Box Hill, and also Croydon. *Anaitis plagiata*.—Plumstead, Lee, and Brockley. *Chesias spartiata*.—Dartford; larvæ on broom, June 3rd, imagines emerged in August.

C. obliquaria.—Shirley; larvæ on broom. *Tanagra chaerophyllata*.—Loughton; in a meadow.

NOTODONTIDES.—*Dicranura furcula*.—Blackheath, Forest Hill, Lee, Lewisham; taken it at 6 p.m., drying its wings on several occasions, in June; I have also taken the pupa from willow-bark, and also bred the species from larvæ. *D. bifida*.—Blackheath; larvæ from poplars; pupæ of this and the above are very difficult to find, as they are finished off very neatly between the cracks of the bark. *D. vinula*.—Larvæ on sallows, willows, and poplars; Brockley, Lewisham, and Greenwich Marshes. *Pygaera bucephala*.—Greenwich, Lee, and many other places. *Clostera curtula*, *C. reclusa*.—Bred from females taken on dwarf-sallow; Shooter's Hill. *Ptilophora plumigera*, *Ptilodontis palpina*.—Blackheath; on fences. *Lophopteryx camelina*.—Bred from larvæ taken at Kidbrook, Wickham, Shooter's Hill, and Lee. *Leiocampa dictæa*.—Greenwich Park, on fence, and Lee. *L. dictæoides*.—Lee, on lamps; also bred from larvæ. *Notodonta dromedarius*.—Shooter's Hill, Wickham, and Wimbledon. *N. ziczac*.—Wimbledon, Abbey Wood, and Darenth. *N. trepida*.—Loughton; larvæ by beating. *Diloba caeruleocephala*.—Lee, Lewisham, Loughton.

CYMATOPHORIDES.—*Thyatira derasa*, *T. batis*.—Common at sugar; Burnt Ash, Kidbrook, and Plumstead. *Cymatophora diluta*, *C. or.*—Wickham. *Asphalia flaricornis*.—Wickham; on birch.

NOCTUIDES.—*Bryophila perla*.—Very common on Greenwich Park wall, Blackheath side. *Triaena tridens*.—Larvæ beaten out of white-thorn; Lee. [Mr. Gregson informed me that fresh specimens of *T. tridens* could be picked out by the ochreous tinge that suffused the forewings; all that I have bred have that tinge; I have bred a number of *T. psi*, but I have never seen it on that species.] *T. psi*.—Blackheath, and everywhere else in the district. *Acronycta leporina*.—Larvæ on birch; Wickham, Plumstead, and Keston Common. *Apatela aceris*.—Larvæ on sycamore; Blackheath, Lee, Greenwich, etc. *Cuspidia megacephala*.—Larvæ on poplars; Blackheath, Lee, Greenwich, etc. *Craniophora ligustri*, *Phaëtra runcicis*.—Wickham, Darenth, Shooter's Hill. *Leucania conigera*.—Lee, Wickham, Blackheath. *L. lithargyria*.—Bred from larvæ at Kidbrook. *L. obsoleta*.—Brockley. *L. comma*.—Loughton, Lee, and also Lewisham. *L. straminea*.—Very common on Greenwich Marshes in July; this locality has now been destroyed. *L. impura*, *L. pallens*.—Greenwich, Lee, Lewisham, and Kidbrook. *Calamia phragmitidis*.—Greenwich Marshes. *C. lutosa*.—Lee pit. *Nonagria fulva*.—Lee and Wimbledon. *N. typhæe*.—Brockley; pupæ common in the stems of bulrushes. *Chortodes arcuosa*.—Kidbrook, in a swamp. *Gortyna flavago*.—Greenwich Marshes; larvæ and pupæ very common in stems of burdock. *Hydroecia nictitans*.—Kidbrook, Catford, and Lee. *H. micacea*.—Greenwich Marshes, Brockley; I have found pupæ in thistle-stems. *Axylia putris*.—Plumstead, Blackheath. *Xylophasia rurea*.—Wickham. *X. lithoxylea*, *X. polyodon*.—Blackheath, Kidbrook, and Lee. *X. hepatica*.—Wickham and Shooter's Hill. *Dipterygia pinastri*.—Plumstead and Blackheath. *Neuria saponariae*.—Lee. *Heliopobus popularis*.—Blackheath and Lee. *Charaëas graminis*.—Wimbledon. *Cerigo cytherca*.—Lee pit, Croydon, and Brockley. *Luperina testacea*.—Blackheath; common on lamps. *Mamestra anceps*.—Blackheath and Woodside. *M. brassicae*.—Common everywhere. *M. persicariae*.—Blackheath and other places. *Apamea basilinea*, *A. gemina*.—Lee, Lewisham, and Green-

wich. *A. ophiogramma*.—One taken at Brockley. *A. oculea*.—Common everywhere. *Miana strigilis*, *M. fasciuncula*, *M. furuncula*.—Greenwich, Lee, Lewisham, Brockley, and many other places. *Grammesia trilinea*.—Burnt Ash, Blackheath, and Kidbrook. *Caradrina morpheus*, *C. alsines*, *C. blanda*, *C. cubicularis*.—Lee, Lewisham, Blackheath, and Brockley. *Peridroma suffusa*.—Lee and Wickham. *P. saucia*.—Lee pit; at sugar. *Agrotis puta*.—Plumstead, Blackheath, and Wickham. *A. segetum*, *A. exclamationis*.—Blackheath and other places. *A. cortic-a*.—Lee and Kidbrook Lane. *A. nigricans*.—Greenwich Marshes. *A. agathina*, *Lycophotia porphyrea*.—Bred from larvæ taken at night in Shirley; the best way to breed these species is to plant the foodplant in a flower-pot, then gauze it over, letting it take its chance in the weather; if dry, water it through. *Triphaena janthina*.—Kidbrook and Burnt Ash Lane. *T. fimbria*.—Larvæ taken at Wickham and Shirley. *T. interjecta*.—Kidbrook, Lee, and Lewisham. *T. orbona*, *T. pronuba*.—Kidbrook, Lee, Lewisham, and many other places. *Noctua glareosa*.—Wickham Wood. *N. augur*, *N. plecta*.—Blackheath, Lewisham, and Lee. *N. c-nigrum*.—Lee and Wickham. *N. triangulum*.—Lewisham. *N. brunnea*, *N. festiva*, *N. dahlii*.—Wickham and Shooter's Hill. *N. rubi*.—Lee, Wickham, and Shooter's Hill. *N. umbrosa*.—Blackheath, Lewisham, and Lee. *N. baja*.—Lee, Shirley, and Greenwich. *N. neglecta*.—Red variety, bred from larvæ taken at Shirley. *N. xanthographa*.—*Trachea piniperda*.—Bred in Wickham and Bostal Wood. *Taeniocampa gothica*.—Lee, Blackheath, and Lewisham. *T. rubricosa*.—Kidbrook and Plumstead. *T. instabilis*.—Lee, Lewisham, and also Greenwich. *T. populeti*, *T. stabilis*, *T. gracilis*, *T. miniosa*, *T. munda*, *T. cruda*.—Dartford and other places; at sallows.

(To be continued.)

Practical Hints relating to the Eupitheciids.*

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

(Continued from p. 182.)

The long slender larva of *Eupithecia indigata* is to be found in June and July on Scotch fir; when young it appears to confine itself to the inflorescence, afterwards feeding upon the leaves. It has also been reared upon larch, juniper, and cypress.

The imago of *Eupithecia indigata* is to be found in April and May, sitting on the trunks of fir-trees, often at a considerable height; when disturbed it flies off, and then usually descends within reach of the net; its natural flight at dusk, round the fir-trees, keeps it well up out of reach of the net.

The larva of *Eupithecia constrictata* is to be found in August and September on the flowers of wild thyme; difficult to find by day, more readily by night, when it is actively engaged in feeding.

The imago of *Eupithecia constrictata* is on the wing in June and July, hiding among the beds of thyme (on which the larva feeds) or in clumps of dwarf willow, or other herbage affording shelter; it is readily disturbed by the beating-stick, flying swiftly close to the ground, preferring the thymy slopes of chalkhills, downs, and the sandhills where thyme grows freely by the sea. Reported as abundant on the

* For further "Hints," see *Practical Hints for the Field Lepidopterist*, I, II, and III.

thymy slopes of the mountains near Barmouth. It is a much overlooked species.

The long slender larva of *Eupithecia lariciata* is to be found in June and July on larch, from which at this time it may be readily beaten. Will feed in confinement also upon spruce-fir.

The imago of *Eupithecia lariciata* flies at dusk about the larch-trees, but is then difficult to capture. By day it rests on the trunks and branches of the larch-trees, preferring the thicker parts of the trees; from here it may be beaten out and captured, as it drops rather slowly to the ground.

The larva of *Eupithecia castigata* is to be found in June and July, and again in September and October. It appears to be a general feeder on trees, shrubs, and flowers—*Lychnis*, *Sedum*, bracken, etc.

The imago of *Eupithecia castigata* is to be found in May and June, and again as a partial second-brood in August, hiding by day in hedges, or resting on the trunk or branch of a tree. It may then be beaten from its hiding-place. It is also to be captured at dusk flying over bushes and hedges in lanes, woods, gardens, indeed, almost everywhere in suitable places. Barrett says that it loves to rest by day on the underside of the branches of a large tree, and may sometimes be seen in scores, specimen after specimen in following order, almost touching one another; when noticed they will move a little way, one at a time, in a restless fashion, but will not fly unless really disturbed.

The larva of *Eupithecia virgaureata* is to be found in June, and again in August, September, and October as a partial second-brood, on the blossoms of golden-rod, and occasionally also on ragwort, milfoil, and heather.

The imago of *Eupithecia virgaureata* is on the wing in May and June, and again in July and August; it hides during the day among its foodplants or the surrounding herbage, and may be disturbed therefrom, but is best sought at dusk, when it flies naturally over its foodplants, and is then easily captured.

The larva of *Eupithecia albipunctata* is to be found at the end of May and through June, and again from the end of August, throughout September and October on the flowers of *Umbelliferae*—*Angelica*, *Heracleum*, *Anthriscus*, *Peucedanum*, *Cicuta*, *Laserpitium*, etc. In confinement it will feed on elder, and it is possible to get three broods in a year. The larva rests in daytime on the underside of the secondary umbels, and is to be obtained by searching, or by gently beating the flowers against the side of an umbrella.

The imago of *Eupithecia albipunctata* is to be obtained in May and June, and again as a second-brood in August. In the daytime it is rarely seen, hiding among the herbage near its foodplant, but appears to be more usually found flying at dusk over the flowers on which the larvæ feed.

The larva of *Eupithecia pimpinellata* feeds in August, September and early October on the flowers of *Pimpinella saxifraga* and *P. magna*, eating the blossoms, often resting by day on a flowerstalk, of which it looks a part. It prefers plants growing on hedgebanks by roadsides. It is also recorded as feeding on flowers of *Angelica sylvestris*, *Bupleurum falcatum* and *Peucedanum oreoselinum*.

The imago of *Eupithecia pimpinellata* is on the wing in June and

July, hiding by day among the herbage near its foodplant, and difficult to disturb at this time, but flies at dusk over its foodplant, by hedges, etc.

The larva of *Eupithecia helveticaria* and its var. *arceuthata* are to be found in June and July, and again as a partial second-brood in September, and may then be beaten from juniper. It is found in all Scottish hills where its foodplant grows, as well as in Lancashire, Bucks, Wilts, and Surrey.

The imago of *Eupithecia helveticaria* is to be found in May and June, and again as a partial second-brood in August and September. It hides by day in the juniper bushes and may be beaten therefrom, or may be captured flying at dusk around its foodplant. The southern examples are much paler than those from Scotland.

The larva of *Eupithecia satyrata* is to be obtained (sometimes in abundance) in the flowers of *Senecio jacobaea*, *Centaurea nigra*, *Scabiosa arvensis*, *Verbascum thapsus*, and many other plants, feeding also upon heath, sallow, etc., on the northern moors (where the specialised race *callunaria* replaces the type). In our southern woods we have beaten it in plenty into an umbrella with larvæ of *Eupithecia absynthiata*, etc.

The imago of *Eupithecia satyrata* appears in May and June, is frequently beaten in woods and wood-ridings, or disturbed from bushes and hedges on the borders of heaths, moors, etc., or other hiding-places. It hides during the day but flies freely at dusk. In the Orkney Islands a very special form, var. *curzoni*, replaces the type.

The larva of *Eupithecia plumeolata* feeds in August in the flowers of cow-wheat (*Melampyrum pratense* and *M. arvensis*). It spins up the flowers, and bunches of the affected heads should be carefully tied up in bags, the larvæ often pupating in a dried corolla-tube.

The imago of *Eupithecia plumeolata* is to be found throughout June, hiding either among its foodplant or much more frequently on tree-trunks near, from which, however, it flies at the least provocation. It flies freely in the evening over its foodplant, and is sometimes quite abundant in clearings in woods, etc., where its foodplant grows.

The larva of *Eupithecia isogrammata* is to be found in July and August, feeding inside the buds of *Clematis vitalba*, a little black hole in the bud betraying the presence of a larva. It moves from one bud to another and feeds up very rapidly.

The imago of *Eupithecia isogrammata* is on the wing in June and July, and is very active in the early evening when it is to be seen flying swiftly over its foodplant in tall hedges; by day it may be readily disturbed with the beating-stick, but is very ready to take flight, and one wants to be pretty sharp to net it.

The larva of *Eupithecia pygmaeata* is to be found in June and July, and again in September, feeding on the flowers of *Stellaria holostea*, It may also feed on the flowers of *Cerastium tomentosum*, *C. triviale*, etc.

The imago of *Eupithecia pygmaeata* occurs in May and June, and again in July and August, flying in the afternoon sunshine over its foodplant. It loves sunny spots on the edges of wood, or heaths, or hedgesides where its foodplant is abundant; also the wide open paths of fens, etc. It flies swiftly in the sun, but disappears as soon as it is at all cloudy.

The larva of *Eupithecia trisignata* is to be beaten into an umbrella

in September and October from the flowers of *Angelica sylvestris* and *Heracleum sphondylium*. It feeds on the flowers and seeds, resting during the day beneath the umbels.

The imago of *Eupithecia trisignata* is on the wing in June and July; hiding among the herbage near its foodplant, and is of a most retiring disposition. It is still local, but is possibly much overlooked.

The larva of *Eupithecia valerianata* is to be found in July and August on the flowers of *Valeriana officinalis*, from which it may be sometimes beaten or picked off in great numbers. It does not seem to affect other valerian species.

The imago of *Eupithecia valerianata* is to be found in May and June flying at late dusk over the plants of *Valeriana officinalis*. It is rarely seen in the daytime and appears to be almost confined to the marshes, fens, ditches, osier-beds, etc., where the common *Valeriana officinalis* grows.

The larva of *Eupithecia fraxinata* is to be obtained in August and September on ash (although it will feed in confinement on *Laurustinus*); it prefers to pupate in a slight cocoon under a piece of loose bark, or in a deep furrow, or under a piece of moss growing on the trunk, although it sometimes enters the ground for the purpose.

The imago of *Eupithecia fraxinata* is to be found in late June and July, and again as a partial second-brood in September and October. It sits in the daytime on the trunks or branches of ash-trees, usually resting high up; it flies at late dusk and is readily attracted to light.

The larva of *Eupithecia tamarisciata* is to be obtained in August and September on tamarisk, and may be found by searching or by beating carefully in an umbrella.

(To be continued.)

Lepidoptera of the Hammersmith district.

By J. F. BIRD.

Having collected in the western district of London, my father and I were extremely interested in reading Mr. Dollman's list of macro-lepidoptera (*antea*, p. 145) taken between 1893 and 1902, in Bedford Park, Chiswick. Perhaps a list of the macros taken, or observed, by us at Hammersmith, on our premises, from June, 1891 to 1900, may be found interesting on account of the locality being still further in London, and consequently more surrounded by bricks and mortar, than even Bedford Park. I have marked all the species found in one or other of the earlier stages (*i.e.*, ovum, larva or pupa), with an asterisk, and those attracted by sugar with an S.

DIURNI:—*Rumicia phlaeas*, twice in 1896 and 1900; *Celastrina argiolus*, once, in 1897, and the second brood rather common in 1900; *Pieris brassicae**, common in some years; *P. rapae**, very common; *P. napi**, fairly common; *Gonepteryx rhammi*, once, August 7th, 1895; *Argynnis adippe*, once, July 15th, 1896; *Aglais urticae*, occasionally; *Pyrameis atalanta* (S), very common in 1899, at sugar and fallen fruit; *Epinephele janira*, once; *Coenonympha pamphilus*, once. SPHINGIDES:—*Smerinthus ocellata*, an imago in 1897, and one larva on apple; *Amorpha populi*, the larva very common, and the imagines frequently seen; *Mimas tiliae*, occasionally; *Sesia stellatarum*, one in 1892, and two in 1899. ÆGERIIDES:—*Ægeria tipuliformis*, once; *Æ. myopi*

*formis** (S), very common, and occasionally attracted in the daytime to sugar spread on pear trees, but generally to be seen sunning themselves on the upper surface of leaves, especially large leaves like those of the hollyhock. ARCTIIDS:—*Arctia caja*, very occasionally; *Spilosoma lubricipeda**, very common, the larvæ sometimes too abundant; *S. lubricipeda* ab. *fasciata*, four specimens; *S. menthastri**, also very common. ZEUZERIDES:—*Zeuzera aesculi**, only too abundant, notwithstanding our efforts to reduce the number by squashing dozens every year, the larvæ terribly destructive. COSSIDES:—*Cossus ligniperda* (S), once at sugar in 1899. HEPIALIDES:—*Hepialus lupulinus*, fairly common; *H. humuli*, one or two males only. NOLIDES:—*Nola cucullatella**, one larva on plum. LITHOSIIDS:—*Nudaria mundana*, one male in 1898, on garden wall. LYMANTRIIDS:—*Porthesia similis*, not more than once, I think; *Leucoma salicis**, one bred in 1892, and an imago in 1897; *Orgyia antiqua**, very common. PSYCHIDES:—*Funera casta?* (*intermediella*), occasionally. LACHNEIDES:—*Malacosma neustria*, a dead one lying in a gutter (I hardly know whether this ought to be included). NOTODONTIDES:—*Cerura bifida**, one bred in 1898; *C. vinula**, the larvæ common; *Phalera bucephala**, larvæ on nut once. NOCTUIDES:—*Triaena psi** (S), common; *Apatela aceris** (S), rather common; *Cuspidia megapcephala** (S), very common; *Peridroma suffusa*, a worn female at light in 1900 (June 15th !); *P. saucia* (S), once at sugar in 1898; *Agrotis segetum* (S), fairly common; *A. puta*, one at light in 1898, and another in 1900; *A. exclamatoris* (S), common; *A. nigricans* (S), two at sugar in 1900; *Axylia putris** (S), common; *Triphaena fimbria* (S), once in 1900; *T. orbona* (S), common in some years; *T. pronuba* (S), very common; *Graphiphora augur*, once only in 1895, I think at sugar; *Noctua plecta**, not common; *N. c-nigrum* (S), frequently at sugar; *L. baia* (S), once in 1900; *N. rubi* (S), not common; *N. vanthographa* (S), common; *Hadena thalassina*, twice; *H. oleracea** (S), very common; *H. trifolii** (S), very common; *Mamestra brassicae** (S), very common; *M. persicariae** (S), common; *M. sordida*, one at lily in 1897; *Hecatera serena*, three in 1899, two of them at turk's-cap lilies (we found these flowers rather attractive); *Dianthoecia cucubali**, larvæ rather common on *Lychnis flos-cuculi*; *D. capsincola**, common at flowers, the larvæ common, in the seed-vessels of *L. flos-cuculi* and pinks; *Luperina testacea*, occasionally at light; *Xylophasia lithoxylea* (S), rather common; *X. monoglypha* (S), very common; *X. rurea*, once at light in 1892; *Apamea basilinea*, common; *A. gemina* (S), one in 1899; *A. oculea* (S), very common; *A. ophiogramma*, once in 1903; *Miana strigilis* (S), abundant at sugar, especially var. *aethiops*; *Miana fasciuncula* (S), occasionally; *M. bicoloria* (S), sometimes rather common; *Dipterygia pinastris* (S), was getting common two or three years before we left; *Euplexia lucipara** (S), very common; *Phlogophora meticulosa* (S), not common; *Helotropha fibrosa* (S), once in 1900; *Hydroecia nictitans* (S), once in 1900; *H. micacea* (S), two in 1898; *Leucania impura* (S), one or two at sugar; *L. pallens* (S), one or two at sugar; *L. conigera* (S), once in 1900; *L. lithargyria* (S), occasionally at light and sugar; *Taeniocampa instabilis**, not common; *Naenia typica** (S), abundant; *Amphipyra tragopogonis** (S), occasionally at sugar; *Caradrina morpheus* (S), rather common; *C. quadripunctata* (S), common; *C. blanda* (?), one at light in 1899; *Grammesia trigrammica* (S), one in 1900; *Dyschorista fissipuncta**, the larvæ only, on poplar, rather common; we used to procure them

by wrapping an old table-cover round the trunk of a poplar-tree and find them in the folds next morning; *Calymnia trapezina** (S), occasionally; *C. affinis* (S), once or twice at sugar; *Mellinia circellaris* (S), occasionally; *Anchoceles litura**, a few larvæ on mint; *A. lunosa*, not uncommon in some years at light; *Scopelosoma satellitia*, one caught in a cob-web; *Cucullia umbratica*, occasionally; *Plusia chrysitis**, rather common, one or two larvæ on mint; *P. gamma**, very common; *Chrysoptera moneta*, one at the flowers of *Lychnis flos-cuculi* in 1899; *Habrostola triplasia**, rather common, larvæ on hop; *Catocala nupta** (S), the larvæ very common on poplar. DELTOIDES:—*Herminia tarsipennalis*, the imagines common about a wood heap; *H. grisealis*, once or twice; *Hypena rostralis*, occasionally; *H. proboscidalis*, occasionally. GEOMETRIDES:—*Urapteryx sambucaria**, very common; *Rumia crataegata**, common; *Cabera pusaria*, very occasionally; *C. exanthemaria*, once at light in 1900; *Macaria liturata*, once in 1893; *Halia vauaria*, not very frequently; *Ennomos angularia**, very occasionally; *Crocallis elinguaris*, occasionally; *Biston hirtaria**, very common; *Amphidasys betularia**, the imagines rarely, but the larvæ not unfrequently; *Phigalia pedaria*, once in 1896; *Boarmia rhomboidaria** (S), very common; *Hemerophila abruptaria**, common; *Hybernia aurantiaria*, once; *Abraxas grossulariata**, common; *Acidalia interjectaria*, once or twice; *A. incanaria** (S), very abundant, two melanic specimens in 1895; *A. areolata*, common; *Melanthia rubiginata*, once at light in 1898; *Melanippe montanata*, once only; *M. fluctuata** (S), very abundant; *M. subtristata*, once in 1891; *Coremia unidentaria*, occasionally; *Larentia pectinataria*, once in 1891; *Cidaria associata*, occasionally; *Pelurga comitata*, once or twice; *Scotosia rhamnata*, once at light in 1899; *S. dubitata*, once in 1894; *Campptogramma bilineata*, occasionally; *Hypsipetes lutata*, occasionally; *Oporabia dilutata*, once; *Cheimatobia brunata*, occasionally; *Eupithecia centaureata**, common, larvæ on fennel; *E. subfulvata*, once or twice; *E. isogrammaria*, not common; *E. fraxinata**, very common; *E. subnotata*, common; *E. vulgata**, very common; *E. assimilata*, common; *E. rectangulata*, rather common, and very black.

Besides these, we also met with the following species in Hammer-smith, but not on our own premises (I do not say garden, because some were found in the house, attracted by light). *Cilia glaucata**, one larva on hawthorn; *Taeniocampa stabilis*, one or two in Ravenscourt Park; *Cosmia diffinis**, one larva; *H. defoliaria**, *H. progenmaria*, *H. leucophaearia*, *Anisopteryx aescularia*, *Larentia didymata*, all rarely; *Eupithecia pumilata*, one in Ravenscourt Park in 1895.

Collective Inquiry as to Progressive Melanism in Lepidoptera.

SUMMARY OF EVIDENCE PREPARED BY L. DONCASTER, M.A.

(Continued from p. 168.)

PHIGALIA PILOSARIA.—In the south of England only light forms occur, but the buff type is widely distributed, and the markings may be nearly, or quite absent. In the north, the prevalent form is darker, and usually greenish. A smoky form appeared in Yorkshire, probably about 30 years ago, and has spread widely. Later, a darker, uniformly smoky, form appeared, which now occurs in Yorkshire, less commonly

in the surrounding counties, and at Swansea. Only light recorded from Worksop (Alderson), Lynn (Baker, Atmore), Norwich (Pitman), Bury (Norgate), Colchester (Harwood), Kent (Hewett), Sussex (Christy), Marlborough (Meyrick), Wigtonshire (Gordon), Berlin (Kloos). Very dark recorded as occurring rarely, Sheffield (Brady, Doncaster), Hereford (Hutchinson), London district (Fenn, Partridge), Bristol (Prideaux), Chilwell (Notts) (Pearson), Market Drayton (Woodforde). The darkest form occurs regularly at Halifax (Halliday), Huddersfield (Porritt, Mosley), Bradford, Barnsley, Rotherham (Hewett). At Huddersfield, 45 years ago, only lightish forms were known; a dark form appeared some 30 years ago, and the fully smoky form, with no markings, became frequent about 1890 (Porritt, Mosley). This form seems to have appeared at York between 1900 and 1903 (Hewett, Adkin); it was recorded from Wharfedale about 1884 (South), Gainsborough in 1891 (Fowler), Sheffield, 1896 (Brady, Doncaster), and occurs at Great Ayton (Lofthouse), Selby (Hewett), Lancaster (Forsythe), Macclesfield (South), Derby (?) (Hill, 1886), Burnley (Clutton, only recently); a quite similar form is found in the Swansea district, and the Vale of Neath, where the prevalent form is rather dark, as in Yorkshire (Llewelyn, Hewett). It is said to be more frequent in some seasons, and to be increasing more rapidly in some districts than in others, *e.g.*, at Huddersfield it is said to be increasing (Porritt), at Sheffield, it is no commoner than 10 years ago (Brady, Doncaster). Breeding experiments show some discontinuity between the darkest form and the type; a black ♀ giving 70%-80%, black ♂s and ♀s (Hewett); another giving 5 ♀ and 6 ♂ black, 10 ♂ light (South, *Int.*, 1894, p. 138).

AMPHIDASYD BETULARIA.—According to Barrett, the type form only was known until about 1848. The var. *doubledayaria* appeared in the Manchester district in 1850, at Cannock Chase in 1878, in Berkshire, 1885, Cambridge, 1892, Norfolk, 1893, Suffolk, 1896, London, 1897. Abroad at Hanover in 1884, in the Netherlands, before 1888, and has now reached Thuringia, Saxony, Silesia, etc. At Newport (Monmouth), the two forms were about equally common in 1870; now the black is found almost exclusively. Intermediates between the type and *doubledayaria*, are recorded from many localities where the black var. is found. According to Barrett, they were formerly more frequent than now, and he suggests that they have been superseded by the fully black form. When records of intermediates are examined more closely, it is found that they are of two types. The majority are of the type form, but more thickly speckled with black than in normal *betularia*, they show the typical markings, and are, probably, to be regarded as dark fluctuations of the type. True intermediates do, however, occur, and although the number seen has been small, it suggests that they are more frequently males than females. They may either have the forewings almost completely black, and the hindwings pale, as in *betularia*, or the forewings may be very thickly speckled with dark scales, which obliterate all definite markings. These specimens have a blurred, smoky appearance, the pigment, like that of *doubledayaria*, being apparently less intense than in the black specks in *betularia*. When *doubledayaria* is crossed with the type, in general no intermediates are produced, but the

offspring are either all *doubledayaria*, or a mixture of the two forms. FROM CORRESPONDENTS.—Scotland: Forres (Brady), Wigtownshire (Gordon), type; from latter county, one small male, uniform brownish. An intermediate from Kincardine (Horne). Ireland: Light form over the whole island. One *doubledayaria* at Castle Bellingham, 1896 (Kane); darkly spotted specimens, and one *doubledayaria*, same locality, 1894 (Thornhill). Isle of Man: Two *doubledayaria*, 1904 (Cassall). Lancashire: Burnley, Manchester, black prevalent, type occurs (Clutton, Tait). Lancaster, both occur (Forsythe). Cheshire: Chester, Delamere, Warrington, type rare or absent; a suffused form occurs less rarely; black, common. At Delamere a buff form is found (Arkle, Collins). Yorkshire: Huddersfield, now only black, 45 years ago only type was found (Porritt, Mosley). Halifax, black prevalent, suffused form of type occurs. As at Huddersfield, black appeared suddenly between 1860 and 1870, and gradually replaced the type (Halliday). Bradford, black now prevalent, but still scarce as late as 1876 (Butterfield); Leeds, Rotherham, Barnsley, Sheffield, Doncaster, Hull, Keighley, Middlesborough, black prevalent (Porritt, Hewett, Wigin, Brooks, Brady). York, about equal numbers (1900) (Hewett). Great Ayton (1900), type probably commoner than black (Lofthouse). Rotherham, black, appeared suddenly about 1887, no gradual darkening (Brooks). Westmoreland: Kendal and Windermere, black much commoner than type; first appeared about 1870 (Moss). Durham: Hartlepool, black now prevalent, light still occurs. A few intermediates recorded (Robson, Rosie). Lincolnshire: Gainsborough (Fowler), Rutland (Snowden), Notts, Worksop (Alderson), Chilwell (Pearson), both light and black; occasional intermediates. Norfolk: Lynn, black first appeared 1892, in 1900 prevalent (Atmore, Baker). Norwich, black not observed 1901 (Pitman). Cambridgeshire: Ely, first black about 1895 (Cross). Cambridge, light prevalent, black first taken 1892, now seen every year (Farren). Suffolk: Black occurred at Ipswich, 1894 (Morley, Pyett). Essex: Black appeared at Colchester, about 1892 (Harwood), Dovercourt, 1902 (Mathew); Woodford, assembling produced 17 type, 10 black, 1905 (Main and Harrison).

(To be continued.)

Note on the pairing and egg-laying habits of *Euchloe cardamines* and *Gonepteryx rhamni*.

By CECIL FLOERSHEIM, B.A., F.E.S.

The courting of *Euchlœ cardamines*, like that of most butterflies, is a brief affair, and on two occasions this year the pairing took place so quickly in my butterfly-house, that, although my head was turned away from the spot only for a minute or so, there were two butterflies *in copula* when I looked round again. Once, indeed, I nearly trod on a pair which had settled just behind me, as I stopped to examine a twig.

Coitition takes place on or near the ground, and I have never observed any happening at a height of more than six inches from it. It lasts a comparatively short time, and in no case which I have observed, for more than two hours. It almost always took place between 11 o'clock a.m. and 2 p.m. *E. cardamines* appears to be less sensitive to cold in

this respect than most butterflies, for on Friday, April 27th, when the sun was shining, but the day too cold for *Gonepteryx rhamni* to be on the wing, I had two pairings of *E. cardamines* in my butterfly-house, the insects having emerged at this early time through the pupæ having been kept indoors through the winter. The ova, which I saw laid, were deposited singly on the stalks of the flowerheads and unopened buds of *Erysimum*, the butterfly pausing in her labours to feed, after laying a few eggs; indeed, I watched one on several occasions suck the honey from the very flower-head beneath which it had laid the ovum.

Although I succeeded in catching two female and six male specimens of *Gonepteryx rhamni* before April 20th this year, I was unable to get them to pair in my butterfly-house. The males, indeed, were assiduous in their efforts to effect a pairing, but the females invariably refused by cocking up their bodies, and must, I suppose, have already mated, as they laid ova freely enough afterwards. Whereas, moreover, the males of *E. cardamines* flew off almost at once when the females showed unwillingness, those of *G. rhamni* were most persistent, and the female seemed to enjoy their attentions. The male would flutter beneath the female, striking up against her with his antennæ from time to time, while both danced like gnats, but were otherwise almost stationary in the air. Sometimes they used to fly upward, sometimes downward, till after a few minutes the female appeared to tire of the game, and settled on a leaf or twig, with her body still cocked up, and her wings, not merely flat, but depressed, so as to effectually prevent all approach by the male. He, however, still tried to effect copulation, and even crawled over her outstretched wings as she rested. When finally she flew off, she did so fluttering as before, and the male recommenced his efforts, still dancing underneath her. At last, after about ten minutes of unsuccessful courting, he flew away, only to begin the whole affair over again when he met her some ten minutes later, having evidently gained nothing from experience.

It was not until the females had been in my butterfly-house for more than a month that oviposition commenced, but perhaps the prevalent cold weather had much to do with this. The ova were deposited singly, but often two or more on the same leaf, generally on the undersides, but sometimes also on the upper surface of the leaves of *Rhamnus frangula*. They, like those of *E. cardamines*, are of a milky-white in colour when first laid, but darken afterwards. On May 29th, I took one of the females, which I had observed to be ovipositing, out-of-doors to a small plantation of *Rhamnus frangula* and *R. catharticus*, which I had made this winter. On my giving her her liberty she at once commenced laying ova on the *Rhamnus frangula*, but though she flew in and out of the shrubs of *R. catharticus*, which were interspersed with it, she never once laid an egg on them. I watched her for about half-an-hour, during most of which time she was busy egg-laying. After depositing about half-a-dozen eggs, she would rest a few minutes on the ground or on a stone. Towards the end her instinct appeared to fail her in a curious manner, as she actually laid an egg or two on a box-border growing underneath the *Rhamnus*. But I have frequently observed butterflies in my cage make similar mistakes, and they appear to be guided only by the smell of the plants when making their choice. Several times I have seen *Papilio machaon* lay

its eggs upon a plant of potato growing by the side of a *Skimmia* bush, on which it was ovipositing.

From 11 a.m. to 2 p.m. seems to be the usual time both for *E. cardamines* and for *G. rhamni* to lay their ova.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from vol. xviii., p. 185).

GENUS II: PÆCILIMON, Fischer.

This genus contains a large number of apterous, plump species, generally green in colour, of medium or small size, and mostly very locally distributed; the genus is characterised by the transverse sulcus of the pronotum being situated before the middle, and by the hinder margin of the pronotum being rounded. The distinction of the species is very difficult, but there are only four recorded from western Europe, and these are quite distinct.

TABLE OF SPECIES.

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|--|-----------------------|
| 1. Ovipositor about twice as long as pronotum; big species (antennæ ringed with black) | 1. FIEBERI, Ullrich. |
| 1.1. Ovipositor hardly $1\frac{1}{2}$ times as long as pronotum; smaller insects. | |
| 2. Antennæ ringed with black | 2. IONICUS, Kollar. |
| 2.2. Antennæ not ringed with black. | |
| 3. Pronotum ♂ curved down posteriorly, covering the elytra; abdomen with broad black dorsal stripe | 3. LÆVISSIMUS, Fisch. |
| 3.3. Pronotum ♂ arched posteriorly, leaving elytra free; abdomen not striped above | 4. INCERTUS, Targ. |
| 1. PÆCILIMON FIEBERI, Ullrich. | |

Large and stout; antennæ ringed with black; pronotum ♂ constricted anteriorly; legs speckled; colour varies from uniform green to orange, with broad black stripes on pronotum and abdomen. Length of body, 25mm.-30mm. ♂, 25mm.-32mm. ♀; of pronotum, 7mm.-9mm. ♂, 7.5mm.-10mm. ♀; of posterior femora, 18mm.-22mm. ♂ and ♀; of ovipositor, 12mm.-20mm. ♀.

The southern specimens are usually larger than the northern ones. It is widely distributed in the mountains of southeastern Europe; in the south Tirol it occurs at Monte Baldo.

2. PÆCILIMON IONICUS, Kollar.

Distinguished from the preceding by its smaller size and shorter ovipositor, and from the following by the black-ringed antennæ. Length of body, 18mm. ♂, 24mm. ♀; of pronotum, 6mm. ♂, 6.8mm. ♀; of posterior femora, 19mm. ♂, 22mm. ♀; of ovipositor, 10mm. ♀.

An eastern form recorded from Naples and doubtfully from Tessin.

3. PÆCILIMON LÆVISSIMUS, Fischer.

Of medium size; olive-green, varied with reddish; distinguished from the following by the form of the pronotum and the black stripe on the dorsum; from the preceding by the unringed antennæ. Length of body, 16mm. ♂, 20mm. ♀; of pronotum, 5.2mm. ♂, 7mm. ♀; of posterior femora, 16mm. ♂, 19mm. ♀; of ovipositor, 8.5mm. ♀.

Recorded from Messina,

4. PÆCILIMON INCERTUS, Targioni.

Distinguished from the preceding as indicated. Length of body, 19mm. ♂ and ♀; of pronotum, 4.2mm. ♂, 5.5mm. ♀; of posterior femora, 16mm. ♂, 18mm. ♀; of ovipositor, 9mm. ♀.

An Italian species recorded from Savigno in the Italian Riviera, and from Prata Sannita in Calabria.

GENUS III. BARBITISTES, Charpentier.

This genus is distinguished by the cerci of the male, which are bent down strongly and crossed beneath the subgenital lamina.

TABLE OF SPECIES.

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|---|--------------------------|
| 1. Subgenital lamina ♂ with posterior border broad, not pointed. | |
| 2. Subgenital lamina ♂ smooth, not crested. | |
| 3. Subgenital lamina ♂ with hinder border straight, the terminal lobes emarginate on the inner angle. Cerci ♂ smooth. | |
| 4. Cerci ♂ apically hooked; cisalpine species | 1. SERRICAUDA, Fabr. |
| 4.4. Cerci ♂ blunt; transalpine species .. | 2. OBTUSUS, Targ. |
| 3.3. Subgenital lamina ♂ with hinder border round, the terminal lobes rounded on each side; cerci ♂ somewhat thickened at the angle | 3. CONSTRICTUS, Br. |
| 2.2. Subgenital lamina ♂ with a very sharp raised crest. | |
| 3. Colour dark, rarely green, always bright; lower border of crest continuously curved; elytra ♀ strongly punctate with violet radial spot .. | 4. BERENGUIERI, Azam. |
| 3.3. Colour green, not bright; lower border of crest excavate; elytra ♀ finely punctate; entirely green | 5. FISCHERI, Yers. |
| 1.1. Subgenital lamina ♂ with hinder border compressed, pointed; cerci of ♂ hardly crossed | 6. PULCHRIPENNIS, Costa. |

1. BARBITISTES SERRICAUDA, Fabr.

Green, varied with dark reddish, with two yellow bands, more or less distinct, throughout the body. Length of body, 15mm.-17mm. ♂ and ♀; of pronotum, 4mm. ♂, 4.5mm. ♀; of posterior femora, 15mm. ♂, 17mm. ♀; of ovipositor, 10mm.-11mm. ♀.

On shrubs and in clearings in the late summer and autumn in many mountains in central Europe. In France, at Larche in the Basses-Alpes, in the Vosges, and at Beynes near Digne; Mont Doré. In Belgium, at St. Michel in the Ardennes (rare), Chatillon, and near Brussels. It occurs also in south Germany; in the Swiss Jura and central Switzerland, and in the Austrian Alps from the Tirol to Vienna.

2. BARBITISTES OBTUSUS, Targioni.

Differs from the last only in the blunt cerci of the male. Occurs in the south of France at Chabrières near Digne, at the foot of Beyne. In Italy at Cagliari, and Monte Generoso, Tessin, near Mendrisio. In the south Tirol at Bad Ratzes.

3. BARBITISTES CONSTRICTUS, Brunner.

Resembles *B. serricauda*, but smaller, and distinguished by the shorter constricted pronotum and the distinctly rounded lobes of the subgenital lamina of the male. Length of body, 14mm. ♂, 17mm.

♀; of pronotum, 3mm. ♂, 3.5mm. ♀; of posterior femora, 15mm. ♂, 15.5mm. ♀; of ovipositor, 11mm. ♀.

A widely distributed eastern species; it occurs in Silesia at Glogau.

4. BARBITISTES BERENGUIERI, Azam.

Length of body 23mm. ♂, 27mm.-28mm. ♀; of pronotum, 4mm. ♂, 5.5mm.-6mm. ♀; of ovipositor, 10.5mm. ♀.

According to Azam, who defines this species, numerous in the Chênes des Maures in the south of France. Distinguished by the characters given in the table of species.

5. BARBITISTES FISCHERI, Yersin.

This species is readily distinguished by the very distinct and sharp keel along the subgenital lamina of the male. Length of body, 21mm.-22mm. ♂, 22mm.-23mm. ♀; of pronotum, 3mm.-4mm. ♂, 4mm.-5mm. ♀; of posterior femora, 16mm.-21mm. ♂ and ♀; of ovipositor, 10mm.-11mm. ♀.

In France, this species is common near Hyères and Saint Tropez, chiefly on oaks, in the summer. Usually somewhat rare, in 1888 it multiplied so abundantly at the latter locality that it caused serious damage to the vineyards and woods. In Spain it is recorded from Burgos.

Other French localities are Draguignan, Bagnols, Trigance (Var), Chanolles, Chabrières, Allons, Colle Saint Michel.

6. BARBITISTES PULCHRIPENNIS, Costa.

Distinguished from its congeners by the sharply-pointed subgenital lamina of the male; the cerci of the male are but slightly crossed. Length of body, 17mm. ♂, 18mm. ♀; of pronotum, 5mm. ♂ and ♀; of posterior femora, 17mm. ♂, 18mm. ♀; of ovipositor, 8mm. ♀.

An Italian species; Calabria; Voltaggio in the Riviera, San Quirico, Pegli. It occurs on oaks in June and July, but appears to be nowhere common.

(To be continued.)

NOTES ON COLLECTING, Etc.

IMMIGRANT PYRAMEIS CARDUI.—I think we have every prospect of a *P. cardui* year. I found them very plentiful at East Grinstead on May 30th, 1906, flying round thistles, and on the 31st on the downs, near Lewes, they simply swarmed, and seemed to take a delight in flying round me and following me for some distance, the usual thing when one has no net. On June 6th and 7th I also found them very plentiful along the shore of the Sussex coast, where they were disporting themselves in batches of half-a-dozen, flying round each other in circles, or else sunning themselves on a favourite stone on the beach. Taking advantage of the latter habit I succeeded in getting a couple of snap shots. The day was very fine and the sun hot. I should also mention that *P. gamma* was at the time very plentiful on the downs at Lewes on May 31st, mostly resting on low plants, but in nearly every case in a very lethargic condition, and allowing themselves to be handled as though dead, which is rather contrary to what one usually expects with this species, in bright sunshine. They were not in the pink of condition, and a strong westerly wind was blowing at the time. — C. W. COLTHRUP, 127, Barry Road, East Dulwich. June 22nd, 1906.

NOTE ON *NÆNIA TYPICA*.—The larvæ of this insect are very plentiful in the gardens here every year on the leaves of the common flag (*Iris*), but what puzzles me is, where does the perfect insect go to when it takes its flight? I have watched the flowers, and have sugared, with no success, and during seven years' residence here I have never taken it at light. Can any of your readers enlighten me? Of course, I have bred the insect freely.—*IBID.*

LEPIDOPTERA NOTED LATELY AT MUCKING.—After collecting nine seasons in one locality, it is refreshing to turn up new species. This year has not been without its surprises. Last night, one of the hottest of this summer, I netted a magnificent specimen of *Eupithecia succenturiata*, a species which I had never seen alive before. I also took *Cidaria picata*, and a pale form of *Acidalia promutata*, both in perfect condition. In my breeding-cages two specimens of *Lobophora sevalisata*, from larvæ beaten from osiers, and a fine *Amphidasys betularia* var. *doubledayaria* also from a beaten larva. I have added *Syrichthys malvae*, which, of course, I should have taken before.—(REV.) C. R. N. BURROWS, Mucking Vicarage, Essex. June 22nd, 1906.

A SUCCESSFUL TRANSPLANTING EXPERIMENT.—*AGROPHILA TRABEALIS*.—From June 30th to July 2nd, 1903, I was in the Brecksand district, and happened upon a considerable colony of *Agrophila trabealis* (*sulphuralis*). Of the specimens captured, several females laid, as is their wont, a number of eggs, which I brought home to Mucking, with the purpose of rearing them in captivity. These eggs, laid upon July 3rd, hatched on the 11th. Meanwhile, I had noticed the resemblance of my churchyard to the locality from whence my prisoners came, and instead of rearing the little larvæ in confinement, I turned them out amongst abundant foodplant to feed for themselves. In 1904, and again in 1905, I looked in vain for specimens of the insect. But last night a single specimen flew to light, and proved to me that my experiment had not failed. This is the third year that this most local moth has been able to maintain itself in my neighbourhood, and I have every hope that it may get such a hold, that it will remain here for all time. I send this note, not with the sole purpose of advertising *A. trabealis* to the world, but as a warning to entomologists that, if they take the species in these parts, they may know whence it came.—*IBID.*

HELIOTHIS PELTIGERA IN ESSEX.—I was walking round my garden after dark on July 1st last, chiefly boxing *Aplecta advena* from valerian flowers. At 10.20, just as I was going indoors, I was amazed to see a specimen of *H. peltigera* flitting gently and prettily from flower to flower (of valerian). I determined not to risk boxing it, and rushed precipitately indoors for my net. Luckily, on my return, the moth was just where I left it, and was hanging down from a flower which evidently afforded it a plentiful supply of nectar. In the net it was rather lively, but I boxed it without injury and found it to be a fine female. As a number of *Sesia stellatarum* had appeared on the scene on the morning of the same day, I quite think *H. peltigera* was also an immigrant, brought over by the prevailing north wind. If it is not new to Essex, there are, at any rate, no recent records of its occurrence in the county.—(REV.) G. H. RAYNOR, Hazeleigh Rectory, Maldon. July 3rd, 1906.

ORIENTATION OF CALLOPHRYS RUBI.—Dr. Chapman (*antea*, p. 169) has, to some extent, anticipated me in an observation which I intended to put on record, but, although he speaks from a wide experience and I only of a single specific instance, I do not think he has rendered my note entirely superfluous. On June 5th, while staying at Westwell, in Kent, I chanced to get a specimen of *Callophrys rubi*, which I had netted, to “settle” (in exactly Dr. Chapman’s sense), on my forefinger, and to remain there a minute or two. Noticing the “twist and twinkle,” resulting in vertical exposure of the undersurface to the sun, and remembering Dr. Longstaff’s observations*, it occurred to me to move my finger gently in such a way as to reverse the conditions, *i.e.*, to expose the butterfly horizontally to the sun. Immediately, though without undue haste, it turned round to regain the position it had chosen. I repeated the experiment six or eight times (I neglected to keep count) before it finally flew away, and each time with the same result. This convinces one that the attitude is one of real importance, and, though I do not pretend to decide between the rival theories of maximum warmth and cryptic effect, my own leanings are towards the latter view. It is at least interesting that *C. rubi*, resting among leaves where it has little to fear from its own shadow, settles in a position quite antithetical to that assumed by certain ground-resting Satyrids and others which reduce their shadow to “insignificant dimensions.”—LOUIS B. PROUT. *July 1st, 1906.*

THE LARVA OF PLEBEIUS ARGUS (ÆGON) ATTENDED BY ANTS.—It may interest your readers to know that the chief foodplant of *Plebeius argus* (*ægon*) in South France, appears to be *Dorycnium suffruticosum*. I beat some green Lycænid larvæ from this plant, in the Ste. Maxime range of mountains, in May last, which had a dull crimson dorsal line. They pupated in due course, and now have emerged as this species. This “blue” is common in the Alpes-Maritimes and places where the *Dorycnium* grows, and the butterflies are always to be seen flying around the plants. Ants attended the larvæ, which had quite tall processes on the 8th abdominal segments. They keep those two little tubes out until an ant touches them with its antennæ, when they draw them in, shooting them out again as soon as the ant passes on. The larvæ, however, progress all right when deprived of the ants, and they have another way, I fancy, of getting rid of the secretion from these glands. I hope to make fuller observations another year.—H. POWELL, F.E.S., Poste-Restante, Entrevaux, Basses-Alpes. *June 26th, 1906.*

OLEOPTERA.

DONACIA OBSCURA, IN THE NORFOLK BROADS.—Mr. F. Balfour-Browne having shown me specimens of *Donacia obscura* he took last year at Sutton Broad, I went down this June to try for it. My friend, Mr. Chitty, who was down there collecting water-beetles, joined me. The first day we were unsuccessful, much sweeping and searching failed to produce the insect; the following other species of *Donacia*, however, were found: *D. crassicollis* (common), *D. versicolor*, *D. dentipes*, *D. vulgaris*, *D. cinerea* (common), *D. clavipes* (very common), *D. thalassina*, *D. nigra*, *D. impressa*, and *D. sericea*. The next day, Mr. Chitty having

* “Some Rest-attitudes of Butterflies: Heliotropism” (*Trans. Ent. Soc. Lond.*, 1906, pp. 97-106).

swept a pair of *D. obscura*, in cop., from the side of a dyke, serious search began, and eventually I ran the insect down in a ditch near by. The beetles were on and about the flower-heads of *Carex rostrata*, and by moving the *Carex*, etc., and looking in the water beneath, we each took our series. I would, therefore, advise any coleopterist, who may be looking for this beetle, to look out for *Carex rostrata* in flower, and to examine the water beneath, as the insects drop readily, and can be found on the surface of the water. It is of interest to record the fact that Mr. Balfour-Browne took a ♂ *D. clavipes*, in cop. with ♀ *D. obscura*. This extends the knowledge of the distribution of this rare species in Britain. Fowler gives Arundel; Maberley, Cheshire and Scotland; and to this must be added West Meath and Cork, Ireland (Yerbury and Kemp); Little Salkeld, Cumberland (Britten), and Sutton Broad, Norfolk (Balfour-Browne). — HORACE DONISTHORPE, F.E.S., 58, Kensington Mansions, S.W. June 21st, 1906.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—June 14th, 1906.—EXHIBITS.—EUCLIDIA MI AND E. GLYPHICA.—Specimens taken recently in his own garden at Ashtead, Mr. West. PIERIS BRASSICÆ.—A batch of 39 pupæ, formed upon a tumbler, which had been placed among the larvæ in the breeding-cage. Light and dark pupæ were intermixed at random, Mr. A. Sich. PORRITIA GALACTODACTYLA.—Pupæ from Horsley, Mr. Carr. PACHETRA LEUCOPHÆA OVA.—Clusters of eggs found at night upon grass stems, with the mother sitting just above them, Mr. Tonge. PHRYXUS LIVORNICA AND OTHER IMMIGRANTS.—Several members reported the occurrence of the species in Britain, and also of *Pyrameis cardui* and *Plusia gamma* in some parts of the south, from whence they appeared to spread. RAPHDIA NOTATA AND PANORPA GERMANICA.—A ♀ of the former taken at the Black Pond, Esher, and a very sparsely marked example of the latter captured at Haslemere, Mr. Lucas.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—May 1st, 1906.—EXHIBITS.—Preserved larvæ of ACIDALIA DEGENERARIA, SESIA CHRYSIDI-FORMIS, and MELITÆA ARTEMIS, Rev. C. R. N. Burrows. ORGYIA GONOSTIGMA.—First brood, bred from wild larvæ in July, 1905, and second brood, which emerged in September and October of the same year, all from the Essex locality, Mr. W. J. Kaye. HYBERNIA PROGEMMARIA var. FUSCATA, and melanic PHIGALIA PEDARIA (PILOSARIA), both from Saltaire, Mr. V. E. Shaw. The Rev. C. R. Burrows reported that he had bred CELASTRINA ARGIOLUS this spring, from ova laid in the spring of last year, the insects having passed the time of the autumn emergence. June 4th, 1906.—EXHIBITS.—EUVANESSA ANTIOPA, larvæ in the last stadium, from the south of France, Dr. T. A. Chapman. HEMEROPHILA ABRUPTARIA.—A series darker than the usual London form bred from light parents, themselves the offspring of a crossing between light and dark forms, Mr. E. Harris. PLUSIA MONETA.—A cocoon, about twice the usual length, and open at both ends. FIDONIA ATOMARIA.—A specimen with two extra rudimentary wings, Mr. C. P. Pickett; Mr. Pickett reported that he had obtained 50 ova from a pairing between SMERINTHUS OCELLATA and MIMAS TILIE. June 18th, 1906.—EXHIBITS.—PYRAMEIS CARDUI.—Larva reared on burdock, which apparently bore out the suggestion, made by Dr. Chapman, that the larva of this species is more densely covered with hairs in the last stadium, when fed upon

this pabulum, as compared with those fed upon thistle, Mr. A. Bacot. *SESIA CULICIFORMIS*.—An Essex specimen, with the belt white instead of red. *TÆNICAMPA OPIMA*.—From an Essex locality, where the ground had been burned over some years since. The specimens were of much lighter coloration than those taken shortly after the fire, suggesting response to environment by some more rapid process than selection, Mr. A. W. Mera. *MIMAS TILIE*.—A rust-red specimen; *AMORPHA POPULI*, with lilac-tinted bloom; and *ADSCITA GERON*, from the Chiltern Hills, Mr. C. P. Pickett.

CURRENT NOTES.

Mr. W. Denison Roebuck, 259, Hyde Park Road, Leeds, would be pleased to have any records of Yorkshire hymenoptera that entomologists are able to send him, for a forthcoming new list which is in preparation. Full data are desirable wherever possible.

There are some very spiteful remarks being published in *Ent. News*, concerning Dr. H. G. Dyar. We know Dr. Dyar's excellent work and we do not think his traducers improve their entomological position by such amazing pettiness; one is inclined to suspect the science of people whose manners are bad and spitefulness evident.

Mr. W. G. Wright, whose just-finished book *The Butterflies of the West Coast of North America*, was in the hands of the publisher, has had everything destroyed in the recent San Francisco holocaust—book, original blocks, stereotype plates—everything has been annihilated.

Mr. E. B. Williamson, who some years ago questioned the accuracy of the orthodox explanation as to the manner in which the ♂ dragonfly grasps the ♀ during copulation, has published some very interesting notes on the subject in *Ent. News*, xvii., pp. 143 *et seq.*

The Société Entomologique de Belgique has reached its jubilee this year. In commemoration thereof the Society determined to publish a "Jubilee Volume," and this has just come to hand. The various memoirs included are—"Diptères de la Belgique," by J. C. Jacobs; "Recherches sur les deux *Pseudocuma* de la Mer Flamande," by Gustave Gilson; "Une chasse de nuit en 1859," by L. Becker; "Histoire naturelle de *Hypoplectes adpersaria*, Hb.," by L. J. L. Lambillion; "Notes pour la classification des Diptères," by Aug. Lameere; "Le Macroglosse (observations et expériences)," by Félix Plateau; "Notes pour servir à l'étude des Hydrachnides de Belgique," by E. Rousseau; "Catalogue des Aphides de Belgique," by H. Schouteden; "Un Nouveau Collembole Marin (*Anuridella marina*)," by V. Willem. The parts, however, that will interest the general entomologist are the discourse of M. E. Fologne, the President, and one of the foundation members, and that of Aug. Lameere, the well-known Vice-president. These give not only a resumé of the Society's work and position fifty years ago, but also considerable historical detail relating to the evolution of entomological work in Belgium during the last half-century, a period full of the most striking advance in all branches of biological science, an advance in which the society has fully shared, and the work of whose members has done much towards a thorough knowledge, not only of the fauna of the home country, but also of those countries into which its members have, for various purposes, found their way. May the society live long and increase in prosperity are our heartiest wishes.

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EXCHANGES.—*The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of address" is open free to subscribers so far as there is space available.*

Duplicates.—Larvæ or pupæ of *Io*, *Atalanta*. *Desiderata*.—Many species to renew.—J. Ovenden, Frindsbury Road, Rochester.

Duplicates.—Larvæ: *Oblivaria* (*rufata*), *Betularia*.—V. E. Shaw, 20, Salisbury Road, Bexley, Kent.

FOR EXCHANGE.—Parts I-XI *British Butterflies* (J. W. Tutt) in exchange for good, set, Lepidoptera.—F. Blanchford, 16, Jubilee Street, St. Leonards, Exeter.

WANTED FOR PHOTOGRAPHING.—Fertile ova of *Machaon*, *Aporia cratrægi*, *Hyale*, *Sinapis*, *Euphrosyne*, *Latona*, *Polychloros*, *C-album*, *Sibylla*, *Iris*, *Epiphron*, *Hyperanthus*, *Typhon*, *Betulæ*, *W-album*, *T. quercus*, *Argiades*, *Semiargus*, *Arion*, *Thaumas*, also *Plexippus*, *C. dispar* (*rutilus*), *Bœtica*, and fullfed larvæ and pupæ of most butterflies in the British list. Will be returned uninjured if desired, or paid for at current prices.—A. E. Tonge, Aincroft, Reigate, Surrey.

WANTED.—Observations on the egg-laying of *Thecla quercus* and other Theclids.—J. W. Tutt, 119, Westcombe Hill, S.E.

WANTED COLEOPHORIDS.—Cases and larvæ, particularly those of the *palliatella* group, with pistol-shaped cases. Any cases found during March and April, would be particularly acceptable, as very little is known of the wintering cases. Records of captures and localities are also of use. I shall be pleased to do what I can in return.—Hy. J. Turner, 98, Drakefell Road, New Cross, London, S.E.

Desiderata.—Cicindelidæ (Tiger Beetles) of the entire globe desired, in exchange for insects of North America. I offer many of our rarest species in first-class condition.—H. F. Wickham, State University, Iowa City, Iowa, U.S.A.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. October 3rd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. September 3rd, Exhibition. Outings; July 22nd, Coulsdon, 10.25 a.m., Cannon Street; July 28th, Loughton, 2.41 p.m., Liverpool Street; September 1st, Abbey Wood, 2.32 p.m., Cannon Street; September 9th, Bromley, 9.51 a.m., from Ludgate Hill.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m.; July 26th, Collecting Reports; August 9th, August 23rd; September 8th, Field Meeting, Sevenoaks (S.E.R.); September 13th, Paper and Exhibits.

North London Natural History Society, The Amherst Club, Amherst Road, N., at 7.45 p.m. September 1st, Excursion, Burnham Beeches, Paddington, 2.38 p.m.; September 11th, September 25th, September 29th, Excursion to Epping Forest, Liverpool Street, 1.35 p.m.

Lancashire and Cheshire Entomological Society.—Royal Institution, Liverpool. Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained. (No dates received.)

Birmingham Entomological Society, Norwich Union Chambers, Congreve Street, at 8 p.m. October 15th.

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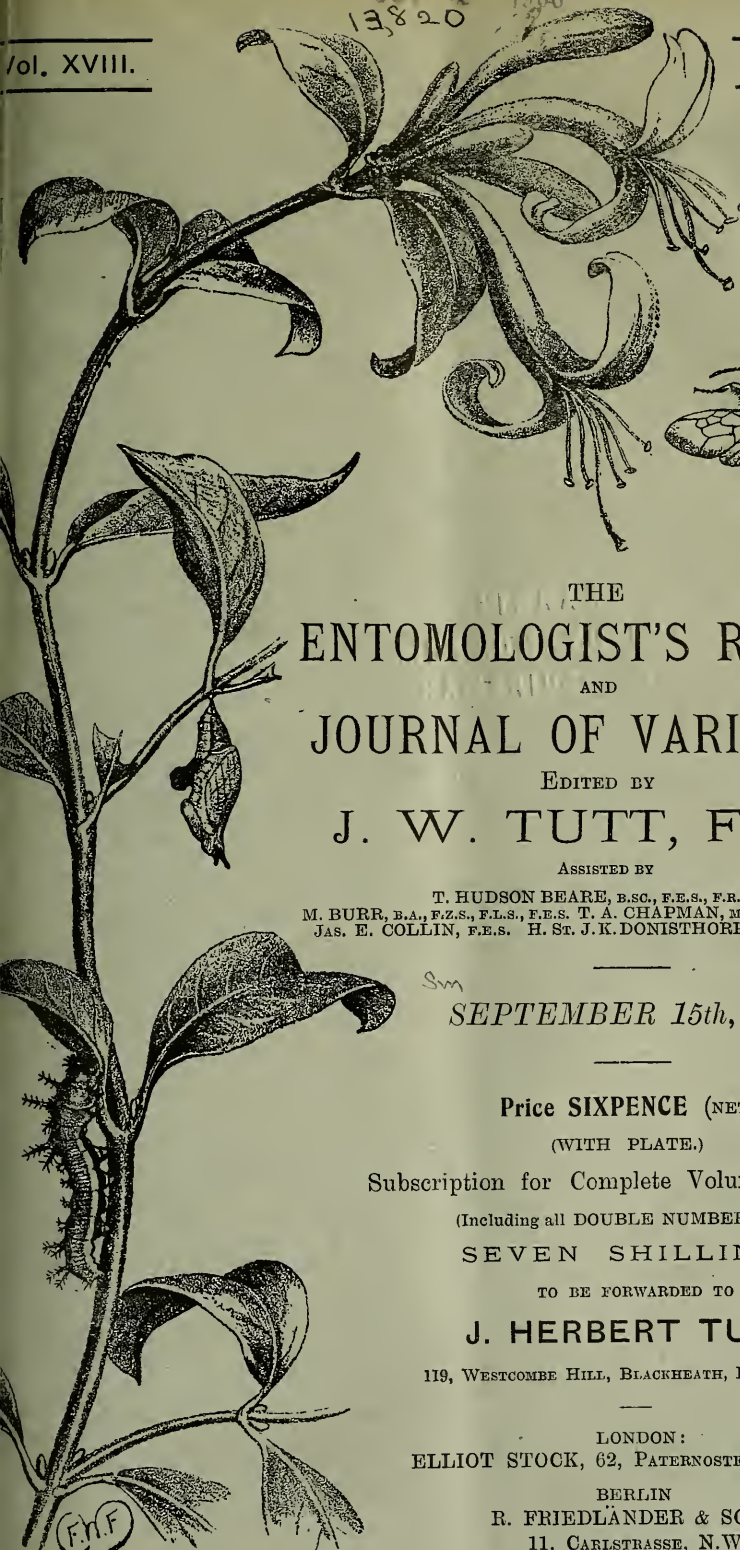
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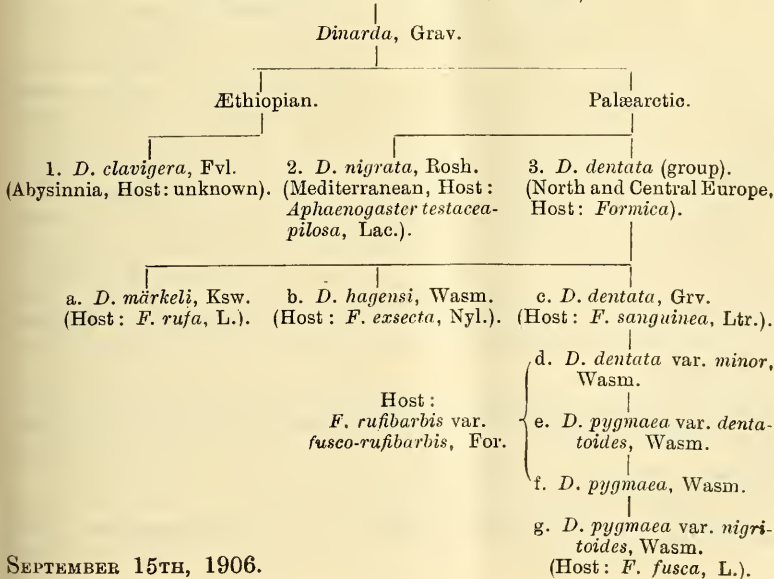
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Dinarda pygmaea, Wasmann (Deutsch. Ent. Zeit., 1894, p. 277), a species of Myrmecophilous Coleoptera new to Britain.

By HORACE ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

Having heard that it has been asserted that *Dinarda hagensi* is the same species as *D. dentata*, or at least, as the beetle taken by Mr. Keys in Cornwall, two or three years back, and which was named *D. dentata* for him, and the ant with which it was taken *Formica fusca*, I compared *Dinarda hagensi* with my Woking specimens of *Dinarda dentata*, and of course, found them distinct species, as I had done before with my Wellington College *D. dentata*. It then occurred to me that I had got a specimen of Mr. Keys' insect which he had kindly given me, and which I had put into one of my "ants'-nest drawers." On comparing this with *D. hagensi* and *D. dentata*, I found it was quite distinct from both of them, so I at once sent it to Father Wasmann, and told him it had been taken with *Formica fusca*; also that *Atemeles paradoxus* had been taken in the same nests both by Mr. Keys and myself. He returned it to me as *Dinarda pygmaea*, Wasmann. He pointed out, however, that *Atemeles paradoxus* does not occur with *Formica fusca* (and neither, of course, does *Dinarda dentata*), but both it and *Dinarda pygmaea* are found with *Formica rufibarbis* var. *fusco-rufibarbis*, For. Mr. Keys, on hearing from me, went to get some of the ants, and he sent me specimens from three of the nests, which I sent on to Father Wasmann, and they are all *Formica rufibarbis* var. *fusco-rufibarbis*, For. This is exactly what was to be expected, as true ants'-nest beetles are exceedingly constant in keeping to their own hosts, a point which one begins to appreciate after a good many years collecting in ants' nests, and which I should like to impress upon coleopterists. When one does get a species away from its own hosts, it is only by chance, and singly. The following is a table showing the relationship of the *Dinarda* family and their hosts:—

ANCESTRAL TYPE OF DINARDINI (UNKNOWN).



Mr. Keys is to be congratulated on his capture of this interesting addition to our list. We now possess four species of *Dinarda*—*D. märkeli*, Ksw., found with *F. rufa*; *D. dentata*, Grv., found with *F. sanguinea*, *D. hagensi*, Wasm., found with *F. exsecta*, and *D. pygmaea*, Wasm., found with *F. rufibarbis* var. *fusco-rufibarbis*, For. *D. pygmaea* is the smallest of the four species. In the other three species, the thorax is distinctly broader than the elytra, whereas, in *D. pygmaea*, it is not appreciably so. *Formica rufibarbis* var. *fusco-rufibarbis* must occur in the Isle of Wight, as *Atemeles paradoxus* has been taken there. British records of both *Atemeles paradoxus* and *Dinarda dentata* with *F. fusca* must now be corrected.

Practical Hints relating to the Eupitheciids.*

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

(Concluded from p. 204.)

The imago of *Eupithecia tamarisciata* emerges in May and June, and is to be disturbed during the daytime from its foodplant, or the herbage in its vicinity, amongst which it hides.

The larva of *Eupithecia innotata* is to be obtained from August to October on the flowers of *Artemisia maritima* in the coast districts. It is also to be reared on *Artemisia campestris*, *A. vulgaris*, and *A. absinthium*, on all of which it is an exceedingly common insect in central Europe.

The imago of *Eupithecia innotata* is to be obtained in late June and July, but is rarely seen, hiding by day in the herbage near its foodplant, and flying at late dusk over, or in, the neighbourhood of the latter.

The larva of *Eupithecia subnotata* is to be found in August and September feeding on the buds, flowers, and seeds of *Chenopodium album*, *C. olidum*, *Atriplex patula*, and other Chenopodiaceous plants; it remains on the plants during the daytime, but is more active by night, and may then be easily found by searching or beating.

The imago of *Eupithecia subnotata* is to be obtained from late June till early August; it hides during the day among its foodplant and can rarely be disturbed, but just before dark it flies rapidly over the masses of *Chenopodium* that collect on waste places, when it may be easily netted, or, later, the moths can be boxed off the leaves and flowers as they run over the plants apparently preparatory to egg-laying.

The larva of *Eupithecia campanulata* is to be found in August and the beginning of September on the unripe seeds and seed-capsules of *Campanula trachelium*, as well as in gardens on *Campanula latifolia*, *C. media*, *C. persicaefolia*, and many other *Campanula* species. The withered blossoms and seed-capsules may be collected in a district where the species is known to occur, or the larvæ may be beaten into an umbrella.

The imago of *Eupithecia campanulata* is rarely seen; hides most successfully by day, but flies over its foodplant at late dusk, or is to be found on the flowers of *Campanula trachelium*, etc., egg-laying. Even then the moth is very rarely seen.

* For further "Hints," see *Practical Hints for the Field Lepidopterist*, I, II, and III.

The slender larva of *Eupithecia vulgata*, our commonest species, is to be found in June and July, and again as a second brood in August and September, on ragwort, golden-rod, hawthorn, willow, bramble, raspberry, etc., feeding chiefly on the leaves, but also on the flowers; it is, in fact, a most general feeder.

The imago of *Eupithecia vulgata* is to be seen almost everywhere in May and June, and much more rarely again in August, resting on fences, palings, in fact almost anywhere. Its natural time of flight is in the late evening, by hedgesides, in gardens, etc. It sometimes swarms at light.

The wrinkled yellow larva of *Eupithecia expallidata* is to be found in September and October, on the flowers of golden-rod, preferring the scattered plants growing in open places in woods, or by the sides of the wide open ridings passing through. In confinement it will eat Michæmas daisy. There are rarely more than one or two larvæ on a plant, and these appear to be best obtained by beating the golden-rod on the sides of an umbrella.

The imago of *Eupithecia expallidata* is to be found on the wing from late June until August. It is not often seen by day, hiding successfully among the herbage near its foodplant, and being rarely disturbed, but at dusk it is more active, and, after dark, is often to be found flying over, or settling upon, the blossoms of golden-rod, heather, ragwort, etc., on the nectar of which it appears to feed greedily, its tongue deep in the nectar of a floret, and its wings standing upright over its back, when it can be taken with the fingers quite easily.

The larva of *Eupithecia absynthiata* is to be obtained from August until November upon the flowers of *Senecio jacobaea*, *S. erucifolia*, *Solidago virgaurea*, *Eupatorium cannabinum*, *Artemisia vulgaris*, *Achillea millefolium*, etc. It may sometimes be beaten into an umbrella in great numbers from ragwort flowers in September, pupating on the surface of the ground, and emerging the next spring without trouble.

The imago of *Eupithecia absynthiata* emerges in June and July, is sometimes to be found sparingly at rest on fences, etc., near its foodplants, or disturbed from among the herbage and wildflowers growing among them, although always very scarce compared with the abundance of the larvæ. After dusk it is sometimes to be taken freely whilst feeding on the nectar of the flowers of various composite plants.

The short, thick, larva of *Eupithecia minutata* is to be found in August and September on the blossoms and seeds of *Calluna vulgaris* and *Erica tetralix*, on which it is locally common, and may be obtained by sweeping.

The imago of *Eupithecia minutata* is to be found by day by walking through the heather, but is much more abundant at dusk, when on the wing, flying over the same plant, in June and July.

The slender larva of *Eupithecia assimilata* is to be found in June and July, and again in September and October as a partial second-brood, on black- and red-currant bushes in gardens, or in hedges on wild hop.

The imago of *Eupithecia assimilata* is sometimes to be found commonly on the fences of gardens where currant bushes are still in existence, or it may be beaten out of hedges in the daytime, where wild hop grows; at night it comes freely to flowers, and also to light.

The larva of *Eupithecia jasioneata* is very like that of *E. campanulata*, and is to be found in August and September in the seedheads of *Jasione montana*, forming a chamber in the seedhead by eating away the inner portion and hiding in the cavity thus formed; sometimes it feeds exposed on the surface of the flower-head, burying its head deeply into the cavity, which it then forms on the surface.

The imago of *Eupithecia jasioneata*, very like that of *E. castigata*, is on the wing in May and June, hiding by day among its foodplant, and flying by night, when oviposition seems to take place. At present it appears to be confined to the southwest counties of England, and the southern counties of Ireland, though possibly much overlooked.

The larva of *Eupithecia tenuiata* is to be found from mid-March to early May, feeding in the catkins of *Salix caprea*, *S. cinerea*, etc., and is best obtained by collecting the catkins, and keeping them in bags, when they will pupate in due course, and the moths emerge in abundance.

The imago of *Eupithecia tenuiata* is to be obtained in May and June, being sometimes disturbed in moderate numbers during the daytime by beating, either from the willow-bushes or the herbage beneath them. At dusk, however, it may be taken in abundance, flying quickly round the tops of the willow-bushes, and not at all difficult to see or net.

The larva of *Eupithecia subciliata* is to be captured in April and May, and is best obtained by beating maple-trees, with an abundance of flowers, into an umbrella or beating-tray. The larva lives on the blossoms, and only eats the leaves when the former are no longer available.

The imago of *Eupithecia subciliata* is on the wing in July and August; it rests by day on the undersides of the branches or the trunks, or beneath the leaves of maples, flying off rapidly to the ground if disturbed; sometimes obtained in numbers by gently beating large trees.

The larva of *Eupithecia dodoneata* is to be obtained in June and July, on oak and hawthorn, feeding on the young, newly-formed, and just expanding, leaves, and affecting the evergreen, as well as the common, oak.

The imago of *Eupithecia dodoneata* is to be obtained in May, and the beginning of June, resting by day on the branches of an oak or large hawthorn, from which it may be dislodged by a smart blow from a beating-stick, usually flying to the ground and being readily captured. At dusk, it flies about the trees, and may then be taken by standing so that as it flies it comes between the collector and the sky.

The larva of *Eupithecia abbreviata* is to be beaten in June and July, when it is not uncommon, feeding in the most ordinary way on the leaves of oak, preferring trees in large oak-woods.

The imago of *Eupithecia abbreviata* is to be taken in April and May, in oakwoods; by day it rests on the branch of an oaktree, when a sharp blow from the beating-stick will dislodge it, and it will gently flutter away, usually making for the ground. Barrett observes that other trees are sometimes chosen for rest, and he has seen quite a number of moths congregate under the branches of beech, where the oak-trees are not provided with suitable horizontal branches to allow them to indulge their usual habit.

The larva of *Eupithecia esiguata* is to be found in September and

October, and seems to be a general feeder, having been recorded from hawthorn, currant, dogwood, and snowberry, feeding on the leaves.

The imago of *Eupithecia exiguata* is on the wing in May and June, resting by day on the trunks and branches of hawthorn and other trees, posts, fences, and, if disturbed, flies away quickly and often escapes. At dusk it is on the wing naturally, and may sometimes be netted flying round trees, or along hedgesides, but, although widely distributed, never seems to be very abundant.

The larva of *Eupithecia sobrinata* is to be beaten from juniper bushes throughout the spring, April and May, clinging tightly to its foodplant, and wanting considerable force to dislodge it.

The imago of *Eupithecia sobrinata* flies about the juniper bushes in bright sunshine, or rests thereon so lightly that it is most easily disturbed. Its natural time of flight, however, is at late dusk, when it is sometimes very abundant. The small light Scotch examples which are found by searching the stems of the juniper bushes in Perthshire, etc., are very beautiful, and another supposed local form, also light, but of full size, is to be disturbed from the juniper bushes growing near the cliffs at Dover. It is on the wing from late July until October in one long drawn-out brood.

The larva of *Eupithecia debiliata* is to be found in April and May, feeding up between the united leaves of *Vaccinium myrtillus*.

The imago of *Eupithecia debiliata* is on the wing in June and July, when it may be found resting by day on the trunks of trees that grow in the vicinity of its foodplant, from which it may be disturbed by means of the beating-stick. It flies naturally at dusk, and in its local haunts may sometimes be taken in abundance.

The variable larva of *Eupithecia coronata* is to be found in June and July, a partial second-brood from August till November, on flowers of *Clematis vitalba*, *Solidago virgaurea*, *Eupatorium cannabinum*, and many other plants.

The imago of *Eupithecia coronata* is to be found from April to June, and again as a partial second-brood in August, resting by day on tree-trunks in the neighbourhood of *Clematis*, etc., or hiding in the thick bushes near, when it may be dislodged by the beating-stick. At dusk it may be taken flying about bushes and hedges over which *Clematis* is growing.

The larva of *Eupithecia rectangulata* is to be found in April and May, in the blossoms of apple (wild and cultivated), drawing the petals together and feeding inside the tent thus formed. It may sometimes be collected in large numbers in orchards.

The imago of *Eupithecia rectangulata* is to be found by day in June, resting on the trunks of apple-trees, or on fences or other suitable places in their vicinity. At dusk the moths fly very freely, sometimes in little swarms around the ends of the branches of the apple-trees, when they may be easily netted.

The larva of *Eupithecia pumilata* is to be found from May-June, July and September, probably as three broods, on the blossoms of furze, hawthorn, mountain-ash, holly, clematis, etc.

The imago of *Eupithecia pumilata* is to be found in April, May-June, and again in July-August, and may be disturbed by day from among its hiding-places by means of the beating-stick, or it may be

found on trunks, posts, and suitable places near its foodplants, whilst sometimes it is to be found on warm sunny days on the wing.

The larva of *Collia sparsata* is to be found in August and September on *Lysimachia vulgaris*, feeding upon the blossoms and leaves and hiding by day beneath the leaves, especially of plants sheltered by bushes of hallow, buckthorn, etc.

The imago of *Collia sparsata* is to be found in July, and is difficult to obtain during the daytime, but, at dusk, in its haunts on Wicken Fen, among bushes of willow and buckthorn near its foodplant, it is sometimes to be taken in the greatest profusion.

Collective Inquiry as to Progressive Melanism in Lepidoptera.

SUMMARY OF EVIDENCE PREPARED BY L. DONCASTER, M.A.

(Continued from p. 208.)

AMPHIDASYS BETULARIA (continued).—Derby (Payne), Market Drayton, Cannock Chase (Woodforde), Birmingham (Wainwright), Hereford (Hutchinson), both type and black. Shropshire, light prevalent, intermediates and black scarce (Newnham, Hill). London district: Black occurred, 1897, still scarce (Mera, Bacot, Hewitt). Farnborough, Reigate, Leatherhead, Sussex, Stroud, Bristol, Marlborough, Teignmouth, black not observed (Hewitt, Prideaux, Davis, Meyrick, Christy). One black, Croydon 1906 (Gower). On the Continent: Romsdorf (Rhenish Prussia), black now prevalent, intermediates common, light scarce. The dark forms appeared about 1888, and full blacks occurred from the first (Haverkamp). Crefeld: Black, very rare in early eighties, in 1895-6, about 50%. Varies in number from year to year. Intermediates bred from black ♀, in addition to type and black (Crefeld, *Naturf. Verein*, 1895-6, p. 25). Loreley district, only type, 1897. Berlin: Black appeared 1903, still very scarce (Kloos). Belgium: Intermediates recorded 1886 and 1894 [Refs. given Bateson, *Sci. Progress*, vi., p. 561]. Breeding.—Brentwood: Black ♀ × type ♂ gave 123 type, 109 black (Bacot). Woodford: Type ♀ × black ♂, gave 57 type, 47 black (Main and Harrison, *Proc. Ent. Soc. Lond.*, 1905, p. vi). Worthing: Black ♀ × type ♂, gave 18 type, 11 black (Fletcher. See Bateson, *Sci. Progress*, 1898, vii., p. 13). Harrison and Bacot, *Trans. City Lond. Ent. Soc.*, 1905, p. 5, black ♂ × type ♀, gave 57 type, 50 black; type ♂ × black ♀, gave 123 type, 109 black. Lynn: Offspring of black pair, all black (Baker). From two black parents (3 grandparents black, 4th unknown), about two-thirds of offspring were black (Bankes, *Ent. Rec.*, vii., p. 181). Intermediates recorded in addition to type and black, at Rotherham (Brooks, 1887), Essex (Williams, *Proc. Ent. Soc.*, 1898, p. xxxvi), and Crefeld. London, 1902, type ♂ × black ♀ with some white scales, gave 13 moths, all with black bodies, forewings black, dusted with white, hindwings light (Carr).

VENUSIA CAMBERICA.—There are two distinct dark varieties of this species. In South Yorkshire, an evenly smoky form, with dark hindwings, occurs; in North Yorkshire, a form with the hindwings light, the forewings suffused with black, leaving more or less conspicuous pale rays towards the outer margin. In Scotland (Gordon, Horne, Barrett), Ireland (Barrett), Northumberland, Durham (Rosie, Robson), East Riding (Hewett), Staffordshire (Woodforde), Sussex

and the Continent (Barrett), only the pale form is recorded. At Sheffield about 90% are now of the smoky type, at Doncaster about 50% (Brady). This form has only been observed in recent years; it has also occurred at Burnley (Lancashire) (Clutton). Great Ayton (North Yorkshire), the form with black suffusion is not rare, but less common than the type (Lofthouse).

ACIDALIA AVERSATA.—The banded and plain varieties are constantly found together throughout the range of the species, but their relative frequency varies in different places. The form with a reddish ground colour is found especially in the eastern counties (Barrett). In London a form occurs which has the wings thickly dusted with black scales (Barrett); this type seems to be found more frequently in London than elsewhere, but is recorded from the New Forest (Christy), and Scotland (Gordon). From a plain ♀ were bred about equal numbers of plain and banded (Adkin). From a ♀ thickly dusted with dark scales were bred 3 very dark, 2 like parent, 2 banded and sprinkled with dark scales, 2 plain, 1 buff (Christy).

EUPITHECIA RECTANGULATA.—Only light (green and pale brown) recorded from Rutland (Snowden), Colchester (Harwood), Suffolk (Clutton), Lynn (Baker), Dalton, near Hartlepool (Robson), Wigtonshire (Gordon). At Norwich (Pitman), Cambridge (Farren), Farnborough (Hewitt), Stroud (Davis), Bude (Brady), the species varies from green to very dark. At Newcastle (Robson), and in Cheshire (Arkle, Tait), only dark forms, probably not extreme black. In the London district — Lee (Fenn), Brixton (Adkin), Hammersmith, Catford (Hewitt), etc., the black form is now prevalent, especially in the south of London. Sixty years ago the light forms were prevalent, but have now disappeared more or less completely, in some districts (Fenn).

CAMPTOGRAMMA BILINEATA (not included in the 1904 list).—The typical form is prevalent over the whole of England. Accompanying it are found forms in which there is a dark clouding of the central band of varying intensity; such forms are rare in the south and east, commoner in the north and west, and more frequent near the coast than inland (Barrett). In Scotland, both south and north, specimens with the dark central band are common and prevalent, but the depth of colour and arrangement of the clouding vary with locality. This form is also found in Scilly (Adkin), and in Ireland, especially in the west, and a sooty-black form occurs in islands off the west coast (var. *isolata*) (Kane).

TEPHROSIA CONSONARIA.—Mr. E. Goodwin has discovered a melanic variety near Maidstone, in a district some miles from any town or factory smoke. It was first taken about 1892, and has occurred every year since. The male is a deep brownish-black, the female black. The dark form is less common than the type. Ova obtained from normal females in the affected district yield about 10% of melanics; ova from black females yield from 30%-75% of melanics, averaging about 50%. Black ♀ × black ♂ gave 38 black, and 4 typical. No other records have been received of melanism in this species, but it is well-known in the allied *T. biundularia*, both in the north and in South Wales.

T. CONSORTARIA.—In the same locality Mr. Goodwin has taken melanic *T. consortaria*, with dark grey ground colour. This form is scarce, but has occurred for several years. Ova from dark females

have given all the offspring dark, from normal females all the offspring normal.

ACRONYCTA PSI.—The typical form is prevalent or exclusive over the whole of England, except the London district. In London and its neighbourhood a dark grey form occurs, and in parts of the district the light form is not found. The dark form is reported as occurring rarely in Wigtownshire (Gordon), Linlithgow (Hewett), York (Hewett), Market Drayton (Woodforde), Cheshire (Arkle), Cambridge (Farren), Colchester (Harwood) (at the two latter places only within the last 20 years), Farnborough (Hewitt), an intermediate form is reported from Deal (Colthrop). London district—only dark for 35 years, perhaps darker now than 35 years ago (Mera), Dulwich, all melanic (Colthrop), Lee, dark common, light still occurs, but more rarely than 50 years ago (Fenn).

XYLOPHASIA POLYODON (MONOGLYPHA).—In the south and midlands the typical light form is prevalent, with some variation in depth of colour. Over the whole of Scotland, in Ireland, especially in the west, and in the northern counties of England, every grade from light to black is found. According to Barrett the black variety was first described from Scotland in 1857, but there is no evidence of its origin. Records of its increase in frequency are given from Paisley, Hartlepool, and less certainly from Huddersfield. Scotland—Loch Earn, type commoner than black (1892, Doncaster). Near Arisaig, it varies from light to black, dark intermediates prevalent (Doncaster). Wigtownshire, light occurs, intermediates prevalent, brown-black generally with lines visible, common, full black less common (Gordon). Paisley, light to black, dark intermediates prevalent; the dark forms became commoner between 1890 and 1896, but were found on the moors in the neighbourhood before 1890 (Stewart). Ireland—dark and black forms widely spread, especially on west coast (Kane, Tutt). Donegal, varies from light to black, dark forms numerous (Johnson). England—Newcastle and Tyne valley, light common, intermediate prevalent, black about 4%, found especially nearer the city (Rosie). Hartlepool, light, medium, dark, black, all common; black unknown 50 years ago, not common 20 years ago; now as many can be taken in one night as in a season 20 years ago (Robson). Yorkshire, ranges from light to very dark, latter occurs more or less all over the county, including Hull (Hewett), Huddersfield, dark prevalent, black about 4% (Porritt), Leeds (Wigin), York (Hewett), black rare, Giggleswick (Podmore), 4 black in several hundreds, Sheffield, full black rare or absent (Doncaster, Brady). Lancashire, Burnley, black perhaps 5% (Clutton), Grange-over-Sands, about 20% (Podmore). Black recorded as rare, Derby (Hill), Rugeley (Freer), Church Stretton (Newnham), Market Drayton (Woodforde), Worksop (Alderson). Isolated very dark or black specimens from Ely (Cross), Southend (Whittle), Tenby (Graves), Reigate, Bristol (Prideaux).

MIANA STRIGILIS.—The dark form, with no light grey band, seems to occur over the whole range of the species, but the relative frequency varies greatly. There appears to be discontinuity with regard to the presence of the light band, but in both classes the depth of colour varies considerably. Records from Eastbourne (Colthrop), Felixstowe (Mera), Teignmouth (Jordan), mention the light form as prevalent. In Wigtownshire (Gordon), Lincolnshire (Raynor), at Doncaster (Porritt), Lynn (Baker), Colchester (Harwood), Ely (Cross), Farnborough

(Hewitt), Church Stretton (Newnham), Bristol (Prideaux), all forms about equally common. In Lancashire, Yorkshire, Durham (Hewett), Cheshire (Tait), Notts (Pearson), Birmingham (Jordan), Stroud (Davis), Cambridge (Farren), the London district (Mera, Fenn), and Berlin (*Berlin Entom. Verein*), the dark forms predominate, and are reported to be more frequent than formerly in London (Fenn), Hartlepool (Robson), Huddersfield (Porritt). At Hartlepool (Robson), Burnley (Clutton), only the dark form now occurs. At Sheffield, the light form has a darker grey than in the south (Brady). In Ireland, in some places the light, in others the dark, form predominates (Kane).

POLIA CHI.—There are two distinct dark varieties, *suffusa* and *olivacea*. Both occur in the north of England; in some districts both are found, in others, only one or the other. The typical light form occurs in the greater part of Scotland (Aberdeen, Forres, Kintyre, Wigtownshire, Kincardine), Ireland, Cumberland, Yorkshire, Burnley, Lincolnshire (Boston), Norwich, Notts (Chilwell), Market Drayton, Hereford, Devonshire. The variety *suffusa* occurs at Newcastle, scarce (Rosie), Durham (Robson), Bishop Auckland, Birtley, Chester-le-Street. Yorkshire—Middleton, Cleveland (Robson), Huddersfield, Halifax, Bradford, Rotherham, Sheffield (Porritt), Chester (Arkle), but is apparently nowhere actually prevalent. Its distribution is somewhat capricious, *e.g.*, at Huddersfield, about 30% are reported as rather dark, and perhaps 6-7% very dark, but at Saddleworth, 12 miles away, only the pale form occurs (Porritt). So on the hills to the south of Sheffield, very dark specimens are rare or absent, but are not infrequent a few miles away (Brady, Doncaster). At Huddersfield, the very dark form appeared suddenly about 1890, but forms darker than the type had occurred for many years. The extreme Huddersfield form is not identical with *suffusa* (Porritt). Var. *olivacea* was first described from Edinburgh in 1831 (Barrett). It occurred at Hartlepool, nearly 50 years ago (Robson). Around Newcastle it is now not much less common than the type (Rosie); it occurs at Sunderland (Brady), Birtley, Chester-le-Street, Bishop Auckland, etc. It occurs also at Huddersfield, Bradford (scarce), Sheffield (rare) (Porritt), Bolton (Lancs.) (Allen), Lancashire (both scarce) (Forsythe). In Durham, *olivacea* occurs chiefly near large towns, *suffusa* on the moors (Robson). Both forms seem somewhat discontinuous from the type, but some intermediates occur.

APLECTA NEBULOSA.—In the southern counties only the palest form is found. In the midlands, and even in some localities in Berkshire, the ground becomes grey instead of white, and this darkening is intensified further north. The pale form reappears in Scotland (Sutherland, Argyle, Barrett), (Wigtownshire, Gordon). It occurs together with the grey type at Bristol (Prideaux), in Shropshire (Newnham), North Wales (Arkle), Worksop (Alderson). In Ireland, the pale type is prevalent; dark specimens recorded from Galway (Kane, Dillon). Only the grey form, varying somewhat in intensity, recorded from Market Drayton (Woodforde), Sheffield (Brady), York (Hewett), Newcastle (Rosie). In addition to the prevalent grey, very dark specimens found at Huddersfield (Porritt), and apparently in the South-west Riding generally and occasionally at Lancaster (Forsythe); in south Yorks these are now commoner than formerly. In Cheshire (Delamere), a rather dark form is prevalent, and an

extreme, nearly black, form (var. *robsoni*) has occurred since about 1890 (in 1904, dark form about 10%, black about 3%). The black var. may have grey or white fringes (Arkle). Black parents gave 5 light, 5 intermediate, 14 black (Arkle, *Ent.*, 1904, p. 187). A black ♀ gave 4 black and 21 dark grey (South, *Ent.*, 1904, p. 264). Light parents gave 11 light, 1 black (Arkle).

MELANISM IN LARVÆ.—In the Newcastle district, melanism is reported in the larvæ of *Odontopera bidentata*, *Miselia oxyacanthæ*, *Abraxas grossulariata*. In *O. bidentata*, most larvæ are nearly black, about one in 50 being pale (Nicholson). Of *M. oxyacanthæ*, about 5% are grey, the prevalent form is brown and dark brown, and 10% are an intense velvety black (Rosie). In *A. grossulariata*, 15% deep black, sometimes with white marks on the anal plate, the plate on 2nd leg, and a light ventral line. The imago is normal. This variety was first observed 30 years ago, and has become much commoner (Rosie, Robson).

(To be continued.)

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from p. 212.)

GENUS IV: ISOPHYA, Brunner.

This genus resembles the last in the form of the pronotum, that is, in having the transverse sulcus behind the middle, and in having the hinder border straight or broadly sinuate, but not rounded as in *Poecilimon*; the form of the cerci is the same as in *Poecilimon*, and that distinguishes it from *Barbitistes*. There are a number of difficult eastern species, but only three occur in western Europe.

TABLE OF SPECIES.

- | | |
|--|----------------------|
| 1. Ovipositor $2\frac{1}{2}$ times as long as pronotum; pronotum, seen from the side, flat | 1. COSTATA, Br. |
| 1.1. Ovipositor less than twice as long as pronotum; pronotum, seen from side, concave above. | |
| 2. Large; subgenital lamina ♂ with hinder border broad, roundly emarginate | 2. PYRENÆA, Serv. |
| 2.2. Smaller; subgenital lamina ♂ narrow posteriorly, triangularly emarginate | 3. KRAUSSI, Brunner. |

1. ISOPHYA COSTATA, Brunner.

A member of the group in which the ovipositor is $2\frac{1}{2}$ times as long as the pronotum; fastigium of the vertex dilated apically; colour green. Length of body, 20mm.-23mm. ♂ and ♀; of pronotum, 5.5mm. ♂, 5.2mm ♀; of posterior femora, 20mm. ♂, 18mm. ♀; of ovipositor, 13mm. ♀.

A rare species, which has been taken in July at Mödling near Vienna.

2. ISOPHYA PYRENÆA, Serville.

(= *camptoxipha*, Fieber, Brunner, and Redtenbacher).

Characterised by the uniform green colour. Length of body, 22mm.-25mm. ♂ and ♀; of pronotum, 4.2mm. ♂, 4.5mm. ♀; of posterior femora, 18mm. ♂, 20mm. ♀; of ovipositor, 9mm. ♀.

Chiefly a native of eastern Europe, but it occurs in northern Switzerland, and also in the Pyrenees at Bagnères de Luchon, Bagnères,

Cauterets, and at Toulouse; it is also recorded from Vanne, near Sens, Clermont Ferrand, between 600 and 1300 mètres. It is found in Bohemia; in Austria, it is noted from Rekawinkel, Gutenstein, Heiligenkreuz, Baden, Gaden, Buchberg, Reichenau and Kranichberg. Also at Domleschg, in Switzerland.

3. ISOPHYA KRAUSSI, Brunner.

Differs from the last in the glaucous-green colour, constricted pronotum, shorter elytra, and narrower subgenital plate, which is triangularly excised. Length of body, 20mm. ♂ and ♀; of pronotum, 4mm. ♂, 5mm. ♀; of posterior femora, 16mm. ♂, 17.5mm. ♀; of ovipositor, 9.5mm. ♀.

This species was discovered by Dr. Krauss, in the Schwabischen Alp, near Urach, in Württemberg, from June to August.

GENUS V: ODONTURA, Rambur.

This genus is characterised by the very long feet; the anterior femora in the ♂ are twice as long, and in the female, one and a half times as long, as the pronotum; characteristic also are the comparatively thick antennæ, the short pronotum, which leaves the elytra free in both sexes, the distinctly flattened end of the abdomen, and the ovipositor, which is but little compressed, sharp, and armed with strong crenulations at the apex.

TABLE OF SPECIES.

- | | |
|--|------------------------|
| 1. Pronotum elongated, the lower border of lateral lobes straight, banded with silvery-white, the hinder angle right-angled; left elytron with a distinct vena plicata | 1. ASPERICAUDA, Ramb. |
| 1.1. Pronotum short, lower border of lateral lobes angled, posteriorly rounded; left elytron with vena plicata obliterated. | |
| 2. Smaller; subgenital lamina ♂ triangularly emarginate; ovipositor not more than $1\frac{1}{2}$ times as long as pronotum; Spanish species .. | 2. SPINULICAUDA, Ramb. |
| 2.2. Larger; subgenital lamina ♂ roundly emarginate; ovipositor twice as long as pronotum; Sicilian species | 3. STENIXIPHA, Fieb. |

1. ODONTURA ASPERICAUDA, Rambur.

Distinguished from its congeners by the silver-white stripe on the sides of the pronotum, and the thickened vena plicata of the left elytron of the male. Length of body, 12mm. ♂, 17mm. ♀; of pronotum, 3.2mm. ♂, 4.2mm. ♀; posterior femora, 7mm. ♂ and ♀; of ovipositor, 8.5mm. ♀.

Spain: Granada, Sierra de Gredos, Salamanca.

2. ODONTURA SPINULICAUDA, Rambur.

Distinguished from the last by the shorter pronotum, with the lower margin of the side lobes angled instead of straight, and by the obliteration of the vena plicata, and by the shorter ovipositor. Length of body, 14mm. ♂, 19mm. ♀; of pronotum, 3mm. ♂, 4mm. ♀; of posterior femora, 17mm. ♂ and ♀; of ovipositor, 6mm. ♀.

Spain: Malaga in the late summer; Chiclana in Andalusia; also in Portugal.

3. ODONTURA STENOXIPHA, Fieber.

Recognisable by its larger size, long ovipositor, and roundly emarginate, subgenital lamina of the male. Length of body, 16mm.

♂, 22mm. ♀; of pronotum, 3.5mm. ♂, 4.8mm. ♀; of posterior femora, 18.5mm. ♂, 18mm. ♀; of ovipositor, 10mm. ♀.

Sicily: Messina, Siracuse; also in Sardinia.

GENUS VI: LEPTOPHYES, Fieber.

This is the last of the apterous genera of the family, and the only one represented in the British Islands. It is characterised by the very short, but broad and strongly compressed, ovipositor, sharp at the apex. The species are small and delicate, and very fragile.

TABLE OF SPECIES.

- | | |
|--|-------------------------|
| 1. Pronotum not exceeding metanotum, leaving elytra free in both sexes. | |
| 2. Ovipositor three times as long as pronotum | 1. LATICAUDA, Friv. |
| 2.2. Ovipositor hardly attaining twice the length of pronotum | 2. PUNCTATISSIMA, Bosc. |
| 1.1. Pronotum extending to hinder margin of metanotum; elytra ♂ free from the vena plicata; in the ♀ almost entirely hidden. | |
| 2. Smaller; with black marks on sides | 3. ALBOVITTATA, Kollar. |
| 2.2. Larger; elytra ♂ with two black bands | 4. BOSCI, Fischer. |

1. LEPTOPHYES LATICAUDA, Frivaldsky.

(= *ruficosta*, Frey-Gessner).

Distinguished by the very long ovipositor of the female, and the strongly marked costal margin of the elytra of the male. Length of body, 17mm. ♂, 20mm. ♀; of pronotum, 4mm. ♂ and ♀; of posterior femora, 18mm. ♂ and ♀; of ovipositor, 10mm.-13mm. ♀.

This is an eastern species, which has occurred at Mendrisio and at Voltaggio; also at Lachens in France. It is common enough where it occurs, on oaks, from the end of July to the end of September.

2. LEPTOPHYES PUNCTATISSIMA, Bosc.

Characterised by the short pronotum, almost entirely free elytra, with a faint black stripe in both sexes, by the long subgenital plate straight at the end, and by the almost circular curved cerci of the male; the colour is green, covered with a mass of black specks and some reddish lines. Length of body, 12mm. ♂, 16mm. ♀; of pronotum, 2.5mm. ♂ and ♀; of posterior femora, 15mm. ♂, 16mm. ♀; of ovipositor, 7mm. ♀.

Common in autumn and late summer, on trees and shrubs throughout west central Europe. It occurs in Denmark, Seeland, Bornholm; in Sweden, Schonen; at Kullen, in northwest Skåne. In Britain, it is common enough in the southern half. It is common throughout France, but rarer in the south. Also throughout Switzerland, from Zurich to Geneva. In Italy, it is found in the north. It is doubtfully recorded from Kissingen, but otherwise, apparently absent from Germany and Austria. It is also common in Belgium.

3. LEPTOPHYES ALBOVITTATA, Kollar.

In this and the following species, the fastigium of the vertex is furrowed above, and the pronotum of the male is slightly recurved at the hinder border. This species is dirty green in colour, covered with reddish spots. Length of body, 10mm. ♂, 15mm. ♀; of pronotum, 3mm. ♂, 3.5mm. ♀; of posterior femora, 12mm. ♂, 14mm. ♀; of ovipositor, 5mm. ♀.

This species replaces the last in eastern Europe. It has been taken as far west as Regensburg, in Bavaria; it is found also at Pressburg. It occurs in the Tirol at Kaselruth, Valsugana, Monte Baldo and Salzburg.

4. LEPTOPHYES BOSCI, Fieber.

Bright green, with few spots. Distinguished from *L. punctatissima* by the longer cylindrical pronotum, the form of the cerci, which are straight, and the subgenital lamina is different; from the preceding species by the not narrowed pronotum, absence of clear lateral stripes, sometimes visible in that species, and by the two black spots on each elytron. Length of body, 13mm. ♂, 16mm. ♀; of pronotum, 3·2mm. ♂, 4·5mm. ♀; of posterior femora, 15mm. ♂, 16mm. ♀; of ovipositor, 8mm. ♀.

Occurs in the Lower Austrian Alps, Val Dalecane, near Vienna at Gloggnitz, Hohenberg and Sauerbrunn.

GENUS VII: ACROMETOPA, Fieber.

This is the first of the winged genera; there are two species, one occurring in Greece, the other in Italy and Dalmatia; they are easy to recognise by their much larger size than our other winged species of the family. They are large, smooth, bright green insects, with very long jumping legs; the wings do not extend far beyond the elytra.

1. ACROMETOPA MACROPODA, Burmeister.

Easy to recognise by the smooth, bright green colour and large size. Length of body, 22mm. ♂, 30mm. ♀; of pronotum, 7mm. ♂ and ♀; of elytra, 36mm. ♂, 26mm.-28mm. ♀; of posterior femora, 38mm. ♂ and ♀; of ovipositor, 8·5mm. ♀.

A native of Italy and Dalmatia; recorded from Sicily, Sardinia and Naples; also from Pegli, where, however, it is very rare. It is found on shrubs, especially on veitch, in July and August.

The Lepidoptera of the southeastern district of London.

By WILLIAM WEST.

(Continued from p. 209.)

NOCTUIDES. — *Orthosia ypsilon*.—I found a colony of larvæ in Blackheath Park at roots of poplars, they fed up well, and emerged freely; abounded at dusk on Greenwich Marshes, flying round the willows. *O. lota*, *O. macilenta*, *Anchocelis rufina*. *A. pistacina*, *A. lunosa*, *A. litura*, *Cerastis vaccinii*, *C. spadicea*, *Scopelosoma satellitia*.—All taken during September and October in Lee pit, by sugaring the leaves of willows. *Hoplorina croceago*.—Bred from eggs laid by a ♀ taken at Darenth. *Tiliacea citrigo*, *T. aurago*, *Xanthia cerao*, *X. silago*, *Mellinia ferruginea*.—Lee pit; sugaring the leaves of willows during September and August; of the five species *Tiliacea aurago* was the commonest. *Cosmia trapezina*.—Lee, Lewisham, and Greenwich. *Calymnia diffinis*, *C. affinis*.—Kidbrook and Lee; sugaring elms throughout August. *Eremobia ochroleuca*.—Croydon, at *Silene* bloom. *Dianthoecia carpophaga*, *D. capsicola*, *D. cucubali*.—Larvæ, September and August, in seedpods of *Silene*: Croydon and Greenwich. *D. conspersa*.—The wind being too rough to work the downs at Caterham, I turned my attention to the fence, and was rewarded by taking 28

specimens, in fine condition, on June 28th, 1877. *Hecatera serena*.—Very common on fences on Blackheath. *Polia flavicincta*.—Shooter's Hill and Blackheath. *Epunda lutulenta*.—Wickham; I found a pupa in the stem of burdock in Greenwich Marshes. *E. nigra*.—Darent. *Cleoceris riminalis*.—Wickham. *Miselia oxyacanthæ*.—Kidbrook and Burnt Ash. *Agriopsis aprilina*.—Shirley. *Phlogophora meticulosa*.—Greenwich, Blackheath, and Lee. *Aplecta herbida*.—Crown Woods and Shooter's Hill. *A. nebulosa*.—Blackheath and Lee. *A. tineta*.—Shooter's Hill also Crown Woods. *Euplexia lucipara*.—Blackheath, larvæ very fond of fern. *Hadena protea*.—Darent, Wickham, and Shooter's Hill. *H. dentina*.—Blackheath, Greenwich, and Lee. *H. chenopodii*.—Bred from *Chenopodium*; Greenwich Marshes. *H. oleracea*.—Bred from *Persicaria*; everywhere. *H. pisi*.—Bred from larvæ found on broom; Plumstead and Brockley. *H. thalassina*.—Wickham, Lewisham, and Lee. *H. contigua*.—Blackheath. *H. genistæ*.—Bred from ♀ taken in Greenwich Park. *Xylocampa lithoriza*.—Wickham Wood. *Cucullia verbasci*.—Larvæ on betony; Kidbrook and Lee. *C. lychnitis*.—Larvæ on mullein; Box Hill. *C. asteris*.—Larvæ on golden-rod; West Wood and Shooter's Hill. *C. chamomillæ*.—May 3rd and 12th, 1874, and May 16th, 1875, on fences; Greenwich Park; larvæ in July on the borders of cornfields, Kidbrook, Hither Green Lane, Lee. *C. umbratica*.—Kidbrook, Lee, and Greenwich. *Heliothis dipsacea*.—Croydon. *Anarta myrtilli*.—Shirley; larvæ common throughout the summer and autumn. *Heliodes arbuti*.—Kidbrook, Lee, and Brockley; I used to take it commonly in May flying over stichwort. *Acontia luctuosa*.—In a meadow near Caterham. *Brephos parthenias*.—Wickham Wood. *B. notha*.—West Wood, Shooter's Hill. *Habrostola urticae*, *H. triplasia*.—Larvæ on nettles; Burnt Ash. *Plusia chrysitis*.—Kidbrook and Burnt Ash. *P. iota*.—Kidbrook, Lee, and Lewisham. *P. gamma*.—Everywhere. *Gonoptera libatrix*.—Blackheath and Lee. *Amphipyra pyramidea*.—Shirley and Loughton; larvæ under bark in December; they were packed closely, and when discovered they slid about on the ground; it was a difficult job to catch them, one wanted half-a-dozen hands. *A. tragopogonis*, *Naenia typica*, *Mania maura*.—Shirley, Lewisham, Kidbrook, Lee, and many other places. *Toxocampa pastinum*.—Box Hill. *Catocala nupta*.—Blackheath, Greenwich Marshes, Lee, Lewisham; by sugaring willows. *Euclidia mi*.—Brockley, Box Hill, and Croydon. *E. glyphica*.—Headley Lane and Brockley. *Phytometra aenea*.—Headley Lane, Croydon, Brockley.

DELTOIDES.—*Hypena proboscidalis*.—Kidbrook and Burnt Ash. *H. rostralis*.—Greenwich, in the house and on fences. *Bomolocha crassalis*.—Leith Hill. *Pechipogon barbalis*.—Dartford, Wickham, and Shooter's Hill. *Zanlognatha tarsipennalis*.—Dartford. *Z. grisealis*.—Shooter's Hill, Wickham, and Croydon.

AVENTIDES.—*Aventia flexula*.—Bishop's fence, Wickham side.

PYRALIDES.—*Pyralis fimbrialis*.—Kidbrook and Lee; near haystacks. *P. farinalis*.—Greenwich; in bakehouses. *P. glaucinalis*.—Brockley; amongst thistles. *Aglossa pingualis*.—Kidbrook and Greenwich; in stables. *Cledeobia angustalis*.—Box Hill. *Pyrausta punicealis*, *P. purpuralis*, *P. ostrinalis*, *Herbula cespitalis*, *Emnychia cingulalis*, *E. anguinalis*.—Amongst wild herbs in Headley Lane and Caterham Junction; two broods, May and August. *E. octomaculalis*.—West

Wood and Darenth. *Endotricha flammealis*.—Darenth, Wickham, and Shooter's Hill. *Cataclysta lemnalis*, *Paraponyx stratiotatis*, *Hydrocampa nymphaealis*, *H. stagnalis*.—Flying over Southend Pond, at Lewisham and Burnt Ash Lane. *Botys flavalis*.—Amongst low plants on Greenwich Marshes. *B. hyalinalis*.—Beating; Headley Lane and Lee. *B. verticalis*, *B. urticalis*.—Amongst nettles; everywhere. *Ebulea crocealis*.—Lee and Lewisham. *E. verbascalis*.—Greenwich Marshes. *E. sambucalis*.—Plumstead. *Pionaea forficalis*.—Everywhere. *P. stramentalis*.—Lee. *Spilodes palealis*.—Amongst clover; Caterham. *S. cinctalis*.—Caterham. *Scopula lutealis*.—Lee; and Brockley railway bank. *S. olivalis*, *S. prunalis*.—Kidbrook, Lewisham. *S. ferrugalis*.—Lee, Lewisham and Greenwich; in 1861 it swarmed everywhere. *Stenopteryx hybridalis*.—Very common on Blackheath. *Scoparia ambigua*, *S. cembrae*, *S. dubitalis*, *S. mercurella*, *S. truncicolella*.—On fences on Blackheath, and trees in Greenwich Park.

CRAMBIDES.—*Crambus falsellus*.—Greenwich, Croydon. *C. pratellus*.—Blackheath, Brockley. *C. pascnellus*.—Box Hill. *C. pinetellus*.—Wickham, Caterham, Dartford. *C. perlellus*.—Blackheath, Brockley, etc. *C. warringtonellus*.—Railway bank, East Greenwich. *C. tristellus*.—Blackheath, Brockley. *C. inquinatellus*.—Caterham, Brockley. *C. contaminellus*.—Two at rest on fence on Blackheath in September, 1876; never before, nor since, have I seen the species, although I have worked for it. *C. geniculellus*.—Blackheath, Greenwich. *C. culmellus*.—Everywhere. *C. chrysonuchellus*.—Croydon, Dartford. *C. hortuellus*.—Blackheath. *Chilo phragmitellus*.—Greenwich marshes. *Schoenobius forficellus*.—Near ponds in brick-fields; Lewisham. *Anerastia lotella*.—Box Hill. *Ilithya carnella*.—On grass stems; Box Hill. *Myelophila cribrella*.—Larvæ very common in thistle-stems on Greenwich marshes; the stems I cut during the autumn, and hung them up during the winter and spring with success; the moths emerged freely; if I recollect aright, they changed to pupæ during the spring. *Homacosoma sinuella*.—In a pit; Dartford Brent. [N.B.—I have lost all records of the remainder of the species of this beautiful little family.]

HYLOPHILIDES.—*Halias prasinana*.—Larvæ on birch and hazel, May and June; Shooter's Hill, Lee, and Wickham. *Hylophila quercana*.—Larvæ on oak in June; Wickham. *Farias chlorana*.—Larvæ on sallows in Lee and Greenwich marshes. *Sarrothripa revayana*.—Burnt Ash, Wickham; in September.

TORTRICIDES.—*Tortrix podana*.—July; everywhere. *T. piceana*.—Dartford. *T. xylosteanæ*.—July; everywhere. *T. sorbiana*.—June and July; Darenth and Wickham Woods; comes freely to sugar at dusk. *T. rosana*.—Larvæ on elm, May and June; everywhere. *T. diversana*.—This species I used to take very commonly in Kidbrook Lane, both in the larval and imaginal stages; but the species strangely confined itself to a hedge of elm, about 100 ft. in length, and, although there is plenty of elm in the neighbourhood, only solitary specimens occurred elsewhere; it flies in company with *T. rosana* at dusk, which makes it very troublesome to take; beating earlier in the evening is best; I could spot the moths as they flew, generally lower than *T. rosana*. *T. cinnamomeana*.—West Wickham; July and August. *T. heparana*, *T. ribeana*.—Everywhere; on every tree and plant.

T. corylana.—West Wickham, Blackheath; August. *T. unifasciana*.—Everywhere. *T. costana*.—Bred a very fine and variable series from larvæ taken on Greenwich marshes, on thistles and other low plants during May. *T. semialbana*.—Taken the first week in July by beating maple on the road to Darent Wood. This species is not common; four is the most that I have taken in one day; when disturbed it drops low amongst the herbage. *T. icterana*.—Railway-banks; Brockley, East Greenwich. *T. viridana*.—Everywhere, on oak-trees. *T. ministrana*.—Kidbrook, Shooter's Hill. *T. forsterana*.—Kidbrook; on hawthorn. *T. branderiana*.—Larvæ taken in May on aspen in Abbey Wood and at Dartford. *Dichelia grotiana*.—Kidbrook, Blackheath, Lee. *Leptogramma literana*.—Shooter's Hill, on oak-trunks; Blackheath, on fences; April and October. *L. scabrana* and *L. boscana*.—The former in September and October, the latter in July, on elm; Plumstead. My first discovery of *L. scabrana* was in October, 1872, in an elm hedge, about 50 ft. long, in Cage Lane, Plumstead, when it was taken quite unexpectedly. Touching the hedge with a stick, it started out in great numbers, settling on the ground around me. It was very sluggish, and I was able to box the specimens with the greatest ease, putting two or three in an ordinary pill-box, where they remained a day and night without injury. *L. boscana* was found the first week in July, 1874. This species is just the reverse in its habits. It is very active and easily damaged. In 1875 I bred a fine series from larvæ collected in June. The same year I bred *L. scabrana* from larvæ taken at the end of August, the larvæ of both species being alike. The time between their appearance, being suited to double-brooded insects, caused me to be suspicious, and I was determined to breed it from the egg. I tried *L. scabrana* first, collecting a quantity of ♀s, and kept them alive on elm-twigs until the following February, then they died off without laying any eggs, then I tried *L. boscana* in 1876, but failed to get eggs. In 1877, I experimented with *L. boscana* again, and this time with success. The following is my note on the matter: "Having captured ♀s of *L. boscana* on July 15th, 1877, I placed them in a large-mouthed pickle-bottle. I obtained eggs on the 17th of that month, laid on the sides of the bottle in little green patches. On the 24th I noticed little black specks in the eggs, the next day they hatched. Having placed some elm in the bottle, and covered the mouth up with fine muslin, I turned it bottom upwards and left it for a week. Upon examination, I found the larvæ had curled the edges of the leaves over and fed on the surface as before. On August 20th they attained the size of $\frac{1}{2}$ in., and came out of their webs occasionally and fed on the edge of the leaf. On the 28th they drew two leaves together for the last time, for they were all in pupæ by September 3rd. On the 29th the first imago appeared, and was, as I expected, a true *L. scabrana*. I bred 17 in all. The larvæ are pale green, with a few hairs scattered on each segment; head, prothoracic plate, and true legs, black. I think the difference in colour of the imagines is merely protective; *L. boscana* is on the wing during the first and second week in July, while *L. scabrana* needs protection for seven months. I have found it at rest during the winter with its wings wrapped round the twigs of the elm, which makes it very difficult to see. Remarking on this discovery, Mr. J. Jenner Weir made some remarks (*Address to the West Kent Natural History*

Society, 1878), noting that the differentiation of the colours of the white *L. boscana* and the dark grey *L. scabrana* appears to be a seasonal variation in response to their environment, concealment during bright summer weather being effected by the insect being then produced of a silvery-grey colour, and, when the dulness of autumn and the wet have darkened the stem of the elm-trees, then the insect produced is of a sombre grey hue; the curious fact may also be noticed that the offspring never resembles the parents, but always the grandparents.

Peronea sponšana.—September; beating beech at Loughton; Blackheath, on fences. *P. comparana*.—West Wickham. *P. schalleriana*.—West Wickham; August. *P. variegana*.—Blackheath, Lee, Lewisham. *P. cristana*.—Amongst whitethorn, Loughton; September. *P. hastiana*.—Larvæ during September and October on dwarf willow, on Shooter's Hill, Wimbledon, Plumstead. *P. ferrugana*.—Two broods, June and September; Kidbrook, Plumstead, Lewisham. *P. tristana*.—Two broods, July and October on *Viburnum lantana*; Dartford, Caterham. *P. aspersana*.—July; Box Hill, Dartford. *Teras caudana*.—August; Lewisham, Lee. *T. contaminana*.—August and September, on whitethorn; Lee, Lewisham, Blackheath. *Dictyopteryx loeflingiana*.—Oak, in June; Lee, Lewisham. *D. holmiana*.—July, on crab-apple; Lewisham. *D. bergmanniana*.—June, on wild-rose; Burnt Ash, Kidbrook, Lewisham. *D. forskaleana*.—July, on maple; Lee, Kidbrook, Plumstead, Lewisham. *Argyrotoxa conwayana*.—June, on privet; Plumstead, Lee. *Ptycholoma lecheana*.—June; Plumstead, Dartford. *Ditula semifasciana*.—July; on willows, in Lee pit. *Penthina picana*.—June, on birch: Darent Wood. *P. sororeculana*.—August; Wickham, Shirley. *P. capreana*.—September, on willow; Wickham. *P. pruniana*.—June, on blackthorn; Lee, Lewisham. *P. ochroleucana*.—July, on rose; Kidbrook, Lee. *P. cynosbana*.—July, on whitethorn; Kidbrook, Lee. *P. gentianana*.—Larvæ and pupæ during winter in teasel heads; Greenwich marshes, Lee. *P. sellana*.—July; South-Eastern Railway-bank, East Greenwich. *P. fuligana*.—Blackheath, Kidbrook, Lee; July. *Antithesia salicana*.—July, on willows and poplars; Plumstead, Lee pit. *Spilonota ocellana*.—July, on poplars; Blackheath. *S. laricana*.—July; Blackheath. *S. aceriana*.—July; Blackheath, and other places. *S. dealbana*.—July, on poplars; Blackheath. *S. neglectana*.—June, on poplars; Blackheath. *S. suffusana*.—June, on whitethorn; Kidbrook. *S. rosaccolana*.—July; amongst standard roses in my own garden at Greenwich. *S. roborana*.—July, on wild rose; Kidbrook. *Pardia tripunctana*.—June, on wild rose; Kidbrook, Lee. *Aspis admammiana*.—On brambles; Kidbrook, Lewisham, Lee. *Sideria achatana*.—July, on whitethorn; Kidbrook, Lee. *S. bifasciana*.—June; Darent Wood. *S. cespitana*.—July; Caterham. *S. lacunana*.—Swarming, on nettles, everywhere. *S. urticana*.—Kidbrook, Shooter's Hill. *Euchromia purpurana*.—June; Box Hill. *Orthotaenia striana*.—July; South-Eastern Railway-bank, East Greenwich. *Eriopsela quadrana*.—June; Darent Wood. *Phtheochroa rugosana*.—July, amongst briony; Kidbrook. *Cnephasia politana*.—Shirley Common. *C. musculana*.—June; Shooter's Hill, Wickham Woods. *Sciaphila nubilana*.—July, on whitethorn; Kidbrook, Lee. *S. perterana*.—Brockley, on railway-bank. *S. subjectana*.—Kidbrook. *S. virgaureana*.—Kidbrook and other places. *S. chrysanthemana*.—Green-

wich Park, on oak-trunks; Blackheath, on fences; July. *S. pasivana*.—June; Brockley, Beckenham, Kidbrook. *S. hybridana*.—June; Kidbrook, Lewisham. *Sphaleroptera ictericana*.—June, railway-banks; Brockley. *Bactra lanceolata*.—June, amongst rushes; Kidbrook, Lee, Lewisham. *Phoxopteryx siculana*.—Box Hill. *P. uncana*.—June; Box Hill, Caterham. *P. biarcuana*.—May; Darenth Wood, Bostal Heath. *P. comptana*.—July; Box Hill, Caterham. *P. lundana*.—June and July; Dartford, Kidbrook, Caterham. *P. derasana*.—Beaten commonly out of whitethorn on the road to Darenth; May and June. *P. diminutana*.—June; Box Hill. *P. mitterbacheriana*.—May and June; Dartford, Wickham Wood, Abbey Wood. *P. upupana*.—Beaten out of oak, flies high up; Darenth Wood; June. *P. lactana*.—May and June, on aspens; Darenth, West Wickham. *Grapholitha nisana*, *G. cinerana*.—August, on white poplars; Blackheath, Lewisham. *G. nigromaculana*.—July and August, on ragwort; South-Eastern Railway-bank at East Greenwich and Brockley. *G. campoliliana*.—May and June, on birch; West Wickham. *G. minutana*.—June and July, on white poplars; Blackheath. When there was a storm from the southwest, this species could be taken in abundance, by watching the fence, as the moths were driven from the trees. It is a very active insect and difficult to box. I used an ammonia bottle when working for them. *G. trimaculana*.—July, on elm, everywhere. *G. penkleriana*.—July to September; Blackheath, Lee. *G. obtusana*.—May; Shooter's Hill, Abbey Wood. *G. naevana*.—July, on holly; Blackheath. *Phlaeodes tetraquetra*.—May and June; Darenth Wood. *P. demarniana*.—June; Darenth Wood. *Hypermoecia cruciana*.—July, on willows; Lee. *Batodes angustiorana*.—July, on yews; Lee, Box Hill. *Paedisca bilunana*.—June; Blackheath. *P. oppressana*.—July; Wimbledon. *P. corticana*.—July, on oaks; Blackheath, and other places. *P. profundana*.—August; Blackheath, West Wickham. *P. solandriana*.—August; West Wickham. *P. semifuscana*.—Larvæ on willow, in June; imagines in August; Lee pit. *Ephippiphora bimaculana*.—September; West Wickham. *E. cirsiana*.—June, on knapweed; Brockley. *E. pilugiana*.—May; West Wickham. *E. brunnichiana*.—June, amongst coltsfoot; Lee, Brockley, Lewisham. *E. foeneana*.—Larvæ very common in roots of mugwort, collected during April on South-Eastern Railway-bank, East Greenwich; they emerged very readily when the roots were placed in a box, filled with sand. Cover the box with muslin in June. *E. nigricostana*.—June; Kidbrook. *E. trigeminana*.—July; Brockley. *Semasia spiniana*, *S. janthinana*.—July; Blackheath, Lewisham. *S. rufillana*.—Caterham. *S. woberana*.—Very common on fences, in July; Blackheath Park, amongst laurels. *Coccyx strobilana*.—Bred from spruce cones collected in March and April; West Wickham. *C. splendidulana*.—June; West Wickham. *C. argyran*.—May, on oaks; Greenwich Park. *C. hyrciniana*.—May, on firs; Bostal Wood. *Heusimene fibriana*.—April, beaten from oaks; Darenth Wood. *Retinia buoliana*.—Blackheath Park, on fences. *R. pinicolana*.—July, on pines; Wickham. *Carpocapsa splendana*.—Bred from acorns, July; Shooter's Hill, Darenth, Wickham Wood. *C. grossana*.—Bred from beech-nuts; Box Hill. *C. pomonana*.—Bred from purchased fruit, apples and walnuts; also from edible chestnuts collected in Greenwich Park. *Opadia funebrana*.—Bred from sloes collected at Loughton. *Endopisa*

nigricana.—May and June, in pea-fields; Plumstead. *Stigmonota internana*.—May, amongst furze-bushes; Blackheath, Loughton. *S. composana*.—August, in clover fields; Kidbrook, Lee, Lewisham. *S. regiana*.—June and July on sycamore; this species rests high up on the sycamores. The best way to take it is to watch a fence or brick wall near the trees on which they live, at 9 a.m., when the imagines may be seen drying their wings by the side of the pupa-cases, which are generally placed between the slats, or in the crevices, of a fence. I have also seen it in brick-work. It is very rare. I have also seen it on fences later in the day. [We have bred it from the larval hybernacula done up beneath sycamore bark; in Greenwich Park.—ED.]. *S. roseticolana*.—Dartford. *Dicrorhampha politana*.—June, amongst yarrow; South-Eastern Railway-bank at East Greenwich, and Brockley. *D. alpinana*.—On tansy; Greenwich. *D. flavidorsana*.—August; Beckenham. *D. sequana*.—June; East Greenwich, Caterham, Brockley. *D. petiverella*.—June and September; East Greenwich, Brockley. *D. plumbana*.—July; East Greenwich, Caterham. *D. plumbagana*.—June; Greenwich marshes. *D. acuminatana*.—June; Brockley railway-bank. *D. simpliciana*.—July and August; bred from the same roots of mugwort as *E. foeneana*; East Greenwich. *Pyrodes rhediella*.—May and June; Plumstead, Lee, Dartford; beating hedges. *Catoptria albersana*.—June; Darenth Wood. *C. ulicetana*.—May and September, on furze; Blackheath. *C. juliana*.—Bred from acorns and chestnuts collected in Greenwich Park. I have also taken it at rest on the trunks of oak at Lee and Kidbrook. Solitary trees in meadows must be worked for this species, it is very rarely seen in woods. *C. hypericana*.—Amongst *Hypericum*, in June; Plumstead, West Wickham, Dartford. *C. conterminana*.—June, amongst lettuce, which grows very commonly in an old gravel-pit near Dartford Brent. I have also taken it on the railway-bank at East Greenwich, near market-gardens. *C. cana*.—Amongst thistles, on Greenwich marshes. *C. fulvana*.—Bred from knapweed; Forest Hill. *C. hohenwarthiana*.—Amongst knapweed; Lee, Greenwich, Kidbrook. *C. aemulana*.—Amongst furze-bushes; Bostal Heath. *Chorentes scintillulana*.—Wickham Wood. *Xylopada fabriciana*.—Everywhere, amongst nettles. *X. pariana*.—Amongst golden-rod; Plumstead. *Lobesia reliquana*.—Darenth and Wickham Woods. *Eupoecilia nana*.—Blackheath Park; common on fences. *E. dubitana*.—Brockley. *E. atricapitana*.—Railway-bank at East Greenwich. *E. maculosana*.—Abbey Wood. *E. sodaliana*.—Beating hedges on the road to Darenth Wood. *E. hybridellana*.—Caterham. *E. angustana*.—Shirley Common, Plumstead. *E. roseana*.—Bred from teasel-heads; Dartford, East Greenwich. *E. implicitana*.—Bred from camomile; three broods—the first in May, the second in July, the third in September. The larvæ feed on the leaves, the flower-heads, and stems of the plant. The moth was very common along the river-bank from East Greenwich to Charlton. *E. anthemidana*.—Bred from the seed-heads of *Erigeron acre*; East Greenwich, railway-bank leading to the river (three broods). *Xanthosetia zoegana*.—Brockley, East Greenwich. *X. hamana*.—Brockley, East Greenwich, Lee, Lewisham, Blackheath. *Chrosis tesseraana*.—Brockley, Box Hill. *C. rutilana*.—Beaten from juniper; Caterham. I sought this species several years before capturing it. The way to take it is to keep your net low down, and well under the bush while beating. *Argyrolepis subbaumanniana*.

—Croydon. *A. zephyrana*.—Brockley, East Greenwich. *A. badiana*.—Swarming in July amongst burdock; Greenwich marshes. *Cochylis francillana*.—Burnt Ash Lane, Lee. *C. dibucidana*.—Box Hill, Brockley. *C. smeathmanniana*.—Greenwich marshes. *C. stramineana*.—Brockley, Lee. *Aphelia osseana*.—Box Hill, Croydon. *Tortricodes hyemana*.—Wickham, Shooter's Hill.

My list of Tineina was a very long one for the London district; but having parted with the specimens, and unfortunately lost my records. I cannot now deal with them.

Variation of *Polyommatus astrarche*, Bgstr., in Durham.

By J. W. H. HARRISON, B.Sc., F.E.S.

There seems to be a great need amongst entomologists for some arrangement of the various forms of *P. astrarche* as known to us in Durham. Very few seem to have a definite idea of what is included in *P. var. salmacis*, Stphns., and I have more than once been asked for a series of *salmacis*, "white-spotted ones preferred." A request like this seems to ignore entirely the fact that Stephens, in his original description of the form, expressly stated that the males of his new variety did not possess the white spot. The true explanation of this confusion is, as I explained in my paper on this species in the *Ent. Rec.* for November, 1905, that, as originally described, *P. var. salmacis* is not a form that can be deemed a recognisable variety. In these few notes, while retaining the name *salmacis* for part of what Stephens included under that name, I shall endeavour to limit it, so that we have at least something definite and connected as the male and female forms of the variety. Incidentally, I shall include a description of all the forms I have taken in Durham which admit of classification:—

1. Both sexes above: dark iridescent fuscous; forewings with a black discoidal spot; both wings with a series of deep orange spots close to, and parallel to, the posterior margin. Below: male, greyish-brown; female, a warmer more decided brown. Ocelli with black pupils arranged exactly as *P. icarus* var. *icarinus* = *P. astrarche*, Bergstrasser.
2. As in *P. astrarche*, except that the black discoidal spot is surrounded with a white ring = ab. *albiannulata*, n. ab.
3. As in *P. astrarche*, except that both sexes have the black discoidal spot of the forewings replaced by a white one. Females with the row of red spots normal on both wings. Males with the row becoming obsolete, more especially on the forewings = ab. *salmacis*, Harrison (var. *salmacis*, Stephens, in part).
4. As in *P. var. salmacis*, but the ocelli beneath without the black pupils = ab. *artaxerxes*, Fab.
5. As in *P. var. artaxerxes*, but in addition the hindwings also possess a white discoidal spot = ab. *quadripunctata*, Tutt (I have never seen this form in Durham).
6. As in *P. ab. quadripunctata*, but with ocelli with black pupils = ab. *subquadripunctata*, n. ab.
7. As in *P. astrarche*, except that the row of red spots above is becoming obsolete = ab. *semi-allous*, n. ab. (var. *salmacis*, Stephens, part).
8. As in *P. astrarche*, red spots obsolete = ab. *allous*, Hb. (I took one of this form on July 14th, 1906).
9. An underside form almost parallel with ab. *obsoleta* of other Lycænidæ, and ab. *persica* of *icarus* = ab. *vedrae*, Harr.
10. A small form, with underside of a light silvery-grey colour; ocelli becoming obsolete; basal ocelli reduced to two = ab. *inclara*, Harr.
11. A normal-sized form, underside colours normal, but ocelli (especially close inward from the white median dash) becoming obsolete = ab. *semi-vedrae*, n. ab.
12. Above, fringes brown otherwise normal; beneath, of a rich warm brown,

almost chocolate. The white wedge suffused with brown; fringes sharply divided into an inward white band, and an outward brown band = ab. *brunnescens*, n. ab.

The above arrangement is the result of a close examination of about 320 specimens belonging to friends and myself, which were in my possession until last week. Of course, they do not include any casual aberrations, of which I have in my possession one or two rather striking ones. One (taken July 21st, 1906) has the right hindwing of a silvery colour as in *Rumicia phlaeas* ab. *schmidtii*, but the red spots are normal, and form a strange contrast to the white ground. Another (taken July 20th, 1905) has the white spots twice the normal size, and still another has the forewings powdered with coppery scales.

In conclusion, as far as lies in my power, I am willing to aid entomologists to secure a representative collection of Durham forms.

Pupal skin and pupal hairs of *Zephyrus quercus* (with plate).

By DR. T. A. CHAPMAN.

The umbrella- or trumpet-hairs of the pupa of the "coppers" (*Chrysophanids*) are by no means widely distributed amongst the *Lycaenidae*, so far as my few observations serve to form an opinion, and, in the *Theclid* division, are certainly rare. In *Zephyrus quercus* we have a very interesting form showing a transition between ordinary spiculate hairs, as they occur, say, on *Thecla w-album*, and fully formed trumpet-hairs. They have a genuine trumpet extremity, although it is small and more pronouncedly spiculate than in *Chrysophanus*. They are also like the trumpet-hairs, smaller than ordinary spiculate hairs are; for instance, they are about a third of the length of the spiculate hairs on the pupa of *T. w-album*, viz., 0.1mm. in *Z. quercus*, 0.34mm. in *T. w-album*. In the plate x, from Mr. Clark's very good photograph, the region shown is near the spiracle, of which a portion is seen, of the 2nd abdominal segment. Five trumpet-hairs and a portion of a sixth appear on the plate. There also appear a number of lenticles, chitinous circles that look as if they ought to carry hairs, but have their lumen merely closed by a faintly dotted membrane. There are also two circles that are almost certainly bases of trumpet-hairs that have been broken away. In the pupa of *Zephyrus quercus* these lenticles are very numerous near the spiracles, but very sparse elsewhere, the greater part of, for instance, this 2nd abdominal segment being occupied by the dark stellate points, with connecting ridges, that we saw so well-developed in the pupa of *Thestor ballus* (*antèa*, vol. xvii., p. 145). In the plate, the area shown is so small that it does not extend outside the lenticular region of this spiracle, and may leave the impression that the lenticles are a more marked feature of the pupal skin than is really the case. Suggestive as these stellate points are of hairs, they do not here, any more than in the other pupæ examined, appear to belong to the same phylum as the hairs and lenticles, that always occur in the spaces between the ridges, which are attached to the stellate points, but invariably avoid hairs and lenticles. The magnification of the figure is 200 diameters.

A new hybrid SpHINGID: *Thaumas hybr. densoi* (*vespertilio* ♂ × *euphorbiae* ♀), n. hybr.

By P. A. H. MUSCHAMP.

Several *Thaumas vespertilio* ♂ and *Hyles euphorbiae* ♀ were placed

in one side of a silk-covered cage, and on the other side, separated only by a fine silken screen, a few *H. euphorbiae* ♂s and *T. vesperilio* ♀s. Of the former, two *euphorbiae* ♀s paired at once with *vesperilio* ♂s, and subsequently laid respectively 108 and 97 eggs. No pairing, however, took place between *vesperilio* ♀s and *euphorbiae* ♂s. The eggs all hatched, and the larvæ at first did well, feeding hungrily on *Euphorbia*, and continued to do so up to the final stage. Each stage was carefully drawn and painted for future reference. The following is a rough outline of the various stages of the hybrid compared with those of the parents, a number of each of which were reared side by side with it:—

FIRST STAGE.—*Vesperilio*: Ground colour light yellow, head of the same colour, anal segment rather darker. The setæ are exactly the same in the three different larvæ. No caudal horn.

FIRST STAGE.—*Euphorbiae*: Ground colour light olive-green, head and base of prolegs being of a very dark olive-brown colour. Caudal horn from 0.5mm. to 0.6mm. in length.

FIRST STAGE.—*Densoi*: Ground colour light yellowish-green, head rather darker, with a little intermixture of olive. Caudal horn from 0.2mm. to 0.3mm. long. Anal segments and prolegs darkish green.

SECOND STAGE.—*Densoi* differs from *euphorbiae* in that the yellow-grey subdorsal line is very much more clearly indicated, and the white spots are prominent. The ground colour is nearer that of *vesperilio* at same stage. The shield on the head is black, and the prolegs vary from green, as in *vesperilio*, to black, as in *euphorbiae*. The stigmatal line is more distinctly marked than in *euphorbiae*, less so than in *vesperilio*. The caudal horn is short and stumpy, relatively the same length as in the first stage, exceptionally, in a very few cases, it is completely missing (in not one case was it wanting in the first stage).

THIRD AND FINAL STAGES.—*Densoi* varies in the adult larva very much more than in the first two stages, but is altogether within the broad limits of the *euphorbiae* larvæ, from which, however, it differs with regard to the length of the caudal horn. In no case was this horn more than one-half the size of the caudal horn of *euphorbiae*, and, in several cases, it did not exist at all. In the course of the last stage the larvæ were attacked by the fatal "flacherie," and, in spite of every care, 90 per cent. perished.

PUPÆ.—These are rather nearer *vesperilio* than *euphorbiae* in size and general appearance; the black markings (almost non-existent in *vesperilio*) are clearly defined, though not so dark as in *euphorbiae*.

IMAGO.—Two ♂ and two ♀ moths have emerged after three weeks of pupal life. The females are full of eggs. The ground colour of the forewing is of the *vesperilio*-grey, with, in two cases, a yellowish-pink shading combining with the grey; the bands exist as in *euphorbiae*, but greatly diminished in breadth and in length. The hindwing is the hindwing of *vesperilio*, but with a broader pink outer margin. The underside is much pinker than in *vesperilio*, which it resembles with regard to the grey marginal bands of the hindwing. The abdomen and thorax strongly resemble those of *euphorbiae*. However, in two insects, the 3rd abdominal black band is visible as in *vesperilio*.

As noted above, this new hybrid has been carefully drawn and coloured at every stage, side by side with the parent larvæ and pupæ,

and I may add that these drawings are at the disposal of any person who may desire to publish them.

In the *Nat. Hist. of the Brit. Lep.*, iv., pp. 44 *et seq.*, is a detailed account of the Eumorphid hybrids already known to science. Of these one *Hyles* hybr. *epilobii* has the parentage ♂ *euphorbiae* × ♀ *vespertilio* (*op. cit.*, p. 46).

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

OVUM OF *THESTOR BALLUS*.—Laid singly on the backs of the leaves of the uppermost whorls of *Boujeania hirsuta*, Reichb., partly hidden by the white hairs of the foodplant. Mostly placed near the apex of the leaf, sometimes on the matted hairs, but usually well hidden among them. Upright, tiarate, depressed at the apex, and flattened at the base, walls rounded. When first laid possibly pale yellow, certainly becoming green afterwards and finally deep purple-grey. Height, 0.4mm.; diameter, 0.61mm. Sculpture: The shell is covered with a rather fine net-work, which is, however, well raised above the general surface. The cells so formed are mostly irregular pentagons, measuring about 0.03mm., but becoming larger towards the base. There are no prominences at the angles of the cells, nor any thickening of the cell walls. Thus the egg differs strikingly from that of *Callophrys rubi*. The micropylar basin is rather wide but not deep. The cells of the micropylar area do not differ in shape from those on other parts of the egg, but they are much smaller and more delicate. The rosette consists of seven or eight cells, and is rather difficult to observe without destroying the eggs. [Described April 29th, 1906, from ova sent by Mr. H. Main, who received them from Dr. Chapman from the south of France].—ALFRED SICH. [In the *Ent. Rec.*, xv., p. 122, we gave a description of an egg that we had every reason to believe was that of *Thestor ballus*. Mr. Sich says he found an egg of *Callophrys rubi* on the same plant as that on which the *T. ballus* egg he describes was laid, and suggests that the egg we described was probably that of *C. rubi*.—ED.]

FOODPLANT OF *THESTOR BALLUS* AT HYÈRES.—I found *Thestor ballus* abundant at Carqueiranne in 1906, and have nothing to alter, as to the foodplant it there affects, that I noted in the *Ent. Rec.*, xvii., p. 22. In the cultivated patches, *T. ballus* takes advantage of the way in which the culture benefits *Anthyllis tetraphyllum* as a weed. Away from the cultivation, however, it specially adopts as its foodplant a very hirsute plant, which may have been offhand, but erroneously, named *Lotus hispidus* by entomologists, and may be the plant intended by that name by the authorities, who cite *Lotus hispidus* as the foodplant of *T. ballus*. This hirsute plant, Mr. Raine tells me, is *Boujeania hirsuta*, Reichb. I fancy *Dorycnium hirsutum* is a synonym. I found one plant of this with dozens of eggs of *T. ballus* on it, others had them more sparingly.—T. A. CHAPMAN, M.D., Betula, Reigate. September 11th, 1906.

NOTES ON COLLECTING, Etc.

LIVING SPECIMENS OF *BRYOPHILA MURALIS*, *B. PERLA*, ETC., ATTACKED BY FUNGUS.—I was at Worthing during early August, and paid particular attention to *Bryophila muralis* and *B. perla*. I was much

struck by the fact that almost every specimen was affected by a red fungoid growth, which, in some cases, almost covered the entire under surface of the wings and body, and in many appeared on the upper surface of the wings also. I imagined that this might be a parasitical disease due to their habit of sitting on walls, but I took many specimens of *Miana furuncula (bicoloria)*, also some *Eupitheciae* in the same locality, affected in the same way, though to a less degree, and, as far as my experience goes, *M. furuncula* has no such marked predilection for walls. I expect this subject has often been thrashed out before, but my excuse must be that I am practically a beginner, having been abroad so much lately as to be quite out of touch with entomological matters. I hope that someone may take compassion on my ignorance and enlighten me on the subject of the cause and effect of this growth through the medium of your valuable magazine.—(CAPT.) P. A. CARDEW, Ripley House, Castle Avenue, Dover. *September 4th, 1906.* [We should be glad of information concerning any fungus thus attacking lepidoptera. Our correspondent is surely not referring to the little red mite, so often common on these and other species.—ED.]

LEUCANIA FAVICOLOR IN SHEPPEY.—I took several specimens of *L. favicolor*, at sugar, early last month, on the Medway marshes near Queenborough. This, I believe, is the first time it has been taken in the Isle of Sheppey.—(LIEUT.) J. J. JACOBS, 63, Marine Parade, Sheerness-on-Sea. *August 16th, 1906.*

SECOND BROOD OF CUPIDO MINIMA.—According to Barrett, evidence is wanting as to the occurrence in England (with the exception of the Brighton and Dover districts) of a second brood of *Cupido minima*. It may, therefore, be worth noting that a friend and I, on August 16th, took several specimens of this species, in very fair condition, on the Devil's Dyke, near Newmarket. This may perhaps be explained by the fact that the grass on the dyke is never cut, so that the foodplant is available all the year.—G. L. KEYNES, D.Sc., 6, Harvey Road, Cambridge. *August 19th, 1906.*

URBICOLA COMMA AND POLYOMMATUS CORYDON IN CAMBRIDGESHIRE.—I may also mention that we have this year found *Urbicola comma* locally plentiful on Royston Heath, and that *Polyommatus corydon* ab. ♀ *semibrunnea* appears to be by no means rare in this locality, as we have obtained five specimens without much trouble.—IBID.

AMPHIDASYS BETULARIA AB. DOUBLEDAYARIA ON WIMLEDON COMMON.—Between June 20th and 28th, 1906, I took 48 specimens of *A. betularia* ♂ by the joint attraction of virgin ♀s (typical) and light. Of these 48 specimens, 29 were more or less typical, 14 were ab. *doubledayaria* and 5 intermediate forms, thus giving, roughly, 61% of typical specimens, 29% of ab. *doubledayaria*, and 10% of intermediate forms. All the intermediate forms were of average size, whilst 4 of the ab. *doubledayaria* were small, as also were 2 of the typical specimens. The intermediates are really type specimens very thickly speckled with black, and not the true intermediates as defined by Mr. L. Doncaster (*Ent. Rec.*, xviii., p. 207).—RALEIGH S. SMALLMAN, F.E.S., Wressill Lodge, Wimbledon Common, S.W. *August 3rd, 1906.*

ACONTIA LUCTUOSA AT LIGHT IN LONDON.—The abundance of common insects at light in this part of the southeastern district of London has probably not been equalled for many years. Two insects appear to be especially worthy of notice, *viz.*, an example of *Acontia luctuosa* in a

shop in Dermody Gardens, Lewisham, on the evening of July 7th, and a specimen of *Apatela aceris* ab. *infuscata*, Haw., on a shop front on "the Pavement," Lewisham, on the evening of June 29th. The latter still appears to be a very rare form in this country.—A. M. COCHRANE, Lewisham, S.E. July 16th, 1906.

IMMIGRATION OF *PYRAMEIS CARDUI*.—I notice that several correspondents mention the immigration of *Pyrameis cardui*, but, as most of the records appear to be from the southeastern counties, perhaps its appearance in this quarter may be worth noting. The first one I saw this year was on May 28th, at Tintern, and I have since seen specimens in this neighbourhood on June 3rd, 4th, 5th (several), and July 5th. I have also met with examples, while cycling, at Goodrich, in Herefordshire, on June 19th; Berrow, in Worcestershire, on July 3rd; and a good number in Herefordshire last Saturday, July 7th, in the open country between Whitchurch and Pencoyd. One I saw on this date had the temerity to chase a bird, a thing I have never seen a butterfly do before. I was riding quietly round a bend in the road and started a blackbird out of a hedge, when it flew across the road to an oak-tree. On the road was a specimen of *P. cardui*, basking in the sun, which, seeing the bird flying by, promptly made after it, keeping an inch or two behind until it had reached the tree, when it left it and sailed round back to the road again.—J. F. BIRD, The Nurtons, Tintern, Monmouthshire. July 9th, 1906.

AGRIADES CORYDON IN MONMOUTHSHIRE.—While out last Saturday evening, August 11th, searching for aberrations among the *Rumicia phlaeas* and *Polyommatus icarus* sleeping on grass-heads, etc., I was very much surprised to come across a fine male specimen of *Agriades corydon*, a species I did not expect to find here. Probably it was a wanderer from one of its habitats in Gloucestershire.—IBID.

LAPHYGMA EXIGUA AT BEXLEY.—When in company with Mr. V. E. Shaw, I took a grand specimen (σ), in bred condition, of *Laphygma exigua* here last night fluttering in the grass.—L. W. NEWMAN, Bexley, Kent. August 27th, 1906.

☛ OLEOPTERA.

TWO EXCURSIONS TO NORTH WALES FOR COLEOPTERA.—On June 21st I went to Barmouth for a few days' beetle-hunting, the chief object of the trip being to take the tiger-beetle, *Vicindela maritima*. This is common at Harlech, near by, and it was found in numbers on the sandhills there. Other things taken at Harlech worthy of mention were: **Cholera agilis* (σ) and *Cassida nobilis* (swept), and *Cis pygmaeus* common under bark of palings. *Cistela murina* occurred in numbers on flowers on the very top of the walls of the famous castle. *Philopertha horticola* was in great numbers everywhere, indeed, not only at Harlech, but at Barmouth and all the places round, though out of all the thousands observed, only one aberration, a blue-black form, was taken, at Llanbedr. The Bog of Arthog was once visited, and a search at the roots of reeds, flags, etc., in the bog produced *Alianta incana*, *Erirhinus scirpi*, *Anchomenus gracilis*, *viduus*, and var. *moestus*, *puellus*, and *thoreyi*, *Quedius semiaeneus*, *Actobius cinerascens*, *Evestethus ruficapillus*, *Paederus fuscipes*, *Elaphrus uliginosus*, *Galeruca calmarensis*, *Hoplia philanthus* (swept), **Bledius longulus*, etc. At Barmouth itself,

**Diglossa mersa*, *Cilenus lateralis*, and **Bledius longulus* were taken under stones on mud below high-water mark, *Byrrhus fasciatus* on walls, *Amara patricia* under stones on the hills at the back of the town, and, in a swamp near the railway, *Tachyusa atra*, *Philonthus micans*, *Stenus ater*, *Anchomenus viduus*, *Homalota graminicola*, *Lathrobium quadratum*, and *Demetrius atricapillus* were taken, and *Hoplia philanthus* was swept. At Llanbedr, the best things were *Telephorus fuscus* and **Larinus carlinae*. The weather was cold and wet during the whole visit, which no doubt somewhat spoiled the collecting. On the 26th a rush back to London was made for social duties, but the 29th saw me again on the road to north Wales, this time to meet my colleague, Professor Beare, and to go to Snowdon. June 30th saw us early on foot from Llanberis, which we made our headquarters, to make the ascent of Snowdon, and we first devoted ourselves to the capture of *Chrysomela cerealis*, the object of the trip, of which we each took a dozen specimens, and then turned our attention to other mountain species. Search under stones produced *Pterostichus aethiops*, common, *P. vitreus*, rare, *Carabus arvensis*, *Nebria gyllenhali*, *Corymbites cupreus* var. *aeruginosus*, etc. Shaking moss at the top of Snowdon proved the most productive means of obtaining beetles, and, in this way, we took *Anthophagus alpinus*, *Mycetoporus angularis*, **Oxyypoda soror*, *Geodromicus globulicollis*, *Byrrhus fasciatus*, and *Patrobus assimilis*, all not uncommon, and *Acidota crenata* and **Heterothops praevia* were taken sparingly. *Oxytellus nitidulus* and *Trogophloeus corticinus* were wrung out of moss in a small waterfall. *Homolota tibialis* and *H. eremita*, among other species, were common in the moss, and a few *H. alpestris* were taken. *Rhagonycha paludosa* was swept in numbers off rushes. The red form of *Ayabus bipustulatus* (var. *soleri*?) was common in the loch. The species marked with an asterisk appear not to have been recorded from north Wales before.—HORACE DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W.

HOMALOTA CUSPIDATA, ER., AND ITS PREY, ANOURA MUSCORUM, TEMPL.—The very distinct *Homalota cuspidata*, ER., has fallen to me several times this year beneath bark of oak and birch near Winlaton, and that of beech in Gibside. In all cases it was found in association with colonies of a peculiar apterous grub-like insect belonging to the *Collembola*, and which I am now able to identify as Templeton's *Anoura (Achorutes) muscorum*, and, this evening, finding the *Anoura* in the first instance, further search revealed also the *Homalota* in question. On three occasions I have watched *H. cuspidata* devouring *A. muscorum*, and, in the circumstances, I think there can be little doubt that it forms the chief food of *H. cuspidata*. *Lipura corticina*, Bourlet, an allied Podurid of sub-cortical habits also falls a prey to *H. cuspidata*. The species mentioned are all additions to the Northumberland and Durham fauna.—RICHARD S. BAGNALL, F.E.S., Winlaton-on-Tyne. April 13th, 1906.

REVIEWS AND NOTICES OF BOOKS.

A PRELIMINARY LIST OF DURHAM DIPTERA WITH ANALYTICAL TABLES, by the Rev. W. J. Wingate. [Published by Williams and Norgate, 14, Henrietta Street, Covent Garden, W.C. Price 9s.]—This work forms volume ii of the new series of the *Transactions of the Natural History*

Society of Northumberland, Durham, and Newcastle-upon-Tyne, and far exceeds in scope what one would imagine from the title, for, as the author remarks in the preface, it contains a guide to the specific characters of 2,210 British species, and of 318 European species, which may yet be found in Britain, while the *List of Durham Diptera* numbers only 634. A short introduction explains the object of the work, and this is followed by hints on collecting and preserving specimens, an explanation of the numbering and a description of the terms employed illustrated by a "Fly Chart" of a hypothetical species of Diptera; six other plates contain illustrations of various structural details. It is a pity the author should have felt obliged to attempt to introduce yet another system of terminology for the wing-veins of Diptera, if, for the sake of brevity, a system of numbering and lettering were preferred, Comstock's system, founded upon a morphological basis, was ready to hand. The general arrangement of the tables is excellent, and the repetition of the distinctive numbers for each family and genus at the top of every page makes it exceedingly easy to refer to any family, generic, or specific, table. The tables are mainly translations and compilations, a few families are not dealt with at all, and a number of British species are not included in other tables, possibly, because the author was unable to refer to the descriptions. One cannot help noticing several orthographical errors, such as *Ramphormyia* for *Rhamphormyia*, *Ramphidia* for *Rhamphidia*, *glabifrons* for *glabrifrons*, etc., and the author should have referred to p. 5019 of Zetterstedt's *Diptera Scandinaviae*, vol. xiii., before asserting that there was no such name as *Rhamphomyia furnipennis*, Zett. The work is admittedly for beginners, and should be of great assistance in inducing people to take up the interesting study of this neglected order, while if carefully used, it should soon give anyone a general idea of the families and genera, but a beginner must look forward to difficulty at times in using the tables, and, in no case, should he come to hasty conclusions as to species, without reference to descriptive works. It is impossible for anyone but those who have studied the Diptera to realise the enormous difficulties attending the compilation of analytical tables for our British species; all the author hopes for his attempt is that it should be found "better than nothing;" this there can be no doubt it is, and, in spite of the many unavoidable imperfections, it may honestly be called a useful guide to the study of British Diptera.—J.E.C.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 12th, 1906.*—EXHIBITS.—PHYTOMETRA VIRIDARIA.—LARVÆ feeding upon *Polygala vulgaris*, Mr. Goulton. OVA IN SITU OF COLEOPHORA VIMINETELLA on willow, C. SOLITARIELLA on *Stellaria holostea*, and an imago of GONIODOMA LIMONIELLA, bred from stems of *Statice limonium*, from Southend, Mr. Turner. CRYPTOCEPHALUS PARVULUS AND C. PUNCTIGER.—A short series, and several BALANINUS CERASORUM from Darenth Wood on July 1st, Mr. West. SARROTHRIPUS UNDULANUS (REVAYANA).—A cocoon and pupa, Mr. F. B. Carr. *July 26th.*—POLYOMMATUS CORYDON.—Pupæ from larvæ reared on horse-shoe vetch, and CALLOPHRYS RUBI, pupæ from ova laid on flower-heads of dogwood,

Mr. Rayward. He also showed ova of *LYCÆNA ARION* and *PLEBEIUS ÆGON*, and referred to the relatively small size of the former. He also reported that, of some 30 larvæ of *P. corydon*, taken at Reigate on June 18th, nearly all were attended by ants, *Formica flava*, and gave most interesting details of their inter-relations. August 9th.—*OCHSENHEIMERIA VACCULELLA*.—Living examples, with a short summary of the little that is known of the species, Mr. Sich. *PYGÆRA PIGRA*.—A beautiful aberration by Mr. Sich. *ACIDALIA MARGINEPUNCTATA* (*PROMUTATA*).—Fullfed larvæ from Eastbourne ova, most were ready to pupate, only about ten would probably hibernate, Mr. Adkin. *AGROTERA TRABEALIS*.—Living larvæ from Cambridge, also larvæ of *CUPIDO MINIMA* from Horsley, Mr. Rayward. *ENODIA HYPERANTHUS* VAR. *CÆCA*.—From Horsley, Mr. Edwards. August 23rd.—*MOMA ORION*.—A long series bred from a New Forest female, and *PHORODESMA SMARAGDARIA*, a series bred from Essex, one of them being of a more intense green, and without the usual white markings, Messrs. Harrison and Main. *HELIOTHIS PELTIGERA*.—Taken at Brockenhurst on June 1st. *BROMOLOCHA FONTIS* (*CRASSALIS*), from Leith Hill in early July. *ÆGERIA CULICIFORMIS*, from Beaconsfield, Mr. Turner. *POLYOMMATUS BELLARGUS*.—Females from Eastbourne in June, Mr. Adkin, who read notes upon the geographical distribution of the blue race of this sex. *COSMOTRICHE POTATORIA* AB. *BEROLINENSIS* ♂.—A fine bred specimen, Mr. Mann for Mr. Oldham. *POLYOMMATUS BELLARGUS*.—Pupæ from Folkestone larvæ, Mr. Rayward. The exhibitor gave a most interesting account of the inter-relations of ants and larvæ of this species. Dr. Chapman said that he was on one occasion easily able to find larvæ of *Rusticus argyrogonomon* by the groups of ants attending each larva.

CURRENT NOTES.

On June 10th, 1906, the Hon. N. Charles Rothschild bred an example of *Sesia andreniformis* from a larva that he found mining in the stem of *Viburnum lantana*. Mr. Sydney Webb, of Dover, suggested this plant as likely to yield larvæ of this rare insect as long ago as 1898, but it was not found till this year.

The Baron Crombrugghe de Picquendaele has published in two parts an excellent list of the Micro-Lepidoptera of Belgium, with extended locality lists, notes, etc. It is quite one of the best local lists yet published on the continent.

Dr. K. Schawerda publishes a detailed account of the variation of *Parasemia plantaginis*, with several new aberrational names, some of which appear to be synonymous with others already published (see *Ent. Record*, ix., pp. 187-192, etc.).

The Right Hon. Lord Walsingham adds *Blastotere glabrata*, Zell., to the lepidopterous fauna of Britain. He captured two dozen good specimens from an old spruce-fir hedge in the kitchen garden at Merton Hall.

Mr. A. Thurnall succeeded in rearing *Aristotelia lucidella*, on August 7th, from stems of *Fleocharis palustris*, cut on July 4th for *Bactra furfurana*.

ERRATA.—Page 205, line 41, for "1903" read "1893"; page 204, line 36, omit "June."

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Entomological Society of London.—11, Chandos Street, Cavendish Square, W. 8 p.m. October 3rd, 17th.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. September 23rd, Coulsdon, 10.25 a.m., Cannon Street; September 29th, Loughton, 9.14 a.m., Liverpool Street.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m.; September 27th, "Collecting Notes"; October 6th, Fungus Foray; October 11th, "Exhibition Lantern Slides."

North London Natural History Society, The Amherst Club, Amhurst Road, N., at 7.45 p.m. September 25th, October 9th; September 29th, Excursion to Epping Forest, Liverpool Street, 1.35 p.m.

Lancashire and Cheshire Entomological Society.—Royal Institution, Liverpool. Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained. (No dates received.)

Birmingham Entomological Society, Norwich Union Chambers, Congreave Street, at 8 p.m. October 15th.

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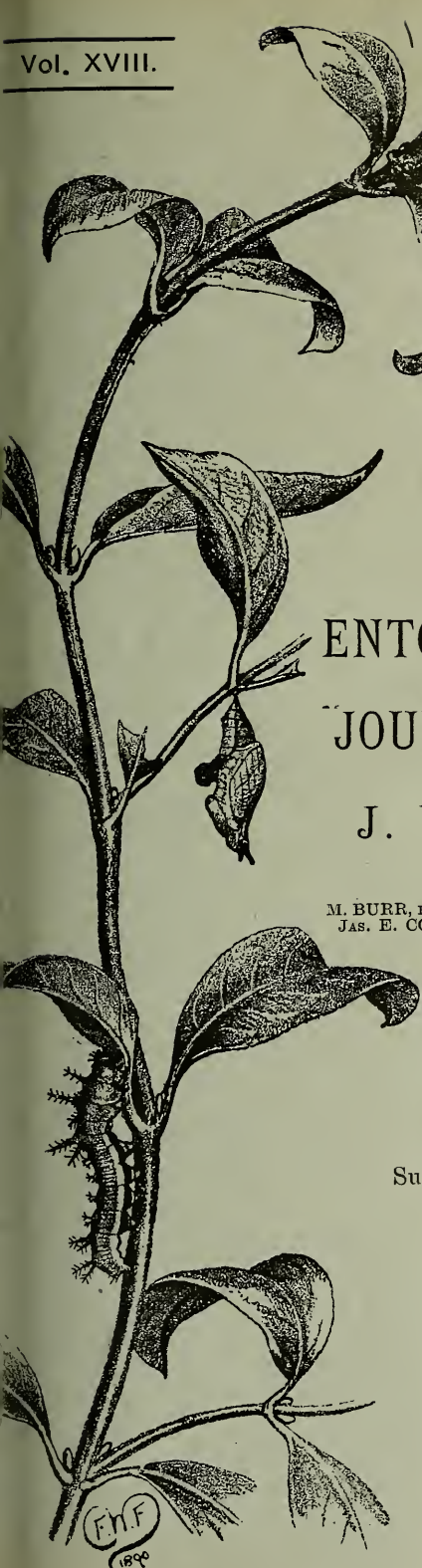
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Stenoptilia graphodactyla, a species of Alucitid new to the British fauna.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.E.S.

I have quite recently bred from marsh gentian (*Gentiana pneumonanthe*) a few imagines of a plume which appear to me to be different from *Adkinia zophodactylus*, to which, of our British species, it seemed to be most closely allied, and which I now learn from Mr. Tutt is *Stenoptilia graphodactyla*, and near to var. *pneumonanthes*, Schleich. The credit of the discovery of the species, whatever it may be, is due to my wife. She collects plants, and, among a number of specimens she was drying, that had been obtained near Wimborne, was a head of marsh gentian containing several flowers. After they had been pressing for several days, under a considerable weight, she examined them to see if they required placing between dry sheets, and was not best pleased to discover that some of the flowers had been much eaten by a couple of little larvæ, which looked none the worse for having been subjected to such pressure. She brought them to me as she thought they might be something good, as they were feeding upon rather an uncommon plant, and I at once saw they were the larvæ of some kind of plume. I consulted the only book I had with me, Leech's *British Pyralides*, but could find no gentian-feeder, but thought the larvæ might possibly be that of *Adkinia zophodactylus*, which feeds on *Erythraea*, an allied plant. This was about the middle of August, and these two larvæ were then nearly full-grown. I placed them in a large glass-topped box with some flowers of gentian, into which they crawled, but in a day or two they came out, spun pads of silk on the glass, and, in about 48 hours changed to pupæ, hanging head downwards. The first moth appeared on August 29th, and the second on the 31st, and I noticed that they were not a bit like the figure of *A. zophodactylus* in Leech's book. These larvæ appeared to be rare, for, after several days' careful search among the gentian, which itself was by no means plentiful, I could only find about a dozen, and two or three more were found among the drying plants. On September 1st I netted one of the perfect insects, and on the 4th two more, which were beaten from mixed herbage in the locality where the gentian occurred. On this latter date I also took three pale brown plumes, much the worse for wear, which I thought might be *A. zophodactylus*, but proved to be *A. bipunctidactyla*. The following description of the larva was taken on August 25th:—

"Pale green, with a darker green dorsal line, below which is another dark subdorsal line, bordered on each side by a pale greenish-white line, the lower edge of which is rather indented; spiracles minute, white, in a black ring; the anal segments somewhat attenuated; the 2nd segment much smaller than the others; head pale yellowish-brown, clouded with darker reticulations; the whole surface covered with a pile of short pale brownish hairs, with longer ones in groups of two, three, or four, arranged along the sides and back. In some larvæ the dorsal stripe is tinged with purple, and the general colour a yellowish-green. Pupæ greenish-yellow."

I may add that there was no *Erythraea* growing where these plume-larvæ were taken. The last moth was bred on September 20th.

A few notes on rearing *Loweia (Chrysophanus) alciphron* var. *gordius*.

By R. M. PRIDEAUX.

A female of this insect was captured in the Rhone Valley, near Martigny, on June 23rd, 1905, which was persuaded to lay a few eggs on the stems and leaves of common sorrel. (A photo-micrograph of some of these ova, taken by Mr. Tonge, has already appeared in Mr. Tutt's *Natural History of British Butterflies*, and was reproduced in this magazine, December, 1905.) The ova began to hatch on July 12th, thus disproving, in this instance, at least, the statement that the species hibernates as an egg.

The young larvæ closely resemble those of *Rumicia phlaeas* in appearance and habits, being very sluggish then and during their entire larval life. At this stage they are closely covered with long, relatively stout, hairs, pointing slightly backwards; they make inroads into the green substance of the leaves of *Rumex acetosa*, leaving the upper epidermis intact. The larvæ moulted three times before hibernation, after the first moult obtaining, more or less, the characteristic "wood-lice" shape; they are entirely green throughout their larval stages, covered with short, pale, pinkish-brown bristles; none of my specimens showed any limit of the pinkish linear lines seen in *R. phlaeas*. Early in November, with considerable unanimity, the entire thirteen larvæ that I then possessed, ceased feeding, and attached themselves rather loosely to the sorrel leaves, where they were all found, somewhat shrunken in size, in the following March, when they were transferred to fresh sorrel leaves, on which, when the weather was warm, they very leisurely began again to feed.

The black larval head is scarcely ever visible, even during feeding, the segments behind it enclosing and enfolding it. Except during the moulting process, the least touch is sufficient to dislodge the larva from its foodplant; should it fall upon its back, the leisurely manner in which it twists itself back on its feet characterises its sluggish habits and attitudes under all conditions.

The larvæ either retired under dead leaves for pupation, or spun up under the lid of their cage. There is a fairly substantial thoracic girdle, the cremastral attachment being but slight. The pupa is dumpy in shape, and pale olive-brown in colour, mottled with darker shades. As in the case of the other *Chrysophanid* pupæ, the dorsal and abdominal areas are covered with stalked, glassy, parachute-shaped prominences. Of the thirteen larvæ, one was lost by a misadventure; eleven of the remainder began pupating on May 25th, 1906, the first butterfly being disclosed on June 23rd, in all, four males and seven females (in the order given) resulting.

The specimens are of average size, the males resemble those captured in the same locality as the parent female last year, of a light type, the purple flush being rather in the nature of a pale mauve, general, suffusion.

The thirteenth larva, oddly enough, ceased feeding after the last moult, shrank somewhat in size, and attached itself to the side of its cage, and remained, aestivating, in this situation for about three months. Early in September it again showed signs of activity, and is now (September 11th) apparently feeding up with a view to pupation.

A Few Odd Notes on Lycaenids, etc.

By J. W. H. HARRISON, B.Sc., F.E.S.

On July 14th I was out after *Polyommatus astrarche*, but, as it became dull, I spent the remainder of the day in examining the numberless *P. icarus*, which were resting on the grass and rush heads, for aberrations. I only took two or three worthy of mention. The first was a male specimen of ab. *icarinus*, Scrib. This is the first specimen of this form I have taken; it is now in the possession of Mr. G. B. Walsh of Hull. Not far from this specimen I got a dwarf form, also a male, expanding only 22mm. This contrasted greatly with some giant *P. astrarche* I had taken earlier in the day with a wing expanse of 35mm. Several of the female examples I took, in addition to the inner half of the fringes above being grey, possessed a dark brown or almost black line, on the underside running parallel to the margin and bisecting the fringes. I looked in vain for male examples of this form. Just as I was leaving, I got a remarkable form of the female; it was quite symmetrically marked. The forewings beneath possessed the discal scar, but the two basal ocelli, or rather their remains, were moved up to the scar, and, together with the black centre of the scar, and the remains of the subterminal row of ocelli, which were also moved up to the scar, formed a small black T. The hindwings only possessed a confused mark in the centre; I take this to be a rather unusual form of ab. *persica*. As the insect was a female, I resolved to try for ova, and I was successful; I allowed it to lay about two dozen, and then killed and set it.

It is rather curious how brightly coloured the female blues on the coast are, compared with the dingy brown specimens found inland.

As I noted before, *Cupido minima* reappeared in its inland localities in Durham and Northumberland last year in some abundance after being unobserved for several years. This year, a close search for the insect and also for ova, which were readily found last year, ended in absolute failure, although the butterfly was observed sparingly in a new locality near South Shields.

Polyommatus astrarche and its aberrations were very abundant this year in all its known haunts. I should think its numbers were about six times that of a normal year. This is the more extraordinary, as a friend and myself went for larvæ at the end of April, and, except for a single larva I obtained, and gave to my brother for a correspondent, not one was visible. In an ordinary season, between two and three dozen larvæ has been the usual take. What was still more remarkable, was the absence of any indication of the larvæ feeding. My friend, Mr. Johnson, of Gateshead, before becoming aware of our non-success, also made a search, and also with a total catch of one. The other friends of mine, who were with him, took none. I fancy the larvæ fed up very early in the spring, or took advantage of the open winter, and fed up then. Or, perhaps, with the hereditary tendency to double-broodedness, the larvæ fed up last year in the warm autumn we had, and remained as pupæ all the time. A slight confirmation of one or other of these surmises, I see in the fact that, in spite of the cold June, the insect was out about ten days earlier this year than in 1904.

I have rather a curious incident to relate regarding *Rumicia phlaeas*. During the Christmas holidays I had occasion to send a consignment

of insects to Canada. For the purpose of packing, I went out and collected some sphagnum moss. For some reason or other I delayed my package until February and then sent it. When it reached Canada and was opened, out flew a fine, perfect specimen of *R. phlaeas*. In what condition had that specimen hibernated? and where?

Nisoniades tages in Durham.—I had no opportunity of taking *N. tages* inland, in either Durham or Northumberland, although it occurs sparingly in all suitable localities in northwest Durham and southwest Northumberland, but I took it upon the Durham coast for the first time on July 7th.

Collective Inquiry as to Progressive Melanism in Lepidoptera.

SUMMARY OF EVIDENCE PREPARED BY L. DONCASTER, M.A.

(Concluded from p. 226.)

In the introduction to this paper attention has been called to some of the more important points connected with melanism in moths. It remains to indicate to what extent the evidence hitherto received helps to elucidate the problems mentioned, and to point out in what directions additional information is chiefly needed.

The great interest of progressive melanism lies in the fact that it is almost the only known instance of a secular varietal change which has actually been observed in nature. Many instances are known of change in distribution, but here we have a definite evolutionary process taking place under our eyes, and quite apart from any conscious human interference. It is, therefore, of the utmost scientific importance that the process should be watched with the greatest care; the progress of the variation and its spread from one locality to another must be recorded with accuracy, and all the possible causes must be considered in order that we may find out, if possible, which are really effective. For this purpose observations are especially needed on the borders of the chief melanic areas, *e.g.*, in the Midlands and around Birmingham, and, unfortunately, these are the districts from which the information is at present most incomplete. Breeding experiments are also needed in order to determine how the melanic variation is inherited in different species in order to throw light on the nature of the variation and its manner of spreading. Something has already been done in this way, and has shown that the results obtained are not always similar with different species, but more is needed before any general rules can be laid down.

Although more evidence is still much wanted, the records sent in make it possible to form a definite judgment on several points of importance, and suggest fresh lines of valuable inquiry. We will discuss, in order, the nature of melanic variation and its inheritance, its geographical distribution and manner of spreading, and, finally, the possible causes which may have led to its increase in many localities.

It is evident at the outset that the phenomena spoken of collectively as melanism represent more than one kind of variation. In the first place, in most of the species considered, melanism consists of a general suffusion of black scales, but in *Hemerophila abruptaria* and *Polia chi* the colour is not black, and in the banded form of *Acidalia aversata* the suffusion is strictly limited in area, although a diffusely melanic form also occurs in London. Another obvious difference, and one,

perhaps, of great importance, is that in some species there is a sharp distinction between melanic and typical specimens, intermediates being very rare; in others there is a gradual progressive darkening from the lightest to the darkest forms. Examples of the discontinuous class are *Amphidasys betularia*, *Hemerophila abruptaria*, *Venusia cambrica*, *Acidalia aversata*; of the continuous, *Odontopera bidentata*, *Xylophasia polyodon*, *Diurnaea fagella*. But, in some cases, where the variation is apparently continuous, breeding experiments may reveal undoubted discontinuity among the offspring of the same parents. This was well illustrated by the beautiful series of *Triphaena comes* (*orbona*) exhibited by Mr. Bacot at the meeting of the City of London Entomological Society on November 7th, 1905. A casual observer of his insects might say that, in the families which contained both light and dark specimens, every grade existed between the lightest and darkest, but on closer inspection it became at once manifest that a perfectly definite line could be drawn. There was no doubt at which point in the series the separation came; above it, all the moths were typical, below it, all melanic, but the intensity of the melanism varied greatly, from a slight suffusion to almost complete blackness. This suggests that melanism may be a discontinuous character, although the intensity with which the darkening appears in individuals fluctuates; a sharp line separates melanic from non-melanic, but the depth of melanism varies continuously among the individuals affected. In some species, e.g., *A. betularia*, the melanism, when present, is nearly always complete, but in these also rare intermediates occur, which may probably be regarded as cases in which the darkening is present, but less intense than usual. Such specimens are distinguishable at a glance from dark examples of the type in which the markings are definite, but more than usually extensive; both the type and the melanic form exhibit fluctuating variability, but a given insect can almost always be referred without hesitation to one or the other. On the other hand, in such species as *X. polyodon*, it is difficult to draw any line, or to be confident that any discontinuity exists, and to elucidate such cases further observation and experiment would be of great value, for it is possible that they belong to an independent category of variation having different causes.

Some of the breeding experiments which have been made with melanic species indicate that melanism is inherited in accordance with Mendel's law. This appears to be the case in *T. comes* (Bacot) and *H. abruptaria* (Harris, Hamling, although in Mr. Harris' experiments the numbers diverge widely from Mendelian expectation). In other species, e.g., *A. betularia*, it will probably be found that the same form of inheritance prevails, the melanic form being dominant in each case over the type. In other cases the inheritance is not Mendelian, e.g., in *A. nebulosa* the darkest form crossed with the grey gave intermediates in addition to grey and black, and grey parents may throw a proportion of black offspring.

It has long been known that variations in temperature, moisture, and other conditions may cause differences in the colour and pattern of lepidoptera, but such varieties disappear in the offspring when they are reared under normal conditions. In some cases where varieties have been produced by extremes of temperature, a small part of their offspring has also been abnormal (Fischer), but nothing like the inheritance found in typical melanic cases has been observed. Gräfin

von Linden has shown that the effects of temperature can be imitated by influencing the metabolism during the pupal stage, and it is also fairly certain that by artificially varying the length of pupal life, a greater or less pigmentation may be produced. It has frequently been assumed that melanism may be the result of changed environment acting on the individuals exhibiting it, and the experiments referred to suggest that this may be true in some cases. But breeding experiments prove that in the great majority of cases melanism is exactly comparable with any other form of "spontaneous" variation or dimorphism; it is not produced by the direct action of environment on the individual, but is inherent, and transmitted to offspring in just the same way as other natural varieties. Of the causes which produce such variation we know nothing, but observation and experiment may discover what circumstances favour its persistence and spreading in some cases, and its disappearance or rarity in others. But if it be true that, in some cases, melanism may be produced in nature by the action of external conditions on the individual, while we know that this is not so in other species, it is most important that we should have further observation to enable us to distinguish between these different forms.

The chief object of the present inquiry was to determine the geographical range of melanism at present as a basis for future comparison, and to collect as much information as possible about its spread within the memory of living observers. The extent of the melanic area varies widely in different species; some, *e.g.*, *M. strigilis*, are dimorphic over their whole range, but in such there may be evidence that the dark form is becoming more frequent in some localities, and tending to the exclusion of the light. In the majority of species the dark form is commonest in one or more centres, and becomes scarcer as the distance from the centre is increased. The melanic area may be restricted, as in *H. abruptaria* and *A. psi*, or very large as in *X. polyodon*, and at the present time in *A. betularia*. In some species melanism exists in certain areas, but shows no tendency to spread; in others it has increased its range rapidly within a few years. When such spreading has occurred, it is almost always irregular; in some directions it has progressed quickly to great distances, while in others the type remains predominant quite near the melanic centre. Several examples of this are given in the summary of evidence received, *e.g.*, the black *betularia* first appeared near Manchester; it has spread over Lancashire, Yorkshire, and the northern Midlands, and has now been taken in all the eastern counties, and is not rare in London, but in the south and southwestern counties, and in Scotland, it is still rare or absent. Perhaps even more remarkable is its spread on the Continent, where, beginning apparently from Belgium, it travelled up the Rhine and has now reached Saxony, Silesia, and Berlin. The black variety of this species appeared in Belgium before it was known in the eastern counties or in London, and it is possible that it arose there independently, but it is, perhaps, more likely that it was imported from England and established itself there. The same problem is presented by *P. pilosaria*, of which a black variety is found in the Swansea district, which is said not to differ from that taken in Yorkshire; here, again, it may have been artificially introduced. This species also is very capricious in the spreading of its melanic variety; the black form has rapidly become

frequent at Huddersfield, but, although it occurred at Sheffield in 1896, it seems not to have increased at all, and in some woods near the town it has never been recorded. Other cases of the same kind are given for *P. chi*, etc. It is possible that where melanic varieties are found in widely separated areas, they have arisen independently in each locality, and this is certainly true in some cases, e.g., *Fenusia cambrica*, for, in this species, the dark variety found in the Sheffield district is very different from that taken at Middlesborough. Similarly, Barrett has described several distinct varieties of *O. bidentata*, which seem to be characteristic of different localities.

In cases in which melanism has increased in comparatively recent years, the rate of increase in the melanic area, and the rate of spreading of the melanism into districts previously unaffected, vary in different species. From the evidence received, some idea may be gained as to the rate of increase in some species, e.g., *A. betularia*, *P. pilosaria*, *H. progemmaria*, and, in London, of *E. rectangulata*, but in general it is not yet easy to get definite facts which shall determine exactly how fast the change proceeds. What is needed more than anything else is that, on the outskirts of the melanic area for any species, i.e., especially in the Midlands and around London, observers should each year collect a considerable sample at random, so that the percentage of melanics for every year should be known with accuracy. With common species, such as *H. progemmaria*, *P. chi*, *X. polyodon* and others, this could be done without difficulty, and would lead to most valuable results in the course of a few seasons. It would also help to solve the problem as to whether melanics are more frequent in some seasons than in others, about which, at present, very little is certainly known.

It is well-known that the areas in which melanism is most frequent are either in the neighbourhood of large towns and manufacturing districts, or are characterised by heavy rainfall and damp climate. It seems, from the records received, that the most conspicuous cases of *progressive* melanism, in which there has been a notable increase since it was first observed, are those which have arisen under urban conditions. Examples of this are *A. betularia*, *P. pilosaria*, *H. abruptaria*, *E. rectangulata*, *A. psi*, and *P. chi*. In *X. polyodon* and *C. bilineata* the chief melanic areas are in places with heavy rainfall, viz., west of Ireland and Scotland, but in *X. polyodon* there is evidence that melanism is increasing in the manufacturing districts of the north of England. Somewhat similar cases are *O. bidentata* and *M. strigilis*, both of which have dark varieties in districts far removed from smoke, but show an increase of melanism in smoky localities. A remarkable example of melanism, arising quite apart from smoke, is that observed by Mr. Goodwin in *T. consonaria* and *T. consortaria*, in Kent. *A. nebulosa* is perhaps also exceptional; as in many other species, it is darker in the north of England than in the south, and this was probably the case before manufacturing towns existed, but its most extreme black form occurs at Delamere, where there is not much smoke, and in Scotland the fully light type found in the south reappears. Delamere is a melanic centre for other species also, e.g., *M. liturata*, but it does not seem to be characterised by either excessive smokiness or rainfall.

Although there are, perhaps, not many cases of melanism which have arisen in districts where there is neither smoke nor excessive

rainfall, yet in some species the melanic variation has spread far beyond the area where these conditions prevail. But in most cases, although melanic individuals may become frequent in such normal districts, they do not become predominant; and when they have largely or completely replaced the type in localities far removed from their place of origin, these localities are generally affected by similar urban conditions. As examples of this may be mentioned the prevalence of black *A. betularia* and *P. pilosaria* in manufacturing districts of south Wales, and of *A. betularia* in Belgium and Crefeld.

The relation between melanism and urban conditions has given rise to much speculation and discussion*. It has been pointed out above that we are not justified in assuming that there is an immediate relation of cause and effect between external environment and a given variation of this kind. But it is often stated that, when the dark variety has arisen, it is preserved because it is less conspicuous to enemies, and so replaces the type through a process of natural selection. There is certainly much to be said in favour of this view. A dark variety is undoubtedly less conspicuous on a smoke-blackened tree-trunk than the paler type, and there are other well-known cases of variation in lepidoptera which seem to be in agreement. For example, *Gnophos obscurata* has, in the New Forest, a nearly black variety, which is said to rest on cut peat, and in the north of England it has a yellow-brown form which rests on the clay cliffs of the coast. Some species, e.g., *B. rhomboidaria*, have a grey ground when found in chalk districts in the south of England, and are brown when occurring on other rocks. It is not easy in such cases to imagine any other cause than protective coloration to account for these local forms.

On the other hand, in many species there seems little reason to believe that such protective coloration is likely to be effective. In moths which do not usually rest on trees or walls, but live concealed in grass or herbage, and fly only at night, it seems incredible that the rapid change witnessed can be due to natural selection of colour. There is some reason to believe that colour-variation may be related to constitutional hardiness, e.g., in *Angerona prunaria* it seems that the var. *sordida* is less hardy than the type; and it is conceivable that melanic varieties which have arisen in urban conditions may be constitutionally more fitted to the changed environment than the type. Such an idea is at present purely speculative, but might be tested by rearing numbers of both varieties under identical conditions.

One further point should be mentioned. The species about which information has been collected were chosen because of their frequency, or as illustrating certain special aspects of melanism. But it should be noted that, although melanism is widely distributed among moths, yet it is apparently confined to certain families, and is absent in others; within the family also some species are affected, and others nearly related are not. This subject has been dealt with by Prout (*Entom.*, 1904, p. 151).

In conclusion, while expressing our gratitude to the numerous correspondents who have sent information, we wish to emphasise the fact that more evidence is urgently required, especially from the

* See, especially, Tutt's long series of papers, and discussion in *Ent. Record*, 1890-1893 (reprinted as a separate brochure under the title of "Melanism and Melanochroism in Lepidoptera") (Swan Sonnenschein & Co.).

Midlands, and that negative evidence is of value as showing the present limits of melanism in any species. Careful breeding experiments with melanic species would also yield most valuable results.

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Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from p. 229.)

GENUS VIII: PHANEROPTERA, Serville.

This genus includes delicate, dark green, grasshoppers, with wings notably longer than the elytra; it is only likely to be confused with the following, like which it has the coxæ armed with spines; but, in this genus, the tympanum is open and the anterior tibiæ are unarmed above, except for the apical spine.

TABLE OF SPECIES.

- | | |
|---|------------------------|
| 1. Subgenital lamina ♂ dilated at base, with pointed lobes; cerci of ♂ compressed and dilated in middle | 1. FALCATA, Scop. |
| 1.1. Subgenital lamina ♂ not dilated, with short triangular lobes; cerci ♂ smooth. | |
| 2. Elytra surpassing apex of posterior femora when at rest | 2. QUADRIPUNCTATA, Br. |
| 2.2. Elytra not attaining apex of posterior femora when at rest | 3. NANA, Charp. |

1. PHANEROPTERA FALCATA, Scopoli.

This species must be carefully distinguished from the following: It is of a dark, opaque, green colour, with no black spots on the elytra. Length of body, 14mm.-18mm. ♂ and ♀; of pronotum, 3.5mm.-3.8mm. ♂ and ♀; of elytra, 20mm.-22mm. ♂ and ♀; of posterior femora, 18mm.-22mm. ♂ and ♀; of ovipositor, 5.5mm. ♀.

Common on low shrubs throughout central Europe, but not reaching the Mediterranean coast. In England, a stray specimen has been taken in Cornwall, but it is not a native. It is not rare in the centre of France, and has been taken as far north as Paris; also in the wood of Valence in Seine-et-Marne, at Aigremont in the Vosges, at Misy, at Fontainebleau, Barèges, Gavarnie, Allier, at Couche in

Saône-et-Loire, at Canigou, near Grenoble, Serres in the Hautes-Alpes, at Décines near Lyon. South of the Alps it is rare.

2. PHANEROPTERA QUADRIPUNCTATA, Brunner.

Closely resembles the preceding species, but differs in the paler colour, which is more yellowish, by the four black spots on the elytra of the male, by the deeper side flaps of the pronotum, by the rounded, and not broadened, cerci of the male, and the less sharply bent ovipositor of the female, and by the narrower, sharper, subgenital lamina of the male. Length of body, 13mm.-15mm. ♂ and ♀; of pronotum, 3.5mm. ♂ and ♀; of elytra, 19mm. ♂ and ♀; posterior femora, 17mm.-18mm. ♂ and ♀; of the ovipositor, 5.5mm. ♀.

Replaces the preceding in southern Europe. In France not uncommon in the south, Montpellier, Cannes, Hyères, Toulouse, Tarbes, Bagnols, Montauroux, le Rayran, Caraman, Valence, Drôme, le Var. In Italy at Venice; also in Sicily, Sardinia, and in Spain at Malaga.

3. PHANEROPTERA NANA, Charpentier.

Closely resembles the preceding, but differs in the shorter elytra, less rounded side flaps of the pronotum, and especially by the narrower point of the ovipositor. Length of body, 12mm.-13mm. ♂ and ♀; of pronotum, 3.2mm. ♂ and ♀; of elytra, 15.5mm.-18mm. ♂ and ♀; of posterior femora, 16mm.-17mm. ♂ and ♀; of ovipositor, 4.5mm. ♀.

Really an African insect, this species appears to have been taken in Portugal.

GENUS IX: TYLOPSIS, Fieber.

Resembles *Phaneroptera*, but anterior tibiæ spined above, and tympanum conchatum or shell-shaped. A single species.

1. TYLOPSIS LILIFOLIA, Fieber.

Green or testaceous, or violet-brown and marbled; in appearance like *Phaneroptera*. Length of body, 13mm.-22mm. ♂, 17mm.-23mm. ♀; of pronotum, 3mm.-4.8mm. ♂ and ♀; of elytra, 16mm.-24mm. ♂, 17mm.-24mm. ♀; of posterior femora, 21mm.-27mm. ♂ and ♀; of ovipositor, 4mm.-6mm. ♀.

Common in the neighbourhood of the Mediterranean. In France, only in the extreme south, Marseilles, Hyères, Cette, Vias, Toulouse, Amélie-les-Bains, Bagnols, Montauroux, Draguignan, le Rayran, Carcassonne, Saint Tropez. In Italy at Turin, Pegli, Voltaggio, Naples, Genoa.

The marbled aberration, *margineguttata*, Serv., occurs with the type, but is less numerous; also throughout Spain.

FAMILY II: MECONEMIDÆ.

This is an extremely restricted family of small, delicate, pale green insects, with no stridulating apparatus; superficially resembling the *Phaneropteridæ*, they may be at once distinguished by having the tarsi sulcate at the sides, in common with the following families; the tympanum is open, and the anterior tibiæ have no terminal spine, while the hind tibiæ have an apical spine on each side above, and two apical spines beneath. There are but two genera.

TABLE OF GENERA.

- | | |
|--|----------------------|
| 1. Pronotum narrow, not surpassing the metanotum; elytra and wings perfectly developed and free, or abbreviated; anterior coxæ unarmed; ovipositor with margins perfectly smooth | 1. MECONEMA, Serv. |
| 1.1. Pronotum broad, distinctly surpassing metanotum; elytra entirely hidden by pronotum; anterior coxæ armed with a spine; ovipositor serrated at apex | 2. CYRTASPIS, Fisch. |

GENUS I: MECONEMA, Serville.

This includes two species, of which one is fully winged, and the other has abbreviated wings, in both sexes.

TABLE OF SPECIES.

- | | |
|---|----------------------|
| 1. Elytra and wings fully developed | 1. VARIUM, Fabr. |
| 1.1. Elytra lobiform; wings none | 2. BREVIPENNE, Yers. |

1. MECONEMA VARIUM, Fabr.

Pale green; antennæ ringed; cerci of ♂ long and crossed; ovipositor long and sword-shaped; subgenital lamina ♀ triangularly produced; longitudinal keel on pronotum behind the transverse sulcus. Length of body, 12mm.-15mm. ♂, 11mm.-14mm. ♀; of pronotum, 2.8mm.-3mm. ♂, 3mm.-3.2mm. ♀; of elytra, 11mm.-12.5mm. ♂, 10.5mm.-12mm. ♀; of ovipositor, 9mm. ♀.

Common on oaks and limes from southern Sweden to the Alps. In England, it is quite common, also in Belgium and France, especially in the north. In Switzerland, it occurs at an elevation of 4000ft. in the Oberland. Also in Italy, in Tuscany, and in Spain at Santander. It is found in the Tirol, and in Denmark; in Scandinavia it occurs at at Esperöd, Abusa, and Kullaberg in Skåne, and Kiunekulle in West Gottland. It is found adult late in the autumn, and sometimes may be taken crawling up the windows inside houses, even as late as November.

The name is unfortunate, for it is by no means a variable species.

2. MECONEMA BREVIPENNE, Yersin.

Easy to distinguish from *M. varium* by the rudimentary organs of flight, by the entirely smooth pronotum, and by the subgenital lamina of the female, which is roundly truncate. Length of body, 12mm. ♂ and ♀; of pronotum, 3.5mm. ♂ and ♀; of elytra, 2.5mm. ♂ and ♀; of ovipositor, 7.5mm. ♀.

On flowers and shrubs in southern Europe. In France it is rare, but has been taken at Hyères and Nice. In Italy it is not uncommon at Voltaggio, Pegli and Naples; in the south Tirol, near Trieste, at Laibach, Fiume.

GENUS II: CYRTASPIS, Fischer.

Distinguished from *Meconema* by the ample pronotum which entirely covers the rudiments of elytra. A single species.

1. CYRTASPIS VARIOPICTA, Costa
(=*scutata*, Charpentier).

Pale green in colour; pronotum very ample; organs of flight entirely hidden. Length of body, 13mm. ♂ and ♀; of pronotum, 6.8mm. ♂, 5.5mm. ♀; of ovipositor, 8mm. ♀.

A rare insect, occurring in a few localities in the extreme south of Europe, as in Portugal; in Spain; in Italy also at Pegli and Naples, on *Alnus glutinosus*, under the leaves; in France it is rare, but has been found on walnut and oak, in July, at Niort, François, Deux Sèvres, Draguignan, Bagnols, and Roquebrune.

FAMILY III: CONOCEPHALIDÆ.

This group is but poorly represented in Europe; the two genera that do occur contain each about 70 species, but only one of *Conocephalus*, and but few of *Xiphidium* are found in Europe. The pointed vertex, strongly inclined frons, somewhat slender build, and long and straight ovipositor, give the members of this family a characteristic appearance.

The anterior tibiæ have the tympanum cleft-shaped or rimate, and the hinder tibiæ have an apical spine above on each side; the anterior tibiæ are smooth, not sulcate at the side, with no apical spines; the fastigium of the vertex is free and prominent, separated by the deep sulcus from the frontal costæ; the hinder tibiæ have four apical spines beneath, and the European species have two spines on the prosternum.

TABLE OF GENERA.

- | | |
|---|-------------------------|
| 1. Posterior femora unarmed beneath, or with merely a few minute spinules on the outer margin; fastigium of vertex blunt, shorter than first antennal segment; stature small and slender .. | 1. XIPHIDIUM, Serv. |
| 1.1. Posterior femora with many spines beneath; fastigium of vertex broader and longer than first antennal segment; stature moderately large and stout | 2. CONOCEPHALUS, Thunb. |

GENUS I: XIPHIDIUM, Serville.

This extensive genus includes a number of graceful and slender insects, with strongly sloping face, and long, sometimes extremely long, and straight ovipositor; five species occur in Europe, one being eastern in its distribution.

TABLE OF SPECIES.

- | | |
|---|--------------------------|
| 1. Side flaps of pronotum inflated like a bubble near hinder border; prosternum with two spines. | |
| 2. Elytra and wings surpassing apex of abdomen; ovipositor straight. | |
| 3. Hinder femora on lower margin on outer side with two dark spinules; ovipositor perfectly straight | 1. FUSCUM, Fabr. |
| 3.3. Hinder femora with three to four dark spinules on lower outer margin; ovipositor very faintly curved | 2. THORACICUM, Fisch. W. |
| 2.2. Elytra and wings shorter than abdomen; ovipositor somewhat curved (posterior femora totally unarmed beneath) | 3. DORSALE, Latr. |
| 1.1. Side flaps of pronotum with no inflated bubble; prosternum unarmed | 4. ÆTHIOPICUM, Thunb. |

1. XIPHIDIUM FUSCUM, Fabr.

Delicate grass-green, with a dark dorsal stripe; elytra and wings surpassing apex of abdomen; when at rest, wings slightly surpassing the elytra; ovipositor perfectly straight. Length of body, 12mm.-15mm. ♂, 12mm.-19mm. ♀; of pronotum, 3mm.-4mm. ♂, 3.8mm.-

4.2mm. ♀; of elytra, 12.5mm.-20mm. ♂, 12.5mm.-19mm. ♀; of ovipositor, 10mm.-17mm. ♀.

Common in central Europe. In France, common near Paris, and common in the Vosges; at Vias, and in Seine-et-Marne, at Fontainebleau; Malesherbes, Épisy, Loiret, Amélie-les-Bains, Ile de Ré, Arcachon, Montpellier, Tarbes, Hyères; also in Brittany; Marne, Auvergne, Allier, Les Ramillon, Senlis, Décines, Var; it is found in Germany, in Alsace; in Switzerland, in the Bernese Oberland; in Spain, in the north, at Ferrol; not uncommon in Austria, at Liesing, Mödling, Brück, and Oberweiden. It does not occur in Britain, its congener, *X. dorsale*, having been previously incorrectly recorded under the name *X. fuscum*.

2. XIPHIDIUM THORACICUM, Fisch. de Waldheim.

Differs from the preceding in having four small spines, instead of two, on the outer margin of the undersurface of the posterior femora, and by the very slightly curved ovipositor. Length of body, 14mm.-16mm. ♂, 15mm.-21mm. ♀; of pronotum, 3.5mm.-4mm. ♂; 4mm.-5mm. ♀; of elytra, 16mm.-23mm. ♂; 16mm.-18mm. ♀; of ovipositor, 12mm.-15mm. ♀.

A doubtfully good species of rare occurrence. In France it has been recorded at Mirabeau, Vaucluse, and Pertuis; in Spain, at Santiago de Compostella, Santander, and Madrid; in Portugal, at Coimbra; also in Sardinia.

3. XIPHIDIUM DORSALE, Latreille.

Recognisable by the brilliant, almost oily, emerald-green colour, reddish dorsal stripe, and short elytra and wings, which only attain the length of the abdomen in an exceedingly rare variety. Length of body, 12mm.-13mm. ♂, 12mm.-15mm. ♀; of pronotum, 3mm. ♂ and ♀; of elytra, 6.5mm.-8mm. ♂, 5mm.-6mm. ♀; of ovipositor, 8.5mm.-9mm. ♀.

Locally, but widely, distributed in central Europe. It occurs in Sweden and Denmark; in England, very locally, in the New Forest, Isle of Wight, Studland, Pagham Marsh; in France it is found chiefly in the north, Trappes, Montmorency, Meudon, Épisy, La Bernerie, in Brittany, Meuse, Drome, and also at Hyères; in Germany it is commoner in the north than in the south; in Austria it is rather rare, but occurs at Oberweiden; in Sweden it is recorded from Kjellunge, near Gottland, in the Djurgarden, at Stockholm, at Tanglengs, and Marlebo Myr; in Belgium, at Montplaisir, Ostend, Nieuport, Heyst, and Genck.

It is found in the late summer among reeds in swampy ground. The very rare fully-winged variety has been taken near Colchester.

4. XIPHIDIUM ETHIOPICUM, Thunberg.

Distinguished from the other species by having no inflated spot at the sides of the pronotum, and also by the unarmed prosternum. Length of body, 14mm. ♂ and ♀; of pronotum, 3mm. ♂ and ♀; of elytra, 18mm. ♂, 15mm.-20mm. ♀; of ovipositor, 9.5mm. ♀.

An African species, recorded from Jativa in Spain, Messina in Sicily, and Fréjus in south France.

A puzzling group of Eupitheciids.

By E. M. DADD, F.E.S.

In the *Ent. Record* (*anteà*, p. 157), Mr. Tutt has discussed the question of the specific identity, or otherwise, of the *innotata*—*fraxinata*—*tamarisciata*—group of Eupitheciids. As this group has frequently given rise to discussion here, in Berlin, I cannot do better than to give a *resumé* of what is known of it here. For this purpose, I have applied to Herr Arthur Herz, one of the authors of the "Berlin List of Lepidoptera," who has had considerable experience with, and has bred most of, the species occurring here. He writes: "*Eupithecia innotata*, Hufn.—*tamarisciata*, Freyer—*fraxinata*, Crewe. I have frequently collected larvæ (of *innotata*) in the autumn from *Artemisia campestris*, the pupæ hibernate, as is well known, and, if forced, emerge very early. In nature, *E. innotata* is on the wing in May and early June, occasionally the pupæ hibernate over two winters, and, on one occasion, one emerged from a hibernated pupa in July. I have only once succeeded in rearing the second generation from ova laid by the first; they were fed on the young shoots of *Prunus padus*. The imagines reared showed the same amount of variability as the spring brood, but did not differ from them in any way. The variation consisted of a difference in size, as well as colour and markings. Specimens of small size with obsolete markings, which appear almost unicolorous, I have always regarded as *fraxinata*, Crewe, following the example of the Museum here (which, however, I should not like to quote as an authority). Similar specimens, however, occur in the first generation, they are generally obtained from underfed larvæ, which is no rare occurrence when breeding. The conclusion that these small specimens are due to underfeeding, was confirmed when breeding larvæ beaten in July from sloe, *Prunus spinosa*, the larvæ belonging to the second generation, the foodplant did not last well and consequently only three underfed specimens were bred, all of the *fraxinata* form. The ab. *tamarisciata* is, according to Staudinger's diagnosis, 'smaller, darker, almost unicolorous lead-grey,' my experience is, that it is a rare aberration occurring with the type form."

It seems to me, that at present we are at cross purposes. Is the small unicolorous form of *innotata*, Hufn., which, as above seen, can be bred from the same batch of ova as typical *innotata*, really identical with the species from ash, described from England as *fraxinata*, Crewe? I strongly suspect that it is not, and that the latter has been incorrectly referred by Staudinger to *innotata*, Hufn. Its great similarity to the small unicolorous specimens of the last has, no doubt, caused this confusion. I think Mr. Tutt, however, goes too far when he says "I, for one, consider them as abundantly distinct; the conditions of their environment, their habits, and their foodplants, being so entirely different," for, though, at first sight, this seems to be the case, especially when one associates *innotata* entirely with *Artemisia*, yet, as above shown, this assumption is entirely erroneous, the summer (second) brood having quite different habits from those of the spring brood, the larvæ not feeding on *Artemisia*, but on numerous trees and shrubs, *viz.*, *Prunus*, *Crataegus*, *Rosa*, *Symphoricarpos*, and possibly *Fraxinus*?

From the above it will be seen, that there is also something to be said for placing *fraxinata* as a variety of *innotata*, the onus rests on

English entomologists, who are well acquainted with *fraxinata*, Crewe, and it can, no doubt, be immediately settled by rearing the above species from the egg. If *fraxinata* is really nothing more than a form of *innotata*, then ova obtained from females of this form, should feed up on *Artemisia* and give *innotata*, Hufn., in the spring.

I nearly forgot to mention that Staudinger gives *fraxinata*, Crewe, as the summer brood of *innotata*, and Herr Herz also states that this form is more frequent in the summer brood.

A puzzling group of Eupitheciids.

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

Mr. Dadd has done good service in writing the above, if the information contained is all that is known of the subject in Germany. As an expression of ignorance it is really first class. As I understand the matter, Herr Herz (whose Berlin list is really excellent) gets larvæ of *Eupithecia innotata* regularly on *Artemisia*. These produce some small specimens with obsolete markings, and these he calls *fraxinata*. On one occasion he obtained eggs that produced larvæ that he found would feed on *Prunus padus*, these produced small unicolorous specimens from underfeeding, so he also called these *fraxinata*, knowing all the time that they were *innotata*. So far Herr Herz seems to have proved that, in confinement, *innotata* larvæ can be reared on *Prunus padus*. Herr Herz also bred larvæ of an *Eupithecia* from *Prunus spinosa*, and these produced undersized specimens of a small unicolorous form. These are referred to *fraxinata*. Why? Herr Herz does not seem to have a good series of English *fraxinata* even to get to the extent of satisfactory comparison.

Mr. Dadd goes on to show that Herz has proved *innotata* double-brooded, and says that his evidence proves that *innotata* does not feed only on *Artemisia*, but "on numerous trees and shrubs—*Prunus*, *Crataegus*, *Rosa*, *Symphoricarpos*, and possibly *Fraxinus*." I have an idea that Herz' note shows only that *innotata* will feed on *Prunus padus*, and, possibly, if the examples bred from the "beaten" larvæ were *innotata*, on *Prunus spinosa*. He thinks this evidence goes towards showing a case for supposing *fraxinata* to be a form of *innotata*. As nothing is here said of *fraxinata*, except the misuse of its name, I do not think it shows anything of the kind.

Mr. Dadd thinks that the onus rests on British entomologists to disentangle the muddle made in Germany. British entomologists do not unite *fraxinata* and *amarisciata* as vars. of *innotata*, they treat them as distinct species. We can prove, so far as their biology in Britain permits, their distinctness; it is for the German entomologists to prove their biologic unity. If there is not more "evidence" than Herr Herz offers, and the remarkable statement of Staudinger that a species that emerges in June, from pupæ that have hibernated from September to June, is the summer brood of a species that hibernates from September to May, and is only just (or not quite) over when the so-called summer brood appears, I am afraid we cannot get much further by means of the help of our continental colleagues. Our own evidence is not too illuminating or too abundant, but it shines as a sun compared with the haze that Mr. Dadd quotes from our friend Herr Herz.

Another puzzling group of Eupitheciids.

By E. M. DADD, F.E.S.

There is another group of Eupitheciids which wants clearing up. I refer to the "*succenturiata*—*subfulvata*—*oxydata*" section. Staudinger treats these as forms of one species. He, however, adds a "?" to *subfulvata*. His synonymy reads:

Succenturiata, L., S.N., ed. x., 528, etc. (forma al. albidis).

v. ? *subfulvata*, Hw., "Lep. Brit.," p. 357, etc. (forma fusca al. ant. disco toto fulvo; sp. div. Stgr. esse videtur).

ab. et v. *oxydata*, Tr., vi., 2, 114 (1828), etc. (al. fuscis, ant. ubique strigatis).

Herr Herz writes me as follows: "I have bred this company on one occasion in numbers with great success. The larvæ were beaten in large numbers from yarrow, *Achillea millefolium*, and fed up entirely on this plant. The imagines emerged in the following year from the end of May to the beginning of July, the larger proportion being typical *succenturiata*, L., one specimen approached Staudinger's ab. *exalbidata*; further, there was one typical *subfulvata*, two typical *oxydata*, and three forms intermediate between *succenturiata* and *subfulvata*—*oxydata*. The larvæ showed no appreciable differences." He also informs me that Herr K. Dietze, one of the best known specialists in this group, and who has, perhaps, had the greatest experience with this interesting genus of any lepidopterist in Germany, has already stated it as his opinion, that the above three forms are all only forms of one and the same species.

I have myself seen the bred series of Herr Herz referred to above, as well as many other series bred by other collectors here. If one were inclined before to doubt the connection of the above three forms, the numbers and variety of the intermediate forms immediately upset this conclusion. There would be no difficulty in forming a complete chain of forms showing the gradual mixing of white scales in the fulvous patch of *subfulvata* until the complete *succenturiata* is obtained, and, in the same way, intermediates between *oxydata*, and the other two forms, are also not uncommon. As far as this district is concerned, therefore, I do not think there can be any doubt that the above three forms are rightly brought together, and no doubt this state of affairs exists all over the continent. It will be noticed that Herr Herz bred all forms from larvæ found feeding on yarrow, which, according to English lepidopterists, is the foodplant of *E. subfulvata*, and that, moreover, the larger proportion of the insects bred were typical *E. succenturiata*. The latter is, however, also found feeding on *Artemisia* here, but I have not been able to ascertain whether *E. subfulvata* has also been bred from this plant.

When in England last year, I had a discussion about this matter with Mr. Prout, who scouted the idea of these two insects (*E. subfulvata* and *E. succenturiata*) being forms of the same species, and, as this gentleman has had large experience in breeding both species in England, it seems possible that over in England they have become differentiated. This is also a problem to which English entomologists should turn their attention.

Another puzzling group of Eupitheciids.

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

It may be news to some lepidopterists to hear that Staudinger believed *succenturiata* and *subfulvata* to be distinct species, but so it

was, and he was careful, having handed over this particular section of his *Catalogue*, 3rd ed., to an outside specialist to do, to note, himself, of *subfulvata* as a form of *succenturiata*, “? Sp. div. Stdgr. esse videtur.”

Herr Herz, as I understand from Mr. Dadd's note, beat a lot of wild larvæ from yarrow, did not notice any appreciable differences in them, in spite of the known variation, even within the limits of *subfulvata*, bred therefrom *succenturiata* and *subfulvata*, with certain aberrations which Mr. Dadd has seen, and, on the evidence of these specimens, Mr. Dadd assumes *succenturiata* and *subfulvata* to be in the Berlin district, at least, one species. Is evidence of this kind, based on specimens bred in this way, of one atom of scientific value? *Eupithecia succenturiata* has been bred many times in England from *succenturiata* eggs, and *subfulvata* and its var. *oxydata* from *subfulvata* eggs. The late Mr. Finlay, of Morpeth, at my suggestion, bred and inbred the latter species for ten (or more) successive years, and he must have reared some thousands of specimens, but although every conceivable form of both *subfulvata* and *oxydata* was bred, from eggs laid by either form, there was no *succenturiata*. I still have a large number of these specimens. If Herr Herz had bred all his specimens from the ova laid by a single ♀ of either *succenturiata* or *subfulvata*, then the evidence presented by the specimens would be valuable; but do the specimens at present prove anything except that *succenturiata* and *subfulvata* can both be bred from larvæ found feeding on yarrow? Suppose, for example, from a very large number of caught (or reared from wild larvæ) aberrative Agrotids, I constructed a continuous chain, leading from say *obelisca* at one end, through *tritici* to *cursoria* the other, would this chain prove that *cursoria* and *obelisca* were one species? Until some thoroughly reliable lepidopterist breeds both typical *succenturiata* and *subfulvata* from the eggs of a ♀ of one of them, and proves them to have the same life-cycle, and that the difference of their genitalia is not specific, I shall maintain that the biologic evidence already adduced in England is abundantly sufficient to prove their specific distinctness. I am not surprised that Mr. Prout scouted the idea of these two insects being forms of the same species. Possibly he saw as little in the evidence brought forward as myself. I am not greatly smitten either by the reference to Herr K. Dietze's “opinion”; what one wants are the “facts” on which this opinion is based. One also wonders why Mr. Dadd thinks *succenturiata* and *subfulvata* are very variable “all over the continent.” My own impression is that even with *subfulvata* there are districts where it is remarkably constant to type.

Mr. Dadd concludes that this is also “a problem to which English entomologists should turn their attention.” I know he will not mind me saying that, as a “problem” demanding a scientific solution, and not merely an expression of “opinion,” the English entomologist is the only man who has turned his attention to it. Has Mr. Dadd forgotten the breeding notes published in the *Entom. Record*, on this subject, some years ago?

I have taken the liberty of stating the other side to Mr. Dadd's two notes, directly in connection with the latter, so that our younger British lepidopterists may understand (1) that the older British lepidopterists have not made the muddles that exist in Germany on these questions, and (2) that the older British lepidopterists have already done much to prove the position they take up, by the only

means that can be recognised scientifically, *viz.*, by actual breeding experiments from the egg.

Pupal skin and hairs of *Thecla w-album* (*with plate*).

By DR. T. A. CHAPMAN, F.Z.S., F.E.S.

Plate ix., showing the pupal skin and hair of *Thecla w-album*, may be compared with that of a similar portion of the pupa of *Zephyrus quercus* (*antèa*, pl. x). The magnification here is only half that of the plate of *Z. quercus*. The region shown is practically the same, *viz.*, the spiracular region of the 3rd abdominal segment. (In the plate illustrating *Z. quercus* it was the 2nd abdominal.)

The hairs here are a fairly ordinary form of spiculate hairs, yet their close relationship with the trumpet-hairs of *Z. quercus* is obvious, so that we cannot help concluding from the intermediate forms offered in that species, that the trumpet-hairs are modifications of ordinary spiculate hairs. The hairs in *Thecla w-album* are 0.3mm. to 0.35mm. long, are spiculate for their whole length, and end in a sharp point. We may, perhaps, fancy that there is just a tendency to the trumpet development, in the fact that many of the hairs are thicker at some distance from their extremities than near their bases.

The abundance of lenticles round the spiracles is well-shown in the plate, and the area being larger than in that of *Z. quercus*, there are also included some of the stellate points with their appended ribs, enough to illustrate, what is obvious on an examination of larger areas of the pupal skin, that these points are often connected together by their ribs, but that they always avoid any association with hairs or lenticles; this we found also to be the case in the other pupæ so far illustrated.

In the pupa of *T. w-album* the lenticles are freely distributed over the whole surface (except appendages), and the stellate points and ribs are correspondingly curtailed, differing, therefore, from *Z. quercus*, in which lenticles are abundant only near the spiracles.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

OVUM OF *LYCÆNA ALCON*, F.—On July 17th, 1906, I received from Herr Max Gillmer some ova of *Lycaena alcon*, F. These he took on July 14th, in the Wörnitz, on the border of the Mosigkauer Haide, in Anhalt (see *Ent. Rec.*, vol. xviii., p. 102). They were found on the flowers of *Gentiana pneumonanthe*, L., mostly on the calyx, or corolla, but also on the stalks and leaves, laid singly. The gentian in the Wörnitz only grows in the damp parts of the meadows, but luxuriantly, reaching a height of over eighteen inches. Of the eggs received, seven were laid on the corolla, and eight on the calyx. They were all on the unopened flower-buds, some of which were still green, while others already showed a purple corolla. The white ova were very conspicuous and firmly attached. They do not appear to change colour. On examining the gentian buds one day, I was surprised to find a *Lycænid* larva on one of them, as none of the eggs had apparently hatched. Further examination revealed the fact, however, that, on the contrary, nearly all the eggs were empty, and I found that the larva, instead of breaking through the micropylar area or the wall of the egg, as most

of the Rhopalocera do, had cut a neat round hole in the base of the egg, and bored its way into the gentian flower, leaving the visible portion of the eggshell perfectly intact. As the shell is strong it does not shrink, but remains practically unaltered. The egg is much compressed at the base, slightly flattened at the top, more or less circular in outline, micropylar basin shallow (about 0.17mm. in diameter), micropylar pit deep (about 0.06mm. in diameter). The colour is white, except the micropylar pit, which shows green while the larva is in the egg. The vertical, or micropylar, axis measures 0.3mm., and the horizontal axis 0.54mm. The surface of the shell is roughened, as in other Lycænid ova. The top and walls of the egg are covered with an exceedingly strong network. The cords of the net are about 0.15mm. in thickness. The cells formed by the network vary from 0.03mm.-0.05mm. in diameter, and are mostly diamond-shaped or triangular on the upper surface, but polygonal or rounded lower down. There are, however, no very sharp angles, as the thick, almost swollen, nature of the network prevents this. There are only the merest indications of raised points at the angles of the cells. These cells are very shallow at the base, and on the walls of the egg, but, on the upper surface, they are, on the contrary, very deep. They become rather elongate as they dip down into the micropylar pit, at the bottom of which they break up into the small cells which surround the micropyle. The rosette is formed of four rather circular cells surrounded by rows of somewhat similar cells. [Mr. Gillmer writes that, on the day mentioned, butterflies were swarming, he noted the following on the wing:—*Pieris brassicae*, *P. rapae*, and *P. napi*, *Thecla ilicis*, *Chrysophanus virgaureae*, *C. dorilis*, *Rumiccia phlaeas*, *Plebeius aegon*, *Celastrina argiolus*, *Cyaniris semiargus*, *Lycaena alcon* (especially fond of the marsh thistle), *L. arion*, *Aglais urticae*, *Melitaea aurelia*, *M. athalia*, *Brenthis selene*, *Argynnis aglaia*, *A. niobe* and *ab. eris*, *A. adippe*, *Dryas paphia*, *Melanargia galathea*, *Epinephele ianira*, *Enodia hyperanthus*, *Coenonympha iphis*, *C. arcavia*, *C. pamphilus*, *Adopoea flava*, *A. lineola*, and *Urbicola comma*.]—A. SICH, F.E.S., Corney House, Chiswick.

EGGLAYING OF *DRYAS PAPHIA*.—I was at Parknasilla, Kerry, on August 30th last. *Dryas paphia* was common there, though getting ragged, and I saw a female fluttering about the stem of a rather small fir-tree, that stood close to a woodland path, as if egg-laying. She was between one and two feet from the ground, and, on watching her closely, I saw her curl her abdomen as if depositing an egg. This she did twice, when my approach caused her to fly away. On examining the spot with a magnifying glass, I could see nothing, but, on removing a flake of bark, beneath which the abdomen had been inserted, I found two eggs, attached to near the tips of small fibres of the moss that was plentiful on the tree and entered into its crevices. The eggs were pale, dull yellowish, and quite conspicuous when thus exposed. I lost one, but sent the other to my friend, Dr. Chapman. An hour or so afterwards I was near the same place, and saw a female *D. paphia* fluttering, in a similar manner to that which I have described, at another fir-tree, at a height of about three or four feet from the ground. This one I captured. She may have been the same one, but I think not, as she seemed less ragged than the first. I do not know that I have before seen any similar observation, and think it may be interesting, as the young larva is considered to eat nothing until the winter is

over, and under those circumstances there would seem no advantage in laying the egg on the foodplant, and the hibernaculum selected by the parent would be a safer one. It is stated in some of the books that the egg of *D. paphia* is laid on the foodplant, and if the tree stem is used for the purpose, it seems strange that, with so common an insect, the habit has not been recorded before. Perhaps it has.—F. MERRIFIELD, F.E.S., 14, Clifton Terrace, Brighton. *September 29th, 1906.*

PARTIAL SECOND BROOD OF *MELAMPIAS EPIPHRON*.—Out of a brood of larvæ of *M. epiphron*, which I am rearing from the egg, I have obtained a partial autumn emergence of this insect. My friend, Mr. George Wilkinson, of Workington, took a pair of *M. epiphron*, *in cop.*, at Honister Pass, on July 1st, and kindly sent them to me alive. By the time I received them the ♀ had already laid a number of eggs on the sides of the chip-box, and afterwards laid more, on blades of grass which I placed with the insect in a glass jar. (Of a few of the latter Mr. Tonge secured a good photograph.) The larvæ were fed throughout on a species of grass growing in the garden. Out of about three dozen larvæ, all except four left off feeding when about $\frac{5}{16}$ of an inch in length; but these four larvæ steadily fed up, and one, pupating on September 2nd, produced a fine ♀ on September 11th; another pupated on September 9th, and a third on September 16th, the fourth larva is now quiescent, preparatory to assuming the pupal state. All the larvæ received the same treatment, and were kept in an outhouse. I do not know if the occurrence of a second brood of *M. epiphron* is so unusual as to give this record any value, but I send this note in case you may think it of sufficient interest to publish.—J. ALDERSON, 143, Boundaries Road, Balham, S.W. *September 17th, 1906.* [The feeding-up of larvæ of *Melampias epiphron* in the autumn is probably quite unprecedented. As a matter of fact there is no really well authenticated instance of any species of Erebiid being double-brooded, or partially double-brooded, in nature, and one does not expect to find even odd examples of any Erebiid species feeding-up so as to complete its metamorphoses in the autumn. One would have supposed that the artificial conditions of being indoors would have been altogether insufficient to have caused this change in so fixed a habit, and one is astonished to find *M. epiphron*, even in small numbers, not resisting any tendency such artificial conditions might have to push the larvæ forward. We are greatly indebted to Mr. Alderson for the chance of getting photographs of the larvæ and pupæ of this insect for our work *A Natural History of British Butterflies*.—ED.]

PHRYXUS LIVORNICA LARVA.—The following note embodies the description of a larva of *P. livornica*, found July 20th, 1906, in a sunny garden at Lewes, at rest on a stem of garden mint, preparing for changing to its (last ?) larval skin:—Plenty of vine, *Ampelopsis veitchii*, etc., in the garden. Length 1 $\frac{5}{8}$ ins. in repose. Head small, black. Subspiracular and subdorsal lines bright yellow. Body blackish-grey; between the subdorsal and subspiracular lines profusely dotted with dull pale yellow; the subspiracular yellow line has a tendency to spread on each segment, and on all the abdominal segments has a velvety-black spot above and below this enlargement, the upper one much the darker. Horn (caudal) rough, covered with small sharp spines, and rather blunt, orange at the base, the rest of it black.—F. MERRIFIELD, F.E.S., 14, Clifton Terrace, Bristol. *July 21st, 1906.*

NOTES ON COLLECTING, Etc.

LEPIDOPTERA IN ESSEX.—I have had a rather poor season, and I do not know exactly to what cause to ascribe it, although ever-decreasing time to devote to collecting is certainly a main factor. My collecting, therefore, has had very few interesting features, but there are one or two items—such as they are—that might, perhaps, be recorded. *Lithosia griseola*: I found a larva of this species on an elm trunk at Creeksea, June 16th. *Buccalatrix frangulella* was rather common at Thundersley on June 19th. *Elachista scirpi* was flying freely over rushes and reeds at Pitsea, on the evening of June 22nd. *Orgyia gonostigma*: A ♀ emerged July 16th; taken early on the 18th at Thorndon Park, and suspended from the bough of an oak, she attracted, within a quarter of an hour (10.15 a.m.), one ♂, who dashed round her twice and vanished. She received no other visitor during the four hours I watched her. *Fumea casta*: A ♀ exposed on Thundersley Common was paired with a wild ♂ within five minutes of my putting her down. *Zeuzera pyrina*: A flattened out specimen, that looked as if a cart wheel had been over it, was seen in Southend on July 18th. *Epiblema caecimaculana* was netted at Benfleet on July 28th. *Olethrestes semifasciana*: bred from sallow at Thundersley on July 30th. *Dichrorampha simpliciana*: Bred August 20th out of mugwort brought from Shoeburyness on April 1st. *Trichiura crataegi*: A series commenced to emerge on September 2nd from Shoeburyness larvæ. *Cochlidion limacodes (avellana)*: Three larvæ, each on the underside of an oak leaf, in a wood near Hadleigh, on September 9th.—F. G. WHITTLE, 7, Marine Avenue, Southend. September 9th, 1906.

PHRYXUS LIVORNICA AND LAPHYGMA EXIGUA AT BOURNEMOUTH.—I was fortunate enough to take a nice specimen of *Phryxus livornica* here last June. I also have a batch of larvæ of *Laphygma exigua*, now feeding, from ova obtained from a female taken by Mrs. Hooker, of this town, in August.—PERCY M. BRIGHT, Chunar, Landsdowne Road, Bournemouth. September 26th, 1906.

PYRAMEIS CARDUI IN NORTH DEVON.—I have never found this butterfly in any numbers in this district during the ten summers I have been here, but this year it has been more common than usual. I saw the first on June 3rd, and several others for a few days afterwards, all wasted, but from August 1st to the 20th I saw it every day, when there was any sunshine, and, on the 2nd, at least a dozen flying in our garden, all in good condition. *Plusia gamma*, which I have often found usually abundant in *cardui* years, has been very scarce here this year, both with the spring and autumn broods.—T. W. BRIGGS, M.A., F.E.S., Rock House, Lynmouth, R.S.O., South Devon. September 24th, 1906.

ACIDALIA MARGINEPUNCTATA IN LEWISHAM.—It is remarkable how this species still maintains itself in the wilderness of bricks and mortar that has grown up in the southeast suburban districts of London. On the afternoon of September 20th I picked up a male in first class condition on the brick wall in front of one of the houses in Gilmore Road, Lewisham, and in the evening saw two other specimens on a lamp, within 200 yards of the same place.—J. W. TUTT. September 22nd, 1906.

PYRAMEIS CARDUI AT WARKWORTH.—I would like to record the

taking of the larvæ of this immigrant, on the Northumberland coast at Warkworth, while staying there this summer. The first time I noticed them was on July 25th, during a ramble among the sand-dunes and -banks, securing three from one of the usual foodplants, field or welved thistle (*A. acanthoides*). From July 25th-28th, I took 26 larvæ, these I left in good hands until I returned on August 4th, and found four had pupated. By August 13th there were twenty pupæ and two larvæ. In the majority of cases the dark coloured larvæ prevailed, being the reverse in the pupal state, where the grey or light type predominated. All the insects emerged, only one cripple, the first specimens on August 17th, and the remainder on varying dates until August 30th. Two of the larvæ changed into the pupal state between 8 a.m. and 9 a.m. on August 13th, these I noted carefully as to their duration in that stage, one emerged on the 29th, in the afternoon, and the other on the 30th, in the morning, or $16\frac{1}{2}$ and 17 days respectively. They were uncertain as to their time of emergence, for although the majority come out between 10 a.m. and midday, three emerged before 9 a.m., two at 5 p.m., and one, which had been kept in total darkness, at 11 p.m.—G. NICHOLSON, 26, Lancaster Street, Newcastle. *September 28th, 1906.*

DAPHNIS NERII NEAR BLYTH.—A ♀ of the Oleander hawk in good condition, and resting on the tall grass, was taken by Miss K. Rosie, on the coast near Blyth, on August 6th. I believe this is an addition to the county list.—IBID.

SECOND BROOD OF CUPIDO MINIMA.—The note in the *Ent. Record*, xviii., p. 240, on the second brood of *Cupido minima*, tempts me to note that I took several specimens in fine condition on August 6th last at Streatley, near Reading, no doubt a second emergence, as the first brood was out in June.—W. E. BUTLER, F.E.S., Hayling House, Oxford Road, Reading. *October 2nd, 1906.*

LAPHYGMA EXIGUA AT MUCKING.—If memorable for nothing else, the year 1906 will deserve to be remembered as the *exigua* year. If one could tabulate the captures, and the numbers, the dates, and the localities, such records would surely be of the greatest interest. Having for years led *Caradrina quadripunctata* a dreadful life, I was rewarded this year by capturing *L. exigua* at sugar, on August 23rd. With the exception of one torn specimen, which I found settled on a reed close down to the river-wall, the remainder of my seven captures were taken at sugar in my garden. I was rather surprised that not a single specimen visited my great moth-trap (in the signal-box), but such is the case. Whether I did not keep a sharp enough look out, or whether, as is suggested by notices I have read, this insect strives to conceal itself when visiting light, I do not know. My last capture was on September 21st. This insect appears to have no regular time for visiting the sugar, my captures happening from early dusk until 10.30 p.m. I have been asked whether I consider that *L. exigua* is likely to make a home in England, as have *Caradrina ambigua*, *Plusia moneta*, etc. In my humble opinion this is not at all likely. Although cosmopolitan, it is essentially a southern insect, and probably unable to live the winter through in our country, in a wild state, and I have not a doubt but that these specimens which have been taken this autumn, are the offspring of a considerable immigration earlier in the year. I should, therefore, suggest that there is no reason why it should, in future

years, be more common in England than it has been in time past.—(REV.) C. R. N. BURROWS, Mucking. *October 5th, 1906.*

MANDUCA ATROPOS AT SCARBOROUGH.—It may be advisable to record the discovery, one bitterly cold evening (September 11th), of two large fullfed larvæ of *Manduca atropos*, in an allotment garden here—four were found in all.—A. S. TETLEY, 22, Avenue Road, Scarborough. *October 4th, 1906.*

PARTIAL THIRD BROOD OF CYANIRIS ARGIOLUS.—I took larvæ of *C. argiolus* on ivy flower-buds, from August 25th, and the first pupated on the 26th. I posted a dozen or two to my friend, the Rev. G. H. Raynor, about the 28th, and almost all had pupated when they arrived at Hazeleigh. He bred a ♀ on September 14th, and I a ♂ on the 15th. I have not heard that he has had any more. I certainly have not, but then I did not keep more than one or two pupæ.—(REV.) C. R. N. BURROWS, The Vicarage, Mucking, Standford-le-Hope. *October 4th, 1906.*

RARITY OF XANTHIAS AT SUGAR.—I have persistently sugared since beginning of August only, so have this year missed many Noctuids. I hope to give you an account of results later, but may note again the rarity of *Xanthias* and their allies (except *Mellinia circellaris*). Most of the specimens are worn to death—Are they rare, or are they tired of sugar? I fancy the mild winters are very unfavourable for them, but *M. circellaris* has remained, some large, in spite of the drought, which has dwarfed some of the other species.—IBID.

BOLETOBIA FULIGINARIA AT ST. KATHERINE'S DOCK.—It may be interesting to some of the readers of the *Entomologist's Record* to know that when I was about to start for a trip to Scotland in the steamship "Avon," from St. Katherine's Dock, on July 18th, 1906, I captured a fine female specimen of the above. It was flying about in the morning sunshine at 8.30 a.m. I have also two specimens, male and female, that I captured on the wall of the dock at Lower East Smithfield, on July 3rd, 1895.—J. A. CLARK, F.E.S., 57, Weston Park, Crouch End, N. *October 5th, 1906.*

OLEOPTERA.

LYTTA VESICATORIA NEAR DOVER.—On July 14th last, in the neighbourhood of Ash, near Dover, I noticed, on an ash-tree, a large number of *Lytta vesicatoria*, L., several being *in cop*. I boxed a few for friends, but, on revisiting the spot on the 16th, fully prepared to take a number, was very much surprised to find that they had all disappeared, and on subsequent visits to the same place none were to be seen.—V. ERIC SHAW, 20, Salisbury Road, Bexley, Kent. *August 19th, 1906.*

COLEOPTERA AT WOODBURY, NEWBURY.—I took a house at Woodbury, near Newbury, for August, and although I did not do much collecting during my stay, on account of social duties, etc., still, some nice species were taken, which are, perhaps, worthy of record. Evening sweeping was the most successful method of collecting. The best place about proved to be some woods belonging to the Earl of Carnarvon, and, having obtained permission to work them, some interesting species were taken. The best was *Anisotoma lucens*, Fair. (*oblonya*, Brit. coll.), of which a nice series, very variable in size, was taken. *A. nigrita* was not uncommon, and the rare *Trianthron märkeli* was once swept,

Mr. Harwood, who was with me on this occasion, taking *Thalacrya sericea*. *Liodes orbicularis* occurred occasionally, and the very local and rare *Micrambe abietis* once put in an appearance. Other species were—*Pityophthorus pubescens*, *Pityogenes bidentatus*, *Homalium striatum*, *Ceuthorrhynchus rugulosus* (although there was not any *Matricaria* anywhere near), *Mycetoporus claricornis*, *Gyrophæna affinis*, and *Metococcus paradoxus*, etc. The last-named species was taken, not uncommonly, in wasps' nests, its proper habitat. Birds' nests produced *Philonthus fuscus*, *Choleva colonoides*, *Microglossa marginalis*, and *Euplectus karsteni*. Dr. Joy, having kindly shown me how to work moles' nests, *Homalota paradoxa*, *H. exilis*, and *Choleva agilis* were taken in this way. *Silvanus surinemensis* was beaten out of a faggot far away from any houses or buildings, but I think, as my friend, Mr. E. A. Waterhouse, suggests, it was probably introduced in pheasants' food, a fact which will account for the capture of such species as *Calandra granni* and *C. oryzae* in woods, and possibly for the occurrence of *Carpophilus sexpustulatus* (*Ent. Mo. Mag.*, 1906, p. 179).—HORACE DONISTHORPE, F.E.S., 58, Kensington Mansions, South Kensington, S.W. September 27th, 1906.

CURRENT NOTES.

Scientific coleopterology, as a branch of experimental zoology, is practically, one suspects, almost dead in Britain, or to put it more gently, it æstivates all summer and hibernates all winter. The American coleopterists, however, are doing a considerable amount of interesting work in this direction, and the most recent paper, "Inheritance of dichromatism in *Lina* and *Gastroidea*," by Isabel McCracken, appears to be a careful contribution to the subject discussed.

Dr. D. Sharp (*Ent. Mo. Mag.*, p. 220) adds *Carida affinis*, Payk., to the British list of coleoptera. Many specimens were taken by Colonel Yerbury and Mr. C. G. Lamb, in Strathspay, in July, 1905, occurring in fungus on an old tree. On seeking it again this year, July, 1906, it was found that the particular tree had been cut down and cleared away. No other similar tree was discovered, and no more specimens of the insect taken.

Mr. J. R. Malloch (*Ent. Mo. Mag.*, p. 233) records the capture of some 30 specimens of a species referred to *Phora cubitalis*, Beck., on aspen trees at Bonhill, Dumbartonshire. If the species be correctly named this is an addition to the British fauna.

Although comparatively few records have been sent for publication of the abundance of *Laphygma exigua* this autumn, yet one hears of large numbers having been taken in various ways—particularly at sugar—in the southern counties, where, possibly, the Isle of Wight and Devonshire have produced most specimens. We hear of single collectors who have captured almost a hundred examples apiece, and others who have several large broods of larvæ feeding satisfactorily. As is usually the case with our immigrating species, they appear, on the rare occasions that they visit us, to be even more prolific here than in their own haunts. The absence of the usual parasites that keep them in check in their own districts, is probably the greatest factor in their special abundance here in the autumnal brood, the progeny, one supposes, of a comparatively limited number of immigrants that reached us in the early summer. Records noted this month are—"a

few in the Isle of Wight" (Douglas); "a few each evening, from September 8th-14th, at Freshwater" (Newman); 52, and a nice batch of larvæ, in Somersetshire" (Rawlings); "one at Romford" (Claxton); "two at Brankstone" (Thorne).

We hope later to have a word or two to say on the immigration of *Phryxus livornica* this year. Mr. Druitt, in connection with a notice of its occurrence in Ireland, makes some general remarks on the subject of immigration, and asks "Why should this insect—assuming it not to be an indigenous British species—pay the British Isles the compliment of flying across the sea, merely as if on a pleasure trip? . . . Persons who have seen *livornica* flying at dusk, have observed that the period of flight does not last more than half-an-hour. Of course, no one can tell how this insect spends the rest of its time, etc. With great deference, I submit that more conclusive evidence is required than has yet been published before *livornica* and *peltigera* can be described as aliens," etc. We do not wish to appear hypercritical, but one would like to know what Mr. Druitt means by much of this. Does he really think that T. B. Fletcher, Daube, Knaggs, Green, Blackmore, Swinton, Oberthür, Caradja, G. F. Mathew, F. W. Frohawk, T. A. Chapman, and some hundred other well-known lepidopterists, concocted 'the conclusive evidence' published under the head of "Habits of *Phryxus livornica*," in a *Natural History of the British Lepidoptera*, iii., pp. 158-161, and to a less extent that on pp. 161-165, which relates (a) to the "pleasure trips" of this species, (b) the powers of flight of this species, (c) the more than "half-hour" flights of this species, and sundry other points bearing on this subject? A matter like this is not to be dismissed at this time of day, with the facts and evidence of three-quarters of a century in front of one, in this airy fashion. If Mr. Druitt will peruse "the evidence" already collected, even if he add no more "fresh evidence" on the subject, and discuss the known facts, probably those entomologists who have studied the subject for some years may be inclined to reopen the matter. It is marvellous that, in this scientific age, opinions, based on a want of knowledge of already recorded facts, are still much more abundant than facts themselves.

Mr. Comber records *Cucullia gnaphalii* at light on June 27th, 1906, at Jarvis Brook, Sussex, whilst Mr. Finzi notes *Leucania unipuncta* at Tenby on August 29th.

If any of our readers have good duplicates of *Oxyptilus (Capparia) teucarii (heterodactyla)* to spare, we should be glad of a pair, "with data," from as many localities as possible to work up our paragraph on the "variation" of the species for *British Lepidoptera*, vol. v. We do not seem to have noted the German forms in this country yet. Still, one would expect they existed even if only as rare aberrations.

We should also be glad if any of our readers who have series of British *Chrysophanus dispar* would send us notes on the variation of their specimens—(1) Exact measurements of largest and smallest ♂ s. (2) Ditto, ♀ s. (3) Variation of colour and markings, upperside. (4) Ditto, underside. From our continental readers we should be most thankful for any notes (or reference to published notes) on the var. *rutilus*, localities, habits, etc. These notes, to be of service, should be sent on at once, as our account of the insect will be published as soon as possible in the *Nat. Hist. of British Butterflies*.

SOCIETIES.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—September 4th, 1906.—

EXHIBITS.—*PAPILIO PODALARIUS* larvæ in ultimate and penultimate stadia, from Switzerland. *LASIOCAMPA QUERCUS*.—A normal specimen, bred from a larva which had been subjected to a pressure of about 40 atmospheres for several periods of about one hour, Mr. A. Bacot. *LAMPIDES BOETICA* and *ARICIA IDAS* from North Spain, the latter having been hitherto recorded only from the Sierra Nevada, Dr. T. A. Chapman. *BOLETOBIA FULIGINARIA*, taken in St. Katherine's Docks in July, 1906, Mr. J. A. Clark. *ABRAXAS SYLVATA*.—A long and variable series, including many clouded forms, from Bucks. *ANGERONA PRUNARIA*, a hermaphrodite specimen, Mr. C. P. Pickett. *NOTODONTA TREPIDA*, bred from New Forest ova, Mr. V. L. Shaw. September 18th.—*DAPHNIS NERII*.—A larva in first stadium, the caudal horn being half the length of the body, Mr. A. Bacot. *AMPHIDASYS BETULARIA*, ♀, densely black spotted, bred from a Mucking larva. *TAPINOSTOLA FULVA* var. *CONCOLOR*, *LAPHYGMA EXIGUA*.—Both taken at Mucking, and a bred specimen of *MELANIPPE UNANGULATA*, having the white central band on forewing largely suffused with brown, Rev. C. R. N. Burrows. *ARGYNNIS AGLAIA*.—An aberration closely resembling *A. adippe* owing to the marginal band being but lightly marked, especially as regards the intramarginal black lines, Mr. G. G. C. Hodgson. *ENNOMOS AUTUMNARIA*.—A specimen heavily suffused with dark scales, bred from wild parents. *LAPHYGMA EXIGUA*.—A series taken recently in the Isle of Wight. *EMATURGA ATOMARIA*.—Melanic forms bred from Bury, Lancashire, and a long series of *BREPPOS NOTHA* which had passed three years in pupa, Mr. L. W. Newman. *EUPITHECIA* ?.—A series beaten from juniper near Dorking, which the exhibitor considered referable to *E. satyrata*, but had at first believed it to be *E. helveticaria* var. *arceuthata*, Mr. L. B. Prout. *PACHETRA LEUCOPHEA*.—Taken at sugar in East Kent. *ABRAXAS GROSSULARIATA*.—An aberration in which the marginal spots on hindwing were absent, Mr. V. L. Shaw. SECOND BROODS.—Mr. L. W. Newman reported that larvæ of *BOARMIA REPANDATA* reared on birch had this year produced a second brood in September, while others, fed on hawthorn, had made very little progress. Also that of about 100 pupæ of *Drepana falcula* 50 emerged in April, the rest in June. *CYANIRIS ARGIOIOLUS*, PARTIAL THIRD BROOD.—The Rev. C. R. N. Burrows stated that from larvæ of *Cyaniris argiolus* which he had collected from ivy blossoms at Mucking, about August 24th, he had bred a male of the third brood, and the Rev. G. H. Raynor a female which had the form of the spring brood.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—September 13th.—ABERRATIONS OF *CALYMNIA TRAPEZINA*.—Mr. Goulton exhibited a long series of *Calymnia trapezina* from the New Forest, the only species met with in several nights' sugaring in August. Many were ab. *rufa* and a few ab. *ochrea*. *ADOPEA LINEOLA* AT GRAVESEND.—Mr. Bellamy, series of *Adopaea lineola* captured at Gravesend. *HADENA CONTIGUA*, ETC., FROM THE NEW FOREST.—Messrs. Harrison and Main, long bred series of *Hadena contigua* and *Coremia unidentaria* from the New Forest. ABERRATIONS OF *ABRAXAS GROSSULARIATA* AND *HYBERNIA MARGINARIA*.—Mr. Barnett, (1) very dark bred examples of *Abraxas grossulariata* from Greenwich larvæ, one of which

was rayed on the hindwings; (2) very pale, suffused, and extremely dark forms of *Hybernia marginaria* from West Wickham. LARVA OF PIERIS DAPLIDICE.—Mr. Sich, living larvæ of *Pieris daplidice* from Geneva, feeding on mignonette. THE ORIGIN OF THE MARBLING OF THE UNDERSIDE OF CERTAIN LYCÆNIDS.—Dr. Chapman, (1) a short series of *Lampides telicanus*, bred from eggs and larvæ found in northwest Spain, and discussed the relationship between the marbling of the undersurface and the usual Lycænid spotting; (2) specimens of *Rumicia phlaeas*, *Polyommatus bellargus*, *Lampides boetica*, and *L. telicanus*, in illustration of his further remarks on the spotting. CATOCALA NUPTA AT PADDINGTON.—Mr. Clark reported numbers of *Catocala nupta* resting on the walls of Paddington Infirmary, all most conspicuously situated. Mr. Main had met with numbers near *Cossus*-infected trees. LARGE SPECIMENS OF RURALIS BETULÆ.—Mr. Kaye exhibited very large specimens of *Ruralis betulae*, bred from Huntingdon larvæ, which were kept close in tin boxes. September 27th.—LEPIDOPTERA BRED IN 1906.—Messrs. Harrison and Main, (1) a long series of *Bisulcia ligustri* bred from larvæ taken at Box Hill; (2) a brood of *Thyatira batis* from New Forest ova; and (3) a series of *Melitaea cinxia* bred from the Isle of Wight, several specimens having the white band of the underside very strongly developed. ABERRATION OF POLYGONIA C-ALBUM.—Mr. Step, for Mr. Carreras, an extremely remarkable aberration of *Polygonia c-album*, from the banks of the River Wye, having the usual dark markings suffused, enlarged, and confused almost beyond recognition. LARVÆ OF ANTICLEA NIGROFASCIARIA.—Mr. Carr, larvæ of *Anticlea nigrofasciaria*, ready to hibernate. CAPTURES IN THE ISLE OF WIGHT.—Mr. Colthrup, (1) a specimen of *Heliothis peltigera*, taken in August, on the south coast; and (2) some nice forms of *Melitaea cinxia*, from the Isle of Wight, of which one had the apical area almost devoid of markings, and the remaining markings much reduced. ABERRATIONS OF LEPIDOPTERA.—Mr. South, (1) a specimen of *Amphidasys betularia*, intermediate between the type and var. *doubledayaria*. This was a real intermediate, very black, sprinkled all over with white dots; (2) *Orobena straminealis*, with very wide blackish borders on the outer margin of all the wings; and (3) *Pyrausta nigrata*, with unusually broad, white bands, a very striking aberration. MICROLEPIDOPTERA.—Mr. Turner, (1) life-history of *Coleophora obtusella* from the Isle of Wight; (2) specimens of *Goniodoma limoniella* and *G. auroguttella* for comparison. ABERRATIONS AND RARE SPECIES BRED IN 1905.—Mr. L. Newman, a very large number of specimens, mainly bred this season, including *Xylomyges conspicillaris*, *Cucullia gnapalii*, yellow ♂s and melanic *Ematurga atomaria*, selected forms of *Melitaea aurinia*, a yellow *Callimorpha dominula*, an extraordinary suffused dark chocolate *Ennomos autumnaria*, varied *Chrysophanus phlaeas*, melanic *Macaria liturata*, *Nonagria sparganii*, a very pink *Anorpha populi*, very varied *Mimas tiliae*, ab. *taras* of *Hesperia malvae*, bred *Brephos notha*, Rannoeh forms of *Drepana falcula*, a smoky *Arctia villica*, *Agrotis cursoria*, *A. ripae*, and *Actebia praecox* in numbers.

CORRIGENDA.—Page 215, line 7, for "*Ramphormyia*" read "*Ramphomyia*"; line 8, for "*Rhamphormyia*" read "*Rhamphomyia*"; line 11, for "*Rhamphomyia furnipennis*" read "*Rhamphomyia fumipennis*."

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Duplicates.—Ashworthii, black Bidentata, black Repandata, dark purple Abruptaria, melanic Multistrigaria, Palealis, Sticticalis, Bistriga, Achatinella, and others. **Desiderata.**—Livornica, Ulvæ vars. bipunctata and wismariensis, Xerampelina var. unicolor, Exulis, Nebulosa var. thompsoni, Roboraria black var., Innotata, Stevensata, Reticulata, Costæstrigalis, Salicalis, Dentalis, Straminalis, Lineolalis, Resinalis, Cratægalis,

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CHANGE OF ADDRESS.—*M. Burr to Shepherdswell, Kent.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. October 17th. November 7th, 21st, December 5th.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. (No dates received.)

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. November 5th, December 3rd. Outing: October 20th, Abbey Wood, Cannon Street, 2.32 p.m.

The South London Entomological and Natural History Society, *Hibernia Chambers, London Bridge.*—The second and fourth Thursdays in each month, at 8 p.m.; October 25th, "Notes on Coleophorids," H. J. Turner, November 8th, 27th.

North London Natural History Society, *The Amherst Club, Amhurst Road, N.,* at 7.45 p.m. October 23rd.; 27th, Excursion to Broxbourne, Liverpool Street, 10.5 a.m., 1.47 p.m. November 13th, 27th.

Lancashire and Cheshire Entomological Society.—Royal Institution, Liverpool. Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained. (No dates received.)

Birmingham Entomological Society, *Norwich Union Chambers, Congreve Street,* at 8 p.m. November 19th, January 21st.

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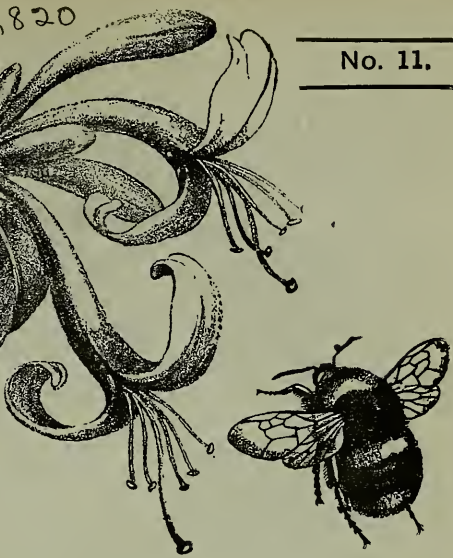
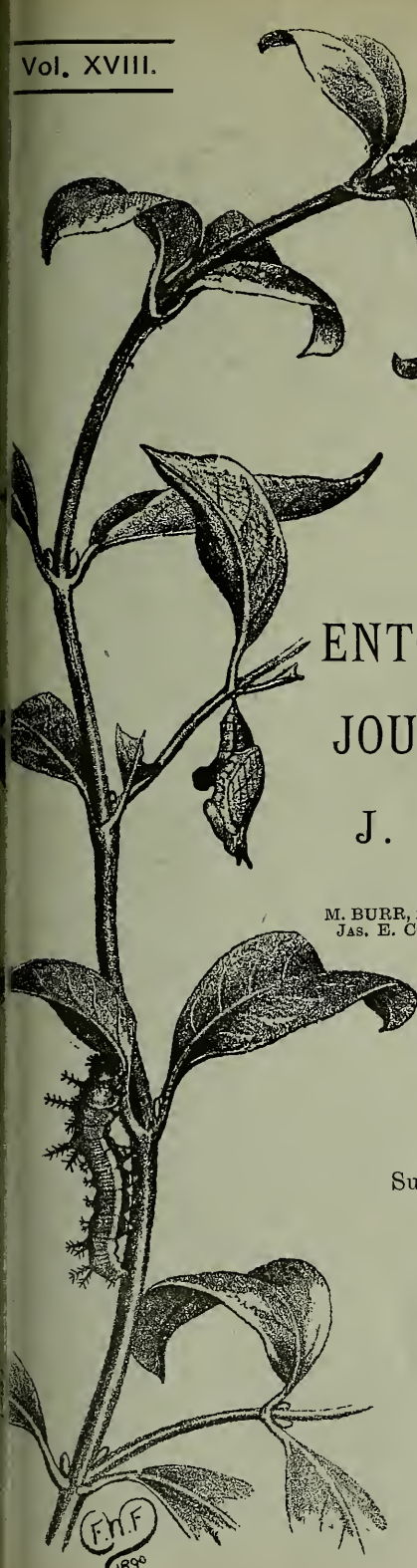
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A comparison of *Agabus affinis*, Payk., with *unguicularis*, Thoms. (with two plates).

By FRANK BALFOUR-BROWNE, M.A. (Oxon), F.R.S.E., F.Z.S., Director
of the Sutton Broad Laboratory.

In the *Ent. Mo. Mag.*, v., 17, 1868-9, Dr. David Sharp published a note upon *Agabus affinis*, Payk., which, up to that time, had been confused in British collections with *Agabus unguicularis*, Thoms.

He gave the following characters, partly from Paykull and Thomson and partly from his own observation, for distinguishing the two species :—

1. The more parallel form of *affinis*.
2. The large punctures on the elytra being more evident towards the base in *affinis* than in *unguicularis*.
3. The difference in shape of the laciniae of the metasternum in the two species.
4. The reflexed margin of the base of the elytra being quite black in *affinis* and obscure red in *unguicularis*.
5. The darker and blacker general colour of *affinis* as compared with the more brassy black of *unguicularis*.

In 1904, Mr. W. E. Sharp contributed a note to the *Ent. Rec.*, xvi., pp. 90-92, in which he sought to make the distinctions between these two species clearer. This note was followed by one from Mr. James Edwards, *Ibid*, p. 187, who suggested that Mr. Sharp had inadvertently transposed the names, as the descriptions did not agree with his knowledge of the species, and he also pointed out that Mr. Sharp had undoubtedly made a mistake in referring to Mr. Thouless' comparison of the stridulating files of the males of the two species. This note drew a non-committal reply from Mr. Sharp and there the matter dropped, leaving the separation of the two species more difficult than it was before.

I have had the opportunity of collecting both species in Britain, in fair numbers, and, in view of the contradictory statements in the notes already referred to, I have thought it worth while to examine the two species carefully, with a view to making a clear statement as to their character.

Agabus unguicularis, Thoms., is a species which occurs not uncommonly in East Norfolk, and I have also recently taken a number of specimens at Chaloner's Whin, York, which agree in their characters with my Norfolk specimens.

Agabus affinis, Payk., is, I venture to think, a not uncommon species in the south of Scotland—I have done very little collecting in the north—and I believe Professor Hudson Beare is of the same opinion. I have taken it fairly commonly in Dumfriesshire, Kirkcudbrightshire, and Dumbartonshire, the only three counties in which I have done any extensive collecting, and I have examined more than 40 specimens of each of these species before venturing on this note.

Mr. W. E. Sharp took as his type of *affinis* certain specimens sent to him from Sweden. They were females, and he found, on comparing them with Dumfries specimens of this species, that "the shape of the latter is distinctly more elongated and parallel-sided, legs and antennae clear red instead of somewhat infusate, and occipital spots much more distinct and of a brighter colour."

Now Mr. Sharp admits that he finds the females of the two species "exceedingly difficult to separate," and he omits two points of

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importance in the above-quoted remarks. He does not say who determined the specific identity of his Swedish specimens, and he does not say how many he had. His remarks apply in all but one character to a comparison of *unguicularis* with *affinis*. The latter is distinctly more parallel-sided, and, in the majority of my specimens, the occipital spots are rather more transparent, that is, a little brighter, than in my specimens of *unguicularis*. I have no *affinis* with clear red antennæ or legs. In all cases the joints of the antennæ, except three or four at the base, are somewhat darkened at their distal end, but the antennæ of *unguicularis* are, in almost all cases, more infuscate.

The legs of all my specimens of *affinis* are dark, and, in most cases, more pitchy than those of my specimens of *unguicularis*.

Mr. Sharp speaks of the "much shorter anterior tarsal claws" of the males of *affinis*. I have taken off and measured, under the microscope, the anterior tarsal claws of several males of *affinis* and *unguicularis*, and I can detect no appreciable difference. Mr. Sharp's impression arises, I believe, from the fact that the tooth on the anterior tarsal claw is somewhat heavier built in *unguicularis* than in *affinis*, which makes the claw of the former look somewhat larger. He speaks of the "dens validus et acutus, mentioned by Thompson" of the anterior tarsal claws of males of *affinis*, but says nothing at all as to any tooth on the claws of males of *unguicularis*.

A comparison of the anterior claw on the anterior tarsus of male *affinis* with that of male *unguicularis*, shows at once the differences referred to by Mr. James Edwards. In *affinis*, the tooth is nearly in the form of an equilateral triangle, the apex of which is directed neither forwards nor backwards; in *unguicularis* the tooth has, as a rule, a slightly longer base, and its apex is directed forward towards the apex of the claw, and it has a heavier appearance.

With regard to the stridulating files on the ventral side of the 3rd abdominal segment of the males of these two species, Mr. Edwards has already pointed out that Mr. Sharp has transposed the descriptions. I have made drawings, by means of camera lucida, of a file of each of the species, and the great difference between the two is at once obvious. The files of *affinis* occupy about $\frac{2}{3}$ of the space of those of *unguicularis*, although composed of about the same number of teeth—the number being somewhat variable in both species—and the ridges are very much stronger in *unguicularis* than in *affinis*.

As to the colour of the reflexed margin of the base of the elytra, it is distinctly black in all my specimens of *affinis*, and dusky-red in all my specimens of *unguicularis*. I can quite believe that, in immature specimens of *affinis*, this colour test might fail, but the elytra of mature specimens of this species are, when examined by transmitted light, much denser than those of *unguicularis*, and I should certainly consider this character reliable between mature individuals.

It is not easy to detect the difference between the metasterna in the two species *in situ*, but, if these are separated out by maceration, mounted flat, and compared under the microscope, the difference is at once obvious (see figure). If the elytra also of the two species are removed and placed side by side, with underside uppermost, a slight difference in shape at the apex is easily seen, those of *affinis* being rather more sharply pointed than those of *unguicularis*.

I have only examined a few specimens of each species in more detail, but I believe that there are certain other distinctions discernible under the microscope. For instance, it appears to me that the metanotum of *unguicularis* is more heavily built than that of *affinis*, and also that the five basal joints of the antenna of *affinis*, male or female, measured together, are longer than the same number of joints in an antenna of the same total length in *unguicularis*. These differences, however, if truly specific, are so small as to be of no value for ordinary purposes. For purposes of identification, therefore, I should consider the following characters:—

1. Form more parallel, colour black; metasternal wings less sharply pointed; reflexed margin of elytra black, and apex more sharply pointed. In male, anterior claw on anterior tarsi with a triangular tooth, apex of which is directed neither forward nor backward; stridulatory files shorter, with ridges very fine and close together. Less reliable characters: Legs more infuscate; antennæ less infuscate; occipital spots more distinct.
= *affinis*, Payk.

2. Form more oval; colour of a slightly aeneous cast; metasternal wings more sharply pointed; reflexed margin of elytra obscure-red, and apex less sharply pointed; in male, anterior claws on anterior tarsi with a tooth, in which apex is directed forward towards apex of claw; stridulatory files longer, with ridges stronger and farther apart. Less reliable characters: Legs less infuscate; antennæ more infuscate; occipital spots less distinct.
= *unguicularis*, Thoms.

DESCRIPTION OF PLATE XII.

Fig. 1.—Metasterna of *Agabus affinis*, Payk., and *A. unguicularis*, Thoms. (scale noted).

Fig. 2.—Underside of elytra of *Agabus affinis*, Payk., and *A. unguicularis* Thoms. (scale noted).

DESCRIPTION OF PLATE XIII.

Fig. 1.—Anterior claw on anterior right tarsus of *Agabus affinis*, Payk., ♂, and on anterior left of *A. unguicularis*, Thoms., ♂ (×400 about).

Fig. 2.—Stridulating file of male *Agabus unguicularis*, Thoms., and *A. affinis*, Payk.

Cryptomorpha desjardinsi, Guér.—A probable Cosmopolitan beetle in Britain.

By RICHARD S. BAGNALL, F.E.S.

Last month (September 18th, 1906), whilst searching the cellar at home, I found a beetle, easily recognised as something unusual, and which Mr. Donisthorpe kindly identified as *Cryptomorpha desjardinsi*, Guér., an insect that has been taken in New Zealand, Mauritius, Madeira, etc., and of which Mr. E. A. Waterhouse took a single example, fifteen years ago, out of a bunch of bananas in London.

C. desjardinsi is a striking insect, about 4mm. in length, linear, and, in colour, reddish-testaceous; antennæ yellow, with joints 7-10 darker, the latter two (9-10) being almost black, whilst the apical joint is clear yellow; the head (with eyes) is slightly wider than thorax, the eyes being large, black and prominent. Thorax with sides crenulate, longer than broad, widest at apex, and from the middle gradually narrowed to base, where it is much less wide than the base of the elytra. Elytra with strongly punctured striæ and wide interstices; pubescence short and strong, arranged in parallel rows, longer and more confused at sides; a dark patch around scutellum, and a dark inverted V-mark on apical third; apex and middle of elytra testaceous, darkening to edges. Legs testaceous. It is most likely that this beetle falls into the same category as certain cosmopolitan *Cucujidae*, etc., and therefore may, in

time, worm itself into the British list, and, on this account, I think it advisable to put the insect on record.

Corticaria crenicollis, Mannh., a new British beetle.

By NORMAN H. JOY, M.R.C.S., F.E.S.

Last August, when examining some dead and quite dry oak branches at Basildon, Berkshire, I came across several specimens of a small light-coloured *Corticaria*, which I at once recognised as an addition to the British list. I sent one of them to the Rev. Paul Belon, who was unable to name it, as he had not his collection with him, but suggested *C. longicollis*, Zett. I therefore obtained a specimen of this species from Herr Reitter, and, by comparing mine with this, was, by the help of Ganglbauer's "Die Käfer von Mitteleuropa," able to identify it certainly as *C. crenicollis*, Mannh., a rare species on the continent. Its nearest ally is *C. longicollis*, from which it differs in having a broader thorax and more parallel elytra. Both these species are separated by Ganglbauer from *C. serrata*, Payk., by the presence of distinct temples, but I cannot say I find this a very obvious character. *C. crenicollis* differs from *C. serrata* in being smaller (it is the smallest member of the genus), of a lighter colour, and in having more parallel and less strongly punctured elytra. At first sight it somewhat resembles *C. elongata*, Gyll., being of the same colour and nearly the same size; the thorax, however, is more evenly rounded at the sides, and more strongly punctured and crenulate, and the elytra are distinctly, although slightly, rounded at the sides.

Hearing that Mr. Pool had taken a *Corticaria* under bark this spring, at Epping, I wrote to him, and he very kindly sent me one of them, which turns out to be *C. crenicollis*. There are specimens of it mixed with *C. serrata*, in the Power collection, from Farnham, and Mr. Donisthorpe has taken a specimen at Chiddingfold, in moss, in company with ants. Mr. Edward Saunders, also, has a specimen from the Capron collection.

The Butterflies of Bagshot, Surrey.

By CECIL FLOERSHEIM, B.A., F.E.S.

The following is a list of the Rhopalocera observed or taken by my friend Dr. Cruttwell and myself within a four mile radius of this place, which is situated amid the pine and heather country in that part of Surrey which borders on Berkshire, and is distant only some 27 miles by road from London:—*Pieris brassicae*, *P. rapae*, *P. napi*, *Euchloë cardamines*, *Colias edusa*, *Gonepteryx rhamni*, *Eugonia polychloros*, *Aglais urticae*, *Vanessa io*, *Pyrameis atalanta*, *P. cardui*, *Dryas paphia*, *Argynnis adippe*, *A. aglaia*, *Brenthis euphrosyne*, *Hipparchia semele*, *Pararge megaera*, *Epinephele janira*, *E. tithonus*, *Coenonympha pamphilus*, *Bithys quercus*, *Callophrys rubi*, *Rumicia phlaeas*, *Plebeius aegon*, *Aricia astrarche*, *Polyommatus icarus*, *Agriades corydon*, *Celastrina argiolus*, *Cupido minima*, *Hesperia malvae*, *Nisoniades tages*, *Adopaea flava* (*thauomas*), and *Agriades sylvanus*, making a total of 34 species. To particularise about some of the less common species which are not merely immigrants:—

EUGONIA POLYCHLOROS.—Though very few elms are to be found

in the vicinity I can remember the time when this butterfly was far commoner than at present. I took a brood of the larvæ on sallow inside this place about four years since, but have never met with another. In April of the year before last, two hibernated specimens were brought me alive by my gardener's boy, but I have not seen this insect at all in this neighbourhood since.

VANESSA IO.—A few years ago this insect, which formerly was abundant about here every summer, seemed almost to have disappeared, but, last August, it suddenly came back in surprising numbers. Indeed, with the exception of *Aglais urticae*, it was the commonest of all the Vanessids. It seems to have quite established itself, and this July I found over 400 of the larvæ feeding within fifty yards of my house.

DRYAS PAPHIA is still fairly common in woodland clearings, etc., about here. I think that I have seen it more frequently than any other of the Fritillaries. I have never come across the var. *valezina*.

ARGYNNIS ADIPPE is, next to *D. paphia*, the most often met with of its family. It seems still to be holding its own in the district, though the country is being more and more cut up into small estates. It was very abundant this summer on thistle heads, etc., on the outskirts of a wood near here.

ARGYNNIS AGLAIA, I regret to say, I have not seen in this neighbourhood for some years, but, though always a rare insect hereabouts, I can remember the time when it was to be found.

BRENTHIS EUPHROSYNE is still far from uncommon about here.

HIPPARCHIA SEMELE is very common wherever there is a patch of heath-clad ground.

BITHYS QUERCUS I have only met with once in a wood some three miles distant from this house.

CALLOPHRYS RUBI is the only hairstreak which is at all abundant here.

AGRIADES CORYDON I have never seen about here, but it was taken by Dr. Cruttwell. I suppose the specimen had strayed from the chalk country about Guildford, which is only some ten miles away.

CELASTRINA ARGIOLOUS is, as might be expected from the fact that both its foodplants are unusually common, the most noticeable of the Lycænids.

CUPIDO MINIMA was taken on a hill just outside this place by Dr. Cruttwell, it does not seem to be at all common.

HESPERIA MALVÆ I once met with in some abundance, resting on the heads of some thistles in a field outside Rapley Farm, near here. I have not often observed it in the neighbourhood.

NISONIADES TAGES I have never taken or seen here myself, but Dr. Cruttwell captured it quite close to this place.

Butterflies in the Wye Valley during 1906.

By. J. F. BIRD.

When living in London, my father and I kept a record of the lepidoptera seen by us each day, but gave up doing so in the country, thinking it would be too great an undertaking. This year I again started a daily record of the butterflies alone, the following being a summary of those noted in the Wye Valley, between Tintern and

Monmouth. Altogether, I have seen 32 species in this district during the season, and to these I have added *Eugonia polychloros*, caught by my father, and *Apatura iris*, observed by my brother in his garden. I have placed them in the order of their appearance:—

Gonepteryx rhamni.—Reappearance on the wing after hibernation, March 6th-June 20th. New brood, August 6th-September 16th. On February 27th, while looking at a Christmas rose, growing in a sheltered spot in our garden, I noticed one of these butterflies clinging to the underside of a leaf, so close to the ground, that the tips of the wings touched the soil; this, perhaps, being where it had passed through the winter. On March 4th, a fine sunny day, it disappeared.

Vanessa io.—Reappearance after hibernation, March 6th-June 6th. New brood, August 1st (bred), August 6th (first wild one) to August 31st, September 8th, September 30th.—Unusually plentiful this year; the hibernated specimens seen in great numbers, especially on the Gloucestershire side of the River Wye, sunning themselves on the road between Bigsweir Bridge and Redbrook.

Aglais urticae.—Reappearance after hibernation, March 7th-April 22nd. First brood, June 23rd-August 7th. Second brood (?), August 22nd to September 11th, September 22nd, October 12th. Also very common, especially during July. Many of this brood entered the house about the middle of July, as if to hibernate, but, after staying from about a week to a fortnight, they left. About the middle of August, specimens again began entering the house, this time to really hibernate. This species and *V. io* were abundant up to August 30th, the latter in companies on the *Eupatorium cannabinum*. The next day was the beginning of the heat wave, experienced all over England, the result being that *V. io* practically disappeared, only three specimens being noted after that date, and *A. urticae* came trooping into the house, seeking dark corners wherein to hibernate, where I really believe we could find two or three dozen. These we mean to leave in peace. *Gonepteryx rhamni* was also affected by the heat, no specimens being seen between August 30th and September 6th, when occasional specimens began appearing again at flowers in the garden.

Polygonia c-album.—Reappearance after hibernation, March 7th-April 4th. Most of the hibernated specimens I saw were in Gloucestershire, basking in the sun, on the road between Bigsweir Bridge and Redbrook. Summer brood, July 12th-August 6th. Autumn brood, September 3rd (first one bred from pupa found on August 26th, suspended to leaf-stalk of hop), September 6th (first wild one) to September 10th. On July 26th, I sleeved a female (netted that morning from thistle-blossom at Llandogo) on a currant bush. On the 31st it was dead, so I removed the sleeve, upon which I found nine ova, all laid separately within a space of three square inches, but not a single one on the plant itself. I also discovered four or five on my finger, which I must have dislodged while taking the netting off, but lost all but two of the latter while walking to the house. An examination through a pocket lens showed that these eleven ova differed in the number of longitudinal keels—six were with ten, four with eleven, and one with nine keels only. Six of these eggs I posted to Mr. Tonge, for photographic purposes, who informed me that they began to emerge on August 5th. He has since very kindly sent me some splendid photographs showing this species in its four stages. The ova

we kept all emerged on the 6th. These handsome larvæ, when nearly fullgrown, place themselves in an extraordinary attitude when resting. The posterior extremity up to, and sometimes, but rarely, including, the last pair of abdominal claspers, is lifted well off the foodplant; the anterior half is bent at right angles and slightly arched to one side, curved back again at the legs, so that the head is turned, almost at right angles, forward. The larvæ pupated between August 28th and August 30th, and so passed through the "heat wave" in that state. I think this must have hurried up the emergence of the imagines, the length of the pupal lives being from 10 to 13 days, instead of 23 to 27 days as noted for the autumn brood last year; averaging less than that of the summer brood, so far as we have ascertained. This high temperature, or, perhaps, the effect of it in hastening the emergence, seems to have acted upon the coloration of the wings, for the upper-sides of all, including the one bred from the pupa I found, have the light margins, and are as light in colour as ordinary specimens of the summer brood (not ab. *hutchinsoni*). The curious thing is that the abnormal heat (if I am right in imagining that to be the cause) has in no way affected the undersides; so that the six specimens we have bred this autumn, have, in appearance, first brood uppersides, with what I believe is the normal dark and plain undersides of the second brood. It would be interesting to hear what results other breeders of this insect have had this autumn.

Pieris rapae.—First brood, April 6th-June 24th. Second brood, July 24th-September 18th.

Pararge egeria.—April 12th, May 4th, and August 29th. In 1904, the males were exceedingly abundant, the females being much less common. In 1905, the species was decidedly scarcer. This year it was very scarce, in fact, the only specimens I saw were single ones on the dates mentioned.

Euchloë cardamines.—April 16th-June 19th. Not so common as usual.

Hesperia malvae.—April 25th-June 19th. Fairly common. On June 12th, I netted a beautifully marked ab. *taras*, unfortunately in rather poor condition.

Nisontades tages.—May 13th-June 30th. Abundant this year.

Pieris napi.—First brood, May 13th-June 11th. Second brood, July 17th-September 1st. Specimens of the second brood were not as well-marked as the same brood last year. The weather, during June and July, was much cooler here this year, than was the case in 1905, and I am wondering whether this was the reason. Examples obtained in 1905 are unusually well-marked, with extra spots showing on the hindwings, and some of the specimens are above the average in size.

Rumicia phlaeas.—First brood, May 15th-June 13th. Second brood, August 6th-September 1st. On August 8th, I captured, at Tintern, a ♀ ab. *caeruleopunctata*, with an extra spot on the forewings, in the discal cell, towards the base of the wings.

Brenthis euphrosyne.—May 15th-June 13th. Not quite so common in our immediate neighbourhood, but plentiful in Gloucestershire, near Redbrook.

Pyrameis cardui.—May 29th-July 25th. New brood, August 3rd (first one bred), August 6th (first wild one) to August 22nd.

Polyommatus icarus.—First brood, June 5th-July 19th. Second

brood, August 6th-September 4th. [I saw one at St. Owen's Cross, Herefordshire, on September 10th.] Although I spent a good many evenings examining specimens at rest, for aberrations, I obtained nothing very wonderful. Several I took show a tendency towards *ab. arcua*, and females of *ab. caerulea*, in varying shades, were as common as usual. The following are the most noteworthy specimens, all being underside aberrations:—(1) ♂, Tintern, August 16th; only the lower of the basal spots of forewings present. (2) ♂, Tintern, August 22nd; all the basal spots of forewings double, the lower spots inclined to unite with last spot of transverse row; in the left hindwing the ocellated spots between veins 1*b* and 1*c* (Meyrick's system) are united. (3) ♂, Tintern, August 30th; the lowest spot of transverse series on both forewings very small, and only faintly visible. (4) ♀, Tintern, August 11th; the orange spots on all the wings very large, being twice the average size; the lower ocellated spots on forewings showing a slight tendency to unite; above the transverse series on right forewing is a small extra spot; the spots between veins 1*a* and 1*b* of hindwings elongated into the shape of a comma. (5) ♀, Tintern, August 18th; a small extra spot above transverse row on forewings. (6) ♀, Tintern, August 22nd; the forewings with extra spots like the last, as well as this, the basal spots are asymmetrical conglomerations of spots and streaks, and the lowest spots of transverse row very large. (7) ♀, Tintern, August 21st; an extra ocellated spot on left forewing, between the discal spot and the top one of the transverse series.

Celastrina argiolus.—First brood, June 5th (only one observed). Second brood, August 7th-August 20th. Scarce.

Coenonympha pamphilus.—June 5th-July 25th, August 7th-September 4th. [St. Owen's Cross, Herefordshire, September 10th.] How many broods are there?

Pararge megera.—First brood, June 5th-June 21st. Second brood, August 19th-August 28th. Not common. Last year it was most abundant.

Angiades sylvanus.—June 8th-August 6th. Common this year.

Epinephle jurtina.—June 18th-September 1st. I saw a freshly-emerged ♀ on August 30th. On July 11th, I netted a ♂ with one hindwing bleached, in the same field in which I captured two last year.

Pieris brassicae.—First brood, June 19th (Redbrook, Gloucestershire, only one seen). Second brood, July 9th-September 2nd. [Harewood End, Herefordshire, September 10th]. Fairly common.

Strymon w-album.—July 5th-August 9th. Abundant as usual.

Enodia hyperanthus.—July 5th-August 11th. I think more plentiful than usual. Abruptly disappeared after two or three very wet days.

Callophrys rubi.—July 9th. A single ♂ specimen at Llandogo, flying round and settling on bramble.

Adopaea flava.—July 9th-August 9th. Very common this year.

Pyrameis atalanta.—July 12th, one worn ♀ seen at bramble blossom. New brood, September 7th-September 18th. Extremely scarce.

Brenthis selene.—July 14th. Only one seen, at Llandogo.

Argynnis adippe.—July 20th. One ♀ only, at Llandogo.

Bithys quercus.—July 20th-September 2nd. Not quite so common this year.

Apatura iris.—About the third week of July, my brother brought us a wing (♂) of this species found in his garden, on the lawn, and informed us that he had seen one fly past him. On August 19th, he saw a worn ♀ flying about a willow, also in his garden, which may have been ovipositing. Unfortunately, we shall not be able to search for larvæ there next year, as he is changing his residence.

Dryas paphia.—July 24th-August 9th and August 29th. The ♂s as common and as ragged as usual. A very few ♀s seen.

Epinephele tithonus.—August 6th. Only one ♂ seen, at Llandogo.

Hipparchia semele.—August 8th. As I was passing by a thistle, in a field at Tintern, I noticed one of these butterflies (a ♂) drop, rather than fly down from it, on to a dry patch of cow-dung lying by the side. This is the only one we have seen in the neighbourhood, and are rather surprised at not having met with more, as there are plenty of suitable-looking spots on the hills around where one would expect to find them.

Agriades corydon.—August 11th. One ♂ at Tintern, already noted in the *Ent. Record*, p. 241.

Eugonia polychloros.—August 29th. One was found by my father in the house, fluttering on a window.

My best record for one day was on August 6th, when I noted seventeen species, namely:—*Agriades sylvanus*, *Adopaea flava*, *Runicia phlaeas*, *Polyommatus icarus*, *Bithys quercus*, *Strymon w-album*, *Pieris brassicae*, *P. rapae*, *P. napi*, *Gonepteryx rhamni*, *Vanessa io*, *Aglais urticae*, *Polygonia c-album*, *Pyrameis cardui*, *Epinephele jurtina*, *E. tithonus*, and *Enodia hyperanthus*.

Some notes on *Camptogramma fluviata* with descriptions of new aberrations.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.E.S.

This species never appears to be abundant anywhere—one never hears of its capture in any numbers—only a stray one now and again turns up in widely separated localities, and at no fixed time of the year. Is it sluggish in its habits? Does it dislike to fly? One would think not, for it has been taken occasionally at light, and the first I ever met with, a male, was disturbed out of a bed of wild peppermint growing in one of the hollows on Braunton Burrows, North Devon, and flew off at a good pace, and I had to run to catch it. This was as long ago as August 25th, 1857, and, on July 23rd, the following year, one of my brothers caught a male at Croyde, a few miles from Braunton, but I have no record as to whether it was taken by day or night, sitting or flying. A good many years elapsed before I met with it again, for it was not until July 24th, 1901, that I took a male, at night, on some reeds, in a reed-bed near Dovercourt; on September 22nd, 1903, I boxed a pair, *in cop.*, about midnight, sitting on a barbed wire fence facing the sea, near Harwich; and, on October 12th, 1904, I took a fine fresh female at rest, by day, on a wall in High Street, Dovercourt, and kept her for eggs, but she died without depositing any, so I fancy she had never paired, as she was in such fine condition when captured.

The female of the pair taken *in cop.* on September 22nd, 1903, was kept for eggs, and confined in a chip-box with some fibres of tow, and fed on syrup placed on a little piece of sponge, and, in the course

of a few days some 60 or 70 eggs were deposited on the tow. The eggs began to hatch on October 2nd, and the young larvæ were placed in a small breeding-cage upon a growing plant of groundsel, upon which they fed up very rapidly, and by the 28th of the month most of them had spun up. The first moth appeared on November 14th, and the last one on November 30th. Fifty-nine moths were bred, and they were very fine examples and nearly twice the size of their parents. Several pairs were confined together in small breeding-cages, and supplied with food on a piece of sponge. Only two pairs were noticed *in cop.*, and, strange to say, both of the females, although kept a long time, died without laying a single egg. The females of two or three other pairs, that I had not seen *in cop.*, deposited three or four hundred eggs upon fibres of tow and pieces of moss. About two-thirds of these proved fertile, and the first larva hatched on December 8th, and, of the remaining eggs that did not hatch, a great many contained fully formed larvæ. On December 21st I counted over 200 larvæ feeding; by January 6th many were nearly fullgrown, and, on the 9th, I noticed many of them spinning up, so they only took about a week longer than the first brood. The first moths, 5 in number, emerged on January 22nd, and the last on February 29th, 102 in all. A few of the larvæ failed to spin up, and a great many pupæ did not produce moths, for only about half were bred. The larvæ and pupæ were kept in a bathroom where the temperature seldom fell below 54° during the night, owing to the hot water cylinder being next door in the drying cupboard, with only a thin wooden partition between, and the breeding-cages were placed on a shelf attached to this partition. Of the 102 moths of this second brood several pairs were kept for eggs, but most of them died without pairing or laying, and the 3 or 4 females that did lay only produced a small number of eggs. These began to hatch on February 11th. The imagines of the second brood were considerably smaller than those of the first brood, being about the same size as their grandparents, and the third brood, which began to appear on April 2nd, were still smaller, and their progeny, who began to emerge on June 10th, were such dwarfs that I did not care to carry on the brood any further.

The larvæ of *C. fluviata* are very sluggish in their habits, feed chiefly at night, and during the day hide away among the lower stems of their food or beneath the leaves.

Among the several hundred moths bred there were sundry examples of two or three distinct and interesting aberrations, which I think are worthy of names and descriptions, so I append them below:—

(1) *C. fluviata* ab. *marginata*, n. ab.—Male, fore- and hindwings typical, but beyond the narrow hindmarginal black line there is a conspicuous pearly-grey fringe. Female, forewings purple-brown; a dusky transverse median band, widest near the costa, crosses the wings obliquely, and encloses the discoidal spot, which is dark and minute, and surrounded by a conspicuous whitish ring; between the median band and base of wings, there are two faint and rather zigzag whitish lines crossing from costa, where they are most distinct, and form a sharp angle to inner margin; about half way between the median band and outer margin, there is a similar angulated wavy line, and beyond it, and quite close to the outer margin, there is another, but fainter, wavy line; at the apex of the wings there is a short oblique dusky patch pointing downwards; the outer margin is inwardly distinctly bordered by a narrow black line, which, in some specimens, viewed through a lens, looks as if it was composed of a series of spots arranged closely together in pairs,

and beyond this is a conspicuous pearly-grey fringe. The hindwings are grey, faintly tinged with rose colour towards the anal angle and inner margin, and with several dark and pale indistinct transverse wavy lines, and with the black hind marginal line and pearly-grey fringe as in the forewings. Of course, the chief character of this aberration is the conspicuous pearly-grey fringe, which is absent in typical examples.

(2) *C. fluvicata* ab. *olivacea*, n. ab.—In this aberration, which is rare, and seems to occur only among the females, the purple-brown of the forewings is replaced by olive-brown, but all the other characters are the same as in typical specimens. I have, however, two examples of this aberration which possess the conspicuous pearly-grey fringe characteristic of ab. *marginata*, but do not think it necessary to give them a varietal name.

(3) *C. fluvicata* ab. *obsoleta*, n. ab.—In this aberration, which is confined to the males, the dark median band is nearly obsolete, or altogether absent.

With reference to my query at the beginning of this paper, as to the retiring habits of this species, I may mention that, on several occasions when removing bred moths from the breeding-cages, some of them have escaped, but instead of flying towards the window, as most Geometers do, or to the ceiling, they almost always fluttered low and gently downwards, and hid themselves beneath a table or in some dark corner of the room. The one I found in the daytime in High Street, Dovercourt, was sitting on the wall within an inch of the ground.

Contribution to the life-history of *Heliothis peltigera*.

By ALFRED SICH, F.E.S.

On July 13th, 1906, Mr. Eustace R. Bankes took, in the Isle of Purbeck, a ♀ *Heliothis peltigera*, and subsequently obtained ova, one of which, and the larva produced from it, owing to the kindness of Mr. Bankes, form the subject of these notes.

OVUM.—Upright, conoid, bluntly rounded towards the top, with the apex itself containing a depression in its centre, raised above the general surface. Height, 0.52mm. Diameter, at the base, 0.5mm., at the top, 0.23mm. Basal outline not regular. Sculpture: the shell is very finely pitted; there are about 35 primary ribs, which are reduced in number as they approach the micropylar area, where they are but fifteen. These ribs are irregular, rather thick (0.016mm.), somewhat keeled. They decrease by running into each other, or by ceasing more or less abruptly. The interspaces between the ribs are about equal in width to the breadth of the ribs. About twenty weak wrinkles encircle the egg, more defined towards the base and summit. The micropyle lies at the summit, on an elevation, down the upper slopes of which the cells of the neat and conspicuous rosette extend. The apex of this elevation is depressed, and, in the centre of the depression, is a raised point, from which the twelve elongated kite-shape cells of the rosette radiate. These cells vary much in length, the longest being 0.05mm. and the shortest about half that length. [Described, July 18th, 1906, from a single ovum, just before hatching. The black head of the larva and its yellow body were distinctly visible through the thin, almost colourless, eggshell. On hatching, the larva cut a hole in the wall of the egg near the summit, but left the shell otherwise uneaten.]

HABITS OF LARVA.—After hatching, the slender, pale yellow, larva hid itself in the flower-head of *Trifolium repens*, with which it was supplied, boring into the florets. It appeared particularly fond of the anthers. It hatched on July 18th, and, on the morning of the 22nd, it had spun a

few threads of white silk, forming a weak platform on which it rested to undergo its first ecdysis. The next morning it was already in its second instar. It fed in the same manner, but ate the filaments of the stamens, and more of the corolla than previously. On the 25th, the larva was again stretched out on a slight layer of silk, and, by the 26th, had assumed the third instar. Two days later it was again laid up, and appeared in the fourth instar on the 29th. On the 31st, a fourth platform had been spun, and the fifth instar was assumed on August 1st. Two days later the larva was again undergoing ecdysis, and it appeared in its sixth and last instar on August 4th. At every change it ate the cast skin. This stadium naturally lasted a longer period than those preceding it, but, on August 8th, the umber markings on the larva became pink, and, on the 9th, the larva was more or less suffused with pink, and went down into earth that evening. About a fortnight later the slender, bright brown, pupa was dug up. It was found, in a rather brittle cocoon, about $1\frac{1}{2}$ inches below the surface. The moth, a ♂, was found with fully expanded wings, resting on the top of the box, September 3rd, 1906. Thus, in $46\frac{1}{2}$ days, the insect developed from ovum to imago. The weather, during this period, was, on the whole, extremely favourable to rapid development. In its later stadia, the larva still confined itself entirely to the blossoms of the clover, never eating the leaves. It rested usually outstretched among the clover flowers, but with head and prothorax bent downwards. It never attempted to spin the blossoms together, or to conceal itself in any way. It was very sensitive to touch, and moved rapidly if annoyed, but otherwise appeared to be rather of a sluggish disposition. When crawling, even in its first stadium, it used all the ventral prolegs, not in any way half-looping as many small Noctuid larvae are in the habit of doing.

LARVA.—*First instar*: Length 2.4mm. Width of head 0.28mm. Head small, black, rather rounded in outline, notched on the crown. Body long, slender, pale yellow, covered with black spicules. Segmental divisions well marked. Spiracles large, black-ringed, rather raised. Thoracic legs dark grey, with white rings. Ventral prolegs long and slender, dark grey. Tubercles black, situated on a large dark grey plate, each carrying one black hair, with a slightly swollen grey apex. Prothorax wider than the head; the deep brown shield carries an anterior and a posterior row of four hairs, the anterior row being the larger. Below the shield, on a common plate, are two tubercles, the front one with a longer curved hair, directed obliquely forwards, the other with a hair about half the length. Below this is the large, much-elevated, spiracle, in front of which is a tubercle with a long straight hair pointing forwards and outwards, and a small tubercle with a very short hair; both these are on a common plate. Again, below these, are two tubercles with equally long hairs, on a common dark grey plate. On the meso- and metathorax, i, ii, iii, iv, and v form an oblique transverse line, v being the anterior. Below v is another tubercle with a long hair, and there are two hairs at the base of each leg. On the abdominal segments, i, ii, and iii are in the usual positions; iv lies behind the spiracle, and v below the spiracle. Lower down is a smaller tubercle and hair, which may be either vi or vii. The anal shield is dark brown, with eight black bristles. *Second instar*: Length 4mm., width of head 0.5mm. Head black, with a few scattered hairs, otherwise smooth and shining. Body slender,

pale ochreous in colour, the dorsal vessel appearing as a dark grey line. There is a slender, pale, subdorsal line, and traces of a pale subspiracular. The prothoracic shield is ochreous-brown; the anal shield is small. There is a dark patch at the base of the anal claspers. The body is covered with blunt black spicules, rather more numerous than in the first instar. On the prothorax, the two tubercles, on a common plate situated just below the shield, carry hairs of more equal length than in the first instar. Both meso- and metathorax have now two, or rather four, additional tubercles, two on each side of the larva. One is situated between, and behind, iv and v, with a rather short hair, and the other, smaller, is just below v. The hairs of both these are pointed. The primary tubercles arise from large brown plates; they are black, and well raised, and carry one hair slightly swollen at the apex, the basal two-thirds black, and the apical third grey or whitish. The length of these hairs, on tubercles i, ii, and iii, is about 0.17mm., on iv and v about half that length. *Third instar:* Length 6.6mm.; width of head 0.66mm. Head and thoracic legs black. Ground colour of the body pale yellowish-grey. Dorsal stripe broad, dark grey, bordered on each side by a series of pale dots. Pale whitish subdorsal and spiracular stripes. Abdominal prolegs very dark grey. Anal claspers yellowish, with basal marks black. Anal shield with a blackish border. Spiracles black-rimmed, rather raised, and surrounded by a brownish plate. There is a strong whitish flange. There are four subsegments on the meso- and metathorax; all the primary tubercles are on the third subsegment. The abdominal segments appear to have also four subsegments. The second subsegment carries i, iii, and the spiracle, while tubercle ii is on the third subsegment. Prothoracic shield somewhat quadrate, yellowish; lateral and posterior borders edged with black. Down the centre are three pairs of black marks; on the anterior border are four black tubercles, each bearing one long white hair, and on the posterior are also four black tubercles, each with a shorter dark hair. The primary tubercles are on very large raised plates (0.10mm. in diameter), practically colourless, but with an irregular black border; the tubercles are black, surmounted by a whitish hair, bluntly pointed at the apex. The hairs of i and iii measure 0.3mm., and that of ii 0.4mm. The additional tubercles on the meso- and metathorax, as described in the account of the second instar, have dark pointed hairs. In this third instar the black spicules, covering the larval skin, are rather more numerous than in the second instar, and they vary much in size. Some of them, especially numerous on the subdorsal area, have developed into secondary skin-hairs, and consist of a small black tubercular point, with a very short, stout, pointed spine at the apex, the tubercle and spine together measuring 0.03mm. The most curious feature, however, in this instar, is the presence on the skin of short (also about 0.03mm.) white truncated rods. These appear to rise directly from the skin, without any kind of tubercular base, but the area immediately around them is devoid of spicules, as it is around the bases of the primary tubercles. These points are situated chiefly on each side of the dorsal stripe; they also form the white borders of the subdorsal stripe, and are scattered also over the dorsal and spiracular areas. *Fourth instar:* Length 11mm. Head narrower than the prothorax, black, much marbled with ochreous on the face. Body slender, slightly flattened on the dorsum; segmental

divisions well marked; subsegmental divisions not well marked. Legs and claspers moderate in length. In general, the larva has a somewhat shagreened appearance. The dorsal and subdorsal areas of the body are yellowish-green; the broad mediodorsal stripe dark greyish-green, with numerous white dots, and more or less bordered with pale spots, each with a short, white, point in the centre. Close to the mediodorsal stripe is tubercle i, and, lower down, ii. In this subdorsal area are many pale spots and points, irregularly placed. Just below ii, runs the narrow, conspicuously pale, subdorsal line, composed of pale spots with a point in the centre of each. The area between this line and the very strong white flange is dark greyish-green, like the mediodorsal stripe, with several, scattered, white points. Here is tubercle iii, and, below it, the small, black, spiracle. Just above the flange, and behind the spiracle, lies iv, while v is situated on the flange, and is subspiracular. The area below the flange is dark greyish-green as are the anal claspers and ventral prolegs, the latter having an ochreous pad and a row of sixteen reddish-ochreous crotchets. The thoracic legs are black, with ochreous bands. The meso- and metathorax have five subsegments, the tubercles occurring on the third; the fourth and fifth subsegments are very narrow. The abdominal segments, typically, also have five subsegments, the first very wide, and the second and fifth very narrow. The primary tubercles much the same as before, but the long white hair is attenuated to a blunt point. The length of the hair on i is about 0.65mm., that on ii, 0.7mm.; iv and v carry hairs about 0.34mm. in length, while iii and vi (as I am inclined to call it) have hairs about 0.6mm. There is a small tubercle, with a short hair, on the prolegs. On the 8th abdominal segment, the trapezoidal tubercles (i and ii) form a square, and on the 9th abdominal an inverse trapezoid, that is, the two tubercles i are further apart than the two tubercles ii. The somewhat diamond-shaped anal shield is of the ground colour and inconspicuous; it carries an anterior and a posterior row of four hairs, in this respect like the prothoracic shield. Except round the bases of the tubercles, the white points, and the spiracles, the skin is covered with shining, black, spicules, which vary much in size. Those which are still simply spicules, are smooth at the apex, on the upper parts of the larva, but sharply-pointed on the venter. They vary much in the state of development from the merest, microscopic, black dot, through the sharply-pointed spicule, up to the small, dark grey, tubercular with a short black point at its summit. The curious white points mentioned in the account of the third instar, have now developed further. They rise from a very small, scarcely perceptible, plate, which runs round their bases as a border. They are rather swollen at the base, and terminate in either a truncated or a pointed apex. They are about 0.5mm. in height, very stout, and snow-white in colour. They are more numerous on the upper parts of the larva than on the parts below the lateral flange. *Fifth instar*: Length 21mm. Width of head 1.7mm. Head small, partly retractile into the prothorax, which, however, is not very wide, the colour is pale ochreous-grey, spotted on the crown with ochreous-brown. Body slender, cylindrical, though slightly flattened on the back. The pale longitudinal stripes give the larva the appearance as if it were much flattened on the back and sides. The flange is very strong, white, commencing on the prothorax, just below the spiracle, and terminating on the 10th

abdominal segment at the base of the anal claspers. Ground colour of the body light green, with a yellow tinge. Mediodorsal stripe dark greyish-green, bordered by large, pale, whitish spots, most conspicuous at the junctions of the segments. Subdorsal line composed of five or six pale, yellowish-white, oblong spots; this line is bent up at an angle on the 8th abdominal segment, forming a conspicuous whitish spot just below tubercle ii. Below this line the lateral area is dark greyish-green, becoming lighter green as the flange is approached. There are here, on each segment, one or two conspicuous pale spots, but their position is not constant. The spiracles are black-ringed. Below the flange is a subventral stripe, conspicuous as an oblique stripe running, over the anterior position of each segment, upwards to the base of the claspers. On the 1st and 2nd abdominal segments is a pale, rather faint, medioventral line. The tubercles, and secondary hair-clothing, are very similar to those of the fourth instar, except that the white points are much more numerous, and many of them reach a length of nearly 0.08mm. I think it was in this instar that I first noticed the presence, on the larva, of those peculiar, very small, tubercles, which often occur in larvæ in front of the spiracle and on the anterior portion of the segments. *Sixth instar*: Length 27mm. The larva is of the same shape, and proportions, as in the fifth instar. Ground colour pale green, with a slightly mealy appearance, on account of the numerous white points. The mediodorsal stripe, which runs uninterruptedly from the anterior of the mesothorax to the centre of the 1st abdominal segment, is black, but, owing to the numerous pale points contained in it, it looks olive to the unaided eye. On the abdominal segments this stripe is interrupted, being quite absent on the 2nd and 3rd subsegments. It is altogether absent on the 9th and 10th abdominal segments. The pale subdorsal line is traceable on the 1st, 2nd, and 3rd subsegments, but conspicuous on the 4th and 5th. The very dark broad stripe below this is constant on all the subsegments. The flange is, comparatively, not nearly so heavy as in the fifth instar, nor is it so white, as it becomes pinkish on the 7th, 8th and 9th abdominal segments. The space between the mediodorsal stripe and the flange is occupied alternately by transverse bands of green and rich umber with a pinkish hue, though on the 7th, 8th and 9th abdominal segments, this space is almost entirely umber. The spiracles, which are brownish-grey, with a black ring, are surrounded by a pale space. Beneath the flange the larva is green, but the flange is bordered below, at the centre of each segment, where tubercle v arises, with umber, and there is a patch of the same colour lower down. The prothoracic shield is brownish-green, not well marked, and there are still only four hairs on the anterior and posterior borders. Below the shield is a tubercle of ordinary size, with a very small tubercle below. Then follows the large, oval, black-ringed spiracle, with a very small, dark, hair in front of it, and a large tubercle further in front. Below the flange are two moderate-sized tubercles. The mesothorax has five subsegments; all the tubercles are on the large 3rd subsegment; i, ii, and iii are close together, in a transverse line, iv is rather further back. Between iii and iv is a small accessory tubercle; v is well forward on the flange, and just above v is a large accessory tubercle with a white hair. Further down is another large tubercle. The metathorax agrees with the mesothorax.

The typical abdominal segments have also five subsegments, but they are not all well-marked. The division between the 1st and 2nd is marked by a pair of green depressions, placed transversely, just behind the two tubercles i. Tubercle i is on the 1st subsegment, tubercle iii, the spiracle, and tubercle v on the 2nd subsegment, while ii and iv are on the 3rd subsegment. Above the proleg is tubercle vi (or vii). On the 8th abdominal segment, as in the fifth instar, the trapezoidals form almost a square, and on the 9th a reversed trapezoid. The anal flap is greenish, and has two tubercles in the centre, and a row of six on its border. There are four tubercles on the anal claspers. The primary tubercles have long white hairs in this instar, and the secondary small tubercles are mostly brown, except on the dark areas of the larva, where they are still black, as on the dorsal stripe, etc. The white points are still more numerous and conspicuous than before, some being 0.07mm. wide at the base, and 0.1mm. high. Perhaps the most conspicuous of these are situated as a pair in front of tubercle i, and three, forming a triangle, on the inner side of tubercle ii. These points are very wide at the base, and taper rapidly to a fine point.

Myrmecophilous notes for 1906.

By H. Sr. J. K. DONISTHORPE, F.Z.S., F.E.S.

Having had a very successful year with ants' nest species, the following notes deal with the more interesting captures, and record new localities for others.

COLEOPTERA.—*Thiasophila inquilina*, Märk.—I have, this year, taken a dozen of this very rare species, with *Lasius fuliginosus*, at Wellington College. I have only found it in the very heart of the nests, and from the deepest packing; Dr. Joy tells me this was always his experience. I kept some specimens alive to experiment with, and they were found to protect themselves in the usual way, which I have demonstrated (*Ent. Record*, 1901, p. 349, and 1903, p. 11) other myrmecophilous "staphs" use, when attacked, against the ants. They were tested with *Formica rufa*, *F. exsecta*, and their own hosts. When approached by an ant they stood quite still, and raised the tail high in the air; the ants would not touch them, and when forced to seize them, dropped them again at once.

Atemeles paradoxus, Gr., was taken by Mr. Keys and myself at Whitsand Bay, with *Formica rufibarbis* var. *fusco-rufibarbis*, in May. This is the only *Formica* species it is found with. We did not take it again in September, when we were searching the nests of this ant; but no doubt it was in the *Myrmica* nests, as *Atemeles* appears to go from *Myrmica* to *Formica* nests about February, when the larvæ are bred, and in summer or autumn the newly-hatched beetles go from *Formica* to *Myrmica* nests to pass the winter. This has always been my experience.

Lomechusa strumosa, F., was rediscovered by me in this country, on May 25th, at Woking, with *Formica sanguinea* (*Ent. Record*, 1906, p. 159), more specimens were taken on the 29th, and again in September. This was, no doubt, the most sensational capture we have had with coleoptera in this country for years, moreover, the lifehistory of the beetle is of exceptional interest. It has been thoroughly worked out and described by Father Wasmann in many of his writings. The

beetle, like *Atemeles*, belongs to the true guests, and possesses a short broad tongue and aborted palpi, as it is fed by its hosts. It also has patches of yellow hairs on various parts of the body, and the ants obtain a sweet secretion from them. The larva of the beetle, which is very like an ant larva, is fed by the ants, and they even put it on their own brood, so that it may devour them. The voracity of the beetle produces, in colonies where it has been for some time, a lack of the nursing instinct in the ants, and so pseudogynes (or false females) begin to appear, and, of course, whenever these are found, *Lomechusa* may be certain to occur. It is from these colonies that the beetles spread to other nests. At first, the beetles are kept in check by the ants digging up and carrying about the *Lomechusa* pupæ, as they do their own, which is, of course, fatal to them. My friend, Mr. Hereward Dollman, has kindly drawn the pseudogynes and a queen and ordinary worker, to show how they differ; also the labium and larva of the beetle, all from the specimens themselves (see plate).

Dinarda dentata, Gr., was taken by me at Woking (a new locality for it) with *Formica sanguinea*, in plenty, in May and September. *D. hagensi*, Wasm., again at Bournemouth with *F. exsecta*; and over twelve specimens of *D. pygmaea*, Wasm. (see *Ent. Record*, 1906, p. 217) were taken by Mr. Keys and myself, in Cornwall, with *F. rufibarbis* var. *fusco-rufibarbis*, in September, and the former has taken it in some numbers since. As there is still some doubt in the minds of one or two coleopterists as to whether these three species of *Dinarda* are distinct or not, I may point out the following facts:—*D. dentata* is only found with *F. sanguinea*, it is the largest of these three, broadest, most robust, and most coarsely punctured. *D. hagensi* is only found with *F. exsecta*, it is always of a lighter colour (more yellow), more elongate, and the elytra much broader than the thorax, more so than in the others. Our form is most constant, I have taken over fifty specimens now, and they were all the same. *D. pygmaea* is found with *F. rufibarbis* var. *fusco-rufibarbis*. It is the smallest of our species, and the thorax is less broad in proportion to the elytra. It varies a good deal, I have a specimen in which the thorax is not broader than the elytra (typical *pygmaea*, Wasm.), and others in which it is, and Mr. Keys has sent me a specimen in which the antennæ are longer and more slender. There are some specimens in the "Power" series of *dentata* which Mr. Waterhouse had put by themselves, and they evidently look different, and are smaller; on examining them I found the thorax to be less broad in proportion to the elytra, and I found they came from Weston-super-Mare. Two of Power's three specimens of *Atemeles paradoxus* also came from Weston-super-Mare, and, as we have seen, that this species is only found with *F. rufibarbis* var. *fusco-rufibarbis*, it follows that the ant must occur there, and it is, therefore, exceedingly probable that these specimens of *Dinarda* were taken with the same ant, as they must have been if they are, as I consider them to be, *Dinarda pygmaea*. I took the larva of *pygmaea* in Cornwall, and on comparing it with a specimen of the larva of *dentata*, kindly given me by Father Wasmann, I find the antennæ are a little longer in the former.

(To be continued.)

NOTES ON COLLECTING, Etc.

ABSENCE OF ICHNEUMONED LARVÆ.—Have any of the readers of the *Ent. Record* noticed the almost entire absence of ichneumons in June species of larvæ this year? Last year, the larvæ of *Eupithecia succenturiata*, of which I found above 70, only 22 of which pupated, the others being stung by the ichneumon that fastens its cocoon at right angles to the unfortunate larvæ at the posterior extremity. This year, so far, I have only had two larvæ stung. *Eupithecia subfulvata* larvæ were treated in much the same way, and in about the same proportion. The larvæ of *Actebia praecox*, this year, were also remarkably free from parasites, for, as a rule, nearly a third of their number are stung.—T. BAXTER, Min-y-don, St. Anne's-on-Sea, Lancashire. *October 9th, 1906.*

PYRAMEIS CARDUI IN BUCKINGHAMSHIRE.—From the various notices which have appeared in this magazine on the subject, there appears to have been a considerable immigration of this butterfly to our shores this season. As a rule, in my rambles on the Chiltern Hills, I have never found it in any abundance, but, in August, from the first week of the month onwards, it was flying everywhere in the neighbourhood of Great Hampden and Kimble, but was very little in evidence after that date. As a rule, I have observed that, when we get an abnormal *cardui* year, there is a corresponding abundance of *Plusia gamma*; while it may also be worth noting that the double immigration in recent years has generally been, in my experience, coincident with a wet and cool summer. This year, however, I have not noticed that the latter species has been more common than usual; while, certainly, a finer August and autumn, generally, has not favoured us since the great summer of 1893. Here, in Middlesex, the scarcity of the common Noctuids has been quite remarkable, and I hear the same account from most local collectors.—H. ROWLAND-BROWN, M.A., Oxhey Grove, Harrow-Weald, Middlesex. *October 23rd, 1906.*

PLUSIA GAMMA IN THE SOUTHEASTERN DISTRICT OF LONDON.—In the last number of the magazine (*antea*, p. 228), Mr. Briggs notes the rarity of *Plusia gamma* this year. Just now it is fairly abundant in our part of the metropolis, coming in to light every evening, the specimens evidently just emerged.—J. W. TUTT, Westcombe Hill. *October 10th, 1906.*

COLIAS EDUSA AT GUILDFORD AND MARGATE.—I saw a specimen flying in the centre of the town of Guildford on August 23rd, and I took, at Margate, four ♂ specimens on September 2nd, three ♂s and one ♀ on September 7th, and one ♂ on September 9th, all in perfect condition, as though only just emerged, with the exception that two ♂s and one ♀ had one hindwing chipped at the anal angle, but were otherwise perfect. It struck me as being rather late for examples in such good condition, I usually expect to find them emerging about August 17th. The ♀ was flying very sluggishly, and was, I thought, ovipositing, but she failed to lay any ova when put under a bell glass.—C. W. COLTHRUP, 127, Barry Road, East Dulwich, S.E. *October 4th, 1906.*

HELIOTHIS PELTIGERA AT MARGATE.—I took a freshly-emerged ♂ specimen flying among lucerne, on August 9th, at Margate.—IBID.

VANESSIDS IN 1906.—I think this can be fairly called a Vanessid

year. I have already given an account of immigrant *Pyrameis cardui* (*anteà*). On July 4th, at Dover, I found quite a number of colonies of larvæ of *Aglais urticae*, some nearly fullgrown, and scattered over the nettles, and others quite small and still in webs. At Llandudno and the neighbourhood, from July 15th-July 28th, I saw about half-a-dozen *A. urticae*: one specimen at Penmaenmawr, on July 24th, which settled on the path, in brilliant sunshine, with wings expanded, allowed me to pillbox it, without attempting to move. On July 30th, at Three Bridges, Sussex, I came across a very large colony of *A. urticae* larvæ on nettles, in all stages, from very small to fullfed, and also one pupa hanging from a nettle, the whole of which was of a brilliant gold colour, without any markings, this eventually produced between 40 and 50 small metallic green flies. On August 4th, I went to Eastbourne for fourteen days. On the 8th, I found a number of pupæ hanging from copings, and, at Brighton, on the 9th, I also found them plentiful in the same position. These, together with the Three Bridges pupæ, produced imagines from August 10th-August 20th, quite 50%, however, produced the small metallic green flies. I kept a sharp look-out at Beachy Head and elsewhere for *Pyrameis cardui*, but saw none at Eastbourne during my stay. At Newhaven, however, I saw three specimens, freshly emerged, on August 14th, not so lively as one would expect, as, in brilliant sunshine, I managed to capture two of them under my panama, and from thence transferred them to pillboxes, where they sat perfectly quiet. On August 12th, I saw my first and only *Pyrameis atalanta* during my visit. It was busily drinking at a puddle in the centre of the town. On August 19th, the day of my return to London, I noticed a very worn ♀ specimen of *Vanessa io*, together with three *Aglais urticae*, in my garden, busily engaged at flowers of scabious. They remained all day, and every day up to the 22nd, when they were joined by another ♀ *V. io*, in better condition, but chipped. I netted the latter to examine it, and, in doing so, frightened the other one away; and, on releasing this one, which was full of ova, it also flew off, and I did not see them again. I should further mention that a specimen of *Rumiccia phlaeas* also haunted these flowers at the same time. This is the first occasion on which I have seen either *R. phlaeas* or *V. io* in my garden. The *A. urticae* continued to visit the garden till I left, on September 1st, for a fourteen days' stay at Margate. Here, on September 2nd, I found *P. cardui* very plentiful at lucerne flowers. At the edge of the patch, the lucerne had grown to twice the height of the rest in the field, and formed a border six inches wide. To this border the insects paid their attention, imbibing the sweets, and, every now and then, taking a short flight into a potato patch adjoining, and returning again without settling. I found that, with one or two exceptions, they were all ♀s, and the majority in good condition, only one or two chipped, and some quite fresh. They were there every day till September 11th, when a sharp attack of cholic put an end to my observations and collecting. On September 7th, I took, at the same place, three *P. atalanta*, in good condition, and on the 9th, another quite freshly emerged. During this time I saw a dozen *A. urticae*, and it was here that I took a ♂ *Heliothis peltigera*, reported elsewhere, and also two *Sesia stellatarum*. I made frequent excursions to other parts of the field, but to no purpose, although it was at the centre where I took my *Colias edusa*. I fancy the reason the insects kept to

this side of the field was twofold. In the first place, probably because the flowers here were richer in sweets, the sun beating on this side of the patch the whole of the day, and secondly, because between this patch and the potato-field was a foot wide stretch of bare earth, which was heated very much by the sun, and suited them admirably for sunning themselves during the intervals of feeding. On my return home, on September 16th, I found an *Aglais urticae* haunting the scabious flowers, which it continued to do for over a week, and became so tame, that it would walk from a flower up my wife's finger, on to her hand, and rest there. It seemed quite to recognise her by her white blouse, and hovered round without fear whenever she went near the flowers, but whenever I, or my little daughter, went near, it was off and away, but returned as soon as we retired to a distance.—IBID.

OXYPTILUS DISTANS AT THETFORD.—Whilst at Thetford, from the end of July to the middle of August, I captured several specimens of the local *Oxyptilus distans*.—E. J. HARE, 11, Woburn Place, W.C. October 11th, 1906.

LEAF-CUTTER BEES AND THEIR NESTS.—One day last August, a wheelwright in a neighbouring village brought me a piece of wood, which was part of the axle of a water-barrel, which had been sent to him for repairs. In it, were three burrows made by a species of leaf-cutter bee—probably says Mr. Guermonprez, of Bognor, to whom I forwarded it—*Megachile ligniseca*, he having bred this species from nests, which appear identical. The cells were constructed of cuttings from rose-leaves, and retained the green colour as vividly as when fresh. The situation selected for these nests struck me as being somewhat unusual. In most seasons, the geraniums in our gardens get sadly disfigured by another species of leaf-cutter bee, doubtless *Megachile centuncularis*, large semicircular pieces being cut out of the petals by them, and that with greater sharpness and neatness than could be effected by the most dexterous use of a pair of scissors. It is a curious and a pretty sight to see the insects flying off with the brightly-coloured pieces, which they take into holes in the ground, and with which they then line their nests.—JOSEPH ANDERSON, Chichester. October 18th, 1906.

A SECOND-BROOD EXAMPLE OF *MIMAS TILIAE*.—I was greatly surprised, on the morning of the 18th inst., when my youngest son sent down to my study a live ♀ of *Mimas tiliae*, in rather worn condition, he found it on the floor of his bedroom (a room on the top floor of my house, the window of which is open night and day). I cannot find any account of a second-brood in any of my books or magazines (Barrett says "no second-brood"), but I suppose it must be a second-brood emergence.—W. E. BUTLER, F.E.S., Hayling House, Oxford Road, Reading. October 21st, 1906. [See *A Natural History of the British Lepidoptera*, iii., p. 419; *Ent. Record*, ii., p. 302, etc.—ED.]

ABUNDANCE AND VARIATION OF *POLYOMMATUS BELLARGUS*.—This species simply swarmed at Folkestone at the beginning of September, and some lovely forms and aberrations were taken. It is very strange, as the first brood occurred very sparingly, all the ground having been burnt, which makes the autumnal abundance the more remarkable. It has been, on the whole, a grand year for insects, *Pyrameis cardui* at Folkestone was a sight, so was it also at all the places I visited on the coast, especially at Torquay, where they were everywhere. *Colias*

edusa was taken at Folkestone in August and beginning of September, one lad taking about 30 during a fortnight. I hope to send you full details of my year's collecting later.—C. P. PICKETT, F.E.S., 99, Dawlish Road, Leyton, Essex. October 6th, 1906.

SCIENTIFIC NOTES AND OBSERVATIONS.

GYNANDROMORPHOUS SPECIMEN OF *ORGYIA ANTIQUA*, LINN.—At the meeting of the Berlin Section of the Internationales Entomologisches Verein Guben on September 18th, 1906, a young member, Herr Alb. Zehbe, exhibited a wonderful gynandromorphous specimen of this species. The right side is male with fully developed wings, the left female and wingless. The division could be plainly followed down the middle of the thorax and abdomen, the sudden change of colour from brown to grey being very remarkable. The left side of the abdomen, being swollen and much larger than the right, gave a strange lopsided look to the whole specimen. It was reared, as I understand, from a Berlin larva.—E. M. DADD, F.E.S., 71, Friedrichstrasse, Berlin. September 22nd, 1906.

A GREEN *PIERIS* PUPA ON THE BLACK TRUNK OF A LIME-TREE AT LEWISHAM.—On the afternoon of September 19th, I saw, on the trunk of a lime-tree, black with soot, a bright green spot, of the tint of a fresh lime leaf, that, on examination, proved to be a brilliantly coloured almost emerald-green pupa which I supposed at first was a newly-formed chrysalis of *Pieris rapae*. It had, however, very dark streaks on the wing-cases. These dark markings made me doubt the species, and I thought afterwards it might be *P. napi*. Being in a hurry, however, I took no further notice, until two days after, I saw again the bright green pupa, brilliantly tinted as before, and knew that this was its fixed adult coloration. I fully determined to make a closer examination, but, having no knife with me, and being desirous to have the pupa *in situ*, I thought I might postpone the matter. This I did, with the result that, on the evening of the 30th, the pupa was clean gone, the silken pad alone denoting its recent position. Two points struck me—(1) The marvellously bright colour of the pupa on such a dismally tinted background. (2) Whether the pupa was conspicuous to a bird and was stolen by one. Certainly, not one in a hundred humans would have supposed it anything but a leaf, yet it disappeared in little more than a week.—IBID.

GYNANDROMORPHOUS *ANGERONA PRUNARIA*.—I bred, this year, a gynandromorphic *Angerona prunaria*, a most extraordinary specimen, in that it varies greatly from the ordinary gynandromorphous examples with one side ♂ and the other ♀. In this specimen the right forewing is ♀, the left forewing is ♂, the right hindwing is ♂, the left hindwing is both ♂ and ♀, the central portion being ♀, and outer edges being ♂; the body is yellow and more ♀; the right antenna ♀, the left between ♂ and ♀. It is of the *sordata* (banded) form.—C. P. PICKETT, F.E.S., 99, Dawlish Road, Leyton, Essex. October 6th, 1906.

CURRENT NOTES.

Dr. Carl Schawerda, 22, Gumpendorferstrasse, Vienna, VI., who is at work on a brochure relating to *Parasemia plantaginis*, asks for help

with regard to aberrations of this species, particularly English or Scottish specimens. He offers cash or excellent exchange in rare insects from Bosnia and Hercegovina.

Major Donovan finds *Luperina luteago* var. *barrettii* widely distributed along the coast of county Cork, the specimens differing much from those taken at Howth, the Cork specimens being large, of a dark slate colour, with very distinct light whitish-grey markings and no yellow shading. They ought to be carefully compared with vars. *lowei* and *ficklini*.

The "county lists" belonging to the "Victoria County Histories" are supposed to be compiled by entomologists for entomologists, and edited by an entomologist. The latest, that from Cornwall, has just been published, and contains, among other entries, "*Oxyptilus hieracii*, by Marshall, at Botus Fleming," etc. "The local *Stenoptilia zophodactyla* is described by Baily as frequent in the Land's End district, and its variety, *plagiodyctylus*, has been found by the same entomologist at St. Levan." These are interesting, but one wonders what insects are meant, and of what possible use a list made up of such records as these can be!!

The sale of Mr. G. F. Mathew's collection does not mean that he is giving up entomology, but that he cannot spare the time to look after a large collection. Some magnificent series of rare insects will be sold, e.g., *Chrysophanus dispar*, *Laelia caenosa*, *Deiopeia pulchella*, *Agrotis subrosea*, *Hyboma strigosa*, etc. The collection also contains some highly interesting aberrations, e.g., *Leucania favicolor* (practically the only extensive variable series in existence), *Arctia villica*, etc.

We have received an article by Mr. N. J. Kusnezov, which we have looked at with great interest, and wondered what it might mean. It looks like a restatement of Jordan and Rothschild's grouping of the Sphingids, with certain new terms which will fall as synonyms. There appear to be no new biological details, nor any recognition of early stage structure or characters. There is no German, French, or English summary of the results, and the native Russian, with our own name cited on almost every page, looks cheering, and leaves us with a vague wonder of what we have done.

SOCIETIES.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—October 15th, 1906.—*ABRAXAS GROSSULARIATA*.—Mr. F. N. Pierce, aberrations of *Abraxas grossulariata* from Wallasey. LEPIDOPTERA FROM LANCASHIRE, DEVON, ETC.—Dr. Edwards, *Limenitis sibylla*, *Calligenia miniata*, *Epione apiciaria*, *Geometra papilionaria*, and *Cidaria silaceata*. Mr. B. H. Crabtree, bred *Odontopera bidentata* ab. *nigra* from Manchester; *Heliothis peltigera* from Sidmouth; *Boarmia repandata*, *Agrotis ashworthii* and *Epunda lichenea* from north Wales. LEPIDOPTERA FROM NORTH WALES.—Mr. R. Tait, Jr., *Agrotis agathina*, *A.* var. *ashworthii*, *Boarmia repandata* and *Cleora lichenaria* from north Wales; *Bithys quercus*, *Ruralis betulae* and *Angerona prunaria* from Hampshire; *Aplecta nebulosa* ab. *robsoni*, and a beautiful melanic specimen of *Jocchaera alni* from Delamere, the last taken as a pupa from an alder.

ABERRATION OF *APLECTA NEBULOSA*, ETC.—Mr. W. Mansbridge, *Aplecta nebulosa*, and its black aberration *robsoni*, bred from ova deposited by a wild black female; a long series of *Macaria liturata* and var. *nigrofulvata*, both from Delamere; a series of *Cabera pusaria* var. *rotundaria* from Knowsley; a series of *Rumia luteolata* from Allerton, showing seasonal variation between the spring and autumn broods. COLEOPTERA FROM DONCASTER.—Dr. Corbett, beetles from the Doncaster district, including the very rare *Carpophilus searpustulatus*, recently taken in an isolated locality, and undoubtedly indigenous British specimens. ORKNEY COLEOPTERA, ETC.—Messrs. J. Dutton and Geo. Ellison, interesting aberrations of *Cicindela campestris*, *Agabus nebulosus*, *Coelambus novemlineatus*, *Otiorhynchus blandus*, and many others from the Orkney islands, collected during a visit last summer to that locality. FLEAS PARASITIC ON *MICROTUS ORCADENSIS*.—Mr. Geo. Ellison also exhibited two specimens of the Orkney vole, *Microtus orcadensis*, a rare British mammal, together with its parasitic fleas, *C. penicilliger*, *C. gallinae* and *T. agyrtes*, and stated that all these parasites were well-known to occur on the domestic fowl.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—October 2nd, 1906.—EXHIBITS.—*POLYOMMATUS ICARUS* from Witherslack, with fringes black-spotted, as in *P. bellargus*, Mr. T. H. L. Grosvenor. *PHORODESMA SMARAGDARIA*, a specimen without the transverse white lines (ab. *alinea*, Burrows), Mr. A. Harrison. *CUCULLIA ASTERIS*, bred from larvæ found on sea-aster, on the Essex marshes, Mr. A. W. Mera. *PAPILIO MACHAON*, with red coloration in all the lunules on hindwings, Mr. L. W. Newman. *ACIDALIA SUBSERICEATA* and *A. MARGINEPUNCTATA*, melanic specimens from North Cornwall, Mr. L. B. Prout for Mr. G. B. Oliver. *SCORIA DEALBATA*, a series from Wye Downs, June, 1906; *PHRYXUS LIVORNICA*, taken at Torquay, June 2nd, 1906, and *CHORTODES MORRISII (BONDII)*, Folkestone, July 10th, 1906, Mr. V. E. Shaw. October 16th, 1906.—*PTEROPHORUS BRACHYDACTYLUS*, a series, bred 1906, from the egg, the parents having been taken as larvæ in Switzerland, in May, 1905, Dr. T. A. Chapman. *NOCTUA XANTHOGRAPHIA*, melanic specimens from Dalnaird Bridge, Mr. J. A. Clark. *CÆNONYMPHA TYPHON*, the type from Aberdeen, and var. *ROTHLIEBII* from Witherslack, and Penryth, Mr. T. H. L. Grosvenor. *ANCHOCELIS LUNOSA*, varying from dark brown to sand colour, from Sandown, Isle of Wight, Mr. G. H. Heath. *EUCHLOË CARDAMINES*, ♂, with the orange tip broken up into alternate strips of orange and yellow, Dr. G. G. C. Hodgson. *LAPHYGMA EXIGUA*, a picked series of specimens, taken at Sandown, Isle of Wight, September 8th to 16th, exhibiting the range of variation, Mr. L. W. Newman. *POLIA XANTHOMISTA*, taken at Bude, Mr. L. B. Prout. *HELIOTHIS PELTIGERA*, a specimen bred from the egg, laid by female taken in Dorsetshire, the imago emerged from the pupa within 42 days of hatching, Mr. Alfred Sich. *LAPHYGMA EXIGUA*, a specimen taken at Pinner, Mr. H. E. Tautz. *TRYPHÆNA IANTHINA*, melanic, bred from ova from the New Forest, Mr. A. J. Willsdon. Mr. L. B. Prout stated that larvæ of *Laphygma exigua* had pupated in a warm room twenty days after emergence from the egg.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 11th, 1906.—*DRACONIA RUSINA*.—Mr. Kaye, a specimen of

Draconia rusina from Trinidad, resembling an irregularly injured leaf, the surface of which had been eaten by larvæ. PONTIA DAPLIDICE.—Pupæ by Mr. Sich, and a photograph of the larva by Mr. Tonge; from Geneva ova. PRODENIA LITTORALIS.—Mr. Step, a larva, probably of this species, found feeding inside a banana-skin. DEVON LEPIDOPTERA.—Mr. Jäger, (1) fine series of dark green and light yellow forms of *Bryophila muralis* from Starcross; (2) *Heliothis peltigera* bred from south Devon larvæ; (3) *Agrotis vestigialis*, with unusually clear white markings, taken at sugar at Starcross; with (4) specimens of *Lyphygma exigua*. PERONEA PERMUTANA.—Mr. R. Adkin, a series reared from larvæ feeding on *Rosa spinosissima*, from Wallasey. VARIA.—Mr. South, (1) nearly fullfed larvæ of *Laphygma exigua*, feeding on plantain, dandelion, and groundsel, they were from ova of a female taken at Kingston by Mr. Richards; (2) *Euchloë cardamines*, from larvæ fed on wallflower; for Mr. Hayward, (3) a *Cubera pusaria*, leaden-grey in colour, and the transverse lines obsolete; (4) a dark form and a red form of *Xylophasia monoglypha*; (5) an almost black *Taeniocampa incerta*; (6) a smoky-grey *Cymatophora duplaris*; (7) a grey-brown *Grammesia trigrammica*, with only very faint transverse lines; (8) an unicolorous fuscous-brown *Ematurga atomaria*; and (9) several, dark, powdered and sprinkled forms of *Tephrosia crepuscularia*, from near Burton-on-Trent. LIBURNIA LEPIDA.—Mr. West (Greenwich), this extremely local species from Esher. ARGYNNIDS.—Mr. H. J. Turner, two extremely large *Argynnis aglaia* ♀s from Gavarnie, Pyrenees, with two ♂s from the Alps, extremely small, and var. *eris*, with typical forms of *Argynnis niobe*. October 25th, 1906.—LEPIDOPTERA.—Mr. Newman, (1) a specimen of *Drepana falcula*, bred on October 25th with others; (2) long series of *Agrotis obelisca*, *Aporophyla australis*, and *Anchocelis lunosa*, from the Isle of Wight; (3) very dark to very light forms of *L. exigua*; (4) very dark *A. segetum* and *A. saucia*; (5) *B. muralis* and *Polyommatus corydon*, taken on September 16th, in the Isle of Wight; (6) fullfed larvæ of *L. exigua*; (7) long series of var. *artaxerxes* of *P. astrarche* from Aberdeen; (8) fine series of *Lobophora hexapterata* from Bexley ova; and (9) short series of *Eupithecia togata* and *E. venosata* from North Wales. ABERRATION OF AGLAIS URTICÆ, ETC.—Mr. South, an *Aglais urticae* with nearly the whole forewings whitish in ground colour, and a *Cerastis ligula (spadicea)* with the left antenna duplicated, but both shorter than that on the right. MYGALE AVICULARIS AND SIREX GIGAS.—Mr. MacArthur, a *Mygale avicularis* from South America, and an unusually large *Sirex gigas* from Mus Tor, Dartmoor. EUPITHECIA RECTANGULATA, ETC.—Mr. Barnett, short series from Welling, all dark forms, and of *Hyria muricata* from Wanborough. APIONS.—Mr. West (Greenwich), short series of the, until recently, very rare Apions, *A. astragalus* and *A. sanguinea*, from Oxford. MANDUCA ATROPOS.—Mr. Edwards, pupa of *Manduca atropos*, from Shooter's Hill. PLEBEIUS ARGUS.—Dr. Chapman, specimens of *P. argus (aegon)*, from northwest Spain, very large, pale beneath, with fine red borders above. SUFFUSED ACRONICTA LEPORINA.—Mr. Adkin, a series of somewhat suffused specimens, bred from Abbott's Wood larvæ.

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CHANGES OF ADDRESS.—*E. B. Nevinson to Morland, Cobham, Surrey. The Entomological Society of Ontario and The Canadian Entomologist to Guelph, Ontario, Canada.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. November 21st, December 5th.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. (No dates received.)

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. December 3rd. January 14th. Field Excursions:—November 18th, Bromley (9.51 a.m., Ludgate Hill); December 16th, Coulsdon (10.25 a.m., Cannon Street); January 20th, Loughton (9.45 a.m., Liverpool Street).

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m.; November 22nd, Special Exhibition. December 13th.

North London Natural History Society, The Amherst Club, Amhurst Road, N., at 7.45 p.m. November 27th.

Lancashire and Cheshire Entomological Society.—Royal Institution, Liverpool. Hon. Sec., H. R. Sweeting, Royal Institution, Colquhoun Street, Liverpool. From whom all necessary information can be obtained. (No dates received.)

Birmingham Entomological Society, Norwich Union Chambers, Congreve Street, at 8 p.m. November 19th, January 21st.

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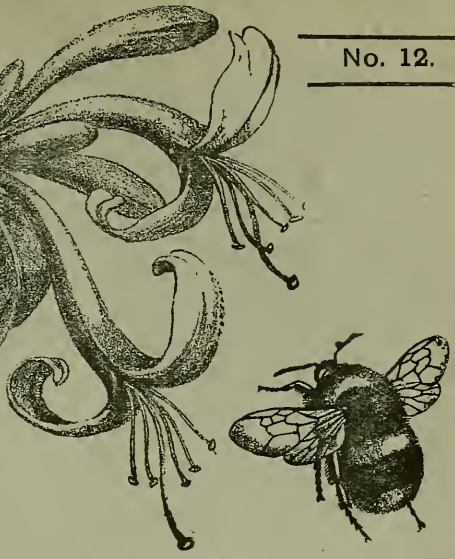
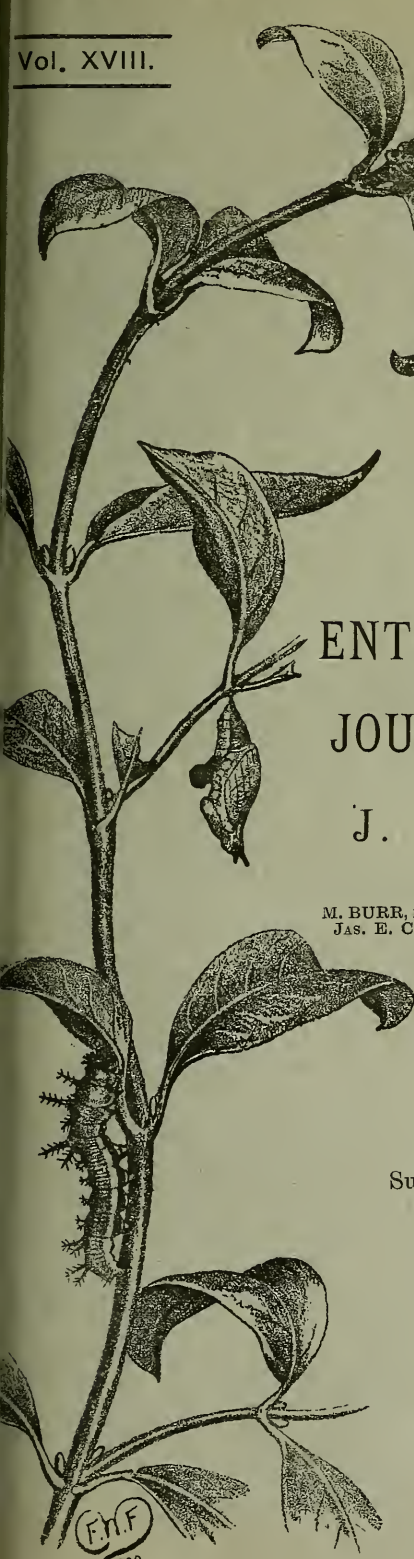
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J. HERBERT TUTT, 119, Westcombe Hill, Blackheath, S.E.

Butterflies at Hazeleigh.

By REV. G. H. RAYNOR, M.A.

I cannot say that 1906 has been a particularly good year for lepidoptera, and, even among species that have been really abundant, such as *Aglais urticae*, striking aberrations have been conspicuously absent. As a class, the DIURNI have hardly been so plentiful as the fine summer would have led one to expect. A very fine ♀ *Papilio machaon*, appeared in my garden on June 7th, and was netted as it settled on a gravel path. Probably, it was descended from some specimens turned out last year by a neighbour living some four miles away. *Euchloë cardamines*, after being abnormally scarce in 1905, turned up this year in moderate numbers only. For many years past I have bred this species largely, and caught almost every specimen seen, in the vain hope of obtaining a ♀ dashed with orange, such as I captured near Cambridge in the early seventies. The larvæ of this species have, for the last two years, been badly infested with the grub of a Dipteron (*Blepharidia* or *Exorista vulgaris*, I imagine); hence, no doubt, the scarcity of the imago. The three common species of *Pieris* have been fairly abundant, but not noticeably so. Some *P. rapae* larvæ I found late in August, on mignonette, yielded three imagines of the third brood, viz., a ♂ on September 9th, and a ♂ and ♀ on the 22nd; whilst on the 23rd I found a freshly-emerged ♀ sitting on a knapweed flower, and another flying on the 25th. A ♀ *Gonepteryx rhamni*, caught on May 12th, I sleeved out on branches of various *Rhamnus frangula* bushes growing in my garden, with the result that she laid 99 eggs. Generally, one, two, three or four were deposited on a leaf, but exceptionally, eleven, twelve, and fifteen. They were laid, generally, on the underside, occasionally on the upperside, and rarely on both sides of the leaf—still more rarely on the plant stem or on the muslin bag. The earliest of these eggs hatched on June 3rd, but the larvæ all succumbed to attacking parasites. The first new butterfly I observed of this species was a ♀, flying among lucerne, on the last day of July. *Pyrameis cardui* first turned up on June 6th, and from then till July 31st, very wasted specimens (doubtless immigrants) were generally to be found settled on the gravel paths in my garden. I did not notice a new specimen till August 21st, and the last specimen I saw this year (on September 17th) was excessively battered. *Pyrameis atalanta* has been scarce, both in the larval and imaginal states, but larvæ of *Vanessa io* and *Aglais urticae* have been unusually abundant. I bred many hundreds of each without obtaining any notable aberration. Indeed, *Vanessa io* (from Essex and Monmouthshire) did not vary at all, not a single ab. *cyanosticta* being reared. On May 13th, I noticed an *Aglais urticae* settled on a nettle, and close to her I discovered a batch of from forty to fifty eggs laid on a small top leaf of the nettle, which they closely resemble in colour; they hatched on June 1st, only changing colour a day or two previously. About two-thirds of the larvæ pupated on July 8th, and the rest a day or two afterwards. The imagines began to appear on July 22nd, and among them was the largest specimen, I think, I have ever seen, the expanse of its wings being $2\frac{1}{2}$ inches, and the colouring very rich. Among the constantly recurring forms of this species is one with a salmon ground colour, which seems to me worthy of a varietal name; it may, therefore, be called

DECEMBER 15th, 1906.

salmonicolor, n. ab. According to my experience, it is found in the broods that emerge in autumn, and is not very uncommon. Another very pretty form I have from Colchester, has a very delicate chalky-blue suffusion at the apex of the forewings, and may be named *caerulapicata*, n. ab. I believe it has also been reared from larvæ taken in Kent. As for *Eugonia polychloros*, it seems to have disappeared from this neighbourhood of late, as I have seen no specimen since 1902, when it was abundant in the larval state. There is an interesting aberration (which I have occasionally bred) having five small black spots inside the blue submarginal band on the hindwings, and may aptly be named *quinquepunctata*, n. ab. The egg of this species seems little known, and, on the several occasions on which I have sleeved females out-of-doors, they have invariably refused to lay. I can, however, inform your readers *how* they are laid, as in June, 1898, I found a nest of larvæ just hatched on the branch of an elm sapling, only five or six feet from the ground. This I cut carefully off and conveyed home, when I discovered the batch of (hatched) eggs situated below a fork near the tip of the branch. The eggs were laid on the uppersurface of the twig only, and in nine adjacent rows running along the twig (which itself is only 1mm. wide). So far as I can count them, the rows respectively contain 8, 10, 11, 10, 9, 7, 5, 4, 2 = 68 eggs.

Reverting to *Euchloë cardamines*, I may say that I possess a very interesting, and, I believe, extremely rare, form of the ♀ ab. *dispila*, n. ab. It is normal on the upperside, but on the underside of each forewing there is, beneath the usual grey black discal spot, an oblong blotch of similar colour, and of about the same size. I bred it on May 21st, 1900, from a larva found here the previous July. I know of the existence of one similar specimen, also reared in this country, which is in the cabinet of a very well-known collector. Should any of your readers possess this aberration, perhaps they will kindly send you a note, or myself a postcard, to that effect. With regard to the Theclids, my efforts to beat larvæ of *Ruralis betulae* in its old haunts, outside Hazeleigh Wood, were quite unavailing, and I fear that the species has disappeared altogether. *Strymon w-album*, which was extraordinarily scarce last year, was rather more common in the larval state this May, but I saw very few imagines in July. The three or four ♀s I caught and sleeved out on wych-elm, did not lay any eggs. Larvæ of *Bithys quercus* were quite plentiful at the end of May, and I reared a goodly number in the hope of getting that rare aberration, ab. *bella*, Gerh., which has a yellow spot at the end of the discal cell on the upperside of the forewings. The only representation of this form in my cabinet was bred by Mr. Harwood, from a Colchester larva, some few years ago. On the afternoon of July 28th, the weather being very favourable, I made a determined effort to obtain the much-desired eggs of this common butterfly, and, till I got home, quite thought I had succeeded. Inside Hazeleigh Wood, in a part where the undergrowth was cleared last autumn, and where the oak-trees stand from ten to twenty feet apart, I detected a female *B. quercus*, at 3.0 p.m., flitting about an oak-tree, some twelve feet from the ground. She settled on the tip of an outside twig and ran quickly along it, curving her ovipositor round the stem on which she was apparently laying her eggs. For about a minute I intently watched her thus occupied, and then, with a swoop of my long-handled

net, I made her a prisoner. Before I did this, I had carefully noticed which twig she had been on, and, finding I could not reach it, or bend it down with my net, I shouted to my groom outside the wood to drive the dogcart in. Mounted on this I easily secured the coveted twig, and, to make assurance doubly sure, I brought home with me the whole of the branch of which this twig was but an insignificant part. But, alas! the most minute and painstaking investigation (with a powerful lens) failed to reveal a single egg! Ineffably chagrined I went down to the wood and brought back from the same tree the two branches surrounding the original one, but with no better success. The ♀ butterfly herself sleeved out on an oak in my garden, lived a few days, but steadfastly refused to lay, as did several other ♀s I treated in a similar manner. I am so used to searching for butterfly eggs that I am practically certain I could not have missed seeing those of *B. quercus* had there been any on the twigs which I examined. I feel altogether baffled and humiliated. But, to counterbalance this disappointment, I made some deeply interesting discoveries about another butterfly, *Celastrina argiolus*. The eastern side of my rectory is covered with a very pretty ivy, having small variegated leaves, and flowering towards the end of August, when I generally find larvæ of the second brood of *C. argiolus* fullfed. I searched this year on the 31st, beginning at 2 p.m., and was greatly surprised to notice two small black ants (*Lasius niger*) running backwards and forwards over a fullgrown larva. This larva I left for further observation, and, on revisiting it at 5.30 on the same afternoon, I found it attended by four ants of the same species. I then "gathered" the larva, which the ants left very unwillingly. There were no ants on nine other larvæ found the same day. Next day (September 1st) I found a larva on the same part of the ivy, at 11 a.m., with two ants running over it, stopping now and then to imbibe some sweet exudation. There were many of these same ants on the ivy, especially at the tips of new shoots, where they were milking black aphides. As these two days formed part of the record heat wave we experienced just then, I am tempted to think that the larvæ may, like human beings, have perspired more freely than usual, and so have attracted the ants. About a week previously to this I had (on August 23rd) observed a very worn ♀ *C. argiolus* ovipositing at 10.40 a.m., on the unopened flower-buds of a very late-flowering ivy, which scrambled over part of my western wall. I did not interfere with the eggs, but on October 5th I found a single fullfed larva, and on the 7th, two others, resulting from these eggs. These three larvæ pupated almost immediately. Hence we may deduce that a ♀ *argiolus* lays her eggs on ivy buds that will be just ready to burst into flower when the larvæ are fullfed; for in my experience the larva always eats buds, never flowers, of ivy. Early in September I received a few pupæ of this species from Mucking, where my friend, Rev. C. R. N. Burrows, found the larvæ in his garden. He himself has recorded the emergence of a single third-brood specimen from one of these larvæ which he kept, and I myself had three such emergences, viz., a ♀ on September 14th, another ♀ (but deformed) on September 20th, and a ♂ on September 22nd. It has been stated in print that the ♀ born here on September 14th is of the spring form, and possibly I told Mr. Burrows so on a hurried post card, but, now that it is off the boards and I come to

compare it with the series in my cabinet, I find that it is undoubtedly of the summer form, for the black marginal cloud extends far enough along the costal margin to touch the discoidal spot, which I believe is never the case in the spring brood.

Structural details of the pupa of *Heliiothis peltigera*.

By A. W. BACOT, F.E.S.

The following notes are made from an empty pupa-case received from Mr. A. Sich. The pupa is that of a female, the sexual organs being moderately distinct, but not in any way conspicuous. Length 15mm., exclusive of the anal spikes, which are 1mm. in length, the greatest diameter is just over 4mm. at the 4th abdominal segment, ventro-dorsally, where the haustellum and other appendage-covers rise into a more or less pronounced keel. In lateral direction I judge that the diameter would be somewhat less than 4mm. These measurements are, however, open to some doubt, as there has been considerable shrinkage and contortion after dehiscence, especially as regards the wing and appendix shield, as well as general extension in length. The structure is fragile, the pupal envelope being formed of transparent brown chitin. In shape it is long and slender, with a gradual taper in both directions with rounded extremities, the head end inclining more to a pointed form than the anus.

The case is cylindrical, save where the wings and appendage-shield cover in the ventral area, and where the thoracic segments rise in the form of a gothic arch instead of the usual rounded arch. There is a distinct, if slight, angular ridge formed along the mediodorsal line on the thoracic segments. The 4th abdominal segment is raised markedly above the level of the 5th in ventral direction, there is, however, no extension of the haustellum and leg-covers beyond the wing-cases, which end just short of the incision between the 4th and 5th abdominal segments.

The contour of the anal end is very even, broken only by the raised lip-like edge of the anal scar, and the slightly pronounced bases of the two slender terminal spines which form its armature. These spines have their bases a slight distance apart, and gradually converge in a lateral direction until their tips actually cross, they have, also, a slight ventral curve; one has the exceedingly slender tip slightly recurved in the opposite direction, but the right spine is without this slender extension, or has had it broken. The spiracles are large and prominent narrow ovals, somewhat raised, and with the surrounding surface slightly depressed, especially posteriorly, on the free segments, the scar on the 8th is a mere seam, and but slightly raised.

The head and appendage-shield consist of the ventral headpiece, and outside this the rather large glazed eye; centrally, there is a small, somewhat raised, labrum; beneath these are the broad bases of the haustellum covers, which rapidly taper and extend to the end of the shield; between the bases of the haustellum there is a small slip, which probably represents the labial palpi. The tips of the third tarsi appear beneath the wings, alongside the tips of the haustellum. The tips of the second extend to about the middle of the 4th abdominal, the tips of the antennæ to the end of the 3rd abdominal, and the tips of the first legs to about mid distance down the shield. A narrow slip of the

hindwings extends to the spiracle on the 3rd abdominal segment, on the right side, but as far down as the spiracle, on the 4th, on the left side.

In dehiscence, none of the thoracic shield appears to have been ruptured, but I am of opinion that this is only apparent, as elsewhere the edges of the parted membranes have come together with great exactitude. In fact, the rupture due to emergence shows very slightly, and then chiefly ventrally. The visible line runs between the head and prothorax along the outer line of the antenna, but the rupture is so clean, and the wing-case so transparent, that, on the right, where the wing-case has slipped inwards to the margin of the haustellum-covers, and the sutures beneath show clearly through, the impression is given that there is no rupture at all on this side. The surface is smooth and polished, except on the anterior portion of the free segments, 5, 6, and 7, where there is a band of deep but smooth pittings, in appearance similar to those made by heavy rain in deep mud.

Tubercles: The scars of both tubercles i and ii are easily made out, the former in some cases giving rise to a hair, but ii is very weak, and does not apparently possess a hair; iii, iv, and v are easily made out, and in many cases bear short, slender, tapering hairs; where absent, they have probably been broken off.

Entomological Notes on the past Season.

By PERCY C. REID, F.E.S.

I fear I cannot record any great amount of success during the past season. I have no captures of *Laphygma exigua* or of *Phryxus livornica*, to mention; larvæ, generally, I found scarce; and, owing to the great heat and drought, my own pupæ emerged very unsatisfactorily. I was in India all the winter, and returned at the middle of March, to find only one *Dasyampa rubiginea* alive, out of half-a-dozen which I was trying to hibernates and breed from. *Taenioampa munda* and *Tephrosia bistortata* were, however, emerging, and a brood of *Halias quercana* larvæ were alive and well. On April 12th, *Demas coryli* and *Nola confusalis* began to emerge, both very early, and *Eupithecia albipunctata* followed on April 22nd, and *Clostera curtula* on April 24th. In May, *Nola cristulalis*, *Meliana flammea*, and *Fidonia piniaria*, began to show. Larvæ of *Eupithecia rectangulata* were abundant, and later on imagines of this insect were particularly numerous. A trip in search of *Eupithecia subciliata* larvæ, resulted in a very small bag. On May 20th, I went up to Kinloch-Rannoch, for ten days. The weather was dull and all against entomology. *Cidaria suffumata* were fairly common, with a very few *Selenia illustraria*, *Eupithecia indigata*, *E. exigua*, and *Tephrosia biundularia*. Pupæ of *Phragmatobia fuliginosa* and *Saturnia pavonia* (*carpini*) were fairly numerous; and a day's hard work yielded a dozen larvæ and pupæ of *Ægeria scoliaeformis*, of which, however, only two emerged, the rest being stung. On June 9th, I netted ♀s of *Selenia lunaria* and *Hemerophila abruptaria*, in the garden here, and both gave me ova, and later on imagines of *Ægeria tipuliformis*, *Bisulcia ligustri*, *Earias chlorana*, and *Chariclea umbra*, came out freely. During the last week of the month I ran down to Lewes, where I bagged fair numbers of both *Adscita geryon* and *Rhagades globulariae*. *Anticlea rubidata* were

common at dusk, but *Melanippe galiata* singularly scarce, and I also secured a few *M. unangulata*. At the end of June, *Anticlea sinuata* and *Eupithecia campanulata* were emerging freely, and early in July *Eupithecia subnotata* began to appear, as well as three *Ægeria chrysidiformis*, which had been feeding as larvæ since the early spring of last year. This larva seems very hardy, for the sorrel roots which I brought from Folkestone, in May, 1905, had been lying unplanted in the breeding-cage, and were, of course, dead and dry, but nevertheless, the larvæ (which throughout the period I frequently inspected, in order to make sure that the larval stage continued for two years) seemed just as contented, and the imagines were just as full-sized, as if they had been feeding on growing plants. On July 7th, I tried for larvæ of *Fidonia conspicuata*, but unsuccessfully, and I fear this insect is now extinct in its Suffolk quarters. A few days later I found *Acidalia rusticata* fairly common near Greenhithe, and *Eupithecia tenuiata* emerged very freely from sallow catkins collected at Wicken. On July 14th, I bagged one *Cymatophora ocellaris* and two *Agrotis ravidata* in the garden here, and later on secured a few more *A. ravidata*, which reappeared after several years' absence. Some larvæ of *Arentia flexula* and *Lithosia helvola*, from the New Forest, did extremely well, and, out of two dozen of the latter, I bred 23 insects—and this after repeated failures under apparently the same conditions! On July 28th, I ran down into Sussex to try a new locality for *Cucullia gnaphalii*, and three days' hard beating resulted in four larvæ. There were hundreds of insects at sugar, of the common sorts, including three *Cossus ligniperda*, one *Arentia flexula* (!), and several *Calligenia miniata*. A few larvæ of *Cymatophora* or, *Acronyeta megacephala*, and *Eupithecia plumbeolata*, completed the bag. During August, *Bryophila perla* was unusually common, and I also secured a nice lot of larvæ of *Cerura bifida*, *C. furcula*, *Triæna tridens*, and *Eupithecia albipunctata*. On August 9th, three *Eremobia ochroleuca* came to light, and, on the 10th, one more. This is the first time I have ever seen this insect at Feering Bury. In the middle of the month, a trip to Kent for *C. gnaphalii* was a complete failure, but I bagged a few *Acidalia ornata*, *Gnophos obscurata*, and *Larentia olivata*. In September, *Citria cerago* emerged freely from sallow catkins, including three ab. *flavescens*, and I found larvæ of *Emmelesia unifasciata* very common on *Bartsia* by the roadsides. Early in October, I was in Scotland for ten days, and tried sugar on a few nights. *Calocampa vetusta* was common, with a few *C. exoleta*, as well as some half-a-dozen each of *Epunda nigra* and *Oporabia filigrammaria*. This, with the exception of six pupæ of *Manduca atropos*, found while digging potatoes round Feering Bury, comprises all I can find worth recording.

Melanargia lachesis.—Notes on the Ovum and young Larva
(with plate).

By H. POWELL, F.E.S.

I received ova of this species on August 28th, 1905, from Miss Fountaine, who kindly sent them to me from Albarracin. They were not glued to anything, but were loose, evidently just as the female had laid them. In general appearance, they resembled those of *M. var. proclida*. Some of the eggs had hatched *en route*, and the remainder did so in the course of a couple of days. The young larvæ did not

seen at all anxious to feed. I think it likely that they do not at once take food, but may wait for some weeks until the grasses have been freshened by rain. If they do eat during this period it is only very little. These did not touch any of the grasses I was able to give them during the first ten days of their lives, but I think they nibbled some *Festuca* later on. On September 20th, I put them on a tuft of this grass growing in a pot, and brought them from England to Hyères. Having seen no trace of them or of their feeding for some weeks, I began to think that all had perished, but about the third week in October they must have become active, for, on October 29th, I examined the plant and found eight larvæ up on the leaves. They were still in the first stadium and quite small, but a tinge of green on the fore part of the body proved that they had taken food, and freshly-eaten leaf-ends were to be seen. After that date they were several times observed up on the grass in the daytime. When startled, they assume an attitude unusual in Satyrid larvæ. The slightest jar or shock will cause them to loosen their hold of the grass stem or leaf, with all but the anal (and sometimes 4th ventral) pair of claspers, curve the body, and bring the head down underneath until it is below the 2nd abdominal segment (see pl. xiv., fig. 3). The curious position assumed by the young larva of *Satyrus* var. *allionia* when startled is quite a different thing. Examined on November 8th (a fine day after a week of rainy weather), they were found healthy and making slow progress. I noted them of a straw-grey colour, with brownish lines, and generally a greenish tinge about the thoracic segments.

DESCRIPTION OF THE OVUM (made from three empty shells, two of which have been partly eaten by the larva).—Shape, roundish, base broad, with a central depression, top broadly rounded; height and breadth nearly equal, 1.05mm.-1mm. Appearance, chalky, with a very slight tinge of buff; eggshell rather thick and opaque. There are about 33-34 main ribs, which become distinct about $\frac{1}{3}$ way up the egg, and terminate at the edge of the broad, low, dome-like top. The 33 or 34 main ribs I counted reach this point, but there are some short, intermediate ones reaching only to the middle of the egg. The depression of the base is slightly roughened. I cannot make out any cell system in it. All around, and extending up to the lower limit of the ribbing, are numerous elevations or points, giving this part of the egg a thickly pimpled look. Between these points run low, rather broad and ill-defined, walls, enclosing shallow cells. The ribs generally merge into the pimples. Something similar occurs towards the top of the egg, when the ribs again break up into pimples and a rough cell-system. The size of the cells diminish as the micropylar area is approached, whilst the pimples disappear. In the centre of all is a rosette of very small cells. The main ribs do not run in particularly straight lines, they are rather wavy, especially towards their lower extremities, where they in some cases divide into two before definitely breaking up into pimples. The ribs do not stand out high from the surface, as compared with those of many Satyrid ova. I should say they are more pronounced than in *Melanargia* var. *procida*, but are much less so than in *M. syllius*. The cross ribbing is very minute, and the number of cross ribs great. Mr. Tonge's photo of the shells is a very good one.

DESCRIPTION OF LARVA.—*First stadium* (made on November 8th,

more than two months after hatching): Length, 4mm.-4.5mm.; width of head, .65mm.; ground colour, pale straw-grey; lines brown, with a pinkish tinge; dorsal central line strongly marked on the abdominal segments, rather weaker on thorax; a space of light ground colour borders it. Below is a faint indication of the second dorsal line, beneath which, after another space of ground colour, is the narrow, but very distinct third dorsal line. The space between these two lines is darker than the normal ground colour, and might be considered as a broad stripe with the second and third dorsal lines as upper and under dark edgings respectively. Another space (rather narrow) of ground colour comes next, and then the supraspiracular line, broad and dark, particularly dark on the abdominal segments towards the end of the body. The spiracular line is a short distance below. It is narrow, rather waved, and faint, interrupted widely at the segmental incisions. Owing to the narrowness of the spiracular line, a wide space separates it from the lateral edging (flange); this is of a pale ground colour; beneath the flange is a broad, but rather pale, shading of reddish-brown; ventral surface and prolegs pale; true legs, pale brownish externally; head darker than the body; rather hairy appearance. *Tubercles, hairs, spiracles and pitting*: The head is rather roughly pitted, its surface appearing to me somewhat coarser than in *Satyrus* species. The positions of the setæ on it are normal, the hairs (colourless) being very long, and there are no dark spots at their bases; body hairs long and colourless; the prothoracic segment has ten tubercles on each half of the body; i is just outside the central dorsal line, and iii is in a line with it beneath, nearly on the third dorsal line; ii is farther back on the segment, at an equal distance from i and iii; the hairs arising from these tubercles are bent forwards; iv is very little lower than iii, but it is farther back; the hair from it leans back, and is rather shorter than the others; v is some distance beneath (about at the level of the supraspiracular line's lower edge) and very near the anterior edge of the segment; its hair is long and slightly bent forward; vi, with a similar hair, is just underneath it; the spiracle stands exactly behind this tubercle, but some distance from it; vii and viii are above the flange, one behind the other; ix and x are near together on the base of the first leg; their hairs are divergent, rather short and stout; there are about four hairs on the leg. *Meso- and metathoracic segments*: Tubercle i is on the 4th subsegment, just outside the light border of the central dorsal stripe; ii is on the third dorsal line, iii near the centre of the supraspiracular stripe, iv is very near iii, but on a slightly lower level and farther back; it is a smaller tubercle than iii; these tubercles are all on the 4th subsegment; v is above the flange, much below iii and iv, and a little further forward. It is apparently on subsegment no. 3, but the subdivisions of the thoracic segments are not easy to follow, especially down towards the flange. On the swollen setting of the leg, is a single tubercle, which comes sixth in the order observed in this larva. If it be vii, then vi is missing; a few hairs grow from the feet. *Abdominal segments*: Tubercle i is situated lower than in those larvæ of *Satyrus* and *Erebia* which I have had occasion to examine. It is on the external border of the faintly marked second dorsal line, on the first subdivision of the segment; ii is on the fourth subdivision, and only slightly below the level of i. It barely touches the inner margin of the third dorsal line on the first

few segments, but is right in that line farther back on the larva, whilst i also touches that line towards the end of the body; iii is near the lower edge of the supraspiracular line, on an intermediate subsegment. The spiracle is a small, shiny brown button; iv and v are well below it, near together on the flange. On abdominal segment 1, v is to the fore of iv, and only a little lower; on segments 2 and 3, v is brought nearer to and more under iv. On segment 4 it is almost under iv. Then it comes forward again until segment 8 is reached, when it is again nearly under iv. The bases of these two tubercles are in contact with one another; vi and vii are on the swelling below the flange, but one of them seems to be often absent, or very hard to detect. On segment 8 the spiracle is *in* the supraspiracular stripe, with which the spiracular line merges at this point. It is a large, pale wart, with a light brown chitinous circle on top. The 9th and terminal segments make practically one, there being only a very slight separating incision. Each prong of the fork is formed by a large, elongated tubercle placed horizontally, and continued in a long, colourless hair. In front and a little lower, is the tubercle on the supraspiracular stripe bearing a long hair. Another long-haired tubercle stands in front of the base of the prong on the dorsal side, inclined strongly backwards. These tubercles correspond respectively with ii, iii, and i (?). The anal clasper has two medium length, and three or four short, thick hairs. The hairs arising from the tubercles on this larva are worthy of notice. They are mostly long, and the curious way in which they are bent, or kinked, is remarkable (pl. xiv., fig. 1). All those on the prothorax incline forwards, being only slightly curved, except the hair from iv, which is straight and lies back, and those from ix and x, which diverge. On the meso- and metathorax, the hairs from i and ii are somewhat enlarged, about $\frac{1}{3}$ up, and abruptly bent forward at this point, leaving a more or less spurred elbow, but the projection is not very prominent. Below the elbow, the hair is thicker than above it. The other hairs on these segments are bent forwards, but not elbowed. On the abdominal segments, the hair from i, and that from ii, are bent *backwards*, but whilst the one arising from i is curved gradually back, rarely showing a trace of "elbow," the second hair is abruptly kinked, almost to a right angle, and shows a sharp elbow with more or less of a spur. The lower part of this hair (below the elbow) is inclined slightly forwards. It is a shorter hair than the first one. In contrast with the arrangement on i and ii, the hair from iii is kinked *forwards*, but it is rarely spurred at the bend; iv and v have their respective hairs bent gently *backwards*. On the 9th abdominal segment the hair from iii is bent *backwards* (pl. xiv., fig. 2).

DESCRIPTION OF PLATE XIV.

1. *Melanargia lachesis*, first instar, showing bent hairs and position of tubercles on thoracic and first three abdominal segments $\times 32$ approximately.
2. " " first instar, showing hairs, tubercles, and lines of the 6th, 7th, 8th, and 9th abdominal segments $\times 32$ approximately.
3. " " first instar, showing position assumed by larvæ when disturbed $\times 4$ approximately.
4. *Daphnis nerii*, first instar: thoracic segments and 1st abdominal, showing positions of dorsal tubercles $\times 20$ approximately.
5. " " lateral view.

A Critical Point in the Structure of the Larva of *Daphnis nerii* (with plate).

By A. W. BACOT, F.E.S.

It is recognised as a character of the Eumorphine section of the Sphingids that, in the first larval stadium, the dorsal tubercles i and ii of the meso- and metathorax are situated on separate bases, these bases themselves being on separate subsegments (see *Nat. Hist. Brit. Lep.*, iv., pp. 42-43).

Mr. H. Powell, in his description of the larva of *Daphnis nerii* (*Ent. Rec.*, xvii., p. 249), states that "on the meso- and metathoracic segments the subdorsal tubercles i and ii are set close together on a common base." The question having been raised as to whether this remark really applied to the dorsal tubercles i and ii or to the subdorsals iii and iv, Mr. Powell undertook to clear up the point on the first opportunity, and now writes, "My observations made in 1904 were correct, tubercles i and ii *are set together* on the meso- and metathoracic segments, both hairs arising from a common base, I enclose a drawing showing the position as I saw them." (See plate xiv., figs. 4 and 5.) As Mr. Powell was kind enough to forward me a newly-hatched larva, I am able to confirm the correctness of his observation, that the hairs arise from a common base, which is situated apparently on the same subsegment that bears tubercle i alone in the Eumorphids.

From the larval point of view this divergence of structure is most important, and quite definitely separates the *Daphnidinae* from the *Eumorphinae* into a group by themselves, of at least equal value to *Hemarinae* and *Sesiinae*, with which groups it is probably more correct to associate *Daphnidinae*, rather than has so often been done, with the *Eumorphinae*.

Tortrix pronubana, Hb., an established British species.

By ROBERT ADKIN, F.E.S.

Just six years ago, the Rev. Frank E. Lowe gave an account of the appearance of *Tortrix pronubana* in Guernsey (*Ent. Rec.*, xii., p. 317), where it seems it had then recently established itself, and he suggested that "it appears most probable that it only wants looking for . . . on the sunny side of some of the *Euonymus* hedges, now so common in the south of England, to be found to be a truly British subject." Yet, so far as I am aware, no one took any trouble to ascertain whether there was any truth in his suggestion or not, at any rate, nothing was heard of the species on this side of the Channel, until the autumn of last year, when a specimen was recorded as having been found in a drawing room at Eastbourne (*Proc. Ent. Soc. Lond.*, 1905, p. lxiii), and another at Bognor (*Ent. Mo. Mag.*, xli., p. 276). Even this knowledge that the species was here, does not appear to have promoted any great energy among our south coast collectors. Perhaps we were willing to accept the theory that the two specimens taken were simply casual visitors, and that the possibility of this pretty little South European species taking up its quarters with us were too remote to warrant the expenditure of time, that *might* be more profitably employed, in investigating the matter. However, be that as it may, it certainly did not occur to me that I was almost daily walking past a colony of the species, when I was at Eastbourne in September last, until one fine sunny morning a *Tortrix* flew across my path, which

brought the species to my mind and set me to work. After a week spent in a fruitless endeavour to find the moth on the wing, I thought of the *Euonymus* hedges, and, after sundry ineffectual attempts, hit upon one in a private garden, where examination of the shoots produced both larvæ and pupæ of a *Tortrix*, from which I eventually reared both sexes of *T. pronubana*, thus proving conclusively that the species is established in this country, but judging by the small number secured, barely a dozen in all, the long time that it took to find them, and its apparent absence from equally promising-looking hedges in the neighbourhood, it cannot have been established in this locality very long, but I am quite in accord with the Rev. F. E. Lowe in thinking that there are probably many places on the south coast, where it only needs looking for to be found. It is a very distinct species, easily separable from all other British members of the genus by its bright orange hindwings.

Lepidopterological Notes from the Levant.

By PHILIP P. GRAVES.

Of the species of the genus *Lampides*, that I have collected here, I took some of the examples to South Kensington when I was home, and compared them with the specimens there. I certainly only know *Lampides boeticus*, *L. telicanus*, *L. theophrastus*, *L. jesous*, and *L. eliseus*, from my own observation. I have seen specimens of *ubaldus* (*thebana*) and *balcanica*. As far as I can judge, *L. boeticus* forms one section of the Palearctic species; *L. telicanus* comes nearer to *L. eliseus* than any other I know. I see Mr. Tutt puts *L. telicanus* in a separate genus, *Langia*; externally, *L. eliseus* seems to come nearer to it than any other. I can say nothing about the genitalia or larval stages. *L. jesous* (*ganva*) seems to link up the *L. telicanus* and *L. eliseus* section with *L. theophrastus* and *balcanica* [*cf.* the black bar markings on the base of the underside of the forewings and hindwings]. *Galba* and *thebana* seem allied, and the former to be near *Chilades trochilus* in habitus; *L. boeticus* flies higher and more rapidly than the rest; *L. theophrastus*, *L. jesous*, and *L. telicanus* have much the same flight, and *L. eliseus* is a ground flier (but of this I have only seen a few) like *C. trochilus*. Your readers may be interested to hear that I have good grounds for suspecting the big lemon-yellow *Teracolus protomedia* to occur in the Sinai, and in Upper Egypt. However, I must wait till I get it. I can get no evidence that any *Teracolus* occurs at Helwân. A German, who collected there, has given me his captures, and I now can give what I believe to be the complete list: *Pontia daplidice* (very rare), *P. glauconome*, *Anthocaris belia*, *Pyrameis cardui*, *Melitaea didyma*, *Plebeius* (?) *allardii* (very doubtful after seeing *allardii*, if it is that species), *Polyommatus lysimon*, *Lampides boeticus*, *Gegenes nostradamus*, *Pyrgus phlomidis*. At the end of January (1906), I visited Port Sudan for the opening ceremony of the Nile Red Sea line, and, though I had no chance of collecting, noted *L. boeticus* and *L. jesous*, *Danais dorippus*, and an unidentified yellow Pierid. I had two or three days collecting—February 1st-3rd, in the grounds of the Hotel Garden, at Khartoum—♂s of *Catopsilia florella* were common, with a few unapproachable ♀s; of Egyptian species, *Danais chrysipus*, with the white aberration (*alcippus*) and transition forms, *Lampides boeticus* and *L. theophrastus* swarmed. Specimens of *Polyommatus lysimon* and *Pyrameis*

cardui were noted, one *C. trochilus*, and one *Chapra mathias*. Of all the species seen, the finest by far was the large black and yellow *Papilio demodocus*; *Teracolus protomedea* occurred in the neighbouring Zoological Gardens with an "orange-tipped" *Teracolus*, which I could not catch or identify. *Danais dorippus* and its albino form occurred sparingly. Its flight is quite different from that of *D. chrysippus*, higher, stronger, and more soaring. It flew round the tops of acacia trees, while the collector stood below in a shade temperature of 105° Fahr., and vainly waited. A few ♂ *L. eliseus* were out, but only one was taken in good condition. I visited Wadi Rished, Helwân, on October 12th, but found nothing but *Pontia glauconome*, two ♀s, *Polyommatus lysimon*, one ♂ and a worn ♀ of *Gegenes nostradamus*; once more *Pyrgus phlomidis* eluded me.

The Butterflies of Abertillery, Monmouthshire.

By W. RAIT-SMITH.

I am sending a few notes on the distribution of our butterflies in this district, in the hope that they may be of some slight service to you. I have been able to devote the whole of my time this year to collecting, so I can claim to have a fair idea of what occurs in this locality. *Pieris brassicae*, Linn.—Common throughout the district, and especially so at Crumlin and Llanhilleth; more plentiful in August than at any other time of the year. *Pieris rapae*, Linn.—Common throughout the district; first specimens taken on April 17th, and the last, a ♀ in fine condition, on September 26th. *Pieris napi*, Linn.—Very common everywhere; this species is the most common of the Pierids in this district. *Euchloë cardamines*, Linn.—The ♂s are common throughout the district, but the ♀s are scarce, only a single specimen of the latter seen in two years. *Gonopteryx rhamni*, Linn.—Common throughout the district, especially so at Crumlin. *Brenthis selene*, Schiff.—Very common throughout the district, and especially so at Crumlin, from the middle of June till the end of July. I have failed to find any specimen of a second brood, although I was on the look out for them. This species is the common fritillary of the district. *Brenthis euphrosyne*, Linn.—Common throughout the district, but much less so than *B. selene*; no specimens seen after June 14th, on which date the first specimens of *B. selene* were taken. *Argynnis aglaia*, Linn.—Rare; a single specimen was taken on a railway bank at Abertillery, on August 6th, 1905, and another this year on August 9th, at Crumlin; both were ♀s. *Argynnis adippe*, Linn.—Common at Crumlin, Llanhilleth, and Mynyddislwyn, single specimens seen at other places; this is the most common of the larger fritillaries. The flight of this species appears to me to be much stronger and more swift than that of *A. aglaia* and *Dryas paphia*; it is also much more restless, seldom remaining long in one place. *Dryas paphia*.—Not common; four specimens were taken in the Llanock Wood, Crumlin, at bramble flowers. Two on August 9th, one on the 18th, and one on the 30th; they were in poor condition. This species seems to be slower on the wing, and easier to catch than either *A. adippe* or *A. aglaia*. *Melitaea aurinia*, Rott.—This local species occurs in some abundance in a marshy field at Pont-Llan-ffraith, but nowhere else that I know of in this district; I did not discover this locality until June

30th. The specimens at that date were getting rather *passé*; a few examples were taken. This species is slow on the wing, and absurdly easy to catch. An excitable collector could exterminate the species in a couple of hours; they have a curious habit of dropping into the grass after a short flight if chased. *Aglais urticae*, Linn.—Very common everywhere; there appear to be several broods. At the present time (October 2nd) there is a brood of half-grown larvæ feeding on a patch of nettles within a few yards of my house. *Vanessa io*, Linn.—Common throughout the district; first specimens taken on August 9th, at Crumlin. This species does not appear to be so common this year as it was last. *Pyrameis atalanta*, Linn.—Common throughout the district; first specimen taken on August 30th; rather irregular. *Pyrameis cardui*, Linn.—Scarce last year, but has been common this year, but by no means abundant. Several specimens were seen at Aberbeeg, on June 5th and 6th, I took half-a-dozen, and was greatly struck by the beautiful condition they were in; two of them were absolutely perfect, and it was hard to realise they were hibernated specimens. [Probably emerged two or three days before in North Africa.—ED.]. The first specimen of the autumnal brood was taken at Crumlin, on August 8th. Specimens were taken almost daily from that date until September 2nd; none have been seen since the latter date. *Pararge megeara*, Linn.—Not common; two specimens (both ♀s) only taken, one on the railway bank at Abertillery, on August 22nd, and the other at Crumlin, on August 28th. I kept a sharp lookout for this species throughout August, but the above were the only two specimens seen. *Hipparchia semele*, Linn.—Very local; I was very pleased to discover this species on July 26th, at Tri-Nant. On that date, 30 specimens were taken in beautiful condition. As I have never taken this species before, I devoted the whole of July 27th to watching their habits. A few brief notes may be of interest. They occurred in abundance on the top of an old "tip" (*i.e.*, an old refuse heap from a disused colliery), which had a number of stunted birch trees growing here and there, together with a little heather and a few brambles. They are very active insects, with a short, quick flight, frequently settling on the ground, where, unless one has marked the exact spot, they become almost invisible. Only once did I see a specimen settle anywhere except on the ground, and on that occasion it was on a birch leaf at a considerable height. When settled, the forewings are partly dropped between the hindwings, the apical eyespot being always visible, unless the insect has been frightened, then the forewings are completely concealed by the hindwings. I repeatedly observed this, and several times frightened a specimen on purpose to observe the effect. If possible, they will nearly always rest on a vertical surface, such as the side of a large stone. In that position they are more difficult to see than ever. On dull days they rest on the underside of birch leaves, close to the ground. Several specimens were beaten out of such positions, and if not netted they went back under the birches. They are very inquisitive insects. My handkerchief laid on the ground, attracted several specimens. After a short inspection, they quickly made off again. As they are very active insects, and by no means easy to catch, I took rather a mean advantage of this curiosity of theirs. By placing large pieces of paper, my handkerchief, etc., on the ground, I netted a good series with very little exertion. Newman says that he never saw them settle on flowers or bask in the

sunshine. I have not observed them basking in the sunshine in the way that other species do, but have repeatedly seen them on the bramble flowers. Copulation invariably takes place in the afternoon, from 3.30 p.m. onwards. One pair I watched closely, and carefully noted the time. At 3.30 p.m., on the afternoon of the 27th, a ♀ settled on the ground within a yard of me. A ♂ quickly followed, several short, quick flights by the ♀ then took place, she was closely followed by the ♂, but was never allowed to come too close. This sort of thing went on until 3.46, the ♂ gradually getting closer to the ♀ every minute. At 3.50, copulation had taken place. The ♀ then flew to the nearest birch and hung from the underside of a leaf. They remained in this position until 5.35 when they separated. Whether they would have remained paired longer than this I do not know, as luck would have it, this pair, in which I was so interested, were rudely disturbed by a small boy dashing into this very birch. The sudden shock may have separated them too soon. I heartily cursed this boy. I saw several pairs *in cop.* on other days, but never before 3.30 in the afternoon. Most of these pairs were closely followed by a second ♂, even after copulation had actually taken place. This species does not fly freely unless the sun is shining very brightly. I hoped to see the female ovipositing, but was never fortunate enough to do so. A second locality for this species was discovered at Mynyddislwyn, on August 6th. They were flying in numbers in an old quarry, and on the sides of the reservoir. This species was seen on the wing until September 5th, although by the end of the first week in August most of the specimens were in a very *passé* condition. *Epinephela janira*, Linn.—Very common throughout the district. Specimens in which one or more of the wings are of a dingy white are not uncommon. First specimens taken July 4th. *Coenonympha pamphilus*, Linn.—Very common throughout the district. *Callophrys rubi*, Linn.—Common at Pentwyn and Penylan, not noticed anywhere else. *Rumicia phlaeas*, Linn.—Very common throughout the district. A specimen, which was without the red band on the hindwings, was taken on the railway bank at Abertillery, on August 26th, 1905. *Polyommatus icarus*, Rott.—Common at Crumlin, Pont-Llan-fraith, Llanhilleth, and Mynyddislwyn, but only occurs sparingly in other parts of the district. *Agriades corydon*, Fabr.—Very rare; a single specimen was taken at Abertillery, on August 26th, 1905. It was a male in good condition. I have thoroughly searched the district for this species, but have failed to find another. The specimen taken was probably a straggler from some other district. *Celastrina argiolus*, Linn.—Not common; two specimens only taken. One at flower of holly, at Pentwyn, on June 7th, 1906, and the other along a shady path in a wood at Llanhilleth. Specimens of the second brood were looked for, but none were seen. Both specimens taken were ♀s. *Nisoniades tages*.—Not common; two specimens only, in poor condition, taken at Crumlin, July 5th. *Hesperia malvae*.—Not common; one specimen only seen at Llanhilleth, on June 9th. *Adopaea thauwas*, Hüfn.—Very common in the open spaces of the Llanock Wood, Crumlin. They occur here in hundreds. Not seen elsewhere throughout the district. First specimen taken on July 11th. *Augiades sylvanus*, Esp.—Very common throughout the district. This completes the list of the species taken. A careful search was made for the following species, but without success—*Aporia crataegi*, *Leucophasia sinapis*, *Colias*

edusa, and *C. hyale*, *Polygonia c-album*, *Eugonia polychloros*, *Melanargia galatea*, *Pararge egeria*, *Epinephele tithonus*, *Enodia hyperanthus*, *Strymon w-album*, *Ruralis betulae*, *Bithys quercus*, *Aricia astrarche*, *Cupido minima*, *Nemeobius lucinia*, and *Urbicola comma*.

Notes on *Coleophora fuscadinella*.

By HENRY TURNER, F.E.S.

This species occurs very commonly all round London; there seems scarcely any elm bushes or trees which do not produce it. On May 8th, 1904, I found numbers of larvæ at Catford, only just from hybernation. The young curved cases were being added to by very narrow flounces of cuticle, the ragged overlapping edges of each successive mouth-opening getting gradually rubbed off, leaving the outside of the case rugose to fairly smooth, according to the age of the additions. The junctions of the successive additions showing as striations, encircling the cases obliquely. They are usually continuous round the case, but not always so. A new addition often consists of six or seven of these flounces, the newest one being placed inside the last newest. The first straight case of this species I met with in 1904, on May 14th, on birch, at Ashted.

The ground colour of the larva is of a darker brown than that of the larva of *C. badiipennella*, and this may serve to roughly separate the two species when both are present on the same trees in their curved case stage. Generally, the larvæ of the two species are very similar. In *C. fuscadinella* the 1st thoracic segment has a large dark dorsal plate, the 2nd segment has two small black patches, while the 3rd segment has no trace of plates. The spiracular plates are present as black dots, those on the 3rd segment being extremely small. The larva has only three pairs of abdominal claspers, as Mr. Sich has elsewhere pointed out. On one occasion a larva was accidentally pulled out of its case by a thread. It was placed with its head close to the mouth of its case and gently touched, when it readily re-entered its house, turned round sharply, and presented its head at the mouth opening. (The case, I may say, was held down firmly, to prevent movement while the larva was re-entering.)

On May 16th, I noticed a larva take up a position on a leaf away from the margin and commence to mine. On May 17th, it had formed a new case and cut it out, except the head end. The case was very pale, and appeared to be not-yet thickened by silk inside, as it was quite soft and impressionable. The anal extremity was obscurely three-cornered.

On May 23rd, at Amersham, I took two very small curved cases on birch, and one on nut. On May 29th, at Chatham, I met with the species in numbers on nut and elm, a few cases on birch, and one on hornbeam. The larvæ seem to feed on both surfaces of the leaves, perhaps more on the lower side than the upper. The cases found on nut were darker in colour, probably from the colour of the dried cuticle of nut being a darker and richer brown than the dried cuticle of elm. The blotches made on the leaves of both nut and elm are circular, or nearly so, in most cases in nature, and generally one larva will make many blotches on each of the numerous leaves on a twig. The blotches made by *C. bicolorella* are easily distinguished from those of *C. fuscadi-*

nella, in being large, irregular, and angulated; often extending over a considerable area of a leaf. On birch, this species makes larger blotches, and not nearly so numerous. Is this because the birch in early summer is a much more succulent food than elm is at any time? For I notice that, in autumn, the young larvæ make a number of small circular inner mines on each leaf they attack. This species usually prefers stunted elms, under the shelter of trees or the shaded sides of large trees.

On May 30th, many of the curved cases taken on the 8th were not yet abandoned. Sometimes the young cases are abandoned small, and sometimes they are much enlarged, often being enlarged in a straight direction before being abandoned for the final stadium and straight case. Do the young larvæ sometimes abandon a curved case and make another, shortly after hybernation, and later on abandon that to build a straight one? I note that sometimes this species enlarges its case by the addition of white silk alone, and sometimes with pieces of cuticle frilled on.

The cases were abundant at Bookham on July 4th, and also at Oxshott on June 5th, almost indiscriminately on the upper- and under-sides of the leaves of elm, birch, and nut.

I have noted that, in confinement, some of the larvæ of this species are most indolent, for, instead of making fresh cases they adapt their curved ones and make them straight by suitable additions. Perhaps I should have said that they were extremely ingenious in availing themselves of this method. The curved cases are slit along the lower side and a new diamond-shaped piece put in. The old valves are fastened together just at the bottom edge where they touch, the old mouth is made to do, but a slit is made along the back at the neck and a V-piece inserted. New anal valves are formed and the whole of these additions show out in strong contrast with the dirty weathered portion which was the old case. I subsequently found several cases treated like this, but I have not seen any cases in nature which show traces of such structure. I may also observe that these larvæ were all late in their development compared with others taken at the same place and time. The occurrence just mentioned took place about June 12th, whereas the other larvæ I had began producing imagines on June 14th.

In 1904, Mr. Main kindly gave me cases of this species found in the New Forest on honeysuckle. This is quite a new food for the species, if they feed on it. The cases were all fixed on the upperside, apparently for pupation, most of them on or near the midrib, as is usual, and there were no traces of the leaves having been attacked. No imagines were produced, only a few ichneumons. I would suggest that the larvæ dropped from the overhanging bushes or trees, and pupated on the leaves they chanced to meet. It often happens, that larvæ are found on all sorts of unusual foods, and they nibble, but cannot thrive or even live on, them. For instance, Mr. Tonge gave me a young larva of this species in its curved case stage, found on *mignonette* in a florist's shop. Given an overhanging hedge and a wind, and these unusual positions must follow.

I possess a straight case, with the curved case still attached about halfway down, and also examples of the strong pad, which the larva makes to fix its case upon when it is preparing for pupation.

Notes towards a Life-history of *Polyommatus donzelii*.

By J. McDUNNOUGH.

During a two week's stay at Pontresina, in the Engadine, in the beginning of August, 1905, I had the good fortune to come across a locality on the wooded slopes of Alp Languard, at a height of about 6200ft., where *Polyommatus donzelii* was very abundant. The males of the species were generally somewhat worn, although a few freshly-emerged specimens testified to the fact that the brood was by no means over; the females, however, were nearly all in the pink of condition, and quite as numerous as the males, a fact rather striking when one takes into account the relative scarcity of this sex in some species of alpine "blues." A reference to Wheeler's *Butterflies of Switzerland* revealing the fact that the foodplant and larva were unknown, the opportunity for clearing up the mystery surrounding the early stages of this species, seemed too good to be lost. Numerous females were consequently observed as they flitted about among the herbage, but they were evidently not in an obliging mood, preferring to flirt with the opposite sex, or sun themselves on the low shrubs, to performing the more important task of caring for the reproduction of their species. A search on some of the numerous plants growing in the neighbourhood, had also no further result than to bring to light a large number of ova of *Aricia astrarche* on *Helianthemum vulgare*, and the hour of mid-day compelled me to retrace my steps to the hotel without any definite result being obtained. Towards 4 p.m., however, I again wended my way up the slopes, and was almost immediately rewarded by seeing a female of the desired species acting in a very business-like manner, settling down time and again among the thick growth, as if engaged in ovipositing. Marking a spot where it had last settled, I instituted a careful search, at first without result, but finally under the curled up margin of a dead leaf of *Geranium pratense*, a *Lycænid* egg was discovered, and I felt I had solved the mystery. A further examination of plants of this species, which was very abundant, produced some 60 or 70 ova, and led to the following conclusion. The ova of *P. donzelii* are deposited mostly singly, occasionally in groups of two or three, under the dried and curled-up marginal tips of geranium leaves, either on the growing plant or on leaves that have entirely withered and died down. In only one single instance was an egg discovered exposed on the upperside of the leaf. To make matters still more certain, I enclosed several living females in a glass jar with geranium leaves, and was rewarded in a few days with a small number of ova, laid similarly to, and exactly resembling, those previously found. The fresh leaves were invariably rejected, and only on those partially dried were ova deposited.

Being uncertain as to the duration of the egg stage, and having no microscope with me, I immediately despatched a portion of the ova to my friend Mr. J. W. Harrison, who very kindly undertook the description. This precaution, as it turned out, was not necessary, for, with the exception of two larvæ, which emerged during a very hot spell in Zürich, on August 22nd, the ova remained intact, and an examination, on my return to Berlin in September, showed the fully developed larva curled up within the eggshell with the evident intention of hibernating thus. It seems, therefore, fairly certain that *P. donzelii*

hibernates in the egg-stage under natural conditions, and that the premature emergence of the two larvæ in Zürich was probably due to the change of altitude, combined with the extreme heat. Of these two larvæ one died immediately, the other fed up well to the 3rd instar, and then prepared to hibernate, remaining hidden under a dead leaf. In the spring, no signs of it being forthcoming, it was presumed that it had died. The remaining eggs were placed in a cardboard box in a cool place on a window ledge until their emergence in the spring. The winter of 1905-6 was a very mild one in Germany, there being scarcely any frost or snow, and during some exceptionally warm days, in the latter part of February, I was horrified to discover that the young larvæ were already making their appearance. A potted food-plant that I had secured in the previous autumn was at once brought into the warm room, and liberally watered, in the hopes of inducing it to send up a few green shoots for my starving progeny. A change in the weather fortunately checked the emergence of larvæ and left me with about half my number of eggs and still some hopes of success. On February 25th, further emergence of four larvæ took place, and I was enabled to place them immediately on a young leaf of geranium, still unexpanded. They at once forced a way into the centre of the bud, and remained there hidden, eating small holes in the parenchyma. By March 10th, all the larvæ that had survived the winter had eaten their way out of the ova. A large proportion of these, however, I was obliged to destroy owing to the scarcity of the foodplant, no signs of it having put in an appearance out-of-doors. From the above it seems fairly probable that the young larvæ in their natural state emerge during the first warm spring days after the disappearance of the snow, and when the geranium shoots are just appearing above ground. Boring their way into these, they are carried upward, enclosed in their protecting sheath, with the growth of the leaf. By the time the leaves have expanded, which they only do after attaining a height of several inches, the young larvæ are sufficiently strong to take a firm hold of the leaf with their claspers. In the earliest stages it is very noticeable that the main hold on the leaf is obtained with the jaws and the prolegs, the claspers, especially when the larva is feeding, being not used at all, and the body often projecting up into the air. Owing to the hairy nature of the geranium stalks, it is very difficult for the young larvæ, even in the second instar, to ascend them, and I observed that, whenever shaken from their leaf, they were unable to return, but wandered about as if seeking some bud just above the ground, into which to bore their way. With increased growth they remained resting either on the upper or lower side of the leaf, being very sluggish, and only shifting their position when requiring food. In the last two instars they showed a great predilection for the fleshy portions of the stalk, boring their way through the epidermis and eating out all the interior portions, thus causing the leaf to droop and die. This is probably due to the fact that in their natural existence, they would, at this stage, be able to feed upon the buds of the flowers; as the plants they were upon had not yet reached this period of their growth, the larvæ were obliged to content themselves with the stalks, often to my great annoyance, for food was scarce.

The following is a detailed description of the various stages. For

that of the egg, I am indebted to Mr. J. W. Harrison, and may merely state that my observation completely corroborates his remarks:—

THE EGG.—It in general resembles that of *Plebeius aegon*, but is very slightly less. It is of the usual Lycænid shape, and is larger than most, agreeing in this with all Lycænids which hibernate in the egg state. The outline is circular, not so much depressed as *Agriades bellargus* at the top; thickness = $\frac{5}{12}$ diameter. It is of a pure white colour, and is intersected by two series of lines which are very much less regular than most Lycænids I have seen. These lines near the centre, are of uniform height, but, as they leave the fourth or fifth row of cells from the micropylar area, rise and thicken at the points of intersection, giving rise to prominent white rounded knobs. The intersection of these lines form a series of quadrilaterals and polygons. So irregular are the intersecting lines, that perhaps it would be better to take the markings as a series of (in nearly all cases) pentagons or hexagons formed round one of the knobs, and joined at the angle to this knob by the white lines (see margin). The micropyle appears darker, and we have 21 small cells of equal size forming the micropylar area. The mesh near the micropyle is finer, and no knobs occur for about five rows of cells. Passing from the micropyle, the mesh very gradually increases. The micropyle itself is situated at the very centre of the depression. The young larva emerges at a point slightly to the side of the micropylar area, eating a jagged hole in the shell sufficient to force its way through, but leaving it otherwise untouched.

LARVA.—*First instar*: Length on emerging about 1.2mm. Larvæ fairly typical Lycænid, of a dull whitish-grey, the skin being thickly covered with very minute spicules. The subspiracular flange is well-developed, and has the appearance of encircling the body, crossing the 9th abdominal segment immediately posterior to the anal plate, and the prothoracic on its anterior margin. The marginal flange is entirely ventral, but quite distinct. The segments are of practically uniform size, the pro- and mesothoracic and the 9th abdominal being slightly larger, and the 7th and 8th abdominals rather smaller than the normal. In the early portion of this stage the mesothoracic segment is subdivided into two equal subsegments (a division which later is not so marked), the dividing line descending laterally about half the distance to the subspiracular flange. Dorsally, each segment, with the exception of the prothoracic and the two final abdominal segments, is slightly raised towards the posterior margin, forming a series of ridges, on which tubercles i and ii are situated. These, as well as the other primary tubercles, are cone-shaped, the apex being polished black, and bearing a long, white, spiculated hair. Besides these tubercles, large round lenticles occupy certain areas of the body. Each of these consists of a circular black ring with white centre, which, under a higher power lens, appears pitted with black spots. The head, which can be withdrawn, is small and black, as are also the true legs and the hooks on the prolegs. The spiracles are of about equal size, and black, being slightly raised above the general surface of the body. Those on the abdominal segments are situated just above the flange in the central portion of the segment, the prothoracic spiracle is much lower, and quite on the posterior margin of the segment. The typical arrangement of the primary tubercles, as seen on the 3rd-5th abdominal segments, is as follows:—In the trapezoidal region are two tubercles,

presumably i and ii, of which i is situated about the centre of the segment, and ii lower and well to the rear. The setæ on these are very long, and inclined slightly backwards. On the anterior margin, and often hidden from view when the larva is quiescent, is an extremely minute tubercle with a short seta, which for descriptive purposes I shall call *ia*. What I take to be tubercle iii is situated about three-quarters of the distance between spiracle and tubercle i, rather nearer the anterior margin; immediately posterior to it is another small tubercle with a minute seta. The space between these and the trapezoidal tubercles is occupied by two lenticles, the larger of which is directly above tubercle iii, and midway to tubercle i; the smaller lenticle is lower down and immediately above the smaller tubercle. On the subspiracular flange are situated three tubercles, of which the central one, directly below the spiracle, is the largest, and bears the longest seta. The anterior tubercle is in a direct line with this, but the posterior one is considerably higher on the flange. The marginal flange also bears two small tubercles. The 1st and 2nd abdominal segments are distinguished by the omission of the small tubercle behind tubercle iii, and on the 6th abdominal the large lenticle occupies a position on the posterior margin; otherwise, the arrangement is similar. The 7th abdominal segment is further modified by the omission of tubercle ii, as well as the smaller lenticle and the tubercle below it, whilst on the 8th abdominal, only one tubercle—that in the trapezoidal region—remains above the spiracle. The group of these on the flange has, however, been augmented by a fourth, situated in the extreme lower posterior corner. On the 9th abdominal is a small depression which bears a similarity to an anal plate, but does not appear to carry any tubercles. This is bordered in the rear by the seeming continuation of the flange, bearing a double row of three tubercles on each side. As regards the thoracic segments, the metathorax resembles the 1st abdominal segment, but has tubercle *ia* much more prominent. The smaller lenticle is wanting, and the anterior tubercle on the flange is moved up in a line with the posterior one, leaving the central one much lower. In the place of the spiracle is a small tubercle with seta. On the mesothorax we find tubercle *ia* greatly increased in size and moved backwards; tubercle iii has been moved up dorsally, so that these two tubercles with the lenticle between, form a group of three in a single straight line on the first subsegment. Behind these, on the second subsegment, are tubercles i and ii. The further arrangement corresponds with that of the mesothorax. On the prothorax the thoracic plate is shield-shaped, the anterior margin being rounded, the sides then sloping back with a slightly concave margin to a point in the centre of the posterior margin, the whole situated in a fairly deep depression, and of a similar colour to that of the skin. On the anterior margin are two small setæ bearing tubercles flanked by two large lenticles. Posterior to these, and extending across the whole plate is a row of six tubercles, the two innermost bearing setæ. On the posterior lateral margins are situated two fairly large tubercles with setæ. Anterior to this plate, and parallel with its margin, is a row of four tubercles on each side. Lateral to these are two further tubercles, and posterior to these latter, is situated the spiracle. As far as could be ascertained, the prolegs bear only two hooks, one anterior and one posterior. The hooks on the true legs are very much curved inwards. Duration of instar 14 days.

(To be continued.)

Myrmecophilous notes for 1906 (with plate).

By H. Sr. J. K. DONISTHORPE, F.Z.S., F.E.S.

(Continued from p. 289.)

Homalota parallela, Man.—I had the pleasure of taking this little "Staph." with *Formica rufa*, at Corbridge, in Northumberland, in company with my friend, Mr. Bagnall, as also the minute *Ptilium myrmecophilum*, All. The former has only been recorded from Scarborough and Scotland heretofore. Mr. Bagnall has also added *Notothecta anceps*, Er., *N. flavipes*, Gr., *Leptacinus formicetorum*, Märk., *Quedius brevis*, Er., *Monotoma conicicollis*, Aub., and *M. formicetorum*, Th., to the Northumberland and Durham list this year.

Notothecta confusa, Märk., was not uncommon at Wellington College, and I also took it at Pyrford, with its host, *Lasius fuliginosus*.

Lamprinus saginatus, Gr., has again been taken by Commander J. J. Walker, at Tubney, with *Myrmica ruginodis*, and Mr. Chitty took it in October with *Ponera contracta*, at Charing.

Heterothops quadripunctula, Gr.—I have taken several specimens with *Lasius fuliginosus*, at Wellington College. I have also taken it with *Formica rufa*, at Weybridge, as has also Mr. Harwood, at Colchester. These are not the true *quadripunctula*, Gr., and I am not quite satisfied if they are the same species (*H. nigra*, Kr.) which Dr. Joy has found in such numbers in moles' nests. They appear to me to be a little larger, the punctuation more alutaceous, and consequently not so shining. The latter species is said to be a var. of *H. praevia*, Er., but, I agree with Joy, without sufficient evidence.

Quedius brevis, Er.—Mr. Champion tells me he took this species with *Formica sanguinea*, at Woking. It has only been recorded with *F. rufa* and *Lasius fuliginosus* heretofore.

Bythinus glabratus, Rye.—Mr. Chitty still continues to take this rare species with *Ponera contracta* at Charing.

Coccinella distincta, Fald., was very common at Weybridge, on and about the nests of *F. rufa*, in May.

Trichonyx märkeli, Aub., was again taken by Mr. Dollman, at Ditchling, in April, this time with *Lasius flavus*.

Amphotis marginata, F.—I took this species in some numbers at Wellington College, and also at Pyrford, with its host *Lasius fuliginosus*, and I bred a specimen out of my observation nest, of the same ant, in October. I may mention that I bred *Dinarda märkeli* in my *F. rufa* nest before. Mr. Jackson took it with *F. rufa* at Bournemouth, and I took it with the same ant at Weybridge, in April, May, and July, and also had the pleasure of taking it with both these gentlemen in their localities.

FORMICIDÆ.—*Formicoxenus nitidulus*, Nyl.—This appears to have been a good year for this rare little ant. Mr. Bagnall took it in plenty with *F. rufa* at Corbridge, in Northumberland, and also in Durham, taking ♂s, ♀s, and ♂s, the ♂ not having been recorded from Britain before. Mr. Jackson took it with *F. rufa* at Bournemouth, and I took it with the same ant at Weybridge, in April, May, and July, and also had the pleasure of taking it with both these gentlemen in their localities.

Leptothorax acervorum, F.—I have taken this ant occasionally with *Formica sanguinea* at Woking, and Mr. Pool took it with *F. rufa* at Enfield; taking winged ♂s and ♀s also.

HETEROPTERA.—*Alydus calcaratus*, L.—I took a larva of this bug (in which stage it is very like an ant) running on a hot sandy bank in company with *Formica fusca* in the New Forest. The specimen was so ant-like that, even after I had put it in a tube, Professor T. H. Beare, who was with me, thought it was an ant. I also took it with *F. sanguinea* at Woking, and at Niton, Isle of Wight, in July, in all its stages, running on a path in company with *F. fusca* and *Lasius niger*.

ARANEINA.—*Thyreosthenius biovata*, Camb.—I have taken this little spider with *F. rufa* at Woking, and, in October, with Mr. Pool, at Enfield. Mr. Bagnall has taken it in Northumberland. These are new localities for it. I believe it occurs wherever *F. rufa* is found.

Evansia merens, Camb.—I took five specimens with *F. fusca* at Barmouth, in June. Mr. Bagnall has taken it with *F. fusca* at Winlaton, and Dr. R. Jackson, with the same ant, at Corbridge. I find I took it with the same ant at Hayton Moss, in Cumberland, in 1903, though I have not recorded it before.

Cryphoeca divisa, Camb.—I this year took five ♀s of this rare spider on one occasion, and several more at other times, with *Lasius fuliginosus*, at Wellington College. I once took a ♂ with the same ant at Oxshott. Before that only a single specimen, a ♀, had occurred at Carlisle, in this country.

It is probable that all these three species are truly myrmecophilous, the first two undoubtedly are, but the following spiders are, I understand, chiefly found in other situations; still, as they have been found before with ants, and continue to turn up in such places, it seems advisable to record their capture here.

Phrurolithus festivus, C. K.—I took this species with *F. sanguinea*, and also with *Lasius niger*, at Woking. I have before taken it with *F. rufa* and *L. fuliginosus* at Oxshott, and Father Wasmann records it with *L. niger*, *L. brunneus*, and *L. fuliginosus*.

Harpactes hombergi, Scp.—I have taken it with *L. fuliginosus* at Wellington College and Pyrford, it used to occur frequently with the same ant at Oxshott, and Father Wasmann gives the same host.

Micaria pulicaria, Saund.—I took it in a nest of *F. sanguinea* at Woking. I found it before with *L. niger* at Mickleham, to which ant it bears a strong superficial resemblance.

Miconeta innotabilis, Camb., and *M. viaria*, Blk.—Both taken with *L. fuliginosus* at Wellington College. I took these species before with both this ant and *F. rufa* at Oxshott.

Hahnia helvola, E. S.—Taken with *L. fuliginosus* at Wellington College, also recorded from ants' nests by Wasmann.

Theridium riparium, Blk.—Taken twice with *F. sanguinea* at Woking. "With *L. niger*" (von Hasselt). "Hunts *Myrmica laevinodis*" (Henking). Blackwall writes "it feeds on ants."

LEPIDOPTERA.—*Polyommatus corydon*.—Mr. A. L. Rayward records (in the *Entomologist*, 1906, p. 197) that, in June last, he found the larvæ of this butterfly on *Hippocrepis comosa*, at Reigate, and that they nearly all had ants (*Lasius flavus*) upon them. He found that the ants stroked the gland on the 7th abdominal segment, and sucked the fluid that exuded from it.

Polyommatus bellargus.—Mr. Rayward subsequently discovered at Folkestone (*loc. cit.*, p. 219) the larvæ of *bellargus* attended by *Lasius*

niger, he found, however, that *L. flavus* much more readily suck the gland of these caterpillars than *L. niger*.

It is very satisfactory to have had these observations made in England, and we congratulate Mr. Rayward. Father Wasmann records, among what he calls the "honey caterpillars," *Lycaena argus*, larvæ with ants, pupæ in the nests of *Lasius niger*. *Lycaena dorylas*, larvæ almost always in company with ants on *Anthyllis vulneraria*. He also writes that the dorsal opening of the 11th segment is present in the larvæ of the European *Lycaena boetica*, *icarus*, *argiolus*, *aegon*, and *medon*, which, on being sought by the ants, is caused to shut.*

PROCTOTRUPIDÆ.—*Exallonyx wasmanni*, Kief.—I have taken this species (♂s and ♀s) with *Lasius fuliginosus* at Wellington College. It is new to Britain.

Tropidopria fuliginosa, Wasm.—I have taken this species (♂s and ♀s) with *Formica rufa* at Corbridge, in Northumberland, and have bred it out of my observation nest of the same ant from Weybridge. I have also taken it with *Lasius fuliginosus* at Wellington College. This is its first record for Britain.

Megaspilus sp.?—I have captured ♂s and ♀s of a small species of this genus with *F. rufa* at Weybridge and Corbridge.

Synopeas sp.?—I took a specimen in a nest of *F. fusca* at Barmouth last June.

Ceraphron sp.?—I took a very small species of this genus with *F. rufa* at Corbridge, in April.

Anteon brevifilis, Kief.—I took a specimen in a nest of *Formica fusca* at Niton, Isle of Wight, in July.

I must thank Dr. Kieffer for having very kindly named all the above species for me.

Pseudisobrachium cantianum, Chitty.—Mr. Chitty has described this new species for a specimen he took at Charing in a nest of *Ponera contracta*. The insect bears a strong resemblance to the ant with which it was found.

Pseudisobrachium subcyanum, Hal.—Only the ♂ is known of this species. Mr. Chitty, who has taken it not uncommonly in the Faversham district, suggests it is parasitic on *Myrmecina latreillei*.

ICHNEUMONIDÆ.—*Hemiteles subzonatus*, Gr.—I took a ♀ specimen in a nest of *Formica rufibarbis* var. *fusco-rufibarbis* at Whitsand Bay, in September. Mr. Morley kindly named it for me. Nothing is known of the life-history, it is very possibly parasitic on the ant.

(To be continued.)

Some remarks on the physiological criterion of species.

By W. E. SHARP, F.E.S.

In a recent issue of this magazine (*Ent. Record*, xviii., p. 217) there appeared a very interesting note on the British species of the coleopterous genus *Dinarda*, Grav., by Mr. Donisthorpe, but, although the article introduces a new species to our list, no morphological specific distinctions are tabulated, and the stress laid on physiological data (that of difference of association) leaves one under the impression that

* For further details of this subject see *Nat. Hist. of British Butterflies*, pp. 30-37, also *Ent. Rec.*, xviii., p. 299.—Ed.

the author considers that such criteria can, in the discrimination of species, supply the place of those of morphology.

This inference, and the fact the same principle has been invoked in the case of other species of coleoptera, difficult otherwise to separate, is the, perhaps, inadequate occasion for the following remarks. In this enquiry, what exactly a species as an objective reality may be need not detain us. The hypothesis is convenient, if not necessary, for any systematic study of nature and its generally accepted test that of fertility *inter se*, sterility *inter alios*. It is, however, evident that this test cannot be applied to the great majority of the objects of the study of entomologists. As a matter of fact, we rely for our specific differentiations almost entirely on morphology and accept sterility, between what we call different species quite inferentially.

In spite of this, however, there is no doubt but that the idea of species is based essentially on a physiological, not a morphological, difference, although at the same time we may suspect that physiology itself might, in its ultimate analysis, be expressed in terms of morphology, coincident, if not dependent, as its conditions probably are, on cell constituents or cellular arrangements. This, however, is perhaps somewhat beside the present enquiry, which is to discover how far justified is the appeal to physiology to supply criteria which morphology fails to give—the cases in point being certain forms of quasi-parasitical coleoptera. Now the reasoning adopted by such apologists seems to be that difference of *habitat* implies difference of *habit*, and that this difference of habit involves a physiological disparity which would include such a generative incompatibility as would make the difference specific.

Does then a different habitat imply a different habit? In the cases under discussion a difference of habitat means the nest of a different species of ant, and by habit I understand that stereotyped direction which co-ordinated cell-functions take, common to a group of individuals expressed and controlled by the nervous system.

I imagine, however, that no one knows better than Mr. Donisthorpe, admittedly our first authority, in this country, on the myrmecophilous coleoptera, that it necessarily and invariably does nothing of the kind. No sane entomologist, for instance, would assert that the form known as *Myrmedonia humeralis*, when found associated with the ant *Formica rufa*, is specifically distinct from the similar form found with *Lasius fuliginosus*. In fact, it appears to me that before any connection can be asserted between habitat and habit, in these cases, we require to know much more than we do at present as to the terms of association, the conditions of the social contract which exists between beetle and ant. That such terms are, in many cases, at most generic, as regards the hosts, we have evidence, and, until we know exactly why they are not so in all, it appears to me we are hardly justified in assuming for a *Dinarda* what we cannot claim for an *Atemeles* or a *Claviger*.

There are, however, other quasi-parasitical coleoptera than those associated with ants. There are special and very closely related beetles which haunt the nests of birds and of mammals, and here, I think, the case may be different. The disparity between say the nest of a tomtit and that of a mole, must be far more complete than between the nests of any two species of ant—the environment must differ essentially,

differ to a degree which might well, I should imagine, involve a difference of *habit* in their respective coleopterous denizens.

That a physiological difference so induced should necessarily be specific, cannot, perhaps, be so easily admitted. Nature is full of cases of complete diversity of habit between forms which are proved genetically to be merely varietal. The most obvious are, perhaps, among domesticated animals. Two breeds of dogs for instance may differ in habit to an extent which must involve the entire nervous system without affecting the reproductive in the slightest, and if it be objected that such differentiation has been deliberately induced by selective breeding within a comparatively few generations, the obvious reply would be that, in the case of the beetles, nature represents a selective force as efficacious, if not as rigid, as that of human agency, extending, certainly, over a much longer period, but leading to possibly precisely analogous results.

Again, it seems to me a fallacious application of the reproductive criterion to assume that, because two groups of beetles are physically debarred from interbreeding (by a different habitat), if they had the opportunity their intercourse would be infertile. They are not necessarily different species because they cannot, and do not, interbreed—you must also prove that they would not if they could. Now I should be sorry if by any of these remarks I might seem to be impugning the validity of any species to which they might apply. Such species may, for anything I know to the contrary, be perfectly valid on morphological grounds. I am, however, certainly, although perhaps incorrectly, assuming a resort to physiological data, not merely as corroborative, but as substitutive in their differentiation, and my contention is that, *in the present state of our knowledge*, such a resort may be misleading. In a word, that if we cannot satisfactorily establish a species morphologically, we cannot do so at all, and the result of such an attempt must be merely the still further encumbrance of an arena already thick with the restless ghosts of defunct pseudo-species—*simulacraque luce carentum*.

Coleoptera in Invernessshire.

By JAMES E. BLACK, F.E.S.

I spent last June in the heart of the Highlands, about four miles from the village of Newtonmore, a locality from which I have already recorded a fair number of beetle captures. This year, the weather was of the finest, and, as the countryside is truly that of " . . . brown heath and shaggy wood, land of the mountain and the flood," there is every scope for the ardent collector's energy.

One marked feature of the present visit was the absence of the larger *Carabidae*. Very few were seen, even of the common species usually abundant there. *Carabus violaceus*, *C. arvensis*, and *C. glabratus*, it is true, did turn up, but only a single example of each, despite much searching for the latter species, the solitary specimen of which was taken on the edge of a foot-track across a moor. On the peaty surface of the same moor a very interesting *Pterostichus* was found, beneath a stone. It must provisionally be put down as *P. versicolor*, Stm., but is quite black in colour, and, besides this, has strong regular punctures all down the elytral striæ, a feature which does not appear to exist in

more than a very slight degree in any species of *versicolor* I have been able as yet to examine. Perhaps some reader may be able to throw further light on this point?

By much patient watching, a few examples of *Anchomenus ericeti* were obtained. This handsome insect seemed specially to delight in the red-green sponge-like *Sphagnum* growing on the edges of peat-holes, and the best way to secure it was found to be by simply selecting a likely spot and squatting down there for a more or less lengthy period of observation—a rather slow process, working out at the ratio of about one beetle to every quarter acre of bog. In a similar habitat, one solitary *Elaphrus uliginosus* was secured. *Donacia discolor* was fairly plentiful on the peat moor, as was also *Telephorus paludosus*, whilst, on one particularly fine day, when the breath of bog-myrtle was sweetest, and all nature seemed astir, a regular “flight” of *Corymbites tessellatus* was observed, probably from an adjacent fir-wood.

In the woods, various good beetles were obtained, amongst which may be mentioned *Otiorrhynchus septentrionalis*, *Magdalis phlegmatica*, *Rhinomacer attelaboides*, and *Ernobius nigrinus* (all beaten out of half-dead fir tops), and one example each of the rare *Nudobius lentus*, Gr., and *Melanotus castanipes*, Pk., from beneath bark, a *Rhagium inquisitor* being got from the same old log as the “Elater.” I have now taken all the three species of *Rhagium* in that district. “Beetle-traps” of cod’s heads failed to attract anything noteworthy, but a dead rabbit furnished a series of the showy *Silpha thoracica*. *S. rugosa* was, of course, abundant, and appears to be by far the most common of the genus up north. Beating broom, which was in all its “golden glory,” produced *Tychius venustus*, and, from sallows, a single *Orchestes salicis* was obtained. Two specimens of the long parallel-sided *Tachinus elongatus* were taken on the roadway, and this, together with the *Nudobius lentus* already referred to, proved to be the best capture amongst the *Staphylinidae*. Water-beetles were scarce. In fact, much laborious work with the water-net in loch and peat-hole produced little or no result, except some *Hydroporus obscurus*, and a solitary *Deronectes assimilis*, to secure which (under the mistaken notion that it was another species) an amount of energy was expended quite incommensurate with the result. By the broad shingle beds of the river Spey, or on the banks of its tributary Truim, many an hour was spent, and, in one particular part of the latter, not far from its junction with the Spey, a colony of *Cryptohypnus pulchellus*, L., was discovered, or rather re-discovered, for I had taken two specimens at the same place three years ago. As a full account of this has already appeared under my name in the *Entomologist's Monthly Magazine*, July, 1906, I need not repeat the particulars here. It was quite an unexpected pleasure to take for the first time *Coccinella 5-punctata*, in a habitat of the most unlikely nature, *viz.*, on the shingle beds of the Spey. [Taken by Mr. Kayes on the shingle-beds of the Tavy at Yelverton.—Ed.] There these ladybirds sat on the stones, but only on one hot, bright, calm day. Moral:—Always take your series when you can get it. *We didn't!*

Another shingle-frequenting beetle was *Cryptohypnus maritimus*, which I took also for the first time. Hunting, or rather stalking, these active creatures is quite in keeping with one’s general ideas of “Highland” sport! The least movement on the would-be collector’s part, and down they dropped off their big boulder-perch (for they seemed to like to sun themselves on the larger stones) and began to

creep and run and jump and fly, or else lay perfectly still like little black grains amidst the sandy gravel of the dry river bed. *Rhinoncus castor* was also obtained on the shingle, and near the more sandy edge, next the turf of the river-bank, such species as *Bembidium anglicanum*, Shp. (*andreae*, F.), *Tachypus pallipes*, *Bledius subterraneus*, *Morychus aeneus*, *Aegialia sabuleti*, and *Chaetocnema confusa* were secured, along with many other commoner species. On a sunny grassy slope a fine ♀ *Meloe violaceus* was taken, and, on being exhibited to a worthy "herd" who chanced to be at hand, caused him to take his first lesson in coleoptera, as he had wonderingly to say "Weel, I never saw a beetle afore!"

During the month I had the pleasure of a short visit from Professor T. Hudson Beare, who shared some of the pleasures of the chase, and who has now kindly assisted in the determination of the results.

Additions to the Coleoptera of the Northumberland and Durham district, 1906.

By RICHARD S. BAGNALL.

During the year, despite the unproductiveness of general collecting and one's limited spare time, many interesting species have been added to our counties' coleopterous fauna. I have already briefly noticed several in these pages (72, 73, 159, 242, etc.), and such are merely tabulated here and denoted by an asterisk. *Harpalus rufibarbis*, F.—Taken by Professor Beare and myself at Greatham. *Coelambus impressopunctatus*, Schal., and *Ochthebius marinus*, Pk. Though not recorded, Mr. Gardner has taken these species at Greatham, where I found them again this year. *Hydroporus ferrugineus*, Steph.—Taken at Hart by Mr. Gardner. **Oxyptoda formiceticola*, Märk. *O. recondita*, Kr.—Very rare, Corbridge; a single example taken by Mr. Donisthorpe in nest of *F. rufa*, July, and another by myself, August, 1906. **O. haemorrhoea*, Sahl. **Thiasophila angulata*, Er. *Dinarda märkeli*, Kies.—One example with *F. rufa*, Corbridge, October. *Myrmedonia humeralis*, Great Corbridge. **Notothecta flavipes*, Gr. **N. anceps*, Er. **Homalota cuspidata*, Er. **H. parallela*, Man. *Gyrophæna pulchella*, Heer, and *G. strictula*, Er.—Both taken by Mr. Gardner in the Hartlepool district, interesting records on account of their known distribution. *Oligota pusillima*, Gr.—Greatham. *O. flavicornis*, Lac.—One example amongst reed-refuse, Winlaton. *Hypocyrtus ovulum*, Heer.—Derwent Valley; *Tachyporus tersus*, Er.—Derwent Valley; these two latter species have been taken by both Mr. Donisthorpe and myself at Gibside and Winlaton. *Mycetoporus lucidus*, Er.—Gibside, March. *M. punctus*, Gyll.—Winlaton. *M. splendidus*, Gr.—Axwell Park, May. *Heterothops binotata*, Gr.—Amongst seaweed, Whitley. **Quedius brevis*, Er. **Leptacinus formicetorum*, Märk. *Stenus gymmeri*, Duv.—At waterfall, Gibside, with *Quedius auricomus*. *Trogophloeus rivularis*, Motz.—In bog near Winlaton. *Homalium punctipenne*, Th.—Tynedale and Derwent Valley. **Homalium caesum*, Gr. var. *subruficornis*. *Phloeobium clypeatum*, Müll.—Winlaton and Warkworth. **Neuraphes elongatulus*, Müll. **N. angulatus*, Müll. **N. sparshalli*, Den., var. ?. **Seydmaenus exilis*, Er. **Tychus niger*, Pk. **Bythinus validus*, Anb. **Biloporus bicolor*, Den. **Euplectus punctatus*, Muls. **E. karsteni*,

Reich. **E. sanguineus*, Den. **E. piceus*, Mots. *Ptinella denticollis*, Fair.—In plenty, Derwent Valley. *P. aptera*, Guér. (?).—Gibside. *Ptilium kunzei*, Heer (?).—I have examples of a "wide-thoraxed" *Ptilium*, which I believe to be *kunzei*, from Winlton. *Ptilium spencei*, Aub.—Tynedale and Derwent Valley. *P. myrmecophilum*, All. *Hister bissexstriatus*, F.—Winlton, one example. *Dendrophilus pygmaeus*, L.—One specimen with *F. rufa*, Corbridge. **Myrmetes piceus*, Pk. *Epuraea oblonga*, Hbst.—Winlton Mill; not recorded from the counties by Bold, though admitted in list from Yetholm, in Scotland. **E. angustula*, Er. **Monotoma conicicollis*, Aub. **M. formicetorum*, Th. *M. quadrifoveolata*, Aub.—An example apparently referable to this species from cellar, Winlton, is unfortunately lost. *Enicmus testaceus*, Steph.—Gibside. *Cartodere ruficollis*, Marsh.—In great profusion amongst haystack refuse, Axwell Park. **Crytomorpha desjardinsi*, Guér. *Cryptophagus lycoperdi*, Hbst.—In a *Lycoperdon*, Gibside. *C. ruficornis*, Steph.—In a powdery fungus (decayed *Daldinia concentrica* ?), Winlton. *Atomaria badia*, Er.—Several taken by Mr. Donisthorpe and myself in the Corbridge pinewoods. *A. versicolor*, Er.—Mr. Newbery has kindly examined several of my *Atomaria*, and refers a very distinct looking pair, taken at Winlton Mill, to this nice species. *Asemum striatum*, L.—Evidently common at Corbridge; taken by Mr. Gillanders, and myself. *Phyllodecta cavifrons*, Th.—Winlton Mill. *Longitarsus gracilis*, Kuts., var. *poweri*, All.—Hart. *Apion tenue*, Kirb.—Sea-banks, Warkworth. Two interesting species of *Scolytidae* have been taken in the district by Mr. Gillanders, viz., *Pityophthorus pubescens*, Marsh, and *Trypodendron lineatum*, Ol.

Of rare and interesting species taken during the year I may mention—*Licinus depressus*, Pk., *Bradycellus distinctus*, Dj., *Pterostichus vitreus*, Dj., *Agabus biguttatus*, Ol., *Oxyptoda brachyptera*, Steph., *Megacronus cingulatus*, Man., and *M. inclinans*, Gr., *Heterothops dissimilis*, Gr., *Quedius scintillans*, Gr., *Q. auricomus*, Kies.; a nice series of all these, excepting the *Oxyptoda* and *M. cingulatus*. *Quedius fulvicollis*, Steph. (one), *Ocyptus ater*, Gr., *Medon obsoletus*, Nor. (three), *Lesteva sharpi*, Rye, *L. punctata*, Er., *Acrulia inflata*, Gyll., *Phloeocharis*, various *Agathidium*, including *badium*, Er., *Liodes orbicularis*, Hbst., *Choleva spadicea*, Stm., *Triplax bicolor*, Gyll., in extraordinary profusion in about thirty localities, between the extreme west of Gibside, and Hollinside on the east, points separated by three miles of woodland. *Alexia pilifera*, Müll., *Florilinus musaeorum*, L., *Aspidiphorus orbiculatus*, Gyll., *Elmis cupreus*, Müll., *Corymbites tessellatus*, F., *Meloë violaceus*, Marsh., in numbers, *Limobius dissimilis*, Hbst., *Acalles ptinoides*, Marsh., *Dryocetes alni*, Georg., etc. From this hastily prepared note it is very evident that, though we boast of over 1700 species within the district, that a great deal yet remains to be done, and resident collectors in many localities, such as, say, Corbridge in Tynedale, Egglestone in Teesdale, Banburgh on the coast, or Rothbury in the hills, would, week by week, add to our northern coleopterous fauna.

OLEOPTERA.

MONYCHUS PSEUDACORI, F., IN THE ISLE OF WIGHT.—On October 15th I went down to Niton, Isle of Wight, to look for *Monychus pseudacori*, and the beetle was found in great profusion in the capsules

of *Iris foetidissimus*. A few specimens were found on the capsules, but the majority and a few pupæ occurred in the seed-capsules. A great number must have already emerged, judging from the holes made by the beetles in the capsules when they come out. Niton is a new record for the insect, Fowler only gives Ventnor and Torbay. I believe Mr. Holland has taken it in Cornwall. I shall be pleased to give it to any coleopterists who may want it, as long as my stock holds out. Next day a flying visit to Blackgang Chine found *Bembidium anglicanum* in fair numbers.—HORACE DONISTHORPE. October 30th, 1906.

HENIOTICUS SERRATUS, GYLL., AT NEWBURY.—In my note on captures at Woodhay (not Woodbury, as printed *antea*, p. 268), I omitted to record a specimen of the rare *Henioticus serratus*, Gyll. Fowler only records it from Forest Hill, one example; Northumberland district, very rare; Scotland, Rannock, very rare. Mr. Kidson Taylor has recently taken it at Llanberis. I have also found two specimens of *Homalium septentrionalis* I swept there.—IBID.

DISTASTEFUL CARABIDS.—In my paper on "Protective resemblance, mimicry, etc., in the British coleoptera" (*Trans. Ent. Soc. Lond.*, 1901, p. 346) I wrote under *Carabus* "I have no doubt that they are more or less distasteful as they possess a strong and most unpleasant smell, and have the power to discharge an acrid fluid. I remember picking up a specimen of *C. violaceus* on the Deal sandhills, which shot this fluid into my eye, causing considerable pain." I took a specimen of *C. violaceus* in the Isle of Wight last month, and I find this fluid has an odour which is indistinguishable from butyric acid, and probably consists largely of this acid in a free condition. Its chemical nature, however, has not been investigated. The interesting point about this emanation is that while ants give off formic acid (CH_2O_2), which is the acid of the first (monocarbon) group of the hydrocarbon, butyric acid ($\text{C}_4\text{H}_8\text{O}_2$) is the acid of the fourth group, and is, therefore, chemically related to the former. *C. violaceus* gives off a fluid which is distinctly acid, caustic, and which possesses both the rancid and the pungent odour characteristic of butyric acid.—IBID.

EPURÆA ANGUSTULA, ER., AND ACRULIA INFLATA, GYLL.—In a recent paper to be published in the *Transactions of the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne*, I was able to prove (conclusively, I think) that both *Epuræa angustula* and *Acrulia inflata* were parasitic on species of *Trypodendron*, and, perhaps, a note on the habits of these two species may be useful. The best way to find these beetles is to examine, in early June, trees or logs attacked by *Trypodendron*; the bark should be stripped away, the underside and the surface of the tree laid bare thoroughly examined, and the holes in the bark probed with a grass-stem. Then the burrows in the tree should be watched; if a *Trypodendron* comes to the surface (in June, that is) it comes hind part foremost, whereas both the *Acrulia* and *Epuræa* come head first, and are, therefore, easily recognisable by their quivering antennæ. A sharp and strong knife thrust at an angle into the run cuts off retreat, and renders capture certain. Mr. Willoughby Ellis, however, suggests directing a blast of smoke through the stem of a pipe, into each hole, an excellent plan that, being a non-smoker, never occurred to me. Where possible, the bark should be replaced and examined every few

days at dusk.* In the light of certain records, it seems strange that the connection between *Epuraea angustula* and *Trypodendron* has not hitherto, so far as I am aware, been established, especially since the parallel form of the *Epuraea* is clearly adapted to the conditions of its life. The *Aerulia* has occurred to me from beneath bark of a *Trypodendron*-infested beech at Gibside, and that of a birch (similarly affected) at Winlaton, whilst four examples have actually been taken from *Trypodendron* borings in the latter tree.—R. S. BAGNALL, Winlaton. October 11th, 1906.

NOTE ON SCYDMAENIDÆ AND PSELAPHIDÆ FROM THE NORTHUMBERLAND AND DURHAM DISTRICT.—General collecting this season was so tedious and unproductive that I devoted my limited spare time to special search for beetles which, owing to their distribution, should reasonably be expected to occur in our neighbourhood; though often disappointed, many of the species thus sought were found, but the majority of the sixty odd species of coleoptera we have been able to add to our counties' fauna this year were quite unexpected, and amongst them were not a few nice *Scydmaenidae* and *Pselaphidae*. To be candid, I had never taken a single example of either family till March of this year, when I found a fine male of **Bythinus validus*, Aub., in Gibside. Later, *B. puncticollis*, Den., was taken in the Derwent Valley and at Corbridge; *B. bulbifer*, Reich., commonly, and several of the (with us) very local *B. curtisi*, Den., at one particular spot in Gibside. **Scydmaenus exilis*, Er., was found under bark of various trees at Gibside, Rowlands Gill, and Winlaton; *S. collaris*, Müll., in many localities; **Neuraphes angulatus*, Müll., occurred in refuse on Greatham Salt Marsh in the south of Durham; a single specimen of **N. elongatulus*, Müll., at Gibside, and another nearer home, whilst a third species of *Neuraphes*, a tiny insect scarcely 0·8mm. in length, which was unfortunately destroyed while undergoing examination under the microscope, I can only doubtfully refer to a small form of **N. sparshalli*, Den., probably Chaudior's var. *minutus*. *Eumicrus tarsatus*, Müll., has been found in fair numbers in vegetable refuse at Axwell Park and Brockwell, and **Tychus niger*, Pk., at Gibside and Corbridge. Perhaps the most interesting things, however, were certain species of *Euplectus*, the more difficult of which owe their final determination to Mr. Donisthorpe's kindness. **Bibloporus bicolor*, Den., occurred beneath beech bark at Gibside and Winlaton, to Mr. Donisthorpe, Professor Beare, and myself; two examples of **Euplectus punctatus*, Muls., at Winlaton, and a nice specimen of **E. karsteni*, Reich., in damp rotten wood, also near Winlaton; *E. nanus*, Reich., common in cut grass and haystack refuse; single examples of **E. piceus*, Mots., at Gibside and Winlaton, from beneath bark of oak and pine respectively, whilst a stray example of **E. sanguineus*, Den., was taken from beneath a stone. I may add that, in July of this year, I found *E. piceus* beneath fir bark, in Glen Ashdale, on the Isle of Arran. [Those marked * are additions to the counties' fauna.]—IBID.

COLEOPTERA IN SUSSEX.—During my somewhat scanty leisure time this year, I have met with no great rarities in the direction of coleoptera; one or two of my better captures seem, however, to be

* In the Irish List (1902, p. 706) *E. angustula* is recorded as "taken in the borings of *Trypodendron domesticum*."—H. J. D.

worthy of a brief note. My best take was, perhaps, another example of that rare little myrmecophilous beetle, *Trichonyx märkeli*, Aub. This was found in a large ant's nest, under a fair-sized flint; the host was *Lasius flavus*. The position of the nest was on the side of a down close to Ditchling Beacon, within a quarter of a mile of the spot where I captured my first example of *T. märkeli*, last spring. This year's specimen was taken on April 8th, last year's on April 26th. By sifting thick moss at Clayton Holt (about seven miles from Devil's Dyke), I obtained *Chrysomela goettingensis*, L., not uncommonly; besides this species, the moss, in this locality, seemed devoid of all coleopterous life whatever, if *Tachyporus brunneus*, F., and *Pselaphus heisei*, Hbst., be excepted. One example of *Orobitis cyaneus*, L., was shaken from moss at Clayton; the protective resemblance that this beetle has to a seed is most remarkable. By sweeping *Umbelliferae*, growing in a lane adjoining Blackbrook Wood, one *Phytoecia cylindrica*, L., was taken in early June. Hawthorn blossom yielded a nice little series of *Mordellistena abdominalis*, F., in company with the species usually thus taken, such as *Lochmaea crataegi*, Forst., *Anaspis*, etc. The latter part of the year (August and early September) found the country very dried up, consequently insects were unusually scarce. By searching *Carduus arvensis*, several specimens of *Lema cyanella* were obtained; this beetle seemed extremely local, and had an irritating habit of quickly dropping from its pabulum when alarmed. The genus *Aphthona* was represented by *A. atrocoerulea*, Steph., *A. atrovirens*, Forst., *A. herbigrada*, Curt., and *A. venustula*, Kuts.; the first three I obtained principally by sweeping flowery slopes on the downs, *A. atrovirens* and *A. herbigrada* being swept in great profusion off thyme-clad hillsides. A little work on the genus *Apion* resulted not unfavourably—*A. vorax*, Hbst., being taken off *Vicia cracca*; a couple of *A. filirostre*, Kirb., off *Medicago lupulina*; *A. meliloti*, Kirb., swept not uncommonly off *Melilotus officinalis* and *M. arvensis*; *A. genistae*, Kirb., very common on *Genista tinctoria*; and *A. difforme*, Germ., found on *Polygonum hydropiper*, in the neighbourhood of Newhaven and Lewes. At the latter locality, by sweeping aquatic plants, *Gymnetron villosulus*, Gyll., was taken; this presumably came off *Veronica anagallis*, which plant was afterwards determined to be there.—HEREWARD DOLLMAN, F.E.S., Hove House, Bedford Park. October 18th, 1906.

COLEOPTERA NEAR LONDON.—On June 6th of this year my father captured a fine example of *Cetonia aurata*, L., at Bedford Park, W. Although, of course, this is far from an uncommon beetle, it strikes one as rather incongruous to find it in a locality so hemmed in with bricks and mortar, and within easy earshot of the District Railway! I also have to record the capture of another example of *Deleaster dichroum*, Gr., from the Ealing district. It was caught on the wing, just before sunset, on July 20th, within a hundred yards of Perivale Church.—IBID.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from p. 258.)

GENUS II: CONOCEPHALUS, Thunberg.

Larger and stouter than *Xiphidium*; the posterior femora have

many spines underneath, and the apex of the vertex is broader and longer than the first segment of the antennæ. There is but a single European species.

1. *CONOCEPHALUS TUBERCULATUS*, Rossi.
(= *mandibularis*, Charpentier).

Pale green or, by variety, testaceous; mandibles golden-yellow. Length of body, 20mm.-28mm. ♂, 24mm.-29mm. ♀; of pronotum, 6mm.-7.8mm. ♂, 6mm.-7.2mm. ♀; of elytra, 26mm.-38mm. ♂, 33mm.-42mm. ♀; of ovipositor, 17.5mm.-24mm. ♀.

In damp localities throughout southern Europe. In France, common in the south; Grenoble, Agen, Itteville, Hyères, Toulouse, Cannes, Fontainebleau, Épisy, Amélie-les-Bains, Arcachon, Lamothe, Ile de Ré, Tarbes, Saint-Genis-Laval, Pertuis, Le Var, Allier, Carcassonne, Le Blanc, Indre, Bourron, Menecy, Saint Antoine, Tarn et Garonne, Pessac, Drac, Montauroux, Nantes, Bagnols, Le Rayran, Dragnignan, Bordeaux, Décines, north of the Alps, only recorded from Bregenz. In Italy, common at the end of August and in the autumn.

FAMILY IV: LOCUSTIDÆ.

This number contains a few powerful species, some of curious appearance, confined so far as is known, to the Palearctic region, and carnivorous in habits. They are characterised by the closed or cleft-shaped tympanum of the anterior tibiæ, which are sulcate at the sides, and have on the outer edge of the upperside three distinct spines; the hind tibiæ have terminal spines on both sides of the upperside, and four terminal spines beneath.

TABLE OF GENERA.

- | | |
|---|-------------------------------|
| 1. Elytra and wings perfectly developed; occiput depressed; vertex horizontally produced; ovipositor obliquely truncate at apex above | 1. <i>LOCUSTA</i> , De Geer. |
| 1.1. Elytra and wings lobiform; occiput globose; vertex deflexed; ovipositor curved near apex, the apex itself slightly gaping | 2. <i>AMPHIESTRIS</i> , Fieb. |

GENUS I: *LOCUSTA*, De Geer.

This genus contains three large bright green grasshoppers, with powerful jaws and long straight ovipositor.

TABLE OF SPECIES.

- | | |
|--|------------------------------|
| 1. Elytra easily surpassing posterior femora. | |
| 2. Posterior femora with black spines, not coloured at base; cerci ♂ much longer than the styles; ovipositor not surpassing elytra | 1. <i>VIRIDISSIMA</i> , L. |
| 2.2. Posterior femora with spines ringed with black at the base; cerci ♂ equalling the styles; ovipositor surpassing the elytra | 2. <i>CAUDATA</i> , Charp. |
| 1.1. Elytra about equalling the posterior femora; (latter with spines dark; cerci ♂ longer than the styles; ovipositor easily surpassing elytra) | 3. <i>CANTANS</i> , Fuessly. |

1. *LOCUSTA VIRIDISSIMA*, Linn.

Large; pale green, sometimes varied with testaceous; elytra and wings long, easily surpassing the posterior femora; posterior femora with the spinules themselves black, but not with a black ring at the base. Length of body, 28mm.-33mm. ♂, 32mm.-35mm. ♀; of pronotum, 7mm.-8mm. ♂, 7.5mm.-9mm. ♀; of elytra, 34mm.-50mm. ♂, 49mm.-55mm. ♀; of ovipositor, 27mm.-30mm. ♀.

This well-known insect is common throughout Europe; from Sweden to Sicily; it is abundant throughout Belgium and France; common along the south coast of England. It betrays its presence by its familiar harsh stridulation; in the south of Europe, especially in the evening, the males maintain a chorus from the tree-tops, but in the more northern countries it appears to prefer beds of nettles.

2. *LOCUSTA CAUDATA*, Charpentier.

Resembles the preceding, but distinctly larger as a rule; the elytra are longer, and the spines of the posterior femora have a dark black ring round their base; the cerci of the male are stouter, and do not surpass the styles, as in the preceding species; the ovipositor is also longer. Length of body, 22mm.-37mm. ♂, 29mm.-36mm. ♀; of pronotum, 7mm.-8.2mm. ♂, 8.5mm.-9.5mm. ♀; of elytra, 39mm.-40mm. ♂, 43mm.-44mm. ♀; of ovipositor, 37mm.-40mm. ♀.

This fine insect to a certain extent replaces the preceding in eastern Europe; it has been recorded from Holstein by Rudow, but this requires confirmation. It occurs in the southern Tirol, and in Austria near Vienna, at Liesing, Mödling, Baden, Piesting, Gutenstein, Gloggnitz, in the Semmering.

3. *LOCUSTA CANTANS*, Fuessly.

Easily recognisable from its congeners by its somewhat smaller size and much shorter elytra and wings. Length of body, 23mm.-28mm. ♂, 25mm.-27mm. ♀; of pronotum, 6.8mm.-9mm. ♂, 7mm.-8.2mm. ♀; of elytra, 25mm.-31mm. ♂, 26mm.-31mm. ♀; of ovipositor, 22mm.-31mm. ♀.

This species replaces *L. viridissima* in the higher elevations of central Europe; it is recorded, however, from Finland. In France it is taken in the Pyrenees at Gavarnie, Barèges, also in the Vosges, Mont Dore, Grande Chartreuse. It is found throughout Switzerland above 2500ft.; it is common at Innsbruck and elsewhere in the Tirol.

4. *LOCUSTA HISPANICA*, Bolivar.

Resembles *L. cantans*, but elytra narrower, noticeably narrowed beyond the middle, and narrowly rounded on the apex; ovipositor much broader than the posterior femora.

Found among nettles in August and September in the Cordillera Carpetana, at San Ildefonso near Segovia, and Cepeda near Salamanca.

(To be continued).

CURRENT NOTES.

Mr. Burr has sent us a most interesting brochure on "The South-Eastern Coalfield." As a clear exposition of the geology of this part of Kent, and the relation of the latter to the geology of Britain as a whole, it is indeed excellent.

The sale at Stevens' on Monday, November 20th, of the collection formed by Paymaster-in-Chief G. F. Mathew, was chiefly remarkable for the fine series of aberrations of *Arctia villica* and the *Leucania favicolor* which it included. As a whole, the specimens were in finer condition than is altogether the rule in collections disposed of at Stevens', and the result was that good prices were the rule, though, as always happens, occasional lots went very cheaply, and others fetched

unduly long prices. Fine aberrations were more attractive than rare species. The *A. villica* were 85 specimens, and sold for £31 12s., but 34 of them accounted for £28 9s. of this, and of these 16 realised £24. More than a dozen specimens had the outer half of the forewing occupied by a large creamy area, by the extension of the usual spots. They were grand specimens, both as to condition and size, and suggested a special race of the insect, certainly no effect of domestication (and ill-usage) of the larvæ. The finest of these brought over three guineas; there were also two remarkably dark specimens. The *Leucania faricolor* were 63 specimens, which sold for £34. The type specimens at 12s. each; one specimen of ab. *acnea*, Mathew, was valued at £4 15s. The other "waincoat's" fetched good prices: 6 *Leucania vitellina*, 55s., 5 for 35s.; *L. albipuncta*, about 5s.; about the same was given for *Tapinostola concolor* and *Nonagria sparganii*: 5 *T. concolor*, 30s. and 26s.; 6 *N. sparganii*, 22s. and 30s.; *Hydroecia paludis*, 42s. for 36 specimens, really for a few fine aberrations amongst them; *Agrotis ashworthii*, about 2s. each; *Luperina luteago* var. *barrettii*, not in fine condition, 13s., 11s., and 13s. for 3 lots of 3 each; *Aplecta nebulosa* var. *robsoni*, about 12s. each; *Xylomyges conspicillaris*, 54s. for 9 specimens; 1 *Xylina conformis*, 18s.; *Asteroscopus nebulosa*, only 2s. each; *Plusia bractea*, 16 in two lots with others, £3 12s. 6d.; 1 *Catocala fravini*, £2 7s. 6d.; 10 *Nyssia lapponaria*, £2 18s.; of 88 "gooseberries," 76 sold for 24s. and 12 for £11 14s.: 2 *A. grossulariata* ab. *lutea*, for £5 10s.; 2 ab. *nigrosarsata*, £2 7s. 6d.; and 1 ab. *fulvaticata*, £1 15s., were the most notable. *Camptogramma fluriata* simply seemed to be valued at about 1s. each, but £2 10s. was given for 10 specimens of named aberrations; 6 *Cidaria reticulata*, £2; *Laphygma exigua*, 3s. 6d. each; a fine aberration of *Melitæa aurinia* sold for £1 6s.; *Hyles euphorbiæ*, "from Raddon's collection," were only good for 4s. each; whilst *Celerio gallii* was valued at 5s.; a *Phryxus livornica* at £1 1s.; and a *Hippotion celerio* at £1 8s.; a pair of *Stenoptilia graphodactyla*, £1 1s. The butterflies sold for £35; "Sphinges" and "Bombyces," £85; Noctuids, £147; Geometrids, £58. Total about £325.

It is with the greatest pleasure we notice that Mr. C. Waterhouse has been nominated as president of the Entomological Society of London. This crowning honour is altogether deserved by one whose whole life has been devoted to entomology.

On December 18th, Mr. J. C. Stevens will offer the collection of, and books on, lepidoptera, belonging to the late Mr. Hildebrand Ramsden, for sale. In January, the collection of Dr. Lang's Palearctic butterflies will also be offered for sale.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—November 8th, 1906.—GEOGRAPHICAL RACES.—MESSRS. HARRISON and MAIN exhibited bred and variable series of (1) *Tethea subtusa*, from Fermanagh; and (2) *Numeria pulveraria*, from various localities, and pointed out the characteristic forms prevailing in each. ABERRATION OF *AGLAIS URTICÆ*.—Mr. MOORE, a specimen of *Aglais urticæ* very nearly approaching var. *polaris*. LEPIDOPTERA FROM SUTTON.—Mr. GOULTON, a specimen of the rare *Heliothis armiger*, taken at light at Sutton, and

a series of *Egeria myopaeformis* from the same locality. EGGS OF STRYMON W-ALBUM.—Mr. Rayward, ova of *Strymon (Thecla) w-album* found *in situ* on bark and twigs of wych elm. ABERRATIONS OF SCOPARIA DUBITALIS.—Mr. R. Adkin, a series of *Scoparia dubitalis*, from Eastbourne, including some exceedingly pale forms, and also a very pale form from Mr. C. G. Barrett's collection, and read notes on this local race. November 22nd, 1906.—SPECIAL EXHIBITION OF VARIETIES AND ABERRATIONS.—Mr. South exhibited the very large Chinese *Aglais urticae* var. *chinensis* to compare with the very small *A. urticae* ab. *urticoides*, bred from larvæ fed on hop. Mr. Lucas, for Messrs. F. W. and H. Champion, (1) a ♂ of the very rare dragonfly, *Sympetrum vulgatum*; (2) a series of *S. flareolum*, including a ♀; and (3) a series of *Cordulia aenea*; all were taken in Epping Forest. Messrs. Harrison and Main, (1) a brood of *Pieris brassicae*, including examples of the female in which the two discal spots on both upper- and undersides were more or less united into a band; (2) series of *Aplecta nebulosa*, from Delamere, Epping, and New Forests, for comparison; (3) bred series of *Tephrosia bimundularia* from the New Forest and from Delamere, the former light, the latter dark and intermediate; (4) bred examples of *Dianthoecia caesia* from the Isle of Man; (5) *Jocheaera alni* from the New Forest. Mr. Kaye, a captured specimen of *Apatura iris* from the New Forest, measuring $3\frac{1}{16}$ ins. in expanse, much larger than any bred specimen. Mr. Dobson, four species of the genus *Sympetrum* taken in one place in Surrey on September 3rd, *S. striolatum*, *S. flareolum*, *S. sanguineum*, and *S. scoticum*. He also showed series of sixteen species of bees of the genus *Bombus*. Mr. G. B. Brown, his captures during a ten days' holiday at Deal, in late July, including *Lithosia pygmaeola*, *Calamia phragmitidis*, *Agrotis tritici*, *Eremobia ochroleuca*, *Dianthoecia cucubali*, etc. Mr. P. J. Barraud, a series of dark and intermediate forms of *Xylophasia monoglypha* from St. Bee's, Cumberland. Mr. South, a short series of *Dichrorampha flavidorsana* from his garden, and read notes on its distinctness and occurrence. Mr. Tonge, lepidoptera taken by him on the Suffolk coast in July, including *Trochilium apiformis*, *Mamestra abjecta*, *Leucania straminea*, *Senta maritima*, *Acidalia emutaria*, etc., together with a series of admirable photographs of the natural resting positions of numerous species of butterflies and moths. Mr. Goulton, varied series of *Oporabia dilutata*, *Melanthia ocellata*, and *Ypsipetes sordidata* (*elutata*) from Ranmore Common, the last comprising black, banded, green, wainscot, and other forms. Mr. Lucas, to illustrate Mr. Champion's exhibit (*suprà*), *S. vulgatum* ♂ s, from Richmond Park and from Denmark, and also drawings of the ♂ genitalia of *S. striolatum* and *S. vulgatum*, as well as photo-micrographs of the ♂ genitalia of the former. Mr. Chittenden, melanic *Larentia multistrigaria* from York, dark *Hadena adusta* from Rannoch, dark *Ypsipetes impluviata* from Arran, etc. Mr. Clark, the ichneumon, *Ophion luteum*, taken on November 21st. Mr. R. Adkin, a series of *Tortrix promubana*, reared from larvæ collected at Eastbourne from *Euonymus* in September last, only two specimens having been obtained previously in this country. He also showed an asymmetrical specimen of *Sesia stellatarum*, the transverse lines of the left forewing uniting into an irregular patch. Mr. Sich, two imagines with cases, of what he thought were *Coleophora milvipennis*, and also German examples of *Valeria oleagina*, *Catephia alchymista*, etc. Dr.

Chapman, (1) a long series of a new species of *Coenonympha* from Galicia, Spain, viz., *C. mathewi*, Tutt, closely allied to *C. dorus*; (2) a series of *Aricia idas*; (3) a series of *Plebeius aegon* with red on the hindmargin of the hindwings; (4) a number of *Erebia palarica*, all three species from Galicia; and (5) a representative exhibit of *Hastula hyerana*, and its various forms from Hyères. Mr. T. W. Hall, white-blotched aberrations of *Arctia villica* and an *Eupithecia*, showing the characters of both *E. minutata* and *E. assimilata*. Dr. Hodson, (1) *Agriades corydon*, with light outer margins; (2) *Polyommatus icarus*, with large blotches of black replacing the orange on the underside of the hindwings; and (2) *Aricia astrarche (agestis)*, with the markings along the outer margins conspicuously wedge-shaped. Mr. Garland, for Mr. Pickett, (1) a gynandromorphous *Angerona prunaria*; (2) an *Ematurga atomaria*, with six wings; (3) a long series of *Hemerophila abruptaria*, showing many melanic forms; (4) fine aberrations of *Agriades corydon* from Dover taken this year; (5) a light *Melitaea cinxia*; and (6) a very pale *Pararge egeria*. Mr. West, Greenwich, cabinet drawers containing his collection of British *Chrysolimidae*, *Endonychidae*, *Coccinellidae*, etc. Mr. Gadge, a wire arrangement to affix to flower-pots for breeding purposes, which could be folded up when not in use. Mr. West, of Ashted, under the microscope, the curious Y-shaped scales of *Pseudopontia paradoxa*, received from Mr. Moore.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 17th, 1906.—EXHIBITS.—MONONYCHUS PSEUDACORI, living specimens, and seed-vessels of *Iris foetidissima* from Niton, Isle of Wight, where the species occurred in some numbers, Mr. H. St. J. Donisthorpe. NOCTUIDES, ETC.—Mr. E. M. Dadd showed a number of *Noctuides* common to the British Isles and Germany, and read some observations on the insular racial characters of these British lepidoptera, as compared with the predominant forms occurring in Germany. He said that England was the home of many dark races, e.g., *Polia chi* var. *olivacea*, *Amphidasys* var. *doubledayaria*, the dark forms of *Hemerophila abruptaria*, *Larentia multistrigaria*, *Phigalia pedia*, *Odontopera bidentata*, etc., and it was, therefore, all the more curious that, in the 22 species of *Noctuides* exhibited by him, the tendency is always for the English form to be lighter, and the German form darker. November 7th, 1906.—EXHIBITS.—PANORPA GERMANICA.—A photograph of a specimen, practically immaculate, taken by Mr. E. A. Cockayne, at Tongue, Sutherlandshire, and a typical specimen for comparison, Mr. H. J. Lucas. HENICOPUS SPINGER.—A long series from El Barco, Galicia, Spain, to demonstrate the dimorphism of the females, one form having wholly black hairs, the others almost wholly white; the males showing no variation in this respect, Mr. G. C. Champion. PRIONOCYPHON SERRICORNIS.—Seven specimens bred from larvæ taken in the New Forest in July, living larvæ—and figures of a larva—and a pupa, Mr. H. St. J. Donisthorpe. ARICIA (LYCÆNA) IDAS.—From Galicia, taken at an elevation of 4500-5000 feet, and observed to lay its eggs upon a species of *Erodium*, Dr. T. A. Chapman. SESIA (ÆGERIA) ANDRENIFORMIS.—Branches of *Viburnum lantana* showing the mines of this insect, now discovered by the exhibitor as the foodplant in Britain, the Hon. N. C. Rothschild. WHITE PIGMENT REPLACED BY BLACK IN PIERINES.—Dr. F. A. Dixey exhibited specimens of Pierine butterflies, selected to illustrate the various conditions under which white pigment might be replaced by

black. He said that, in his opinion, melanism, though it might arise as a variation or sport, owed its establishment and increase to the principle of selective adaptation. *November 21st, 1906.*—EXHIBITS.—*ODONTOMYA ANGULATA*, from the Norfolk Broads, and *ICTERICA WESTERMANNI*, taken by the exhibitor in the New Forest district in August of this year, Mr. H. W. Andrews. *SYMPETRUM VULGATUM*, taken by the exhibitor in Epping Forest on September 4th, the fourth or fifth authenticated British specimen, Mr. W. J. Lucas. *TORTRIX PRONUBANA*, a short series, including both sexes, reared from larvæ and pupæ collected from *Euonymus*, at Eastbourne, in September last, being the first specimens reared in this country, Mr. R. Adkin. *CÆNONYMPHA MATHEWI*, a long series from different parts in the northwest corner of Spain (Galicia), Dr. T. A. Chapman. Dr. Chapman suggested that it may be quite possible that *C. matheui* is a geographical or subspecific variety of *C. dorus*, and not a fully established species.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*November 6th, 1906.*—EXHIBITS.—*PLEBEIUS ÆGON*.—A long series from Witherslack and Ashdown Forest, including an almost grey female, and several aberrant undersides, Dr. G. G. C. Hodgson. *HELIOTHIS PELTIGERA*, from Sandown, Isle of Wight, September, 1906, Mr. G. H. Heath. *RUMICIA PHEAS*, a long series, taken at Bexley, during September and October, 1906, including a golden-coloured specimen, several intermediates between this and the type, and examples of streaked, brick-red, and almost white undersides, Mr. L. W. Newman. *ASTHENA BLOMERI*, from Chalfont Road, June, 1906, Mr. V. E. Shaw. *November 20th.*—EXHIBITS.—*HEMEROPHILA ABRUPTARIA*.—Two broods, reared from pupæ received from Mr. E. Harris. Brood A from light ♀ and dark ♂ (extra light ♀ and dark ♂) yielded 80% dark and 20% light. Brood B from dark ♀ and ♂ (extra dark ♀ and light ♂) yielded 96% dark. Brood A consisted of 48% ♂ and 52% ♀, but in brood B there were 66% ♀ and only 34% ♂. In the over 100 specimens shown, there was nothing approaching to an intermediate form, Mr. S. J. Bell. *APOROPHYLA LUTULENTA*.—Nine specimens, the only examples of the grey form found amongst nearly 200 specimens taken at Mucking this season, Rev. C. R. N. Burrows. *AGROTIS ASHWORTHII*, from north Wales, August, 1906, and a series of *HEMEROPHILA ABRUPTARIA*, including a gynandromorphous specimen, Mr. J. A. Clark. *HEMEROPHILA ABRUPTARIA*.—Three distinct generations, reared from Mr. E. Harris' strain, including a slate-coloured ♂, Mr. G. R. Garland for Mr. C. P. Pickett. *ANTHROCERA PURPURALIS (MINOS)*, from north Wales and Oban, June, 1903, also a specimen of an Anthrocerid taken at Oban at the same time, having six spots on the forewings, but with the fluffy body characteristic of *A. purpuralis*, Mr. L. W. Newman. *APOROPHYLA AUSTRALIS*, from Sandown, September, 1906, including strongly-marked ♂s, and a ♀ of the very rare ab. *ingenua*, also six specimens of *ACIDALIA IMMORATA*, bred as a partial second-brood, from Lewes ova, Mr. L. B. Prout. *HEMEROPHILA ABRUPTARIA*.—A long series from Holloway, Clapton, and Bexley, including many dark specimens, Mr. V. E. Shaw. In the course of the discussion on this latter insect it was made evident that the dark form had long been known in the Clapton district, where Mr. E. Harris took the ♀ from which most of the dark specimens exhibited were descended, and that this dark form is evidently gaining ground there.

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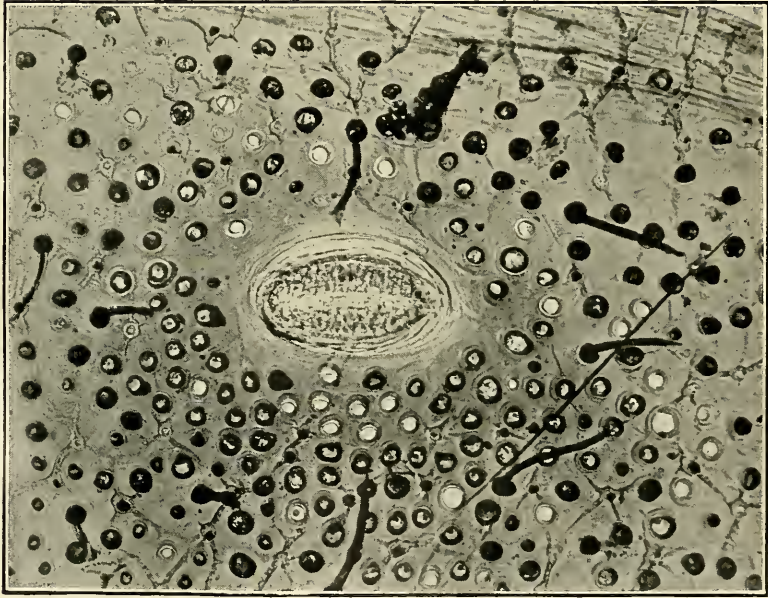


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1. SPIRACLE AND SURROUNDING AREA OF PUPA OF
CHRYSOPHANUS DISPAR ($\times 100$).

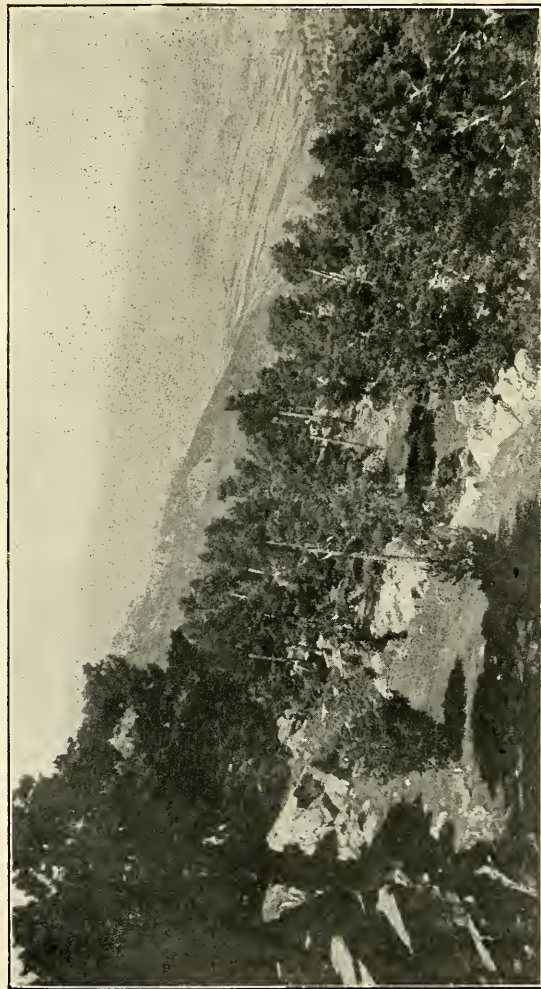
Entom. Record, etc., 1906.



Photo. F. N. Clark.

2. NEARLY ONE-FOURTH OF THE CREMASTRAL AREA OF PUPA
OF *CHRYSOPHANUS DISPAR* ($\times 100$).

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THE HEADQUARTERS OF EREBIA ZAPATERI.

Entom. Record, etc., 1906.



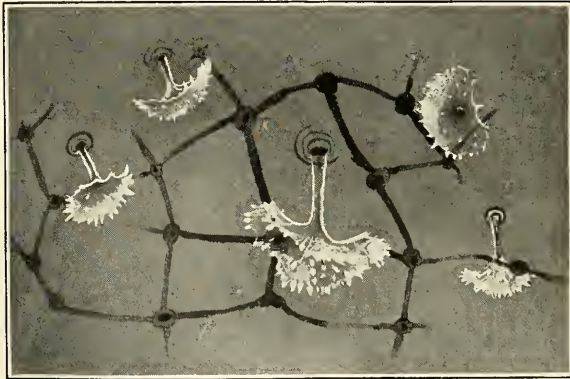


ABERRATIONS OF AMORPHA POPULI.





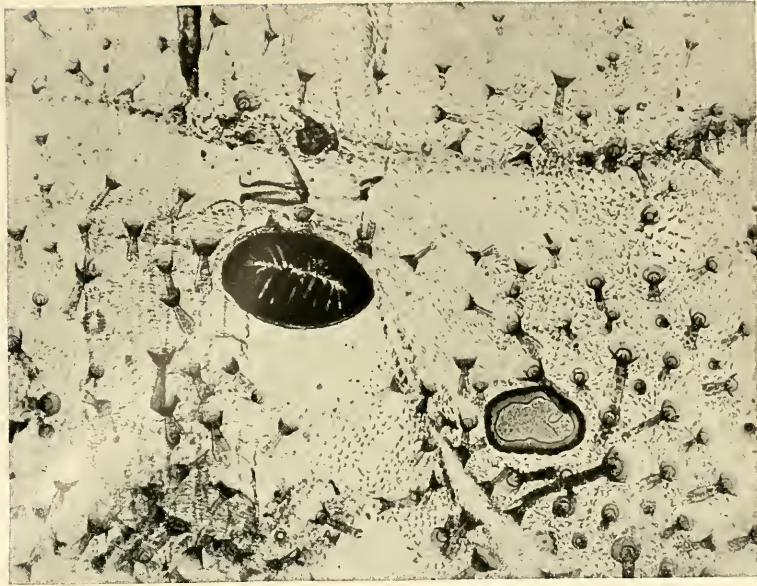
Photo. F. N. Clark.
PUPAL HAIRS OF CHRYSOPHANUS VIRGAUREAE VAR. MIEGII ($\times 200$).



Del. L. M. Chapman.

PUPAL HAIRS OF CHRYSOPHANUS VIRGAUREAE VAR. MIEGII ($\times 200$).

Entom. Record, etc., 1906.



Phot. F. N. Clark.

LARVAL SKIN OF *URBICOLA COMMA*, SHOWING SPIRACLE, LENTICLE, HAIRS AND SKIN-POINTS (LAST STADIUM $\times 100$).



Phot. F. N. Clark.

SPIRACLE AND HAIRS OF LARVA OF *URBICOLA COMMA* (LAST STADIUM $\times 100$).

Entom. Record, etc., 1906.



SALZBURG AND ITS CASTLE.



BECHTESGADEN.



LOOKING TOWARDS IGLS AND INNSBRUCK FROM THE
FULPMES RAILWAY.

Entom. Record, etc., June, 1906.



Fig. 1.



Fig. 2.



Fig. 3.

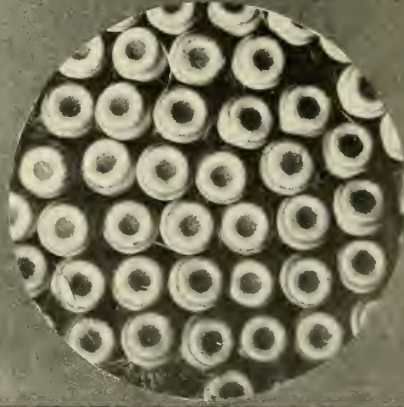


Fig. 4.

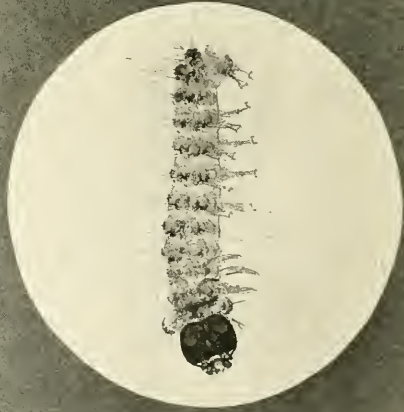


Fig. 5.



Fig. 6.



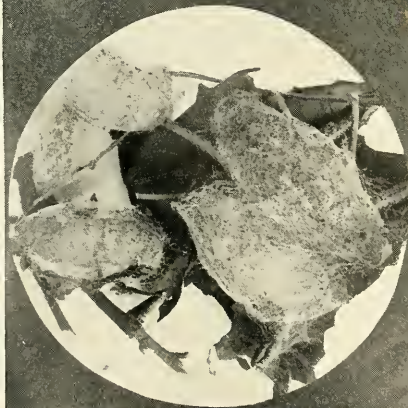


Fig. 7.



Fig. 8.



Fig. 9.



Fig. 10.

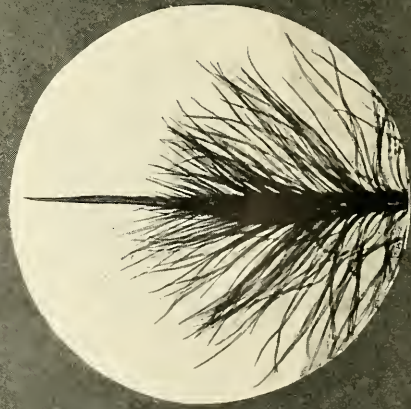


Fig. 11.

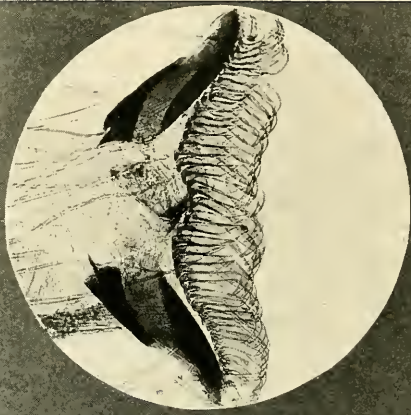


Fig. 12.

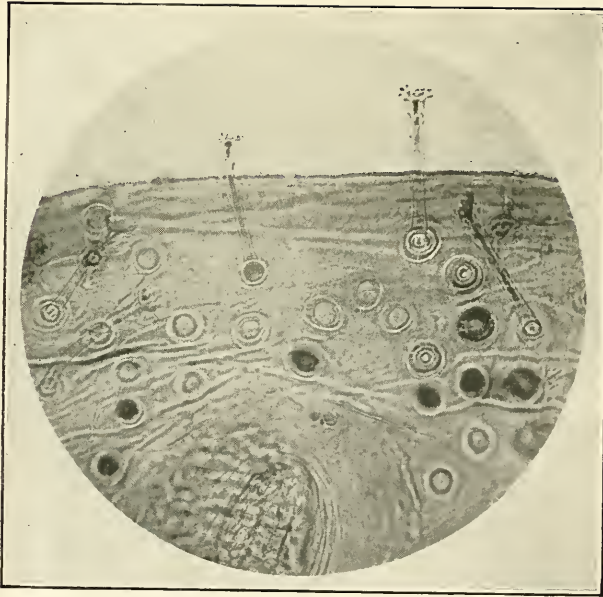


Photo by F. N. Clark.

PUPAL SKIN AND PUPAL HAIRS OF ZEPHYRUS QUERCUS.
SPIRACULAR REGION OF 2ND ABDOMINAL SEGMENT $\times 200$.

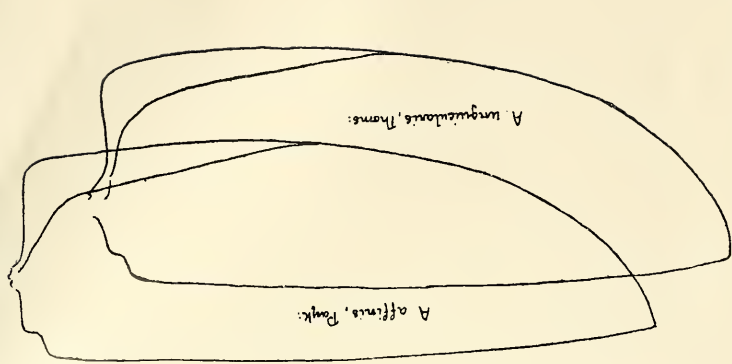
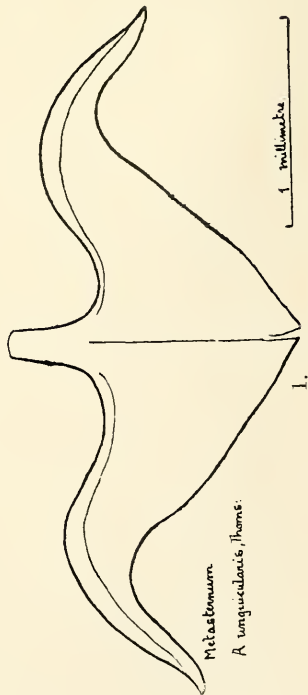
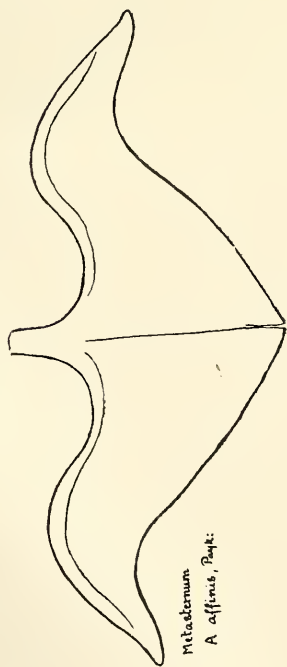
OCT 4 1906



Photo. by F. N. Clark.

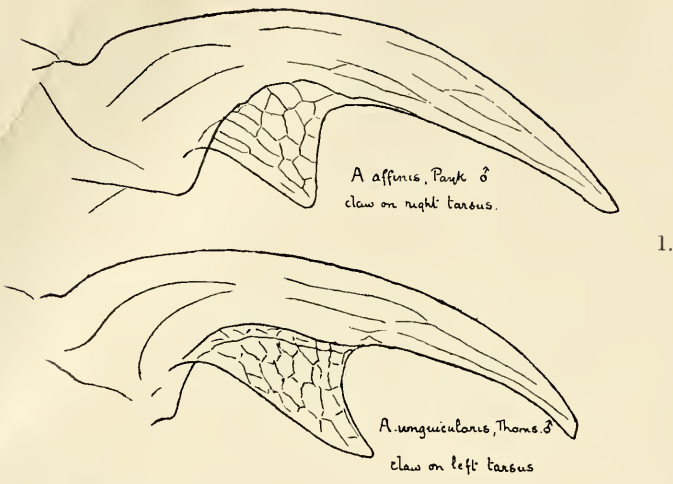
FUPAL SKIN OF THECLA W-ALBUM. SPIRACULAR REGION OF 3RD ABDOMINAL
SEGMENT RIGHT SIDE $\times 100$.





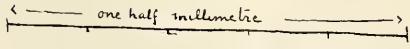
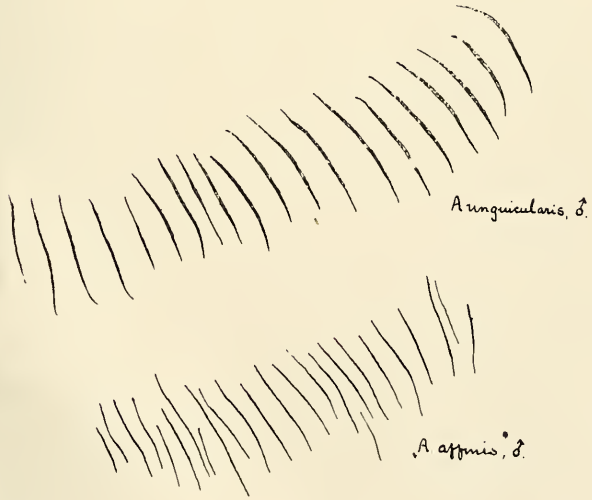
COMPARISON OF AGARIS AFFINIS WITH A. UNGUICULARIS.

Anterior claw on anterior tarsus.

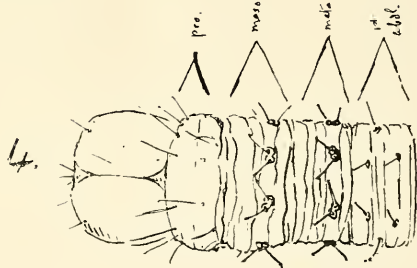
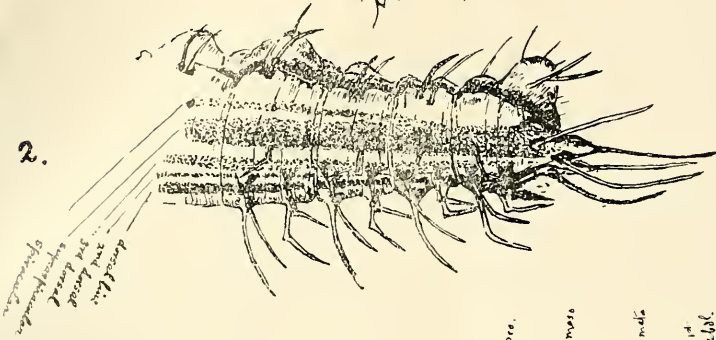
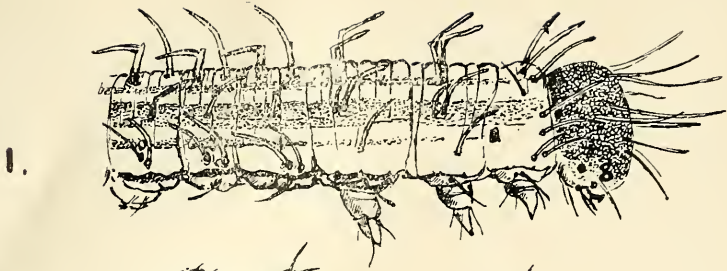


Magnification about 400.

Stridulatory File.



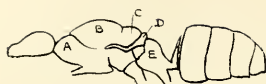
COMPARISON OF AGABUS AFFINIS WITH A. UNGUICULARIS.



Del. H. Powell.

STRUCTURAL DETAILS OF MELANARGIA LACHESIS AND DAPHNIS NERII.

Queen



Pseudogyne



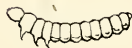
Worker



Formica sanguinea



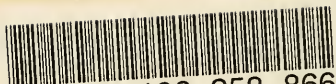
The Labium of *Lomechusa*



Larva of *Lomechusa strumosa*

MYRMECOPHILOUS NOTES FOR 1906.

The Entomologist's Record, etc., 1906.



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