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PREFACE.

Another volume has been completed and we have again to thank our subscribers and contributors for their excellent support during the past year. There has been no special feature like the "century" articles of the last volume, but the volume contains a large amount of most important and useful entomological detail, which has, we believe, kept it quite up to the level of its best traditions.

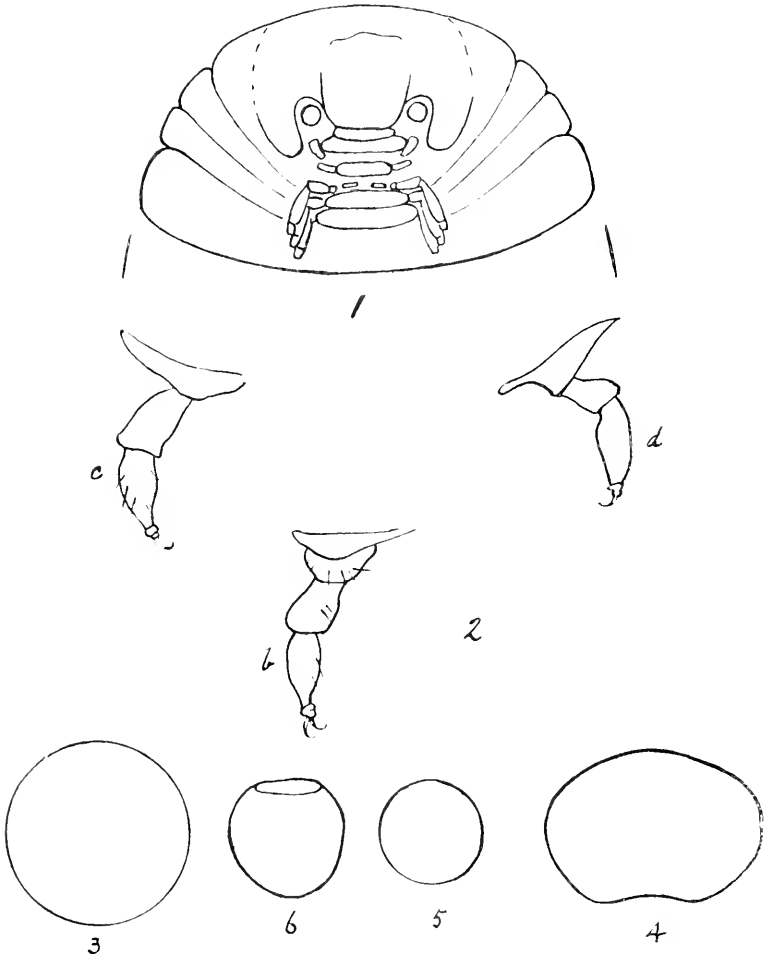
The work of the assistant editors has been especially onerous this year. The coleoptera section under Professor T. Hudson Beare and Mr. H. St. J. K. Donisthorpe has been rather heavier than usual, and Mr. M. Burr maintains well the interest of our orthopterists in the work that is going on in their special branch of our subject. The help of Dr. T. A. Chapman and Mr. L. B. Prout with the lepidoptera, has again been of the utmost value to ourselves and our readers.

Help in the production of the plates polished with this volume is gratefully acknowledged, we have to thank Dr. T. A. Chapman, the Rev. A. M. Moss, the Hon. N. C. Rothschild, and Mr. Dollman. To the latter our readers are indebted for the beautiful handpainted larva of *Dicranura bicuspis*, every copy of which was coloured by the artist himself.

Owing to an unfortunate affection of the eyes, from which Mr. G. B. Routledge is suffering, extra help in the preparation of the Special Index has had to be obtained. Mr. H. J. Turner is helping Mr. Routledge with the lepidoptera, Professor T. Hudson Beare is doing the coleoptera, and Mr. M. Burr the orthoptera. Whilst regretting exceedingly the necessity for obtaining further help, we are exceedingly grateful to those who have so kindly offered their services. We trust that Mr. Routledge, to whose kindness we have been indebted so long, will soon recover from what we hope is but a temporary disability. It is hoped that the "Special Index" will be ready with the January number. We regret to add that, whilst this has been passing through the press, Miss E. Wells, who has for many years been responsible for the "general index" of this magazine, and had only a few days before completed that published with this number, died suddenly of apoplexy on December 5th.

We again ask for a supply of short notes and observations, which should in reality be not at all difficult to obtain. It would appear, however, that such are really more rarely penned than one might fairly expect. I may here point out that the compilation of really good text-books must depend largely on an abundance of such notes made by isolated workers. These notes become of the highest scientific importance when collected together for the purposes of generalisation. Similarly, notes on collecting—with dates, observations and localities—are exceedingly valuable.

In conclusion we beg to tender our heartiest thanks to our subscribers and contributors, and to everyone who has in any way contributed to make the volume a success.



STRUCTURAL DETAILS OF *ORYGIA SPLENDIDA*.

The Entomologist's Record and Journal of Variation.

VOL. XIV.

SPECIAL INDEX.

By T. HUDSON BEARE, F.R.S.E., M. BURR, B.A., F.E.S.,
G. B. ROUTLEDGE, F.E.S., AND H. J. TURNER, F.E.S.

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Retrospect of a Lepidopterist for the Year 1901.*

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

As happens almost every year, unless it be quite phenomenally productive or the reverse, one hears very varied reports from different sources and for different parts of the season as to the general abundance of insect life; but on the whole it appears to have been above the average, and the number of records of the occurrence of species of exceptional interest is by no means a meagre one. Abnormally mild winters have become quite normal of late—if I may thus express myself—and that of 1900-1901 may be said to have been no exception, though perhaps it gave us a little more of seasonable cold than some of its immediate predecessors. The earliest spring Geometers were out on New Year's day, indeed, I believe one or two of them did not even wait for the New Year. Notwithstanding the supposed adverse influences of mild winters on hibernating larvæ in general, I cannot help believing that they are really in some way suited to some of our casual immigrants, and that to them is to be attributed the regular annual occurrence, of late, of some of our erstwhile "rarities." I am aware that spells of awakening at unseasonable times are likely to be injurious to true hibernators, but the case may well be different with some of the southern species which hardly hibernate at all in the strict meaning of the word. Dr. Corbett remarks (*Ent. Record*, xiii., p. 278) that the frequency of larvæ of *Manduca atropos* about Doncaster for three consecutive years (and the same might have been written of many other northerly localities) suggests that the species would appear to have maintained its existence there "without artificial forcing." Then, again, we have *Phlegythontius concolculi*, which has become strikingly abundant during the same period, while the larvæ, previously so rarely recorded in this country, has been found freely in many places. The immigration, too, of *Eurymus hyale* seems to have left some definite traces, as several specimens bearing the appearance of being "British born" were met with in the early summer of the present year, some of them being in inland localities, which the species reached in 1900—e.g., Brackley, Northants (*Ent. Record*, xiii., p. 249). The allied *E. croceus (edusa)* has not been particularly conspicuous this season; some of our provincial entomologists are still a good deal puzzled by the erratic appearance of this species in different seasons, being evidently unaware of its migratory habits and of the

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difficulty it has in maintaining itself with us; thus a recent writer in the *Entomologist* cannot find even a "probable explanation" of the remarkable fact that in a locality where he found *E. croceus* in abundance in 1900 he failed to see one in 1901, and naïvely adds that "this is all the more remarkable as the lucerne field had not been ploughed up or disturbed in any way, there being a fair number of blossoms still in the field, which was being grazed by sheep." I venture to think that if our two species of *Eurymus* had no greater difficulty to contend with than that of food-supply we should have them with us in plenty every year. Another immigrant which has appeared somewhat freely this year is *Pontia daplidice*, which is recorded from Dover, Eastbourne, Brighton, and perhaps elsewhere. Several *Euranessa antiopa* have likewise been met with in different places.

After the mild weather of the late autumn and winter, we were favoured with the usual quantum of cold weather in the spring, and most of the reports speak of the May insects as late in appearing, but the season soon regained its equilibrium, and at Whitsuntide the insects were mostly well up to date, although during the whole season the dates were somewhat perplexing and difficult to follow, some species being certainly late in appearing, others as certainly early.

Of true British butterflies, one is glad to learn that in spite of the dreaded "over-collecting," some of the most local have been met with in undiminished, if not in increased, abundance this year; I need only mention *Lycaena arion* and *Thecla pruni*. I have not heard that the immigrant *Papilio machaon* of 1900 have been able to breed in the country, and am afraid this interesting species must still be regarded as confined to the fens and broads. *Aponia crataegi*, which we thought we had almost lost in this country, seems to be gaining ground, having occurred rather freely in its old locality between Canterbury and Herne Bay, as well as at Dover. Much uncertainty prevails as to the cause of the decadence, from time to time, of this and many other species.

Among the other branches of the Lepidoptera it may be of interest to comment upon a few of the most noteworthy captures. A few *Choerocampa celerio* should no doubt be considered among the class of immigrants, though a friend of mine has reliable information of the finding of larvæ this year, and it is evidently possible for the insect to maintain itself here for a single generation, during the summer. *Deiopeia pulchella* probably falls under the same category; at any rate, the capture of three this season by Mr. Ernest Warne in the same locality (near Earlsfield) may suggest, as the captor thinks, that they really bred there, though one cannot seriously claim this species as British. Of other casual visitors during the season, I can mention two which I have myself had the pleasure of being called upon to determine for their captors. One of these is the specimen of *Helioiphila (Leucania) l-album*, taken at Sandown by our valued Secretary, Mr. S. J. Bell, and already exhibited at one of these meetings. The other is a fine and strongly-marked *Luperina dumerilii*, captured by Mr. H. Douglas Stockwell on September 21st, on a gas-lamp in Dover, which he is kindly permitting me to exhibit this evening. The month of September was very productive in rare Noctuids, some species which used to be of great rarity, such as *Helioiphila vitellina*, *Laphygma exigua*, &c., appearing in considerable numbers in South Devon, and also occurring elsewhere on our south coast. According to recent in-

formation it seems probable that the former, at least, is really indigenous in the district named, though its comparative abundance during the last two or three years is probably attributable to phenomenally favourable atmospheric conditions; the same or similar causes have contributed to the increase of the once rare *Heliophila albipuncta* and *Caradrina ambigua*, though the reports of the present season appear to indicate that they are already on the wane. Probably, however, *C. ambigua* was never so rare as it was reputed to be; at least, there is some ground for believing that it was formerly somewhat overlooked.

Of recent importations (apparently) which have successfully established themselves, two or three deserve mention. *Callimorpha hera*—or, as we shall unfortunately henceforth have to call it, *C. quadrivinctaria*, Poda—is still spreading in Devonshire, and there seems now a good chance of getting a series almost anywhere between Dawlish and Exeter, and perhaps, also, in other parts of the county. *Plusia moneta* is also extending its range in various directions, and one or two of us have had the pleasure of welcoming it to our suburban gardens. Whether *Ithysia* (*Nyssia*) *lapponaria* ought to be referred to under this heading, and if so, how its importation came about, I do not know; it is, of course, possible that it has been very much overlooked. At any rate, it is interesting to learn (*Entom.*, xxxiv., p. 255) that Mr. Cockayne, of Sheffield, has found out how to work for its larvæ in Perthshire, thus following up the success which Mr. W. M. Christy achieved a few years ago. The insect is sometimes regarded as a boreal variety or race (or “Darwinian species”) of the *I. pomonaria* of central and southern Europe, but I am not in a position to express any critical opinion on the subject.

There are a few species which we know to be genuinely British, and a few others which we think may probably be so, which yet continue exceedingly rare in collections, owing in part to our ignorance of their habits, but perhaps also, in part, to the number of their enemies in this country, or to some other unfavourable circumstances, climatic or topographical, which form more or less effectual checks to their increase in the “struggle for existence,” while, at the same time, not so potent as to prevent their continuing with us, however precariously. Entomologists are always pleased to meet with these, and they are often considered as of sufficient interest to be worth recording in the magazines. I notice that *Xylomyges conspicularis* is again recorded this season from a few west-country localities, such as Taunton, Tewkesbury, &c.; I believe the four counties of Herefordshire, Worcestershire, Gloucestershire, and Somerset would cover practically the entire ascertained range of this local moth in the British Isles, although Barrett adds that there are one or two records for Kent, Surrey, Suffolk, and South Wales. Apparently, still rarer species with us are *Mellinia ocellaris*, of which our member, Mr. Burrows, has taken and shown us a specimen; *Sesia* (*Aegeria*) *audreniformis*, taken by Mr. Huggins at Gravesend on July 17th; and *Parascotia* (*Boletobia*) *fuliginaria*, captured by my friend Mr. R. W. Robbins, at Walthamstow, on July 29th. Probably we have still a great deal to learn concerning the habits of these three species; possibly, also, we do not show sufficient zeal in examining “the old rotten woodwork in the cellars and other structures along the banks of the Thames” to secure good series of the last-named, these being the favourite haunts

of the fungus-feeding larvæ of this interesting species. Mr. Robbins' specimen, however, was taken out-of-doors, flitting round a sugared post in the evening; and on the continent I believe its occurrence in the open is quite usual. Is this really another migrant, introduced from time to time by shipping, and only able to thrive when protected from our climate within walls, just as we can easily breed many continental species in our houses which fail to thrive when planted out?

Turning now to the writings of the present year, I can mention only a few of the more prominent, or of those which happen to have come more particularly under my own notice. A good deal of the most important work is done under the auspices of the entomological and natural history societies, or through the medium of the periodicals, and I would urge our members to support such organisations and publications to the utmost of their ability. Especially it seems desirable that every entomologist who takes any deep interest in the progress of the science should unite himself to the "Entomological Society of London," as it is very inappropriately called, seeing that it is essentially a national, and not a local society. It is at present in a flourishing condition financially, but with a larger income it could still further increase its sphere of operations; besides, there is room for a considerable influx of new life, both in the direction of biological research and in that of distinctively British entomology (faunistic, &c.); at present a large part of the annual volume of *Transactions* is devoted to very necessary, but very uninteresting descriptions of new species, and this kind of work needs supplementing (not supplanting) by a great deal more of scientific work, for which at present it would be difficult to find room in its pages. Apart from papers which are essentially descriptive or enumerative, one finds in the volume for 1901 (so far as yet published), some very interesting "Observations on some Species of *Oreina*," by Mr. Champion and Dr. Chapman, throwing some valuable light on the early stages, especially in regard to the viviparity of most of the species; some notes by Mr. Elwes on Mrs. Nicholl's "Catalogue of Butterflies met with in the Lebanon"; a welcome paper on "Cases of Protective Resemblance, Mimicry, &c., in the British Coleoptera," by Mr. Donisthorpe, which reminds us that we lepidopterists can claim no monopoly in dealing with this very important branch of study, although we remember with pride that our favourite Order furnished nearly all the original material for it; and some valuable anatomical notes on *Osmia*, by the Rev. F. D. Morice, which suffice to raise his paper above the level of the ordinary descriptive ones. I must not omit to mention that one of our secretaries, Mr. W. J. Kaye, has contributed an important faunistic paper on the hitherto totally neglected "Lepidoptera-Heterocera of Trinidad," and we are looking forward to other valuable contributions, on those of British Guiana, from the same pen.

Our own Society and our sister Society across the Thames (the South London Entomological and Natural History Society) have each published a creditable volume of *Transactions* and *Proceedings* during the year, the result of our work during 1900. I need not remind you of the contents of our own volume, but I must spare a word of praise for that of our South London friends, which seems to reach the high level attained in 1899, and is much in advance, scientifically, of most of its predecessors in the series; our inde-

fatigable friend Dr. Chapman is again to the fore in the volume in question, having contributed a paper "On some Wing-structures in Lepidoptera."

The *Entomologist's Record* opened the year (and century) with a special "Century Number," which, indeed, overflowed its banks and inundated the greater part of the February number, thus occupying altogether nearly 80 closely-printed pages. Naturally, the articles—which were designed to survey, as far as possible, the entomological progress of the Nineteenth Century—are not all equal in amplitude or in merit, but, nevertheless, they form a very valuable *resumé*, which will often be consulted when the present century is older, and which—if one may venture to prophesy so far ahead—will be of still greater service when the time comes for the next century review. I cannot refrain from quoting the conclusion of Mr. Tutt's prefatory note to the series, so pregnant is it with suggestions which we should all do well to lay to heart. He points out that the failing points of scientific progress are: "(1) An accumulation of wasted effort in collecting material. (2) Want of initiative in striking out new lines of work. (3) Want of perseverance in following up certain definite lines of experiment and observation. (4) Ignorance of work already done. (5) Inability to recognise the requirements of modern science in methods of work." And he adds: "These are so self-evident that there is no need to waste space in discussing them, and one can only look forward to a time when the conditions of modern life, which are all in favour just now of the sciences which are strictly utilitarian, shall not act against the true scientific enquirer, but put him in the same position for real scientific work, as that in which they at present place his more fortunate brethren, the students of chemistry and physics." I need hardly comment on this extract; but I am optimistic enough to believe that the real value of entomology in its modern scientific aspects, and the bearing of these aspects upon the all-important science of biology, cannot much longer remain unrealised, but that we shall soon find ourselves much more favourably placed than is now the case for the pursuit of our studies. I must call attention to the "Evolution Committee" of the Royal Society, which I regard as a happy augury for a wider recognition of our science, seeing that its investigations in the workings of the laws of heredity are being carried out largely upon an entomological basis, under the able superintendence of Mr. W. Bateson, M.A., F.R.S., F.E.S. Let me urge all our members to put themselves into communication with Mr. Bateson, and to ascertain in what way *they* can assist in this enquiry.

The greater part of the contents of the current volumes of our entomological magazines is of the usual class, indispensable to entomologists who wish to keep themselves up to date in their knowledge, but I cannot dwell upon it now. We have to thank our esteemed Vice-President, and former President, Mr. J. A. Clark, for an excellent working-out of aberrations of the protean *Peronea cristana* in the *Entomologist's Record*, accompanied with beautiful figures of the newly-described forms; and the same periodical also contains some good work on the Lachnæids, by Messrs. Tutt, Bacot, and Warburg, which is timely in view of the third volume of Tutt's *British Lepidoptera*—not yet ready, alas, for the subscribers who are so eagerly awaiting it. In

the *Entomologist* one notices an attempt to work out some phases of the variation of the genus *Erebia* upon the lines of the work of Galton, and one wonders whether the articles will further lead us into the mathematical intricacies (without doubt valuable, but somewhat abstruse to the general reader) of Karl Pearson's *Grammar of Science*.

I have not had time to analyse the multitude of continental and American periodical literature, but I judge from an examination of Friedländer's very useful *Entomologische Litteraturblätter*, as well as of the magazines placed on the table at the meetings of the Entomological Society of London, that they have contained comparative little of special value to the lepidopterist, and I am not competent to pronounce on the value of that relating to other orders. The principal Roumanian scientific society has published a two hundred-page list of the Macrolepidoptera of the country, by E. Fleck, and this was closely followed by a "Micro" list from the pen of Caradja, already well-known for his writings in *Iris*. *Iris*, which has very inconveniently changed its title again, being now called *Deutsche Entomologische Zeitschrift: Lepidopterologische Heft*e, hardly keeps up its high character since the editorship passed from Staudinger, but is still a very useful publication to lepidopterists. In one or two other of the German papers, the well-known Esthonian lepidopterist, Huene, has been amusing himself by describing and naming aberrations of palaearctic Heterocera, with the same easy-going disregard for the previous work of nomenclators, which Mr. Tutt has had occasion to criticise in another connection in a recent number of the *Record*. The naming of aberrations is not without its manifest uses (provided it be not carried to such over-minute detail that it be impossible for the possessor of one aberration to name it without possessing the complete series of forms for comparison), but surely it should not be undertaken by those who have not taken the trouble to overhaul the literature already dealing with the subject. Let us hope that the appearance of the new edition of Staudinger will do something to stem the tide of duplications in nomenclature; although it is to be feared its inadequate citation of Tutt's *British Noctuae* will leave much room for the evil to grow in that family.

Of separate works, several of importance are still in progress, and have made some headway during 1901. The third volume of Hampson's "magnum opus" is amongst these, and deals with the remainder of the *Arctiidae* and with *Agaristidae*. I presume Moore's *Lepidoptera Indica* is still in progress, but I do not remember to have seen any new parts during the present year; of Grose-Smith's *Ithoplocera Esotica*, part 56 has appeared. Barrett's *British Lepidoptera* is still making slow progress, the family now under consideration being the *Larentiidae*. Miss Sharpe's *Monograph of the Genus Teracolus* has also advanced by at least three parts, and Riffarth has completed his revision of *Heliconius*, which I ought to have mentioned under the heading of periodicals (*Berl. Ent. Zeit.*, 1901). The first lepidopterological part of *Das Tierreich*, namely, Pagenstecher's *Libytheidae*, appeared early in the year, and has been noticed in the *Entomologist's Record*.

But the most generally important new book of the year has been the long-awaited *Catalog* of Staudinger and Rebel; as I am discussing this rather fully in the pages of the *Ent. Record*, and as some of you have

already made acquaintance with it, I need not say more about it now. An enterprising American, S. F. Denton, has completed a book on moths and butterflies of the United States "with 400 photographic illustrations in the text and many transfers of species from life." We are told in the advertisement that "after much experiment the author has succeeded in perfecting the art of transferring from the wings of real moths and butterflies to a prepared plate paper the millions of tiny scales in all their perfection, fixing the gorgeous colours and luminous iridescence just as brilliantly as when the insects were alive." I have not yet had an opportunity of studying this new departure, but as the price of the work is only a little over £20, perhaps you will all like to order copies for yourselves. Some useful handbooks may complete my list. Such are Kirby's *Familiar Butterflies and Moths*; a new French edition of Berge, by the Abbé de Joannis, which I have not seen, but which ought to be good, if that very able entomologist has revised the text as well as translating; a new edition of Hofmann, commenced by Dr. Spuler, and promising very well; and a Russian translation of Standfuss' celebrated *Handbuch*.

Retrospect of a Coleopterist for 1901.

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

I propose in the present article to deal only with the work of British entomologists, reserving some notes on the work of our foreign friends for a future article. In the January number of the *Ent. Mo. Mag.* (vol. xxxvii., p. 1) I gave an account of the additions to our list of British coleoptera during the two years 1899-1900, and was then able to chronicle eleven additions, one removal, and the confirmation of three doubtful species. The past year has been singularly unfruitful in this respect, practically the only genuine additions have been the varieties and aberrations of species of the genus *Aphodius*, brought forward by Mr. F. Bouskell in his paper on "The Variation and Distribution of the genus *Aphodius*." This paper is most interesting, because it deals very fully with the distribution and variation of the species in a genus found in all parts of the world, and the author discusses very thoroughly the causes of variation and the means of dispersal of insects.

In the January number of *The Annals of Scottish Natural History*, p. 24, the Rev. H. S. Gorham described a species of *Stenolophus*, apparently new to science and to Britain, to which he gave the name of *plagiatus*. From the locality in which it was taken (the banks of the Clyde) I am afraid we must consider this insect as an importation, until it is confirmed by captures elsewhere. Other introduced species are noted in the *Ent. Mo. Mag.* (vol. xxxvii., p. 18), namely, *Lathridius bergrothi*, Reitt., in the herbarium of University College, Nottingham, and *Larinus scolymi*, Oliv., on flowers of *Knautia arvensis* at Colchester, and, in the *Ent. Record* (vol. xiii., p. 219), in a note on "Cosmopolitan Beetles in a London Warehouse," Mr. Newbery records the capture of *Phthora crenata*, Muls. All these are thus recorded for the first time, and, in the case of two at least, we may possibly find they will occur again. It is very desirable that such instances of the introduction of new species by the agency of man, should at once be put on record as a help in solving the difficult problems of insect distribution at the present day.

Mr. Champion has again done good work in clearing up several doubtful points in our lists; in the *Ent. Mo. Mag.* (vol. xxxvii., p. 255) he points out that the insects which have done duty in our catalogue as *Melandrya canaliculata*, Fabr., are really *M. barbata*, Fabr. Records of the capture of this rarity are given by him, and others are added in the *Ent. Record* (vol. xiii., p. 377).

In the June number of the *Ent. Mo. Mag.* (vol. xxxvii., p. 144), Mr. Champion has a valuable note on various species of *Bruchus* found in Britain. As a result, *B. luteicornis*, Ill., disappears from our list, being merely the male of *B. rufipes*, Herbst, and *B. riciae*, Oliv., also disappears, the few supposed representatives of it in our collections being in reality *B. fahraei*, Gyll., a variety only of *B. atomarius*, L., a fairly common British insect; the introduced *B. pectinicornis*, L., also proves to be another species, namely, *incarnatus*, Boh., but the true *pectinicornis* has recently been taken by M. E. A. Waterhouse at Putney, it is, however, most probably also an introduced insect. By this note Mr. Champion has completely cleared away difficulties which had been often a stumbling block to many collectors.

In the *Ent. Mo. Mag.* (vol. xxxvii., p. 91) and in the *Ent. Record* (vol. xiii., p. 337) are articles by Mr. Champion and Mr. Donisthorpe, dealing with the British species of *Limnius*, a plate being given in the *Record* to make clear the points in dispute. I must say that at present the whole matter is left in a thoroughly unsatisfactory state, and it must remain so, until some careful worker takes up this question and both by field work and by thorough microscopical examination of numerous specimens, settles the point as to which species of this genus really are found in this country. Perhaps Mr. Edwards, who is responsible for the plate, will devote himself to the problem.

The year has been, if not productive of new species, prolific in the way in which rarities have turned up, in many cases quite commonly. I may mention *Centhorrhynchidius niectus*, Muls., at Porlock, *Odontopus mobilicornis*, F., at Woking and Tunbridge Wells, *Medon castaneus*, Gr., at Richmond, *Tarsotenus mirittatus*, Rossi, at Harwich, *Lytta resicatoria*, L., in Cambridgeshire, *Anthaxia nitidula*, L., *Agrilus sinuatus*, Ol., *A. viridis*, L., *Platydemus violaceum*, F., *Velleius dilatatus*, F., in the New Forest, and *Chrysoneta cerealis*, L., on Snowdon, a rather remarkable list for one year, due perhaps to the exceptionally hot and prolonged summer of 1901.

The reproach so often made against British coleopterists that they give themselves up entirely to collecting and to synonymical work, can hardly be sustained this year, as we have had quite a crop of valuable papers, dealing with life-histories and other problems of beetle-life. In the *Ent. Mo. Mag.* there have been notes (p. 15) on a Braconid parasite of *Anobium domesticum*, Fourc., by the Rev. W. F. Johnson, a matter of importance from an economical point of view, considering the serious destruction wrought by this beetle in valuable old furniture; on the habits of *Orochares angustatus*, Er., by Mr. Champion (p. 48); on *Encephalus complicans*, Westw., by Mr. C. Morley (p. 151), with his observations on the way the abdomen is carried by various species of *Brachelytra*; on the pairing of *Lampyris noctiluea*, L., also by Mr. Morley (p. 226), an interesting account of a number of experiments he was able to make on this point, and lastly two notes (pp. 256, 280), on the fact that *Attelabus*

curculionides, L., rolls the young leaves of the hornbeam and sweet-chestnut as well as those of oaks. Attention should also be drawn to a note by Mr. Morley (*Ent. Mo. Mag.*, p. 64) on *Harpalus frölichii*, Sturm, though I am afraid he has built up a very interesting theory of the complete disappearance of this insect from Britain on entirely insufficient grounds. In the *Ent. Record* several valuable articles have appeared, notably a most thoughtful and painstaking one by Mr. W. E. Sharp (pp. 147 *et seq.*) on "The Distribution of the British Coleoptera." This paper is too lengthy to attempt to summarise in this brief retrospect of the year's work, I can only strongly commend it to the attention of all those interested in the problem of the present distribution of our fauna. The author has certainly adduced strong evidence in favour of the hypotheses he puts forward, to account for the many apparent anomalies which meet us on every side, when we attempt to unravel the mysteries of this question. Mr. Tutt, in continuation of previous notes, has gathered together from all sources a mass of information on the "Migration of Coleoptera," (pp. 281 *et seq.*). The author has shown again his extraordinary powers of assimilating and presenting in an attractive form, details which in other hands might often prove overwhelming to the student.

In the same journal Mr. Donisthorpe has given, on p. 349, the first instalment of the work he has now been engaged on for many months, in a paper entitled "Some Experiments with *Myrmecophilous Coleoptera* and an observation nest of *Formica rufa*." These experiments are most instructive and are certain to prove most important in laying the foundation for an exact knowledge of the relationship which exists between hosts and guests in the nests of ants. Having had the pleasure of several times seeing this observation nest, and of watching the observations going on, I can personally testify to the extreme accuracy of the records, and to the great amount of time and labour Mr. Donisthorpe is giving to this work, which he has so specially made his own.

The *Transactions of the Entomological Society of London* for the past year also bear testimony to this new line of activity. Mr. Donisthorpe's paper on "Mimicry, protective resemblance, etc., in British Coleoptera," read at a meeting of the Society on June 5th, gave rise to an animated discussion, and brings together into a convenient form for reference a large amount of information on this point, much of it quite new and original, the result of the author's careful notes based on his field work during many years. Another valuable paper is one by Mr. Champion on "Sexual Dimorphism in *Euprestis sanguinea*, Fabr.," illustrated on p. 384 of the *Transactions* by a beautiful plate. Interesting observations were made by the author and Dr. Chapman on the habits of this species during a visit to Spain last summer, and the paper is another warning of the extreme danger of making colour an important specific character when dealing with coleoptera.

The activity of our workers has not however been confined to the coleoptera of Great Britain, as we have had papers during the year on "The Coleoptera of the Faroë Islands," by Dr. Reuter (*Ent. Mo. Mag.*, p. 3), on "A Spanish *Bembidium*," by Dr. Sharp (*Ent. Mo. Mag.*, p. 37), in which an account is given of the species of this genus, which live habitually on the verge of melting snow-fields, and therefore always

at considerable altitudes; on "Coleoptera round about Jerusalem," by Mr. Swinton (*Ent. Mo. Mag.*, p. 156); on "The Coleoptera of Madeira," by Dr. Cameron (*Ent. Mo. Mag.*, p. 220), in addition to descriptive papers which have appeared in the *Transactions of the Entomological Society of London*.

Mention must be made here of an excellent local list printed in one of the "Handbooks" issued by the Local Committee for the Glasgow meeting of the British Association. This handbook was devoted to the "Fauna, Flora and Geology of the Clyde Area," and contains lists of all the various orders. The order Coleoptera was undertaken by Mr. A. Fergusson. Copious references are given, and many notes of the habits of local species, and, though the list is nothing like so complete as the Chatham list of Mr. J. J. Walker, for instance, still it is very good, and will prove invaluable to anyone collecting in the Clyde area. In view of a remark* on p. 380 of the *Ent. Record*, vol. xiii., it may be well to point out that the British Association has nothing to do with the preparation or printing of these handbooks. The work is entirely undertaken by the Local Committee which is always formed in each town where the Association meets.

Looking back over the past year I think, in view of the above facts, that we may fairly congratulate ourselves that it has been a period of progress and general activity in the field of work we have considered in this article—more especially in the wider view we all seem to be taking of the true limits of our corner of the scientific world.

* Due entirely to the overwhelming ignorance of the Editor, for which we apologise. Our remarks were based on the separata from the *Handbook* referring to the "Macro-Lepidoptera," and the "Tenthredinidæ"; now that we are in possession of the whole *Handbook*, and the facts of publication, and understand completely the scope of the work undertaken by the Committee, we appreciate the action that led to the limitation of the various lists. The *Handbook*, as a whole, is an excellent one, although no part will be considered sufficiently full by the specialists who wish to use it.—ED.

Three weeks in Spain.

By (Mrs.) MARY DE LA B. NICHOLL, F.E.S.

Arriving in Barcelona on May 8th, 1901, I found that my friend, Mr. Witty, would not be free to start for Granada before the 14th. This arrangement gave me several days in Catalonia, and I resolved to make a short excursion to the Caldas de Maravilla, a place on the railway, about fifty miles north of Barcelona, where there is a new hotel and a nice well-wooded country. I should have much preferred to explore the Mont Sény, a fine range of mountains about 5000ft. high, and about twelve miles from Caldas de Maravilla, but the snow was still lying on their summits, so it was too early for the high ground, and I resolved to try the low, undulating slopes between Mont Sény and the Mediterranean. Caldas de Maravilla is a nice place, with hot springs, surrounded by rich, well-watered meadows, and many cork woods, with pine clad, broomy hills to the eastwards, and several rapid streams. Birds were abundant, but not butterflies; there was no quantity of anything out, and my bag was a very small one, though the weather was tolerably fine, and I worked hard for three days. I believe that I was about ten days too early for most species, as every one assured me that butterflies swarmed about the

end of May and during June; and, in fact, I never saw a place that looked more promising. I took here:—*Papilio podalirius* var. *feisthameli*, *Thais rumina* (1), *Euchloe cardamines*, *Leptidia sinapis*, *Vanessa atalanta*, *V. io*, *Melitaea aurinia* var. *provincialis*, *M. phoebe*, *Brenthis dia*, *Pararge egeria* var. *egerides*, *Thestor ballus* (1 much worn ♀), *Lampides telicampus*, *Nomiades melanops*, *N. cyllarus*, *Polyommatus corydon*, *P. bellargus* (♀ 1), and a few other very common insects.

Mont Sény would, I think, probably repay the attention of some of our more enterprising entomologists, it is practically unworked, very accessible from Barcelona, and possesses tolerable accommodation for tourists. Mr. Witty spent two days there in June last (the 23rd and 24th), and I venture to send the list of his captures. The most interesting is *Erchia erias*, a variety with only two ocelli, instead of three, on the forewings. I possess a specimen which may perhaps be the var. *hispanica*, given in the new Staudinger-Rebel *Catalogue*. *Papilio podalirius* var. *feisthameli*, *P. brassicae*, *P. rapae*, *P. daplidice*, *Anthocaris helia*, *Euchloe cardamines*, *Leptidia sinapis*, *Colias edusa*, *Gionepteryx rhamni*, *G. cleopatra*, *Thecla ilicis*, *Chrysophanus alciphron* var. *gordius*, *C. phlacas*, *Plebeius argus*, *Polyommatus medon*, *P. icarus*, *P. bellargus*, *P. corydon*, *Cyaniris argyolus*, *Nomiades semiargus*, *Libythea celtis*, *Charaxes jasius*, *Apatura ilia* (very rare in Spain), *Polyommia egea*, *P. c-album*, *Vanessa urticae*, *Vanessa io*, *V. atalanta*, *V. cardui*, *Melitaea phoebe*, *M. didyma*, *M. athalia*, *Brenthis dia*, *Argynnis adippe*, *A. lathonia*, *A. pandora*, *Melanargia lachesis*, *Erchia erias*, *Satyrus circe*, *S. semele*, *Pararge hiera*, *P. megacra*, *P. egeria*, *Epinephele jurtina* (*janira*), *E. ida*, *E. pasiphacae*, *Coenonympha arcania*, *C. pamphilus*, *Spilothyris althaeae*, *Syrichthus carthami*, *S. malvae*, *Hesperia thaumas*, and *Pamphila sylvanus*, a total of 54 species in two days.

Mr. Witty and I arrived at Granada on May 16th, and thoroughly appreciated the beauty of that Moorish paradise, and the comfort of the Hotel de los Siete Suelos, after travelling two days across the dull ugliness of the central plateau of Spain, and sleeping two nights in railway carriages. The town of Granada is situated rather more than 2000ft. above the sea, and the hill of the Alhambra rises about 200ft. above the town. Our hotel is beautifully situated in the wooded park outside the ancient palace, and immediately behind it the hill slopes steeply up to an old fortification, which guards the western end of a rough ridge, about four miles in length and one mile in width, 3000ft. in height. This ridge falls in steep and well-wooded declivities to the Darro, on the north, and in broken precipices and rocky glens to the Genil, on the south. It is "coto," *i.e.*, preserved, which means that grazing and shooting are forbidden and no strangers allowed to wander about, excepting only such as may be staying at the Hotels Roma and Siete Suelos. A very small part of this hill is cultivated; insects, as well as game, find safety there, and it may be recommended as good hunting ground, quite exceptionally so, for Spain. We explored it from end to end, and thoroughly enjoyed its variety—cork and pine woods by the Darro, rocky glens towards the Genil, hollows overgrown with cistus, broom and lavender; little mountain meadows brilliant with flowers, stony patches on the summit, rushy hollows here and there, were all interesting, and all produced different insects. There is a good spring in one of the glens on the south side, but it is not easy to find. We spent three

delightful days wandering about this ridge, which commands splendid views on all sides, especially towards the south and south-east, where the range of the Sierra Nevada displays all its snowy peaks, white and glittering, and very near, against the blue southern sky. I give the list of our captures for May 18th, 19th and 20th:—*Papilio polalirus* var. *feisthameli*, *P. machaon*, *Zegris eupheme* var. *meridionalis*, *Pieris daphidice*, *Anthocaris belemia* var. *glauce*, *A. tagis*, *A. belia* var. *ausonia*, *Euchloe euphenoides*, *Gonepteryx cleopatra*, *Leptidia sinapis*, *Melitaea phoebe* var. *occidentalis*, *M. athalia* var. *iberica*, *M. deione*, *Pararge egeria* var. *egerides*, *Melanargia ines*, *M. syllius*, *Lampides boetica*, *L. telicæus*, *Polyommatus baton* var. *panoptes*, *P. astrarche*, *P. bellargus*, *Nomiades melanops* (much larger than in Catalonia or on the Riviera), *N. semiargus*, *P. icarus*, *Thanaos tages* var. *cercantes*, *Spilothyrus althæae* var. *boeticus*, *Syrictus sao* var. *enrate*.

May 21st we took diligence to Lanjaron, a small watering-place on the southern slope of the Sierra Nevada, where we found good quarters at the Hotel San Roque (entirely Spanish). Lanjaron is a very picturesque place, overlooking the lower hills to the southwards down to the Mediterranean, with fine orange orchards and vineyards all round, ridges rising to the snow immediately behind, and steep glens falling in precipices to the hot, lower valleys, close below the town. Here we spent six days, three of which were hopelessly wet, and the other three only partially fine, so we did not meet with much success with the butterflies. We made three attempts to ascend the ridge behind the town, but as soon as we got about 1000ft. up it, we always came into the clouds, which got thicker the higher we went, so that by the time we reached the snow we thought it best to turn back for fear of losing ourselves. Descending into the glens below us, we found much the same insects as at Granada, only in smaller numbers. *M. deione* was, however, very plentiful, and we got some nice specimens of *P. corydon* var. *albicans* flying in scorchingly hot dry watercourses, where they were scarcely distinguishable from the white rocks they haunted. *E. ida* and *E. pasiphæ* were both common among the cistus, and *E. jurtina* var. *hispulla* was out in some numbers—replacing the type. *A. lathonia* and *A. pandora* also made their appearance, but only very few of these were seen. On the 27th we returned to Granada, and there spent three more very wet days, impatiently watching the clouds, which did not lift till the 30th, when I had two more delightful days on the “coto” ridge. I found *E. pasiphæ* and *E. ida* plentiful, also *Aporia crataegi* and *Thecla ilicis* just out, but nothing very remarkable. The larvæ of *S. proto* swarmed on the sage bushes, and I collected several, from which two excellent specimens were reared by Lord Walsingham. On June 1st I left Granada with much regret, and by travelling straight through reached England on the 4th, after an enjoyable and successful excursion, notwithstanding the wet weather, which is very unusual in Spain so late in the spring.

***Apis dorsata*, Fabr., considered in the light of Domestication.**

By R. HAMLIN-HARRIS, F.R.M.S., F.Z.S., F.E.S.

It is now some years since the idea was first conceived, that by the introduction of *Apis dorsata* (known as the Giant Bee of India), a

valuable addition to our fauna would be obtained, yielding a larger quantity of honey and wax, and generally more profitable than our honey-bee, *Apis mellifica* and its different varieties—var. *liqustica*, var. *carniolia*, etc. According to Dalla Torre :—

Apis dorsata, Fabr., occurs in Assam, India and Java (♀ ♂ ♂). Var. *bicolor*, Klug, occurs in Assam, India, Ceylon and Java. Var. *testacea*, Smith, occurs in Assam and Borneo (♀ ♂). Var. *zonata*, occurs in Assam, Celebes (♀) and the Philippines. [The var. *zonata* also occurs in India, which is not mentioned by Dalla Torre.]

About three years ago a special enquiry was set on foot to ascertain whether or not the Giant Bee of India was really a suitable subject for domestication. At that time I was permitted to look over various reports at the India Office, and all these agreed that *Apis dorsata*, mentioned generally under native names, could not be domesticated on account of its intractable character. The chief points noted are:—

1. It is said to be exceedingly vicious, often attacking man or beast on the smallest provocation.
2. It preserves the same habits and appearance wherever its habitat.
3. It has never been known to build its nest under shelter, but mostly on isolated lofty trees or overhanging rocks.
4. After the honey season the bees will desert their nests, and often travel for long periods and great distances, even crossing such mountain chains as the Nilgheris in their course.
5. They build single combs.
6. And are used to approach from north, south, east, or west.
7. They rarely remain in one locality for more than three weeks, emigrating as flowers become scarcer.

We will consider these points more in detail, to make the subject better understood. Among the hill-men, near Darjeeling (Eastern Himalayas), this bee is known by the name Cargoo, and is generally an object of fear and dislike—according to Sladen. It will be readily seen that the risk of introducing such a bee, even were it possible, into a thickly populated country would be too great. Not only the hill-men of Darjeeling find *Apis dorsata* an undesirable neighbour, but all are agreed on the subject who have had any experience in the matter. Interesting, however, is the way in which the natives of the Malay Archipelago, for instance, take the comb and honey, showing much courage on their part. Perhaps, also, the *Apis dorsata* may be somewhat less dreaded in the islands than on the mainland of India. The native, having located the nest (built some 70 to 80 feet from the ground, sometimes even more*), repairs by night to the spot, and after a wearisome climb, sometimes lasting an hour, with only the smoke fumes of a torch, drives the bees away from the combs, which are then severed from the boughs and let down by cords to his helpers below. Such a rough and ready style of proceeding must necessarily aggravate the bees, and stings, as one may suppose, are plentiful; still the tribesmen do not seem much concerned. It is well known that one of the greatest obstacles to the domestication of this bee is its natural wildness and its inability to settle permanently in one spot. When we consider that *Apis dorsata* usually makes its nest in wild and rocky country, only remaining in one locality so long as flowers abound, we shall better realise why it moves from place to place, and the importance of so doing to its general welfare. Therefore we see that only by completely altering its natural habits could we hope to domesticate this bee, or bring it into use under differing circumstances

* This is for protection against the bears, which are (as is known) fond of honey, and would climb the trees in search of it.

from those in which it has always lived. Also on account of its size, and the power of its flight, the Giant Bee will travel as much as a hundred miles before again settling down to home life.* It is not so much the honey gathered by these bees which is valuable to the natives, but the large quantities of comb they produce, the latter, being melted down into wax, forms a valuable article of industry in India. The hill-men do not trouble much about the honey, but are said to eat the young bees and larvæ with great gusto. Another hindrance to domestication is the way they build their nests, quite in the open, entirely unprotected, and always single combs from about five feet to six feet in length, and about two feet to three feet in depth. Some fine specimens of these combs are to be seen in the South Kensington Natural History Museum. When a species of insect has been used to certain habits for endless generations, in fact has never known any others, it will be readily understood how difficult would be the problem presented to us did we attempt to keep such a refractory creature in confinement. The only attempt made seems to have been a failure. A queen bee was tied by a thread to a stick and placed in the hollow of a tree, and after two to three months a very small piece of comb was found, and the experiment proving useless was abandoned. Since this a writer to the last Government report says that "He had seven hives all well and fed for the winter," but in the spring the "little brutes" decamped by twenty and thirty a day, until each queen in turn left its hive in disgust. Clipping the queen's wings, as is done in modern bee-keeping, would prove fatal to *Apis dorsata*. On account of her uncontrollable character she would probably be lost. The question arises, if we cannot domesticate *Apis dorsata* itself, could we by judicious crossing attain the desired end? The best answer to this question will, I think, be found in the fact that European bees exist which are closely allied to a species found in northern India, which never crossed with *Apis dorsata*. All these facts considered, there only remains *Apis indica*, very similar to our European bee, with which domestication might be a success, but if any real advantage would arise therefrom or not is doubtful, but no doubt can remain that the facts relating to *Apis dorsata* must for ever bar the way to its domestication.

* *Apis dorsata* is, however, inclined to fly somewhat clumsily, and to visit flowers somewhat listlessly.

Notes on the British Myrmecophilous fauna (excluding Coleoptera).

By HORACE DONISTHORPE, F.Z.S., F.E.S.

Ants' nests, as is well known, are inhabited all over the world by many different kinds of creatures. These occur in such situations from various reasons. Some are true guests of the ants, being fed by them like their own offspring; from others, such as some of the beetles, aphides, and scale insects, the ants obtain sweet juices which are excreted by them. Many are scavengers in the nests, feeding on the dead bodies of the ants and their prey, waste vegetable substances and other refuse. Others, again, are parasites in the true sense of the word, living in, or on, the ants themselves, their eggs, or larvæ. Numbers are more or less like ants in appearance, such as some spiders, beetles, bugs, etc., and these "mimics" are generally found

with ants, if not actually in the nests, their resemblance to the ants protecting them no doubt from outside enemies. Some creatures only pass their earlier stages in the nests, being always found at large in the perfect stage. Finally there are the chance guests, which, though not always occurring with ants, are very often found with them. The myrmecophilous fauna, with the exception of the order coleoptera, having been much neglected in this country, and such records as there are being very fragmentary and scattered, I have endeavoured to collect together all the available information published on the subject. I also record for the first time my own captures, some of which are new to this country, and my experience of the habits of the insects. I would here especially thank Messrs. Buckton, Collin, Enock, McLachlan, Michael, Morley, Saunders, Sinclair, Verrall and the Rev. O. Pickard-Cambridge, for kindly helping me in their different orders.

LACERTILIA.—*Anguis fragilis*.—My friend Mr. A. J. Chitty, tells me that he has frequently taken the slow-worm in the nests of *Formica fusca*, at Dorington, in Kent. I think this is worth recording, as the *Amphisbaena*, a blind, snake-like lizard lives in the nests of the leaf-cutting ants on the Amazons. In Guiana, a legless lizard, *Cocilia annulosa* (sometimes called the double-headed snake, its body being equally thick at both ends), lives in the nests of the leaf-gathering ant.

HYMENOPTERA.—*Formicidar*.—*Solenopsis fugax*, Ltr.—This small robber ant lives at the expense of other large species of ants. Sir John Lubbock says (*Ants, Bees, and Wasps*, p. 78), "It makes its chambers and galleries in the walls of the nests of larger species and is the bitter enemy of its hosts. The latter cannot get at them, because they are too large to enter the galleries. The little *Solenopsis*, therefore, is quite safe, and, as it appears, makes incursions into the nurseries of the larger ant, and carries off the larvæ as food." Sharp figures a nest of *Formica fusca* with chambers of this little ant in it (*Camb. Nat. Hist., Insects*, pt. ii., p. 137). Wasmann records it from Europe and North Africa with nearly all the larger species of ants (*Myrm. u. Term. Art.*, 1894, p. 162).

Formicoxenus nitidulus, Nyl. (*Stenammina westwoodi*, aut.).—This is another species found with larger ants. Sir John Lubbock (*loc. cit.*, p. 78) says, "The little *Stenammina westwoodii*, is found exclusively in the nests of the much larger *F. rufa*, and the allied *F. pratensis*." Wasmann (*loc. cit.*, p. 162) gives the same two species as its normal hosts, and Sharp (*loc. cit.*, p. 160) adds *F. congerens*. Mr. Chitty and I took it in a nest of *Formica rufa*, in the Blean Woods, in May, 1901.

Formica sanguinea, Ltr.—This is the slave-making ant, for which purpose it chiefly uses *Formica fusca*. Sharp (*loc. cit.*, p. 150) says that *F. cunicularia* and possibly *L. flavus*, are also utilised by *F. sanguinea* in England. Their expeditions to attack neighbouring nests, and methods of obtaining slaves are too well known to be entered into here. Many other species of ants besides *F. fusca* are found in their nests. F. Smith writes in the *Ent. Annual* for 1868, p. 94, "I have received from a young and most observant hymenopterist, a list of species found in a nest of *F. sanguinea*, at Shirley; . . . *F. fusca*, common; *F. nigra* and *F. flava*, several specimens; *Tapinoma erraticum*, *Myrmica ruginodis* and *M. scabrinodis*, common; *M. lobicornis*, the workers very abundant, but only one female; *Leptothorax accororum*, all the sexes, abundant in August; *L. nylanderii*, several specimens."

Lasius flavus, Deg.—I found a colony of this ant using the same tree as a nest of *Lasius fuliginosus* at Lymington, both species coming in and going out together.

Ponera contracta, Ltr.—Farren White records (*Ants and Their Ways*, p. 239) that "Mr. Janson found it in company with *F. fuliginosus*. I have a specimen found in the same situation, presented me by Mr. Shepherd, of Fleet Street." I took a specimen in a nest of *Formica fusca* at Doddington, Kent, in May, 1901.

Leptothorax acervorum, F.—Farren White records (*loc. cit.*, p. 171) finding it with *F. sanguinea* on Shirley Common. I have taken it in the nest of *F. rufa* at Weybridge.

Leptothorax nylanderii, Foerst.—F. Smith says (*loc. cit.*, p. 94), "The *Leptothorax nylanderii* has never been found in any other situation than in ants' nests, usually those of *Formica rufa*." I have taken several specimens in the nest of *Lasius fuliginosus* at Oxshott.

Asemorhoptrum lippulum, Nyl. (= *Stenammina westroodi*, West.).—This ant does not appear to be looked on as myrmecophilous, Wasmann (*loc. cit.*, p. 162) says, "The true *Stenammina westroodi*, Westw. (*Asemorhoptrum lippulum*, Mayr.) is not myrmecophilous." I think, however, that the following notes prove that it has some claim to be considered so. F. Smith (*loc. cit.*, 1860, p. 92) writes: "I took this rare ant twice in the nest of *Formica fuliginosa*," again (*loc. cit.*, 1861, p. 42): "I may here record the capture of *Myrmica lippula* in the nest of *Formica fuliginosa* by Mr. Edwin Shepherd; Mr. Janson, as well as myself, has also previously found these ants in company"; and (*loc. cit.*, 1863, p. 59), "This minute ant appears to be a constant resident in the nests of other species, at least in this country; whether it is found invariably in such situations throughout Europe, I am not prepared to say, but I have never found it separated from other ants. Mr. Janson and also Mr. Shepherd, find it in nests of *Formica fuliginosa*. I have also myself found it in company with the same species, but sparingly. In May last it occurred in some numbers in ants' nests near Highgate. . . . I am inclined to believe that *M. lippula* never constructs its own nest, but resides constantly with species of *Formicidae*." Farren White says (*loc. cit.*, p. 243), "Mr. Janson has found it in company with the jet ant, *F. fuliginosa*. I have found it at Charlton, Kent, in company with *F. umbrata*." Finally I have taken seven specimens at different times during the last few years in a nest of *Lasius fuliginosus* at Oxshott.

Myrmica scabrinodis, Nyl.—Farren White says (*loc. cit.*, p. 240), "I have found it occupying one side of the raised mound of *flava*, and also sharing with this species the shelter of the same stone." I have found it with the same species in the Isle of Wight, and twice in the nests of *Formica sanguinea* at Weybridge.

Myrmica laevinodis, Nyl.—Sharp (*loc. cit.*, p. 148) says, "It sometimes lives with *F. rufa* in perfect harmony."

Myrmecina latreillii, Curt.—I took two specimens of this ant in a nest of *Lasius niger*, at Doddington, May, 1901.

Pezomachidae.—*Pezomachus vulpinus*, Grv.—F. Smith (*loc. cit.*, 1861, p. 41) says that *P. vulpinus* and *P. micropterus* were both found in the nest of *F. rufa*. Wasmann (*loc. cit.*, p. 167) says the former is a parasite on *F. rufa*.

Microcryptus nigrocinctus, Grav.—I took several ♀s in a nest of

Myrmica lacrinodis in Wicken Fen. In the same nest the beetle *Myrmedonia collaris* occurred in some numbers. They bear a very strong superficial resemblance to each other, both being of the same colour.

Proctotrupidae.—*Lagynodes pallidus*, Boh.—I have taken this species in the nest of *Lasius fuliginosus* at Oxshott.

Bethylus formicarius, Curt.—I took a specimen of this little creature in the nest of *Lasius fuliginosus* at Oxshott.

Litus cynipseus, Hal.—In May, 1901, I bred a number of ♀s of this species out of my observation nest of *Lasius niger* from Portland. Mr. Enoch, to whom I sent them, and who named them for me tells me it is one for whose nidus he has looked everywhere. These creatures live in the eggs of other insects, and Mr. Enoch thinks it highly probable that they bred out from the eggs of the ant.

Diapria acydata, Thoms.—I took a specimen of this creature on April 4th, 1901, out of a patch of *Formica rufa* at Weybridge, "massing" on their hillock. Mr. Morley who named it for me, tells me he took a specimen on April 2nd, 1899, by beating near a nest of *Formica rufa*, in Bentley Woods.

LEPIDOPTERA.—*Myrmecocla ochraceella*, Tgstr.—Of this species Buchanan White writes in the *Scottish Naturalist* (vol. i., 1871-2, p. 258), "About the end of June, and in July, if we examine the blades of grass in the vicinity of a nest of the hill ant, in Perthshire or other parts of the north of Scotland, we shall probably see several specimens of a small yellowish-ochreous moth perched upon them. Sometimes when disturbed they get on the nest and enter some of the doors: the ants appear, strange to say, to be generally rather frightened of them. The eggs are laid in, or on, the nest, and the caterpillars, which are white with brown heads, and with a few scattered hairs, feed upon the decaying vegetable matter of which the nest is composed. As, however, a fat juicy larva would be a morsel too tempting to escape the jaws of the ants, the caterpillar constructs long galleries of small twigs, leaves, etc., fastened together with silk, and thereby protects itself from its hosts. The caterpillar lives during the autumn, winter and spring, and about the beginning of June assumes the pupal state inside the gallery. The puparium is about a third of an inch in length, slender, and yellowish-brown in colour. In Britain, *M. ochraceella* has only been found in Scotland." Wasmann (*loc. cit.*, p. 170) gives *F. rufa* and *F. pratensis* as its hosts. I have taken it at Rannoch, at the end of June, by stirring up the hillocks made by *Formica rufa*, when the insect flies out.

DIPTERA.—*Ceratopogon myrmecophilus*, Egger.—I took a ♀ of this species in a nest of *Formica rufa* at Oxshott, in 1898. On May 14th, 1901, I bred a ♂ out of my "observation nest" of *F. rufa*. This species is new to Britain.

Phylomyza securicornis, Flh.—In the *Ent. Mo. Mag.*, xxx., p. 116, Mr. Verrall introduced this species as British, and mentions that he took some ♂s at Braemar in July, 1873, by sweeping over nests of *Formica rufa*. I have taken ♀s in the nests of *Lasius fuliginosus* and *F. rufa*, at Oxshott. In the former nest I have noticed the flies coming out of the small hole at the end of the entrance of the nest into the tree. On April 29th and 30th I captured ♂s which had bred out of my "observation nest" of *F. rufa*. On May 2nd I captured another ♂ which had just emerged from my nest, the wings not being

yet developed. The wings reached the natural size in about five minutes. On May 16th, I took another ♀ from the *Lasius fuliginosus* nest at Oxshott.

Platyphora lubbocki, Verrall.—This creature was described by Mr. Verrall from a specimen taken by Sir John Lubbock in ants' nests.

Phora formicarium, Verrall.—This species is parasitic on *Lasius niger*. Sir John Lubbock says (*loc. cit.*, p. 26): "If a nest of the brown ants be disturbed at any time during the summer, some small flies may probably be seen hovering over the nest, and every now and then making a dash at some particular ant. These flies belong to the genus *Phora*, and to a species hitherto unnamed, which Mr. Verrall has been good enough to describe for me. They lay their eggs on the ants, inside which the larvæ live." Westwood (*Mod. Class. Insects*, ii., p. 575) says: "I have repeatedly observed, on disturbing the nest of the common brown garden ant, a very minute species of *Phora*, hovering over, and flying upon ants." Mr. Collin tells me he considers this species mentioned by Westwood to be *P. formicarium*, and that he has taken the species by sweeping over ants' nests in Mr. Verrall's paddock at Newmarket.

Scatopse infumata, Hal.—I have taken this species in the nest of *Lasius fuliginosus* at Oxshott.

Sciara, sp. ? 1.—I took a species of this genus, of which several are recorded with ants on the continent, in the nest of *Formica rufa*, at Oxshott. I have since bred this species in numbers out of my "observation nest" of *F. rufa*. I took the first specimen in my nest on April 9th, and saw it constantly after that up to the end of July, when I went away. It does not fly much but walks quickly dodging out of the way of the ants, who appear to pay no attention to it.

Sciara, sp. ? 2.—I took this species in the nest of *Lasius fuliginosus* at Oxshott, on April 2nd and 12th, 1901.

Sciara, sp. ? 3.—I took this species with *F. rufa* at Oxshott in 1900, and with *L. fuliginosus* on April 26th, 1901, also at Oxshott.

Trineura, sp. ?—I have taken a species of this genus, of which several are recorded with ants on the continent, in the nest of *F. rufa* at Oxshott. Westwood (*loc. cit.*, p. 234) records that, on disturbing nests of *F. fusca* he noticed a small species of this genus hovering over the nest and darting at the ants. Wasmann in quoting this record (*loc. cit.*, p. 175) considers that from the description of the nest the ant must have been *F. rufa* and not *F. fusca*.

Microdon, sp. ?—I have seen several of the curious larvæ of a species of *Microdon* in the British Museum. They were taken by Miss Simpson at Kendal, in Westmorland, in a nest of *Formica fusca*, in 1900.

Erebia athiops and its Variation.

By H. MOUSLEY, F.E.S.

I remember some few years ago receiving a letter from a correspondent in which he said: "I wish you collected something more than the butterflies, there is so very little to be done with them, and exchanging becomes a difficult matter." I think, if we obtain a copy of the *Proceedings of the South London Entomological Society* for the year 1895, and read Mr. Tutt's interesting paper on the above insect, and then spend a few days every August for two or three years (the

same as the writer has done) netting and examining hundreds of this insect for aberrations, we shall come to the conclusion that there is a great deal more to be done with one species only of the butterflies than most of us imagine. However, to return to my subject, the ground on which I collected is the most southern in England, so far as I know, where *E. æthiops* is taken, and lies about 30 miles north of Bradford, the elevation being some 700 or 800 feet above the sea-level, and the grassy openings in a large wood the favourite haunts of the species. Referring to the paper already mentioned, we notice that all the specimens exhibited—some 320—were either Scotch or European, and as mine are all English, they should prove interesting from the point of view of comparison.

To begin with, I may say all the specimens are very uniform in size, the females slightly larger than the males, as a rule, and the general colour of both sexes is of a rich velvety black-brown, with the bands well developed. On examining the uppersides of both sexes I find there is no specimen in which the double ocellated spot, or the spot in section 5 of the forewings, is not present, whilst none have more than six on the fore- and five on the hindwings, with three as the least in both cases. On the undersides, five seems to be the most in both cases, with two as the least on the hindwings only. Taking the uppersides of the males first, only three specimens have four spots developed on all four wings; two have four on the fore- and three on the hindwings, and some in both sexes are unequally spotted, having four on the right and three on the left, and *vice versa*, and these I have labelled ab. *inequalis*. Besides these, there is a form in which the bands on all four wings are broken up into little rings surrounding the ocellated spots, which gives the specimens a very dark appearance when compared with the type, and these I call ab. *nigra*. In all, only four answer to this description, with a fifth, which is a very extreme form, and practically comes under the heading of ab. *obsolata* (Tutt, *Brit. Butts.*, p. 432), and which I recorded in *Ent. Record*, 1899, p. 269. On the forewings the black spots and white eyes are very small indeed, with only a few red scales appearing in sections 1 and 2. On the hindwings the spots and eyes, with a few red scales surrounding each, are so very minute indeed that a magnifying glass has to be used to make them out at all clearly. In addition to this, the whole ground colour has more of a grey tone about it, and is not nearly so rich as in the type. This brings us to the females, and by far the most interesting specimen I possess is the one recorded in *Ent. Record*, 1900, p. 297. On the forewings the six spots are arranged in sections 1, 2, 3, 4, 5, 6, a very rare occurrence indeed; and, as regards the uppersides of the hindwings, and the undersides of both the fore- and hindwings, there are five spots developed in every case, making in all a total of 12 spots for this insect. Others have five developed in sections 2, 3, 4, 5, 6, and two have it in sections 1, 2, 3, 4, 5. These two, with the previous one already mentioned, are the only three examples that have the spot developed in section 1, out of many hundreds that must have passed through my hands, thus bearing out what Mr. Tutt says, *viz.*, that it is more of a Continental than an English form. Those having four spots are all, without exception, placed in sections 2, 3, 4, 5, as also those with three spots in sections 2, 3, 5. We now come to the form corresponding with that of the

males where the bands are broken up into little rings, and in which the whole ground colour is of a much greyer tone, and these I have called ab. *pallida*. Only five examples were obtained, and in each case four spots are developed on the forewings. Before concluding the uppersides there is still one more form to be mentioned, and that is the ab. *flavescens*, Tutt, in which the fulvous bands of the females are of a pale yellowish, instead of orange-red. Only two of my specimens fall under this head, and, strangely enough, they happen to be the one containing the six spots, and also one of the two containing the five spots in sections 1, 2, 3, 4, 5. With regard to the undersides of the males, the usual form has only three spots on the forewings in sections 2, 3, 5, but I have two with four in sections 2, 3, 4, 5.* To make quite sure of the hindwings it is absolutely necessary to use a magnifying glass, as in many cases the white points are almost indiscernible to the naked eye. I have gone carefully over some hundred or more male and female specimens, and find that the usual number is three or four. Nine males have five spots and fifteen females the same number more or less developed, whilst only two females have two, and one female six on the right wing only. Two striking aberrations in the males are worth recording. In the one the bands on the fore- and hindwings are almost obsolete, with the spots very small indeed, and in the other the whole ground colour is of a very pale grey, with the bands on the forewings higher than in the type, and more resembling those of the females. The only two other forms that I have to mention, and which both belong to the females, are the ab. *ochracea*, in which the two areas that are grey in the type become distinctly ochreous, and the ab. *leucotaenia*, Stdgr., which is an extreme form of the type, the whole fascia becoming almost white. In this particular locality the ab. *ochracea* far outnumbers the type, and I have been able to obtain some very beautiful and striking examples. Only one specimen comes under the heading of ab. *leucotaenia*, and in this the red-brown transverse band is very much restricted and broken up, allowing the two grey bands to join one another along the whole length of the inner margin, and for about one-third of the distance up towards the costal margin, and beyond this the brown band is twice broken up, allowing the grey bands to go through and join one another again. This gives the wings a very white and silvery appearance, which is increased owing to the outer brown marginal area being somewhat narrower than in most specimens, and of a very pale colour.

Before concluding I have to thank Mr. Tutt for a series of the forms he took at Susa, an account of which will be found in *Ent. Record*, 1898, p. 120. These are much larger than our English ones, and very well ocellated. The undersides of the males are much darker, and one interesting specimen amongst the females has four spots developed on the upperside of the forewings in sections 1, 2, 3, 5, a form which certainly must be very unusual with us. Finally, on comparing my notes with those of Mr. Tutt, I think we may safely come to the conclusion that the species in its most southern English locality is a

* In the females the usual number is three, and four, in sections 2, 3, 5, and 2, 3, 4, 5, respectively, but one specimen has the four spots in sections 2, 3, 5, 6. Only one has the five spots in sections 1, 2, 3, 4, 5, but four have them in sections 2, 3, 4, 5, 6.

well-spotted race, with a tendency, if anything, in the males to develop broken bands, and in the females to suppress the underside coloration of the type and develop that of the ab. *ochracea*.

The Council of the Entomological Society of London.

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

Never since the Entomological Society of London obtained its Charter has there, we believe, been an actual election of the members of Council by the Fellows of the Society. For many years, nevertheless, there have been murmurs from various Fellows at the cut-and-dried method of appointing the Council and officers of the Society. Sometimes this has taken the form of a protest made by a provincial society, many of whose members are Fellows of the premier society; at other times it has consisted of a personal growl from one Fellow to the others, and then there has never been wanting the criticism of the useful individual who is on principle "agin the government," and is always prepared to urge the Society to do better than before, however satisfactory the progress may have been. This dissatisfaction, however, need never have found voice, nor, in reality, has any Fellow cause for complaint, for a glance at the bye-laws will show that it has always been in the hands of a majority of the Fellows, to place whomsoever they chose on the Council and to elect whomsoever they pleased as officials. The Council of the Society has, in this matter, a very simple duty to perform, *viz.*, to recommend to the Society the names of such Fellows as it thinks might be elected as officers or as members of the Council. The duty is a necessary one, for it might otherwise happen that an insufficient number of Fellows might be nominated for the posts of officers and Council, and difficulties would possibly arise. On the other hand any four Fellows may nominate other candidates either as officers or members of the Council, and the election by ballot is made at the annual meeting. We are not aware that the Council has wished to take upon itself, what is evidently the inalienable right of the Fellows, *viz.*, the election of officers and Council, they simply select a sufficiency of names of Fellows to fill the various offices, and thus prevent a hiatus. They do not even say that the names suggested are the best possible that could be selected, although one suspects that this is the opinion of, at least, a majority of the Council.

It may happen, therefore, that the opinions of the Council and of the Fellows generally, may differ widely as to the fitness of particular individuals selected to represent them, and the latter may reasonably be excused if they prefer to select their own representatives in their own way, and, many may wish to do this, in spite of their general acquiescence in the selection made for them, unless some more active individuals take the necessary steps under the bye-laws to nominate other candidates. At this time of day, progress is rapid, the requirements of science are imperative, and it is absolutely necessary if a Society is to progress and to remain successful, that only the best men be selected. At the present time entomologists comprise a heterogeneous combination of specialists—lepidopterists, coleopterists, hymenopterists, dipterists, orthopterists, hemipterists, &c.—and it is evident that representatives of the workers in these

orders should be chosen in some sort of rough proportion to the number of Fellows studying the various branches, but whoever the men selected they should be the best available, men who are known to their fellow-workers at home and abroad, men who have done all in their power to forward the interests of the Society (1) by increasing its membership, (2) by reading papers, (3) by making exhibitions of interesting material, (4) by joining in discussions and preventing the monthly or bi-monthly meetings becoming rather less than the dreary funerals they often would degenerate into were it not for a few individuals who are prepared to prevent it. To select these men is imperative. Social standing, personal friendships, personal pique, and other weak humanities must be swept aside, and the most active, energetic entomologists, who possess the good opinion and confidence of the Fellows throughout the whole country, must be chosen, irrespective of wealth, position, age, personal friendships, anything—except their standing as entomologists.

Now what underlies the dissatisfaction that at present undoubtedly exists in the mode of selection of the Council of the Society? Is it due to the fact that the Fellows recommended are not all in the first rank of active, eager, and capable entomologists, who have raised, are raising, and are still able to raise entomology as a scientific pursuit in the eyes of the entomologists of the world? Is it that these active entomologists (some old, others young), do not feel themselves adequately represented by the method hitherto relied upon for the election of the Council? Is it that there are Fellows, who, being elected on the Council, care so little for the success of the Society that they attend the Council meetings badly, and the ordinary meetings not at all? Is it that there are members of recent Councils who never make an exhibition of entomological specimens themselves, and never offer a word of information, or criticism on the exhibits made by others? Is it that Fellows may be elected who have no exhibits to make, and are entirely incapable of making any useful observations, or giving any useful information on any branch of entomology? These are some of the questions that any observant Fellow naturally asks himself when he hears dissatisfaction openly expressed.

Are our meetings a success? Look at the *Proceedings* for the last few years and note their gradual deterioration. These are the official reports of the meetings, and on their success must largely depend the ability of metropolitan Fellows to attract their friends. Scan the names of the exhibitors and compare with the names of the members on the Council. A very short study of the *Proceedings* may give a hint that will answer some one or other of the above queries in the negative or affirmative. We have heard of a Fellow resigning his membership of the Society because the President elected was not the candidate whom he favoured, and who returned after the elected President's term of office was over? We have heard of members, who, from ill-health, could not attend the ordinary meetings, although retaining a seat continuously for years on the Council? Do such push the Society forward? Could not such be spared for more effective men? Purely entomological experts are not necessary to the success of a Council for the more technical papers are now given to specialists to judge and decide upon as to whether they shall be printed quite apart from the arbiter having a seat on the Council. What is wanted is a

Council of go-ahead entomologists, who will double in two or three years our membership, raise the standard of work done at our meetings, elevate the discussions to those worthy of a living scientific assembly of experts, and thus increase the force that the Society is able to wield for the advance of our favourite study.

After writing the above, we, with others, took steps to have a friendly election this year. Eighteen names are before the Fellows, fifteen of whom will be elected by ballot on Wednesday, January 15th, at 8 p.m. The Fellows themselves, being entomologists, are the best judges of the position of the respective candidates as useful entomologists. We would urge all Fellows to select those whom they think are the best men. If there be any candidate whose position in the entomological world is unknown or uncertain, such surely cannot prove a satisfactory member of the Council of a learned Society. Above all we appeal to the provincial Fellows to attend the Annual Meeting, and, by taking an independent part in the election, show that they have as keen an appreciation of the true position of entomology in this country, and are as jealous of the honour and success of the Society as are those who, mainly by the convenience of their places of residence, must of necessity largely be called upon to govern it.

NOTES ON COLLECTING, Etc.

AUTUMNAL WORK AT BOSCOMBE.—Both sugar and light failed in this district in the autumn of 1901, and ivy was very little better. The only good insects I took were four *Leucania vitellina* and one *L. albipuncta*, two of the former at sugared trees and two at sugared sunflowers. These latter I find a very attractive bait.—R. B. ROBERTSON, Forest View, Southborne Road, Boscombe. *November 11th, 1901.*

SPHINX CONVOLVULI AT CHINGFORD.—I have to record that several *Sphinx convolvuli* were taken during the past autumn at Chingford.—A. J. Croker, Connaught Road, Chingford. *November 15th, 1901.*

AUTUMNAL LEPIDOPTERA AT OXTON.—*Sphinx convolvuli* was common during the autumn. On November 9th I bred a ♀ *Zonosoma porata* from ova laid by a ♀ taken in north Devon, the rest of the brood showing no sign of emerging. The first *Asteroscopus sphinx* occurred in the light traps on the morning of November 5th, and on the 11th I had sixteen, then the frost set in, and I have had none since.—E. F. C. STUDD, M.A., F.E.S., Oxtou, Exeter. *November 19th, 1901.*

POECILOCAMPA POPULI NEAR SOUTHAMPTON.—*Poecilocampa populi* was common on the lamps on the night of December 1st in a suburb of Southampton, apparently quite recently emerged. Among the dozen that I boxed was a ♀, which laid a large batch of ova.—F. C. WOODFORDE, B.A., F.E.S., Market Drayton. *December 23rd, 1901.*

LEPIDOPTERA AT MARLOW IN 1901.—*Eugonia polychloros* was unusually common in the spring, but scarcely seen in the summer. *Vanessa io* and *Pararge aegeria* were not seen at all. At the end of May and beginning of June *Bapta bimaculata* was almost what the late Mr. Stainton would have called a pest. *Leucania straminea* was common amongst reeds at the end of June, *Lithosia mesonella* and *Coremia quadrifasciaria* were taken in July and early in August,

Melanargia galathea made its first appearance in the district, and on the third of the month a solitary specimen of *Thecla w-album* was seen, *Colias hyale* was fairly common from the middle of August until the middle of September, on the same rough hillside which it frequented last year, and so far as I can learn nowhere else in the neighbourhood. It was very restless, and, on the rare occasions when it settled, seemed to prefer ragwort. *Colias edusa* was not observed. Two *Demas coryli* were taken early in June. They were buzzing along not far from the ground very much after the fashion of an ovipositing *Cosmotriche potatoaria*.—A. W. CLARKE, F.E.S., 109, Warwick Road, S.W.

SPREAD OF BUTTERFLIES INTO SUITABLE LOCALITIES.—It is curious how butterflies manage to discover for themselves congenial localities. The hill on which *Polyommatus bellargus* appeared for the first time in 1899, and on which it now seems to have established itself, was, when I first knew it, covered with trees and dense underwood, on the outskirts of which *Brenthis euphrosyne* and *Enodia hyperanthus* used to roam, and *Dryas paphia* was occasionally seen. In the seventies the place was converted into cornland. Then the bad years came and corn was no longer sown. Other crops were tried but nothing seemed to answer, and for the last six or seven years the land has been left uncultivated, and is covered in some places with heather, but principally with coarse grasses, bramble, marjoram, thyme, wild strawberry, burnet, ragwort, and here and there *Hippocrepis comosa*. *Brenthis euphrosyne*, *Enodia hyperanthus* and *Dryas paphia* all disappeared with the woods, and have not come back, although the two former, at any rate, are common enough half a mile away. The first local butterfly to colonise the place was, strangely enough, *Nisoniades tages*, which must have travelled at least two miles. In 1899, a single specimen of *Polyommatus corydon* was seen, now it is abundant, *P. bellargus* appeared as above stated in 1900, and is extending its range. In 1901 the place was prospected by *Melanargia galathea*, and it is to be hoped that it will be found suitable.—IBID.

COLIAS NEAR CAMBRIDGE.—Paying a visit to some chalk-pits near Cambridge on a sunny forenoon last September, I did my best to net a light-coloured *Colias* that was flying about the edge of a sainfoin field, but it would not settle, nor could I get near enough to strike it. I afterwards saw another when fishing near Upware in the Fens, but whether they were *C. var. helice* or *C. hyale* I could not be sure. I made the acquaintance of *C. edusa* in numbers last year at Weymouth for the first time, and was struck by the different behaviour of the insect in the morning, compared with that of later in the day; in the forenoon a few were caught by the expenditure of much energy and a considerable drain on one's adipose tissue, owing to their indisposition to settle, later in the day, however, they were constantly visiting the clover heads and their capture was easy.—W. D. CARR, Sandhurst, Oaklands Road, Wolverhampton. November 29th, 1901.

LUPERINA DUMERILI AT DOVER.—In the latter part of September last, I had the good fortune to take a specimen of this rare Noctuid at rest on a gas lamp in this town. The specimen, which I am told is a female of the typical form, is now in the collection of Mr. Eustace R. Banks. It is best to mention this, to prevent any possible mistakes in the future as to the whereabouts of the specimen.—H. DOUGLAS STOCKWELL, 2, Albert Road, Dover. December 16th, 1901.

CURRENT NOTES.

The *Daily News* of December 30th, 1901, published a long article and a short leaderette on the unusual and unexpected procedure of the authorities at the Natural History Museum in not appointing a successor to Dr. Butler as deputy-keeper of the Insect Department at this institution. The article is headed, in true newspaper fashion, "The story of a snub—Butterflies and a Baronet—Mr. C. O. Waterhouse v. Sir G. Hampson." The facts appear to be somewhat as follows: Dr. Butler retires on a pension of about £380 a year, two-thirds of his final salary—£600. Mr. C. O. Waterhouse, the senior assistant, is at his maximum as assistant of £500 per year, and has two years' service to complete before reaching the retiring age. Mr. W. F. Kirby, next to Mr. C. O. Waterhouse, is also a first-class assistant of long standing. Mr. C. Gahan, one of the best of entomologists, was till a few months ago the senior of the second-class assistants, with Messrs. Arrow, Austen, Heron, and Sir G. Hampson, as his juniors. A few months ago Sir G. Hampson was promoted to be a first-class assistant, Mr. Gahan's claims being apparently overlooked. A good deal was privately said at the time as to the possible object of this promotion, and it was generally assumed that, on Dr. Butler's retirement, Mr. Waterhouse would succeed for a couple of years, and that Sir George Hampson was intended to succeed him. It would appear, however, from the statements in the *Daily News*, that the Government, on account of the war, are not prepared to appoint a deputy-keeper to succeed Dr. Butler at £520 (the minimum salary for this post) per annum, although it would be only a rise of £20 for the senior assistant, Mr. C. Waterhouse. On the other hand, without payment, *i.e.*, at no increase of his existent salary, £300, Sir G. Hampson is stated to have accepted the responsibilities and duties of the post, and Mr. Waterhouse is thus effectively shelved. That Mr. Gahan has in the opinion of entomologists been rather ill-used goes without saying, that Mr. Waterhouse is now also considered by them to be badly treated is obvious, and all feel particularly that his position, especially pecuniarily, ought not to suffer by his being passed over, so that when he retires it should be on the same terms as if he had been at the head of the Department. As to which man—Hampson or Waterhouse—would ultimately prove the better head of the department, nothing can decide but the result, and much would depend on the view taken as to the use to which the collections are to be put, *viz.*, whether the assistant-keepers are to be custodians of the collections in the best sense, for the use of all specialists, or to do entirely technical work based on comparatively small sections, the rest of the collections being left largely in a state of chaos, without additions, &c. As to which would do the more work as head one cannot say. One doubts very much whether Sir G. Hampson would or could do more or better work than he is doing now; on the other hand Mr. Waterhouse would have little time in two years to do anything very new before the time arrived for him to retire. Giving weight to this fact renders it the more unjust not to fully compensate him before his chance passes. No doubt Sir G. Hampson is indebted in some degree for his position to the confidence that the wealthy lepidopterists who are active members of the Council of control feel that the collections which they have made, and which they have already added, or ultimately intend to add, to the national collections, would be in sympathetic hands, and this view, although it must be granted to be a class one, must be accepted as

being the well-considered outcome of deliberate thought by experts personally much interested in the welfare of the collections; but at the same time it must be conceded that, although Mr. Waterhouse and Mr. Gahan are coleopterists, there is no evidence whatever (rather the contrary) that they are not men of equally broad, if not broader views than Sir George Hampson, and would not be equally jealous for the good keeping of those parts of the collection other than those relating to the order to which they are, by the nature of their work at the Museum, supposed to be more specially attached. We still trust that, as a matter of justice, the claims of Mr. Waterhouse will obtain due recognition, and that the just aspirations of so excellent an entomologist as Mr. Gahan will meet with due consideration and reward.

As will be seen from one of our leading articles there will be a ballot for the whole of the members of the Council of the Entomological Society of London this year. We understand that the election is to be conducted on absolutely friendly lines, and with a view of allowing every Fellow to make a choice for himself, and we trust that no paltry personal considerations will be allowed to influence the result. It appears to us that the strong claims of some of the younger men to a seat on the Council cannot long be delayed, and we are at one with those who think that only those who have done something for entomology, who attend the meetings regularly, and do their best to make them a success now, should be elected. The older men (entomologically, not necessarily by age) whose active interest in entomology is past, and who are merely names to the workers of to-day, will, one suspects, naturally give way gradually to their more active successors. We particularly look forward to the chance that such an election will give to the provincial entomologists to express their opinions. The eighteen names before the Fellows are: Revs. Canon Fowler, F. D. Morice, Colonel Swinhoe, Professors T. H. Beare and E. B. Poulton, Dr. Sharp, Messrs. Adkin, Burr, Champion, Chitty, Distant, Godman, Goss, Lloyd, McLachlan, Rowland-Brown, Saunders and Tutt. Of these, fifteen are to be elected. We trust that those who are able and willing to do most for the Society will be chosen. Men who do not attend the meetings, or those who do attend but do nothing to make them successful, should certainly be passed over.

Lord Walsingham writes (*Ent. Mo. Mag.*) with regard to his well-known collection of Micro-lepidoptera: "With a view to avoid misconception and enquiry, it may be well to state for the information of our readers, that by a deed dated November 23rd, 1901, between the Trustees of the British Museum and myself, all my collections of Micro-lepidoptera have now become the property of the Trustees, upon the condition that I am to retain them in my care and custody so long as I may desire to do so. This will in no way interfere with the study or improvement of the collections during my lifetime, but will rather enhance the interest with which I shall endeavour to render them as complete as possible."

Our readers should see the January number of *Science Gossip*. In it are excellent photographs of Miss Winstone and Mr. J. T. Carrington, and their editorial staff. What many lepidopterists who are now past their first youth owe Mr. Carrington for the kindly help that was always freely given them during the time that he was editor of *The Entomologist* (a critical time when the new entomology was struggling hard for due recognition), one can scarcely tell, certainly none owes

more to him than the writer of this note, which he is here grateful to acknowledge. The present excellent condition of *Science Gossip* is a living testimony to the editorial ability of the staff, who have made it quite the most interesting and useful of all magazines on general scientific subjects.

Mr. Claude Morley describes (*Ent. Mo. Mag.*, p. 4) a new species of *Microgaster*, *M. suffolciensis*, bred from among larvæ of *Nothris verbascella*, from Bury St. Edmunds. Its nearest ally is probably *M. globatus*, Nees.

Mr. J. Edwards adds (*loc. cit.*) another species of the Cicadina, *Stictocoris flareola*, Bohm., to the British fauna. The specimens were taken by Mr. W. West, in our south-east London district in September, among long grass in damp places. Such an indefatigable worker and naturalist as Mr. West deserves all the good fortune the gods will give him.

Mr. Wallington records (*loc. cit.*) that Mr. T. Wright, of Warrington, a "new beginner," captured *Ophiodes lunaris* at sugar in Delamere Forest, on June 1st, 1901.

We have heard with much regret of the death of Mr. H. W. Vivian, of Glanafon, on November 17th last, at the age of 33. He was a collector of the pure British type, fond of out-door exercise, keen on getting a good thing, but publishing little or nothing of the facts gleaned or observations made.

We regret to announce the death of Thomas Pigg, M.D., of East Grinstead, in his 77th year, on Monday, December 9th. Many years ago he was an enthusiastic coleopterist, but was better known in the north of England than in the southern counties. He was a friend of T. J. Bold, and was present with him in 1853, when the latter discovered *Anisolabis maritima* near South Shields. He was also a friend of James Hardy and John Hancock. In 1843, with Bold and Hardy, he founded the Wallis Society, a kind of entomological club, meeting alternately in each other's houses. In the "fifties" he was secretary of the Tyneside Field Club, after which he set up in practice in Manchester. His entire collections passed many years ago to T. J. Bold, who in his turn handed them over to the Newcastle-on-Tyne Museum.

PRACTICAL HINTS.*

Field Work for January and February.

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

1.—To force *Macrothylacia rubi* and *Spilosoma fuliginosa*, place the larvæ (after having been exposed to the weather for part of winter) in a box with damp moss, and the box in a warm greenhouse or kitchen, keep temperature up to about 80° F., the larvæ will spin up almost at once without further feeding, and the imagines will emerge in from two to four weeks (Moss).

2.—The cocoons of *Saturnia pavonia* are easily found on the moors when the heather is wintered; they are either on the heather, or on the ground loose, the latter situation being almost as common as the

* PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST, recently published, contains 1,250 similar hints to these, distributed over every month in the year. Interleaved for collectors own notes.—Ed.

former; the important factor for success is to search for them when the vegetation is dead (Arbuthnott).

3.—Cocoons of *Saturnia pavonia* may also be found in whitethorn hedges in winter, spun up on the lower branches about a foot from the top of the bank on which the hedge grows. They are most difficult to see when the foliage is on the trees, and, although exposed when the leaves fall, the colour is so like that of the surrounding branches that it would be easy to miss them (Ransom).

4.—The haunts of *Scuta maritima* are usually coincident with those of *Nonagria geminipuncta*, the larvæ of the former wintering in the old burrows of the latter. The larvæ are easily obtained in a hard winter, when one can more readily examine the dead reeds that fringe the sides of lakes and moors. They have also been found in the old galleries of *Nonagria arundinis* and *N. cannae* in *Typha latifolia* (Dadd).

5.—During the first week of February I searched the stone walls and dykes that separate the fields in Aberdeen, etc., for cocoons of *Arctomyxsis* var. *myricae*, and in a few hours picked up a dozen around Pitcairle; the snow, however, was very deep and the cold intense, and these factors much interfered with a more successful hunt (Reid).

6.—Imagines of *Nyssia hispidaria* are to be taken in late February and March, newly emerged and drying their wings between 4 p.m. and 5 p.m. on the lower part of the trunks of oaks.

7.—In February and March *Hybernia leucophaearia*, *Phigalia pedaria*, *Nyssia hispidaria*, *Amphidasys strataria*, are found commonly by trunk-hunting on the outskirts of the London district—Richmond Park, Chingford, &c.

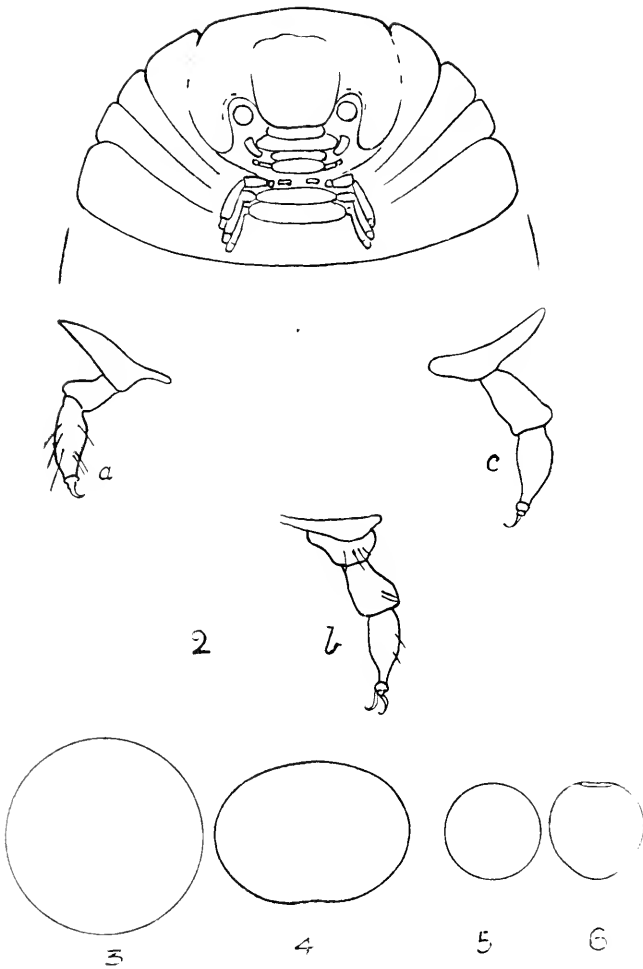
8.—Imagines of *Hybernia leucophaearia* are common on trunks of oak-trees, in February and March, some drying their wings during the forenoon in the sunshine, the lantern revealing them, however, still freshly emerging after dusk. *Phigalia pedaria* may be found at the same time and are often seen hanging with limp wings on the oak trunks at about 8 p.m.

9.—The spring *Hybernias* are all common in Epping in February and March; very fine aberrations of male *Hybernia leucophaearia* and also ♀s. are to be obtained on fences and tree-trunks in the daytime; *H. rupicaprararia* on every hawthorn hedge, the ♀s about an hour after dark are found at the bottom of the hedges, latter on they get higher, and are seen on the outside as well as towards the middle of the bushes; the ♀s of *H. marginaria* are to be found freely on tree-trunks after dark with a lantern, some of the ♂s are very fairly dark.

10.—The larvæ of *Boarmia roboraria* may be beaten from oaks when beating for larvæ of *Cleora lichenaria* in February, before the oak-buds show the slightest sign of leaf. They must loose hold of their silken pad surprisingly early; the larvæ also feed on sallow, whitethorn and birch, feeding up well in confinement on sallow (Moberly).

11.—Early hatching larvæ of *Pocillocampa populi* may be fed up on lettuce; eggs often hatch out-of-doors before the food-plants are available.

12.—At the end of February place your cocoons of *Dimorpha cersicolora* in the sun during the day, and in a warm kitchen at night and during dull weather; few pupæ will then go over to a second year. The imagines will only pair in the sun or in a fairly high artificial temperature, but given these they will do so and lay well.



STRUCTURAL DETAILS OF *ORGYIA SPLENDIDA*.

Butterfly Hunting in Greece, in the year 1900.

By MARGARET E. FOUNTAINE, F.E.S.

For several years I have traversed the countries of central and southern Europe, a somewhat grotesque figure, armed with a butterfly-net. I have wandered along the glorious shores of the Mediterranean, on the French and Italian Rivièras, and up the mountain gorges of the Basses-Alpes, where, in the neighbourhood of Digne, at least, the butterfly-catcher is no longer an object of idle curiosity to the natives, who have long since grown accustomed to him as "a figure in the view," Digne being a locality of such vast repute in the "butterfly world." Then, too, I have trod the dry arid hill-sides of Andalusia, where the dwarf palm grows in clusters, and vegetation does *not* seem to flourish. I have climbed to the lofty alpine pastures of Switzerland and North Italy, and penetrated through the dense mountain forests of Hungary, so still and soundless, save for the silent droppings of the beech-nuts, and the faint whisper of the summer wind among the tree-tops. I have also visited the Island of Corsica, which might be a small item from another planet, for all the resemblance its ways and customs bear to any other spot on earth, possessing, moreover, a separate fauna, as it shares with its neighbour, Sardinia, the interesting fact, that many of its animals, birds and various insects (butterflies by no means excepted), as well as plants, are peculiar to these two islands, and not to be found on the mainland of France or Italy, or, indeed, any other country in the world. Sicily, too, is a glorious spot, one vast flower-garden in the month of May, a fruit-orchard in June, and in July a parched-up wilderness. All these countries do I know, and knowing, love. The happy hunting-grounds of the Red Indian could not have been pictured in more glowing colours to the eyes of imagination than must these southern lands—the happy hunting-grounds of the entomologist—forever remain in the memory of those who have visited them in order to enjoy the pleasures of "la chasse aux papillons!"

In the year 1900 I spent the months of May and June in Greece, and it is my humble hope that the experiences herein recorded may possibly claim some slight interest from at least a few of the readers of this journal. Now I am not going to write about Athens, to enlarge upon the sublime beauties of the Acropolis, and so on, because that is the archaeologists' province, upon which I fear to tread, besides, most people know all about that already. Ordinary tourists will almost invariably take their passage on board an Austrian Lloyd, or Italian steamer at Brindisi, spend a few days, or a week, in passing, on the lovely Island of Corfu, proceed by boat to Patras, or perhaps the Piræus, *en route* for Athens, where they probably remain a week or two, and then, bidding farewell to the Hellenic shores, they sail for other lands, and consider that they are now in a position to say they have "seen Greece!" But merely to have visited Athens and its immediate neighbourhood is, in my humble opinion, by no means to have "seen Greece!" and it was into that fascinating, half-civilised region, generally spoken of amongst the English colony in Athens, as "the Interior," that my inclinations, as an entomologist, prompted me to explore. Of the various hardships and inconveniences I had been led to suppose I should have to encounter in so doing, I do not think, on the whole, I had received at all an exaggerated description.

FEBRUARY 15TH, 1902.

The Greek roads bore in many places a striking resemblance to the partially hardened surface of a ploughed field, and frequently there were no roads at all, but only bridle-paths, for the principal mode of locomotion in Greece is on horseback. This threw my bicycle completely "out of work;" but horses were to be hired everywhere, at from five to seven drachmas for the whole day; though of course such a thing as a side-saddle, was an absolutely unknown item of civilisation. The inns in the country towns and villages are rough to a degree, and hemiptera, other than those to be sought for outside by the entomologist engaged in the study of that class of insects, were in some of these inns extremely plentiful. In fact though the food was bad the accommodation was worse. The Greek innkeeper often seemed to think that to have two sheets on a bed was an unnecessary luxury; and sometimes they provided none at all. Luckily, owing to the kindness of a friend, I was prepared to meet this contingency. Towels also were not visible unless specially ordered. But they manage to provide their guests with a greasy hair-brush and comb, and also with an old clothes brush; to say nothing of a piece of untempting looking scrubbing soap; all of which articles of luxury (?) I used to collect in a heap, telling Marcus (my Greek courier) to cause them immediately to be removed from my presence and never to let them appear again. Nor were these all the contingencies to be provided for in choosing a room in a Greek Hotel, as I would perhaps be told that the charge was one drachma (6d.) a night, and then, while I was inwardly congratulating myself that travelling in "the Interior" was at all events not ruinous, I would be shown into a good-sized room, barely furnished, but with perhaps two or three beds in it. I remember at Tripolitza, deciding upon an apartment of this description, when I happened to remark (of course through the medium of Marcus), that those other two beds might just as well be removed as it would give me more space, to which the prompt reply was:—"Oh! but you see someone else may arrive!"—and then I grasped the full horror of the situation; the one drachma a night was for the *bed* and not exclusively for the room. As matters stood I should be liable to return from one of our long butterfly-hunting expeditions into the mountains to find some objectionable Greek female established in another corner of *my* room. The idea was intolerable, but the way out of the difficulty was obvious; I must hire all the three beds in order to prevent anyone else from doing so. But all this and more must be endured by the butterfly collector in Greece, with just as much patience and resignation as he may happen to have at his command. Yet there was a pleasing variety in the quality of these discomforts, and at Delphi, though the so-called hotel was only a little bungalow-dwelling in the main street, with not so many as half-a-dozen rooms in it all told, the landlord of this unpretentious little habitation who was, I had heard, celebrated as the ugliest and most honest man in Greece, proved himself to be quite worthy of both epithets, and also was so far comparatively accustomed to provide for the English tourist, as to be aware that one of our indispensable little weaknesses is the demand for cleanliness in all things. For Delphi being a place of great archæological interest is on this account occasionally visited by travellers.

There are not very many railways in Greece, and the trains are extremely slow and leisurely in their movements, so much so that

there is no sort or kind of objection raised when the passengers walk along the footboards outside the carriages while the train is at full speed, should they be disposed to do so. I did this once myself on the little branch railway from Dhiakopto up to Kalávryta, when I found my quarters in the small first-class compartment next the engine, a trifle too warm in consequence of the hot smoke which was constantly pouring into it. As I knew there was no stop till Zachloróu, and that there were several long tunnels, I considered it just as well not to run the risk of being suffocated in one of them. With Marcus it was a common practice also to get in after the train had well started. The first time I saw him standing coolly on the platform, as we were slowly steaming out of the station, I naturally thought to myself "Why, that fool Marcus has been left behind." But he soon set my mind at ease on this point, by shortly afterwards appearing at the window of my carriage, to have a few minutes' friendly conversation during the journey, a little habit of his to which I soon became quite accustomed. I once asked him if he had carried on these practices during his trip to England, to which he replied "Only once, and then I was told if I ever did so again I should be fined."

Having found the country round Tripolitza so dry and barren as to be apparently utterly unproductive from an entomological point of view, we were returning on the line of railway between that place and Corinth, when the train suddenly stopped in the midst of the mountains, nowhere near any evidences of what could possibly be mistaken for a station, and Marcus appeared to inform me that the cause for this was "the grasshoppers." So many of them were there that to proceed would be impossible, without running the risk of the engine slipping off the rails. I looked out and saw that the ground was covered with one moving mass of orthoptera. There was not a square inch of earth or visible blade of grass that was not densely populated with these creatures, but as I am a lepidopterist and not an orthopterist, I am unable to say to what species they belonged. Impromptu brushes had to be made of the scrub and brush wood, and these were placed in front of the engine, and by this means the line was swept clear enough for the train to proceed in safety.

The Greek butterflies that I was most anxious to obtain were *Pieris krüperi*, *P. ergane*, *Euchloë gruneri* (*E. damone* I knew must be over long ago, as it only flies in the early spring), *Colias heldreichi* (most especially), *Melanargia larissa*, *Chrysophanus ottomanus*, *C. thetis*, and *Satyrus græca*. All of these I succeeded in taking with the exception of the two last-named species, both of which I should imagine to be July insects, as I left Greece at the end of June without seeing any specimen of them.

Pieris krüperi was common just outside Delphi in May, on a southern slope of the mountain near some red rocks, about 100ft. above the ruins, but the ground was difficult, and *krüperi* is a rapid flyer; it was easier to take it in the partially dried up bed of a stream a short distance from the village, on the left of the main road going towards Arakhova, which was a favourite drinking fountain and place of rendezvous for all thirsty butterflies. The spring brood—var. *vernalis*—was flying with the summer brood the year I was in Greece, though most of the specimens of var. *vernalis* were worn, especially the females, which was remarkable as they had probably emerged a week or ten

days later than the males. Delphi is about 2000ft. above the sea level; and a few days later, down at Loutraki, a comparatively modern place, on the shores of the Gulf of Corinth, I found *krüperi* only, but in excellent condition. They were up a gorge not more than 100ft. from the level of the dried-up, arid plain, where, in the month of May, the barley harvest was being cut and carried on the backs of mules to be thrashed shortly afterwards beneath the feet of some five or six horses which were made to trot round in a circle over the scattered ears. In this plain I also found *Satyrus amalthæa*; the females being equally common with the males (which is so rarely the case with any butterfly), though they were somewhat dissimilar in their habits, as the latter were generally only to be found down on the open plain, while the females preferred to haunt the lower slopes of the mountain. These latter remained in hiding during the hot hours of midday under the grateful shadows of the huge rocks and boulders at the foot of the gorge, from which seclusion sometimes six or eight at a time would, on being disturbed, fly out lazily from beneath one rock, while they seemed supremely indifferent to, and independent of, the little males, who were besporting themselves in the glaring heat of the plain below, where the oleander bushes grew in the dry stony bed of the torrent. *Pieris ergane*, which was common enough near Delphi and in the neighbourhood of Kalávryta, did not apparently occur so low down as Loutraki, whilst *Euchloë grüneri* seemed to be exclusively a mountain butterfly. It flew in certain localities (no doubt in the immediate vicinity of its food-plant) accessible both from Delphi and Kalávryta, but it was practically over by the third week in May. *Melanargia larissa* seemed to be fairly widely distributed, from the middle of May and throughout the month of June, though the Loutraki specimens in May were much finer and more deeply coloured than those I took later at Kalávryta in June. The Lycænids in Greece were, as a whole, distinctly disappointing. However the var. *helena* of *Nomiades semiargus* was extremely interesting. It occurred plentifully all round Kalávryta in May, and most of the specimens were very marked; the orange band on the upperside being remarkably broad and distinct in nearly all the females captured. The var. *parnassia* of this same species occurred near Delphi, but no *helena* appeared north of the Gulf of Corinth. I also took a few specimens of *Polyommatus zephyrus* near Kalávryta in June; and an interesting form of *Polyommatus eumedon* near Delphi in May, without any traces of the arrow mark on the underside of the hindwings, except, indistinctly, in the case of one female.

In order to secure *Chrysophanus ottomanus* I had been told that I must visit Mesolonghi, another place on the sea-level, but very different from Loutraki. Instead of the dry, arid shores of the Gulf of Corinth, Mesolonghi lay surrounded by low, damp meadows, and unhealthy marshes—a perfect fever-bed of snakes and mosquitoes. Marcus did not appreciate the snakes at all, though he was never so vehement in his protestations that he was “not afraid” of them, as when he had just jumped half a foot off the ground at the sight of one; or possibly on no greater provocation than the rustle of a lizard in the grass! But *C. ottomanus* had to be captured, so snakes and mosquitoes alike must for the time being be put up with. And this was the chosen haunt of this brilliant little butterfly, flashing like a spark

of fire amongst the tall green reeds and luxuriant flower-mingled grasses, but it was not so easy to find, and some days elapsed before we came across it at all. But at last Marcus, to his great joy, secured a magnificent female. Still we had not really discovered, so to speak, its headquarters, till one day, when Marcus had gone off for a holiday to Patras, and I was out alone, I encountered what appeared to be a rather evil-disposed person, and in order to disembarass myself of this individual I gave him the slip by pretending to go in hot pursuit after some imaginary butterfly-rarity. Once out of sight I lost no time in taking refuge in flight, by making off in an opposite direction; nor did I halt till I had covered some considerable distance; and by this means I came upon a spot near a little chapel, which we had not previously visited, where *C. ottomanus* (at least the males) flew in some abundance. So the evil-disposed person did me a good turn after all. I was much surprised to find *Pararge roselana* also in this neighbourhood. It seemed such a wonderful contrast to the grand Hungarian forests in the Carpathians, where I had hitherto met with it always at a certain elevation, to come across it here in these moist meadows and marshes, down at sea-level.

Lord Byron is the hero of Mesolonghi, as indeed he is of the whole of Greece, his statue in the Public Gardens is almost worshipped, and the little mound hard by, encased in a covering of cannon balls, beneath which lies the heart of this wonderful man, is also a spot ever to be looked upon by the Greeks with the deepest veneration. Another public erection at Mesolonghi, situated in a central position in the town, is a large square, solid block of buildings, detached on all sides, upon which the pitiless glare of the southern sun pours down mercilessly and relentlessly from morn till eve. This building is the common prison, the wretched inmates of which were herded together like cattle in a pen, but were allowed the privilege of sitting at the barred windows of their prison-house, if they were so disposed, and getting what solace they could by attracting the attention of the passers-by. Some of the countenances of these men were savage and repulsive, others were sad and worn. Many wore the national dress, the folded white linen tunic, looking as if it had never been removed since the time of their arrest, as indeed in many cases it probably never had; some few of them looked cheerful and resigned, almost as though they found a sense of humour in their present surroundings. It was with one of these last that I once held (of course through the medium of Marcus) a short conversation. I began by expressing regret to see him where he was, for which he thanked me; so I went on to say that I hoped he would soon be released. "In two months," was the reply, "and I have already been here ten." Finding that he by no means resented the idle curiosity which prompted my friendly inquiries, but on the contrary seemed rather gratified by it, I waxed bolder, and told Marcus to ask him what he had done to merit this term of imprisonment. This was apparently quite the most fetching question I had yet put to him, for he smiled sweetly, and said he had "tried to kill a man," which crime, he explained on further inquiry, he had attempted to effect by shooting at him with a pistol in a fit of rage, adding (unmasked) that his only regret was that he had not succeeded in the attempt. Still I could not help feeling sorry for this man, and I would generally give him a friendly nod and smile as I rode by on my bicycle. A

week or two later, when I was up in the mountains at Kalávryta, and the thermometer was standing, even at that elevation, at from 80° to 90° F. in the shade, I used to think of these wretched prisoners, and what their sufferings must be, pent up day and night, in that sweltering oven down at Mesolonghi.

There were two monasteries in the neighbourhood of Kalávryta, both celebrated for patriotic reasons. The monastery of Hagia Lavra is distinguished for having been the first place in Greece from whence waved the flag of freedom after the occupation of the Turks, and the monastery of Megaspelaëon, still more celebrated for having been the only place in Greece, which, owing to its absolutely impregnable situation, never surrendered to the Turks at all. The word Megaspelaëon implies "built into the rock," and this is exactly what it is. Several hundred feet of precipitous rock rise up immediately above this wonderful structure, which is only approachable from below by a zigzag bridle-path winding up the steep mountain side. The monks and priests of the Greek Church are not close-shaven like their Catholic neighbours, but on the contrary they seem to prefer the cultivation of long patriarchal beards, so that their appearance is altogether a great deal more pleasing, not to say picturesque. The expression of their faces is often sad, and they give one the idea of men who have grasped the responsibility of life, and are trying to act accordingly. Their hospitality to travellers and strangers is charming, and though their fare is simple, and their mode of living of the roughest, their courtesy and simplicity is ever calculated to command respect. On one occasion when we were out collecting beyond the monastery of Hagia Lavra, a bright sunny morning had clouded over to end in a downpour of rain, accompanied by thunder and lightning, such as seldom occurs save in these hot southern countries, and though we rode as quickly as was possible over the rocky mountain paths, I arrived at the monastery drenched through and through. At once the kindly monks were ready to render me any service that lay in their power. They had a kind of open stove filled with hot smouldering cinders placed at my disposal, and also provided me with a cassock, with many apologies that they were not in a position to offer me a more strictly feminine garment, while my own dress was being dried. Then later on they placed before us a simple luncheon of poached eggs and a kind of sweet confiture, very palatable at first, but which I afterwards found was quite the reverse to an acquired taste. This stuff is made from rose leaves and sugar, and is invariably placed before the guest who visits these monasteries. Marcus hastily told me in English that to offer any remuneration for the hospitality received would be considered as an insult. My best thanks, expressed through the medium of himself, he said, was all I was in a position to bestow. None of these monks spoke any language but Greek, so that on one occasion when I was purposing to pay another visit to Megaspelaëon, Marcus being away at Patras again for two days, I was glad to secure the companionship of a "gentleman from Turkey," who spoke a little English, and whom I happened to meet in the train returning from Zachlorón. He told me he was a Greek, but had come from Turkey to sell bibles (he himself belonged to the Reformed Church) and was now on his way to Kalávryta with that end in view. I suggested that it might perhaps be more to the purpose if he stopped in Turkey, and tried to convert a few Mahometans; to which he replied

in his broken English "They are very fanatic," and dismissed the subject evidently as though it were rather a sore point. I happened to say that I purposed going to Megaspelaeon on the morrow. "Perhaps I shall come too," he remarked composedly, and I, seeing my way to an imprudent interpreter, replied "Perhaps you shall—we will see about it." The result of which was that, shortly after I had returned to the inn in Kalávryta, he arrived "to see about it." So I arranged matters from the wooden balcony outside my window, while the Bible-seller stood in the street below. And a very pleasant and useful companion did he prove himself to be; and he certainly supplied a want, though his conversation at times was rather like that of a methodist preacher. But it was gratifying to show Marcus on his return how well I had managed to get on during his absence.

It was not only in the monasteries that I received hospitality, the same feeling, with a few exceptions, was shown by the peasants, more especially by the shepherds, who were always ready to supply us with milk or cream cheese, if they had it; and, on being asked what payment they required, would, as a rule, spread out their hands saying "Tipote! Tipote!" (Nothing! Nothing!) But the few exceptions to this rule were perfectly exorbitant in their demands, and had to be dealt with accordingly. I do not recommend anyone to travel in this interesting country if he is at all anxious to receive his letters with any sort or kind of regularity or certainty. The postal arrangements appeared to me to be almost without any organisation whatever. I would sometimes receive no letters for two or three weeks, and then, suddenly, some ten or twelve would arrive all together, and this in spite of my invariably causing Marcus to send telegrams to Athens and elsewhere, whenever I changed my address. I heard the same complaint from all whom I met, except from the Greeks themselves, and they maintain that their postal arrangements are admirably managed, and in no way different from those of "Europe." They always spoke of Europe as a thing apart from Greece, as though they considered themselves to belong to another continent.

(To be concluded.)

Retrospect of a Dipterist for 1901.

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

The amount of work done during the past year (1901) in attempting to forward the study of diptera was, as usual, small in volume compared with that done in other orders of insects, but the quality and usefulness of at least some of the work cannot be denied.

On the continent valuable Monographs have been published—the European *Phoridae* by Becker (*Abh. k. k. zool.-bot. Ges. Wien.*, i., 100 pp., 5 pls.), of the *Nycteribidae* by Speiser (*Arch. Naturg.*, 65 pp., 1 pl.), and Kieffer has begun a "Monograph of the European and Algerian *Cecidomyiidae*" (*Ann. Soc. Ent. Fr.*, 1900, 292 pp., 30 pls.), which, although appearing in the *Annales* for 1900 was published in 1901. Wagner has continued his "Aphanipterologische Studien" (*Horae Soc. Ent. Ross.*), and Enderlein has also contributed a short paper on the same subject (*Zool. Jahrb. Jena*); Pandellé has continued his "Etudes sur les Muscides de France" (published in connection with

the *Rev. Ent. France*), and among other authors of short papers on various families of diptera may be mentioned the names of Hendel, Strobl, and Czerny.

Papers on morphology and histology have been published by Noack "Beiträge zur Entwicklungsgeschichte der Musciden," and by Wahl "Ueber die Entwicklung der hypodermalen Imaginalschreiben im Thorax und Abdomen der Larve von *Eristalis*, Latr." (*Zeitschr. Wiss. Zool. Leipzig*); and by Escherich "Ueber die Bildung der Keimblätter bei den Musciden" (*Acta Ac. German.*, 69 pp., 3 pls.); while among other writers on the same subjects may be mentioned the names of Vallé, Enderlein, Meijere, and Muggenburg.

The interest taken in the question of the dissemination of malaria by mosquitoes has induced people to closely investigate the anatomy and physiology of the mosquito (*Anopheles*), and the results have been published in such papers as those of Christophers (*Rep. Malar. Comm. Roy. Soc.*), and Nuttall and Shipley (*Journ. Hygiene Cambridge*), while the whole question of the mosquito-malarial theory has been attacked from all sides and a quantity of literature published upon the subject. It is probable that the interest this question has caused people to take in mosquitoes will be the means of the *Culicidae* becoming one of the best worked out families of the diptera. F. V. Theobald's "Monograph of the *Culicidae* or Mosquitoes" (London: 3 vols. Printed by Order of the Trustees of the British Museum) is a step—and a good long one—in that direction.

Kertész in the *Termes Fuzetek*, and elsewhere, has published several papers on south Asiatic diptera, and he has also published a useful catalogue of the described species of *Pipunculidae* of the world. Miss Ricardo, in the *Annals of Nat. Hist.*, has given further notes on the *Pangoninae* in the British Museum collections, and Stein has written on Walker's *Anthomyidae* in the British Museum (*Zeitschr. Hym. Dipt.*). Among American writers, Coquillett has published various notes and a "Systematic Arrangement of the Families of Diptera" (*Proc. U.S. Nation. Mus.*), while Doane, Tyler-Townsend, and others have contributed towards a knowledge of the north American fauna of diptera; Hunter's *Catalogue of South American Diptera*, of which he has published a continuation, should prove a useful compilation.

As far as the British Isles are concerned the most important work published during 1901 was Verrall's volume on the *Platypezidae*, *Pipunculidae*, and *Syrphidae* of Great Britain; by its aid it should be possible for the British collector to name his captures in those families far more easily, and it will form a foundation upon which the British student can build, while the continental entomologists will undoubtedly find it of considerable assistance in the study of their fauna of diptera. The small band of British workers have added several species to their "List," among which may be mentioned *Atherix crassipes*, Mg., *Lophosia fasciata*, Mg., and *Pachygaster meromelas*, Duf.; Austen has published a descriptive paper (*Ent. Mo. Mag.*) upon the last species, founding a new genus *Neopachygaster* for its reception, and calling the species *Neopachygaster meromelaena*. In the same magazine I have endeavoured to distinguish the three British species of *Heteromyza*, while Wainwright has given some notes on British *Tachinidae*, Bradley notes on British *Trypetidae*, and Henderson has written on the *Tipulidae* in the west of Scotland.

It is to be hoped that more attention will be given to this neglected order of insects during the coming year, and that by careful and conscientious work greater progress may be made in 1902 than has taken place in 1901.

Notes on the British Myrmecophilous fauna (excluding Coleoptera).

By HORACE DONISTHORPE, F.Z.S., F.E.S.

(Continued from p. 18).

ORTHOPTERA.—*Myrmecophila acerrorum*, Panz.—Burr (*Ent. Record*, 1899, p. 187) calls attention to the fact that Westwood recorded this insect from Netley, where it had been taken in moss, but that further evidence is necessary to confirm it as British. Wasmann (*loc. cit.* p. 176) records it from north and mid-Europe. The big form (♀ adult) and medium (♂?) with *Formica fusca* and *F. sanguinea*; also with *Lasius niger*, *L. alienus*, *Myrmica laevinodis*, and *Tetramorium caespitum*. If ants' nests were only more thoroughly worked in this country, it is possible that this interesting little species would be found, and so confirm the old record.

NEUROPTERA.—NEUROPTERA-PLANIPENNIA.—*Hemerobius*, sp.—I took several specimens of the curious larvæ of a species of this genus in the nest of *Lasius fuliginosus* at Oxshott. They cover their bodies with the remains of their prey. As they feed on *Aphidæ* it is probable that they were after the plant-lice of the ants.

PSEUDONEUROPTERA.—PSOCIDÆ.—*Cacilius flavidus*, Steph.—Early in the year I took the very young larvæ in the nests of *Lasius fuliginosus* and *Formica rufa* at Oxshott; later I took the nymph in the same nest of the former, and in October a fair number of the perfect insect in the same nest. The ♀s laid their eggs shortly after capture in the tubes in which they were confined; this suggests that the eggs would be laid in the nest. I have been told that this is a common insect and has nothing to do with ants, but it seems to me worthy of record, as the creature passed its earlier stages in the nests. Hagen has described a Psocid, *Atropos formicaria*, with this same ant in Prussia.

RHYNCHOTA.—HETEROPTERA.—*Alydus calcaratus*, L.—Saunders (*Hemip. Heterop. of the Br. Isles*, p. 52) says this species is often found in company with *Formica rufa*. Wasmann (*loc. cit.*, p. 179) records it from the nests of *F. rufa* and *F. rufibarbis* in Holland; the larva with *Myrmica rubra* and the nymph with *F. sanguinea* in Finland.

Piezostethus formicetorum, Boh.—White (*Scot. Nat.*, 1871, 2, p. 260) records this species from the nests of *Formica rufa* at Braemar. Douglas in quoting this record (*Ent. Mo. Mag.*, 1874-5, p. 174) remarks that it was a similar habitat to that in which it was first taken by Boheman. Wasmann (*loc. cit.*, p. 181) gives its normal hosts as *F. rufa*, *pratensis*, and *truncicola*.

Myrmedobia coleoptrata, Fall.—Douglas (*loc. cit.*, p. 138) writes: "M. coleoptrata was found on a bank at Highgate in company with small black ants, but not in their nests. Neither sex is like an ant, and the apterous female resembles the coleopterous *Aleria pilifera* which was found at the same time and place. But as Herr Fieffenbach found the bugs in the ants' nests, it is certain that this want of similarity is no bar to the safety of the lodgers." I took a ♂ in the nest of *Lasius fuliginosus* at Oxshott. Wasmann (*loc. cit.*, p. 181) mentions as its hosts

Formica rufa, *F. pratensis*, *Myrmica laccinodis* and *Lasius fuliginosus*.

Pilophorus bifasciatus, F. (= *Camaronotus cinnamapterus*, Kir.).—Douglas (*loc. cit.*) says “*Camaronotus cinnamapterus*, which in both sexes is very like a small *Formica rufa* . . . is constantly found on trees, &c., in company with that ant.” Wasmann (*loc. cit.*, p. 182) records it with *Formica pratensis* as well as *F. rufa*.

Pilophorus perplexus, D. and Sc.—Norman (*Ent. Mo. Mag.*, 1878-79, p. 253) says “I saw some larvæ of this species running up and down the stem of an apple tree among a number of *Formica fusca*.” Wasmann (*loc. cit.*, p. 183) in quoting this record, which he attributes to Douglas in error, suggests that *Lasius niger*, L., was the ant he found them with and not *F. fusca*. I have taken it at Chiddingfold in 1898 running about in the “runs” and on the trunk of an oak stump inhabited by *Lasius fuliginosus*. On September 18th, 1901, I took several specimens by beating aspens swarming with *Lasius niger* at Bexley.

Systellonotus triguttatus, L.—Douglas (*loc. cit.*, 1865-66, p. 30) records the capture of this species (♂ s, ♀ s, and pupæ) in numbers with *Formica fusca* at Weybridge. Saunders (*Ent. Mo. Mag.*, 1892, p. 290) records it freely running amongst a colony of *Lasius niger* at Chobham. Wasmann (*loc. cit.*, p. 183) gives the host as *Lasius niger*, suggests that Douglas' record referred to *L. niger* and not *F. fusca*, and points out that the male is neither so like an ant, nor so truly myrmecophilous as the larvæ and females.

Nabis lativentris, Boh.—Sharp (*loc. cit.*, pt. ii., p. 556) figures the young of this bug and writes: “One of our indigenous Nabides is of great interest from the curious resemblance it has to an ant. The likeness is brought about by the sides of the base of the abdomen being very pallid in colour, except a dark mark in the middle; this mark is in shape like the pedicel of an ant. Viewed in profile it is found that on the base of the abdomen there is an elevation like the “scale” in this position in ants, and that the abdomen is extremely ant-like in form. This resemblance is quite parallel with that of an Orthopteron to an ant (see, vol. v., p. 323); the insect is by no means uncommon, and it is strange that this curious case of resemblance should hitherto have escaped notice. The bug runs about on plants and flowers, and is frequently met in company with ants, but we do not know whether it preys on them. Not the least remarkable of the facts connected with this insect is that the resemblance is confined to the earlier instars, the adult bug not being like an ant.” Wasmann records the larva (*loc. cit.*, p. 181) with *Lasius fuliginosus* in Holland, and with a *Myrmica* species in France.

Dictyonota crassicornis, Fall.—Mr. Morley took a specimen of this insect in the nest of *Myrmica rubra* at Covebiltre Broad, Suffolk.

Stygnus pedestris, Fall.—Mr. Keys took a specimen of this bug in the midst of the ants in a nest of *Myrmica scabrinodis* at Plymouth.

Tropistethus holosericeus, Schultz.—Saunders (*loc. cit.*, p. 87) says that Dr. Puton records this species with ants, but he is not aware of its having been captured under such circumstances in this country. Mr. Jennings tells me he took it in an ants' nest at Dorking in 1897.

HOMOPTERA.—CERCOPIDÆ.—*Typhlocyba crataegi*, Douglas.—I took a young larva and later the perfect insect in the nest of *Lasius fuliginosus* at Oxshott. It is perhaps worth mentioning that Belt has recorded the fact that in Nicaragua the larvæ of certain Homoptera were assidu-

ously attended by ants for the sake of a sweet juice excreted by them. Mr. E. Green (*Ent. Mo. Mag.*, 1900, p. 185) gives a note on the attractive properties of certain larval Hemiptera.

APHIDIDÆ.—*Forða formicaria*, C. Heyd.—Buckton (*Monograph of British Aphidae*, vol. iv., p. 84) records specimens taken by Mr. J. Hardy from *Myrmica* nests in Berwickshire, and by Sir John Lubbock at Beckenham. He considers that there is abundant proof that *Forða* is a common companion of ants. Wasmann (*loc. cit.*, p. 187) says it is found in the nests of most small species of ants, especially with *Lasius flavus*. He points out that all the old records of plant-lice with ants, such as Huber, Spence, F. Smith, &c., refer to this species. I have taken it in the nests of *Lasius flavus* in the Isle of Wight.

Forða viridana, Buckt.—Buckton (*loc. cit.*, iv., p. 85) records it as being found in small companies in ants' nests covered by tufts of various grasses, and that the malachite-green variety may often be taken in quantity, nesting with *Formica fuliginosa*. Wasmann (*loc. cit.*, p. 187) records it with *L. flavus*, in Bohemia.

Paracletus cimiciformis, C. Heyd.—Buckton (*loc. cit.*, iii., p. 67) says that this Aphid has been taken in the nest of *F. rufa*, and then usually in company with another underground species, *Forða formicaria*. Newstead (*Ent. Mo. Mag.*, 1893, p. 115) records a colony of this species from a nest of *F. flava* at the Loggerheads, near Mold, North Wales. Wasmann (*loc. cit.*, p. 187) says, "in a nest of *F. rufa* in Germany."

Tychaea setariæ, Pass.—Buckton (*loc. cit.*, iv., p. 88) writes: "Taken in ant-hills at Beckenham." Wasmann (*loc. cit.*, p. 187) captured it in a nest of *Tetramorium caespitum* in Bohemia.

Tychaea trivialis, Pass.—Buckton (*loc. cit.*, iv., p. 86) says, "Taken in ants' nests at Beckenham." Wasmann (*loc. cit.*, p. 187) took it with *Formica sanguinea* in Holland.

Tychaea setulosa, Pass.—Buckton (*loc. cit.*, iv., p. 87) says Sir John Lubbock took it in ants' nests near Beckenham.

Tychaea eragrostidis, Buckt.—Buckton (*loc. cit.*, iv., p. 89) records it from ants' nests at Beckenham, and also at the Cheviot.

Trama troglodytes, Heyden.—Buckton (*loc. cit.*, iii., p. 69) states that Sir John Lubbock found it in ants' nests at Beckenham, and Mr. Hardy in similar localities on the Grampian Hills. He further says it is common in the nests of *M. rubra* and *F. fuliginosa* on the high moors in Berwickshire.

Endeis formicina, Buckt.—Buckton (*loc. cit.*, iv., p. 91) writes: "In May they were numerous in the ant-hills under roots of *Carex dioica*. They mostly affected those nests of *Formica umbrina*, which were located on the dry slopes."

Endeis pellucida, Buckt.—Buckton (*loc. cit.*, iv., p. 92) writes: "Taken under tufts of grass, such as *Poa annua*, covering the nests of ants. . . . They were found at Beckenham in February."

Endeis carnota, Buckt.—Buckton (*loc. cit.*, iv., p. 92) records it in an ants' nest at Beckenham with several other Aphides, including *Trama* and *Paracletus*.

Lachnus formicophilus, Buckt.—This new species to Britain and to science was described by Mr. Buckton (*Science Gossip*, Feb., 1901) from a ♂ taken by me in a nest of *Formica rufa*, at Oxshott, in 1900.

COCCIDÆ.—*Lecanopsis formicarum*, Newst.—Newstead (*Ent. Mo. Mag.*, 1893, p. 138) records two specimens sent him from a nest of *Lasius niger*, on the Chesil Beach, by Mr. Dale.

Rhipersia subterranea, Newst.—Newstead (*loc. cit.*, p. 79) records this species from the nest of *Lasius flavus* on a raised shingle beach at Ingoldisthorpe, near King's Lynn.

Rhipersia tomlini, Newst.—I first discovered this species in Britain on April 19th, 1901, in the Isle of Portland, where I found it in numbers in the nests of *Lasius niger*. It was first described by Mr. Newstead from species taken by Miss Tomlin in nests of *Tetramorium caespitum* and *Lasius alienus* in Guernsey. I introduced specimens into my "observation nest" of *F. rufa*; the ants paid no attention to them beyond touching them with their antennæ. I forced several ants to take hold of specimens of the Coccid, but they always dropped them without hurting them. They lived in the nest for some time, but died from the want of proper food, grasses, etc., to suck.

THYSANURA.—PODURIDÆ.—*Beckia albina*, Nicol.—Sir John Lubbock (*loc. cit.*, p. 74) remarks that this insect belongs to the class of guests which reside actually in the galleries and chambers of, and with, the ants, but which the latter never touch. He continues, "It is an active bristling little being, and I have kept hundreds, I may say, thousands, in my nests. They run about in and out among the ants, keeping their antennæ in a perpetual state of vibration." Wasmann (*loc. cit.*, p. 189) refers to it as "Absolut pannymekophil." I have taken it with *Formica rufa* at Oxshott, Weybridge and the Blean Woods, with *Lasius fuliginosus* at Oxshott, with *Formica sanguinea* at Weybridge, and with *Myrmica sulcinodis* at Woking, and have often seen it running about in my "observation nest" of *F. rufa*. I last observed a specimen on January 8th, 1902, running about under a dead ant.

Orchesella cincta, L.—I have often found this species in numbers in the nests of *Formica rufa* and *Lasius fuliginosus* at Oxshott.

(To be continued.)

On the systematic position of *Gelastorrhinus*, Brunner.

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

In 1893, Brunner established this genus for a new species from Burmah, with the remark, "Ce genre affecte complètement la livrée de certaines Tryxalides, notamment du genre américain *Achurum*. La présence d'une dent minime sur le prosternum m'engage à le placer parmi les *Mesopes*. J'en connais trois espèces, dont une du Japon, une de Madagascar et de Ceylon, et la troisième de Birmanie." This latter is described under the name *G. albolivatus*, and so becomes the type species. The species from Madagascar has been since described by de Saussure under the name *G. edax*; a little over a year ago I had the opportunity to study these insects, and found also a new species from Java and from Sikkim, so there are five species in the genus, of which two are already described. Very closely allied to *Gelastorrhinus* is *Ihadinotatum*, McNeill, with the single species, *I. brevipenne*, Thos., but this genus is next to *Achurum*, Sauss., in position, also an American genus, containing a couple of species. But *Achurum* is ranged by Brunner in the group *Hyalopterygines*, that is, in the *Truxalidæ*, and, on a close comparison, it will be found impossible to separate *Gelastorrhinus*, so that, in spite of a minute tubercle upon the sternum, it must be removed from its unnatural position among the

Mesopes in the *Acridiidae*, and take its place with *Achurum* and *Rhadinotatum* in the *Truxalidae*.

It is so "Truxaline" in appearance, that it has long been a temptation to effect this move, but orthopterists have always said, "it has a tubercle on the sternum, therefore it must be of the *Acridiidae*." But this tubercle is an arbitrary character, which must be treated as a servant and not as a master; these genera are so Truxaline in every other character that the accumulation of other points must outweigh this little tubercle. I have proposed this change to Brunner himself, and it has met with his emphatic approval.

The order of the genera occurring in the first group in Brunner's arrangement of the *Truxalidae* in his *Revision* in 1893, will therefore be as follows:—*Acrida*, Stal. (= *Truxalis*, Fabr.), then the three genera *Achurum*, *Rhadinotatum* and *Gelastorrhinus*; these are followed by *Hyalopteryx*, Charp., and *Truxalis*, Fabr. (= *Metalepta*, Brunner) together, following which are *Calamus*, Sauss., with Karsch's African genera, *Glyphoclonus* and *Amphicremna*, with *Odontomelus*, Bol.; then *Ocyolena*, Karsch, and finally *Amycus*, Stal., and *Machaeridia*, Stal.

Notes on the habits and life-history of *Orgyia splendida* (with plate).

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

During the visit of Mr. Champion and myself to the Albarracin district of Spain last summer, we found at Cuenca a cocoon of *Orgyia dubia* var. *splendida*, under a stone, and another, together with a larva, at Tragacete. I believe we saw the moth on the wing at Cuenca, at Tragacete, and at Albarracin. On a wooded ridge, near Bronchales, a good many moths were seen flying, but none were captured. Noting that my first cocoon contained a female moth that had laid some eggs in her cocoon, and that she seemed to be an *Orgyia*, I concluded that she belonged to the *O. splendida* of which we had seen several males on the wing, and of which I had taken one or two. This called to my mind something I had heard or read about the pairing of some of these *Orgyias*, but when or where I could not remember. I have tried to find out where I had read this, and to discover some reference to the habits of *O. splendida*, but have failed. The only reference I have unearthed is an account by Dr. Breyer in the Belgian Entomological Society's *Annales* of the history and pairing of *Orgyia ericac*. As others may be as ill-informed on this matter as I was myself, it may not be useless to record my observations on *O. splendida*, and, though I think it probable that the facts are already somewhere reported, a confirmation of them may not be altogether superfluous.

O. antiqua, as everyone knows, has a female with well developed legs and rudimentary wings. She emerges from her cocoon, which she never leaves, and lays her eggs on its outer surface. In *O. gonostigma* the history is the same, with the interesting difference that there is an outer loose cocoon, or network of silk, beneath which the female moth remains, laying her eggs on the inner, true cocoon. This is a step onwards towards the habit of *O. ericac*, which, according to Dr. Breyer, emerges from her chrysalis sufficiently to make a small opening in it, but does not emerge from it, but reverses her position in the chrysalis case, so that pairing takes place through this opening, the male outside, the female inside the cocoon. He does not say how the

cocoon is pierced, but I gather that he believes a weak place exists, such as is left for the emergence of the moth in the cocoon of so many species, and that the ovipositor of the moth penetrates this. He carefully notes that the moth preserves the pupal covering of the head, which still covers her anterior extremity when she has reversed herself in the chrysalis case, and specially dwells on this as showing that before her reversal she has thus provided an opening in the pupa-case, but he says nothing about the cocoon.

To return to our *O. splendida*. Finding in the examination of my first specimen that I had an *Orgyia* whose female did not emerge from the cocoon, I concluded that it must belong to the same species as the males we had observed, and the idea occurred to me that my other two specimens might give me the opportunity to observe something of the pairing habits of the species. The cocoons are quite sufficiently transparent to enable one to see the enclosed pupa against the light, and my second cocoon appeared to contain an undisturbed pupa. The first specimen showed that the pupa-case is exceedingly flimsy, and that the moth, in emerging from it, or afterwards, breaks it up into small fragments, retaining, however (as Dr. Breyer records of *O. ericæ*), on her head, the pupal head-coverings. I waited, therefore, until some changes occurred in the cocoon, suggesting the emergence of the moth from the chrysalis case, and this seemed to have occurred when we were at Tragacete on July 24th. My idea was that the moth flew in the evening, as I had met with it on the wing towards dusk. I afterwards, however, saw it flying in the afternoon in bright sunshine. On the evening of July 24th I, therefore, took the cocoon to the hillside and laid it on a stone. The cocoon is of yellow silk, rather soft, but nevertheless not very flimsy, and I specially noticed that though the moth inside was more or less free from the chrysalis, which was, in fact, somewhat broken up, the cocoon itself was quite intact. I had not to wait more than a few minutes before a male moth came up, although I had not previously seen one that evening. I captured this one, and one that came up just after, and think that had I simply captured each as it came up I might have made a considerable bag. My object, however, was observation, and not specimens, and the next moth that came just after, I did not disturb. He soon found the cocoon, and walked very busily all over it, examining carefully, especially by trailing the extremity of his abdomen over it. I take it that this portion of his procedure would have been much simplified had the cocoon been in its natural position under a stone, and but little of it accessible, beyond what I must call the emergence extremity, but, lying loosely on a flat stone, it clearly took some time to satisfy him which was the place where an opening might be expected. Some of the procedure was, however, almost certainly directed to informing the enclosed moth of his presence, and it may be that he ascertains the right spot of the cocoon by the movements of the female within. After some minutes he became quite quiet and motionless, with his head applied to the extremity of the cocoon, and so remained for a space of about ten minutes. What was occurring during this period? The next step noticed, combined with the fact that the cocoon was uninjured just before, renders it almost certain that the moth inside is occupied during this period in making an opening in the cocoon. The male is certainly not doing so, as he is

perfectly quiet, but with an aspect of attention. Suddenly he becomes quite active, thrusts his head into an opening at the end of the cocoon, just where it had been resting, and in less than half a minute disappears entirely into the cocoon, his wings being pressed and folded against his sides, so as to occupy little or no space, so that one reckons that their splendour must be absolutely and permanently destroyed. I then took home the cocoon, now containing two moths instead of one. The opening by which the male had entered was very small indeed, but quite evident, though its margins had closed together again. This was at 6.45 p.m.; at 9 a.m. the next morning matters remained in the same condition—the cocoon still contained two moths. On returning home at 3 p.m. I found the male moth had come out of the cocoon and was at rest in the box. The curious part here is that his wings seemed little the worse for the severe treatment they had received. He is not a very fine fresh specimen, but a fairly good one, for all I can say possibly as fresh as when he first presented himself to my observation. The female then lays her eggs inside the cocoon. They are very large white eggs, and quite free from any adhesive material, but with a similar admixture of wool from the moth to that which Dr. Breyer says *O. ericæ* mixes with her eggs. Seeing the destruction that the moth makes of her pupa-case, and having been lucky in making a fairly satisfactory observation on the second cocoon, I devoted the third to obtaining a specimen of the female pupa, and so did not repeat the observation. My two cocoons and one larva were thus all three free from any parasites, which Dr. Breyer says destroys more than four-fifths of *O. ericæ*.

The ♀ moth has no head-parts uncovered by the permanently worn pupal head-cover, she has no trace of wings, but she possesses six curiously short thick legs, with very strong well-developed claws. I was not inside the cocoon whilst the male was waiting outside, but short of the certainty that might be attained, were such a position possible, I entertain no doubt that the female is tearing the opening in the cocoon with these powerful claws during this interval. After she has laid her eggs she is very flaccid, but still contains a good deal of some material of a fluid or jellylike character, and has a skin of very great toughness. She remains alive for a number of days, and out of the cocoon in a dry pillbox she retains some sort of life for two months, for at the end of that time she was by no means dried up, but was still a flaccid bag with some little fluid contents. How long she naturally retains this condition within the cocoon I do not know, possibly all the winter, for I believe the eggs do not hatch till spring. Nor with the small material at my disposal can I say how this fact operates for the protection of the eggs, but I have little doubt that the body of the mother operates in some way to exclude intruders from the cocoon, or possibly to prevent too dry air reaching the eggs.

The ♀ chrysalis is of a very pale brown, not much darker than straw colour, with a length of 14mm. and a width of nearly 7mm. The whole dorsal region is clothed with a sparse coating of pale yellow hairs, which are placed in some degree, as a dorsal patch on each side, and a row along the posterior margin of the segment, and smaller patches above and below the spiracles. It has at first sight an absolutely maggot-like aspect, and none of the ordinary appearance of a lepidopterous pupa. The segmentations are visible from end to end of the

pupa in all aspects. The following features, however, may be observed :—The front of the head and thorax occupy a length of less than 2·0mm. (pl. i., fig. 1). The front of the head presents four transverse elevations in succession, which appear to be the labrum, mandibles, maxillæ, and labium. Of these the second is the longest and about 5mm. in length, the first and third shorter, and the 4th shortest. Above the first the front of the head is marked off by an encircling groove at this aspect. Below and beside this joint, and a little beyond the end of the ridge marking the labrum, is a rounded elevation, the antennæ, and in the mature pupa some dark eye pigment, just farther out than this. Its disposition suggests, perhaps, rather the larval than the imaginal eye. Just below the antennæ the second ridge has, at its outer extremities, two elevations, which probably represent the jaws. The third ridge has the maxillary palpi very obscurely if at all represented, and the fourth has at each end an actual labial palpus, projecting from the pupal surface and apparently of two minute joints. Below these are the thoracic legs, each as an appendage at the end of a central transverse elevation, following on as a series those of the head, the first depressed in the middle and suggesting that it represents the trochanters of each side, the third comparatively large. The legs are each about 1mm. in length and consist of a minute coxa, a short femur, a tibia which is much the greater part of the leg, and a tarsus small and not obviously jointed. The legs lie flatly on the pupa, but are quite free, not adherent to the pupa or to each other. Of wings there are no traces, but there are on the thoracic segments some irregularities, ranging with those representing the lateral flanges on the abdominal segments.

The prothoracic spiracle cannot be made out (in the preserved specimen) but the first seven abdominal spiracles are very distinct, and of a definite brown colour. The pupa terminates in a very definite cremastral knob, almost a little globe (·3mm in diameter), carrying some ordinary hairs and several stronger browner ones diverging to either side. The texture of the pupal skin is extremely flimsy and delicate. It cannot be removed from the moth except in bits, and the moth itself breaks it up in this way when escaping it. The representation of the mouthparts as four segments (pl. i., fig. 1), precisely comparable with the thoracic ones, in a moth so high as *Orygia*, is especially worthy of notice.

The ♀ moth is of similar form to that of the pupa. Her head is invisible, only that of the pupa-case which continues to cover it being seen. She is of a rather deep blackish-brown, owing to a continuous pile of short hairs. I do not know where the hairs come from that she deprives herself of to place amongst her eggs, but I fancy they come from the whole surface, rather than altogether from the seventh segment. If this be so, then she has a long set of deciduous hairs mixed with the shorter persistent ones. The legs (pl. i., figs. 2 a, b, c) are very short, thick, and strong, barely a millimetre in length, including their attachment; they have a femur 25mm. thick, and the tibia is over 2mm. They consist of a good wide basal plate, lying flat on the body of the moth, rising a little to the articulation. This is probably the trochanter. The coxa can hardly be made out distinctly, but is, apparently, present. The femur is barely twice as long as thick, swollen irregularly in form; the tibia is not twice as long as thick, it is flask-shaped.

tapering to the tarsal end. Beyond this is apparently only one piece, equal to the tarsus and claws; it is a solid knobbed mass carrying two very strong, very curved claws, more than 0.12mm. in length, if measured along the curvature. There are a few bristles on the femur and tibia, the colour of the legs is darker than the rest of the moth, but not quite black.

The cocoon is brown, with admixture of larval hairs, it is quite soft. On cutting one open late in November, the moth, much shrivelled, but not absolutely dried up, was near the opening. The eggs, being quite loose, fell out at once, leaving the cocoon filled with a light brownish wool, which a mere breath of air at once diminishes much in quantity.

One cocoon contained about 130, another 170 eggs. These eggs (pl. i., figs. 3-4) are very large, and look as if made of white porcelain. They are a little flattened, especially at the base. Their diameter is 1.7mm., and height 1.2mm. Taking the egg of *O. antiqua* for comparison, that of *O. splendida* is more than twice the diameter, viz., 1.7mm. against 0.8mm. That of *O. antiqua* (pl. i., figs. 5-6), however, is of a height equal to its width, notwithstanding the cup-like flattening of the micropylar area, so that the egg of *O. splendida* is only half as high again as that of *O. antiqua*, viz., 1.2mm. against 0.8mm. The micropylar rosette is 0.03mm. in diameter, surrounded by an area 0.4mm. in diameter, in which the cells of the surface netting are very small, viz., 0.017mm. in diameter, outside this they are about 0.03mm. The network is not very strongly marked, and the lines little raised, more so within the micropylar area than outside. At this date the greater number of the eggs are unchanged, containing only yolk material like those of *O. antiqua*, but one or two having a darker appearance were found to contain a mature, but dead caterpillar.

The dorsal area of the abdominal segments of the young larva is fully occupied by tubercles i, ii, and iii, ii being very large, and encircling i posteriorly; iii rounded; i and iii with about twelve long hairs, ii with about twenty. The prolegs have two very long crochets marking each end of the semicircle of hooks, the intermediate ones very minute and hardly developed. On the 2nd and 3rd thoracic segments the tubercles are in one transverse row, of which ii is the largest, each with many hairs. On the 1st thoracic there is a row of tubercles in front and a thoracic plate behind them.

EXPLANATION OF PLATE I.*

Diagrammatic notes from camera sketches:

1. Anterior extremity (front view) of pupa of *Orgyia splendida* ♀, showing eyes and antennæ, mouth-parts apparently arranged as four successive segments, and thoracic legs. No trace of wings × 11.

2. Legs of *O. splendida* ♀, magnified × 24. *b.* Right first leg. *c.* Right intermediate leg. *a.* Left posterior leg. The differences are due more to aspect than to structure.

3-6. Eggs of *O. splendida* and *O. antiqua* to show relative form and size:

- | | |
|--|-------|
| 3. Egg of <i>O. splendida</i> from above | × 15. |
| 4. Egg of <i>O. splendida</i> from side | × 15. |
| 5. Egg of <i>O. antiqua</i> from above | × 15. |
| 6. Egg of <i>O. antiqua</i> from side | × 15. |

* Pl. i. published with the January number is hereby cancelled, owing to inaccuracies in the drawing. That published with the current (Feb.) number is the one to which reference should be made.

Entomological Souvenirs.*

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

Twelve months ago, when our leading entomologists wrote the series of interesting and informing articles published in the *Century* nos. (Jan. and Feb.) of the *Entom. Record*, one was at once struck with the distinct line of cleavage, showing, more or less, two distinct types of mental training in the writers, that appeared not only in the line taken by the writers, but also in their evident views as to the broad bases on which, in their opinion, entomology should be studied. On the one side was the satisfaction expressed at the facts amassed and the work chronicled of our knowledge of things; on the other was an implied dissatisfaction that so many evidently capable thinkers and observers largely wasted their best efforts by species-describing and mere reference work, and did not, therefore, add anything at all, commensurate with the time spent, to our knowledge of the vital activities of the organic beings they studied, and hence brought us no nearer to the problems bearing on the phenomena of life.

Amongst those entomologists who have taken a foremost place in drawing our attention to the functional activities of insects and their variation under different external stimuli, is Mr. Merrifield, and it is to him that we largely owe the translation of Fabre's earliest work. He has long wished to bring the observations of our illustrious neighbour under the immediate ken of British entomologists, recognising that if our collectors were once brought under the influence of the methods of such a naturalist—if they once understood that in the open fields real science was to be studied in more interesting and complicated forms than is possible in the closet, museum, or library, from the dried bodies of the victims we profess to love—a force would be brought to bear on our favourite pursuit that would be irresistible in the advance it would make, and would turn to real scientific purposes much of the more or less useless collecting that takes place, perhaps, nowhere so extensively as in this country, although the disease seems very generally distributed in Central Europe.

Fabre, "that inimitable observer" as Darwin called him, obtained his earliest inspiration from Léon Dufour, and his first published entomological work, that gained the honours of the Institute of France, was the complement of Dufour's marvellous account of the manner in which *Cerceris buprestica* fed its progeny on *Buprestis bijasciata*. His account of how he was led to become an entomological observer is graphically told. He relates how, one winter evening, beside a stove where the ashes were yet warm, while his family slept, he was forgetting, while he read, all the cares of the morrow (as professor of physics he was then earning the princely salary of £64 per year), when he chanced to light on the entomological pamphlet by Léon Dufour, to which we have just referred. He says: "Certainly, long ere this, I had felt a great interest in insects; from childhood I had delighted in beetles, bees, and butterflies; so far back as I can recollect I see myself enraptured by the splendours of a beetle's elytra or the wings

* "Insect Life," by J. H. Fabre, D.Sc. Edited by F. Merrifield, F.E.S., with a preface by Dr. D. Sharp, F.R.S. Price, 6s. (Macmillan and Co., Ltd., 1901.)

of a swallow-tail butterfly. The materials lay ready on the hearth, but the spark to kindle them had been lacking. The accidental perusal of Léon Dufour's pamphlet was that spark. I had a mental revelation. So, then, to arrange lovely beetles in a cork box, to name and classify, was not the whole of science; there was something far superior, *viz.*, the close study of the structure, and still more of the faculties of insects." One cannot doubt that the perusal of a book like that of Fabre will open up to many a young naturalist horizons whose very existence he had never guessed, and will throw wide open the gates of a new world where henceforward he will use his mental powers, possibly in a direction in which they have hitherto lain entirely dormant.

To mention in a haphazard manner a fact here and there in the book would be purposeless, and leave probably an entirely wrong impression. The author's detailed observations made upon *Scarabæus sacer* are excellent. He criticises clearly and concisely the conclusions of Blanchard, shows that *Scarabæus sacer* does not call his friends to help him in difficult places, and proves that there is neither community of labour nor community of family, that the eager fellow-worker, under pretence of giving a helping hand, cherishes the project of carrying off the ball of dung at the earliest opportunity. He has seen pillagers and pillaged, and nothing else, and if a number of beetles surround the same ball it means battle, and he concludes that, outside of the cares of maternity—cares in which it almost always shows itself admirable—the insect, unless, indeed, it lives in society, like bees and ants and some others, thinks of and cares for nothing but itself. His account of the cells in which the young *Scarabæus* is reared is altogether admirable.

But it is in his description of the habits of the Hymenoptera that Fabre excels. The thrilling way in which he carried out his experiments on the habits of *Cerceris buprestica*, the manner in which he proves that Dufour was wrong in his views that the poison injected into the Buprestids was an antiseptic preserving the latter from decay till the larva of *Cerceris* had devoured it, and how he himself shows that the poison does not kill, that life is still there—life latent and passive—vegetative life, the destruction of the nervous centres that control movement and volition, yet allowing the functions of the viscera to proceed sufficiently to maintain a deep slumber, which will never be broken, and yet which is not death, ceasing only when the intestine is empty, are all equally delightful. His account of the hunting of *Cerceris tuberculata*, which preys on the weevil, *Cleonus ophthalmicus*, the mining feats it accomplishes in storing its prey for its young, the reason why *Cleonus ophthalmicus* is almost exclusively chosen (one *C. alternans* and a single *Bothyrodereus albidus* form the only exception), the more varied larder of *Cerceris arenaria*, *Cerceris aurita*, *Cerceris ferreri*, *C. quadricincta*, *C. labiata*, and *C. julii*, whilst *Cerceris ornata* brings up its family on Hymenoptera, are exceedingly interesting. The stored weevils, like the stored Buprestids, remain for days (sometimes for weeks) perfectly fresh, though permanently motionless. No less stimulating is his description of the habits of *Sphex flavipennis*, which hunts field crickets, and here one meets with another robber, *Tachytes nigra*, which he found to lay its eggs in the store laid up by the *Sphex*, the latter evidently afraid to drive it from the burrow it had usurped. *Tachytes obsolæta*, banded

white round the abdomen like *Spher albisecta*, is supposed similarly to utilise for its own egg-laying the stores laid by the latter. To follow the author through his account of the ways of *S. flavipennis* is impossible. As to the conditions of the food stored, Fabre says: "Crickets sacrificed by *S. flavipennis* are no more dead, in spite of all appearances, than are weevils struck by a *Cerceris*. The flexibility of the integuments displays the slightest internal movement. If one closely observes a cricket stretched on its back a week, or even a fortnight or more after the murder, one sees the abdomen heave strongly at long intervals. Very often one can notice a quiver of the palpi and marked movements in the antennæ and the bands of the abdomen, which separate and then come suddenly together. By putting such crickets into glass tubes I have kept them perfectly fresh for six weeks. Consequently, the *Spher* larvæ, which live less than a fortnight before enclosing themselves in their cocoons, are sure of fresh food as long as they care to feast."

It is quite beyond the space at our disposal to give any further details. His notes on *Ammophila hirsuta*, *A. sabulosa*, and *A. holosericea*, *Bembex rostrata*, *B. tarsata*, *Cerceris tuberculata*, *Chalicodoma muraria* and other mason bees, are all equally delightful and interesting. To those who are interested in the so-called intelligence of insects, and who draw conclusions as to their actions based on the human standpoint, the book is absolutely necessary as a corrective. The conclusion of his chapter on "The Ignorance of Instinct" is delightful, and the author's views are proved, one feels, most completely. He says: "Instinct knows everything in the unchanging paths laid out for it; beyond them it is entirely ignorant. The sublime inspirations of science, the astonishing inconsistencies of stupidity, are both its portion, according as the creature acts under normal conditions or under accidental ones."

The Entomological Society of London honoured itself in electing M. Fabre one of its honorary Fellows recently. To Mr. Merrifield's insistence on procuring an English translation, and to the talented lady who has translated the difficult Provençal so excellently, every field naturalist owes a debt of gratitude. The book is clearly printed, well illustrated, and the contents are altogether delightful. We hope that when fathers have read and re-read the book they will hand it on to their children, for in such books as this lies the training of our future naturalists. To our educationalists we commend pp. 271-274; we suspect that in some districts of England things are not much better even now, and if Cockertonian views are to prevail, as seems all too likely, in a few years' time things may even be worse.

NOTES ON COLLECTING, Etc.

LEPIDOPTERA AT SEATHWAITE.—I had long anticipated spending a week in the neighbourhood of Seathwaite, the main object being the capture of *Melampus epiphron*. I had already made three or four unsuccessful attempts to do so, and considered that a week must give me at least one fine day in this, the wettest place in the kingdom. With Mr. J. Malcolm, I left Carlisle on the afternoon of June 15th, 1901, for Keswick, where we were fortunate in getting a ride to Lodore. We, however, still had several miles to walk in the hot sun, hampered

by the necessary impedimenta for a week's collecting, but, in spite of the fatigue, we took *Venilia maculata*, *Drepana falcataria*, and *Brenthis selene* on the way, finally reaching our destination by 8 p.m. After a good meal we set out to collect in a wood about a mile away, and unexpectedly met Mr. Thwaites, who was also collecting here. We found *Abraxas sylvata* plentiful, and in good condition, and many insects occurred at dusk, the best being *Cymatophora fluctuosa* and *C. duplaris*. We left Mr. Thwaites applying sugar to the trees, and this was the last we saw of him during our stay. The locality around Seathwaite proved to be a very good one for many of the mountain species. We made two ascents to Sprinkling Tarn, but both days were unfavourable, and, after a long search among the grass, only one *Crambus furcatellus* was taken. At Styhead a better state of things existed, this place being rather sheltered, and we took a few dark forms of *Coenonympha pamphilus*, and further down the mountain, at various times, captured among the rocks *Larentia salicata* and *Melanippe galiata*, also the pretty little *Pyrausta purpuralis* and *Emmychia cingulata*. Fortunately, we came across a man who assured us that we might get any quantity of *M. epiphron* in the Honister Pass. Accordingly, we went there, and found it very common, and although it was only the second week in June they showed unmistakable signs of wear. The species proved to be extremely common in various places above a certain altitude, not confining itself altogether to boggy places on the mountain-side, as some writers assert, e.g., we found it common on very dry ground at the top of Honister Pass. *Nemeophila plantaginis* ab. *hospita* and *Crambus furcatellus* were also taken, as well as a few larvæ of *Characas graninis*, on our return, and a fine specimen of *Cucullia umbratica*. Two or three excursions were made later to Honister Pass, and on two occasions we had the company of Mr. Mousley, of Bradford, and Mr. Glenny, of Wisbech, who came specially to take *M. epiphron*; they were lucky enough to get two fine days, and made a good haul. We had a few fair nights at sugar, when we took the following species: *Thyatira batis*, *Cymatophora fluctuosa*, *Triana psi*, *Pharetra rumicis*, *Craniophora ligustri*, *Hadena thalassina*, *H. contigua*, *H. oleracea*, *H. dentina*, *Hyppa rectilinea*, *Aplecta prasina*, *Xylophasia rurea*, *Euplexia lucipara*, *Noctua plecta*, and *Rusina tenebrosa*. The best night I ever remember at sugar was the Friday night of this week, when moths literally swarmed, the predominating species being *Euplexia lucipara*; even the sugaring brush, which was stuck up in a stone wall, was covered with this species. We filled our boxes on the first round and had to go back to the farm to empty them into ammonia bottles. On our return the same lively state of things existed. Having gone round half the trees, an unfortunate accident happened—Mr. Malcolm stumbled over a stone and broke the paraffin stable-lamp, which we had borrowed from the farm, and abruptly ended the most successful night I ever had at sugar. We returned home on the following Saturday with our spoil, and on our walk to Keswick took *Argynnis aglaja* and a nice lot of *Aglais urticae*, and also *Spilosoma menthastri*, which were in evidence all along the road. Towards Keswick we took a few webs containing larva of *Hyponomeuta padella*, which form very conspicuous objects near the main road. On the whole, we had a fairly successful week, considering how noted the place is for rain.—MALCOLM DIXON, Carlisle. *January 9th, 1902.*

EPUNDA LUTULENTA IN HERTS.—Last autumn I spent three days—September 10th to 12th—at Weston Vicarage, five miles from Stevenage. Whilst watching some tobacco plants between 6.30 and 7 p.m. (only one) I noticed a black speck in the centre of a tobacco flower. I thought it could not be *Plusia gamma*, as it was settled, and quite motionless, but was hardly prepared on boxing it to find that it was a fine male *Epunda lutulenta*—a species I had never taken before. As Mr. A. E. Gibbs, of St. Albans, who is making out the Hertfordshire list of insects for the Victoria County History, informs me that the species is new to the county, perhaps you may deem the record worthy of insertion in your magazine.—(REV.) G. H. RAYNOR, M.A., Hazeleigh Rectory, Maldon, Essex. *January 8th, 1902.*

AUTUMNAL LEPIDOPTERA IN MERIONETH, ETC.—I spent the last week of September and the first week of October, 1901, at Aberdovey, in Merionethshire. Though so late in the season there were more insects about than I expected to find. My captures included a worn example of *Sphinx convolvuli* at rest on a wall, *Epunda nigra* going over, *E. lichonea*, *Nyctina ornitopus* (*rhizolitha*), *Calocampa retusta*, *Peridroma sancia*, *P. ypsilon*, *Anchocelis rujina*, *A. lunosa*, *A. macilenta*, *Orrhodia ligula*, &c. I also saw two specimens of *Polygonia c-album* and one *Pyrameis cardui*. *N. ornitopus* was very plentiful at sugar, also at rest on stones on the mountain-sides, in this respect the species has much the same habit as *Polia chi*. The capture of a larva of *Cucullia asteris* was interesting. After my return, a visit to Delamere produced only two examples of *Epunda lutulenta* worth taking. A rather small, very dark and perfect specimen of *Acherontia atropos*, was brought to me in the beginning of October, caught by a dairymaid in the dairy at Earl Egerton's place, near Knutsford.—G. O. DAY, F.E.S., Knutsford. *November 13th, 1901.*

LEPIDOPTERA IN 1901, ETC.—For a novice I had very fair success last year. Among other species, I found *Amphidasys strataria* plentiful in Epping Forest, 30 examples captured on April 1st and 3rd; *Alencis pictaria* in Epping Forest from April 22nd to May 6th, and I was pleased to take (for the first time there) one at Broxbourne, *Nola strigula* and *Zephyrus quercus*, on July 13th; *Colias hyale* occurred at Hackney Wick, on the banks of the canal, June 25th; and *Sphinx convolvuli* (which I see has been common) in my own garden on September 21st. In north Devon, amongst my captures for the first time were imagines of *Emmelesia taeniata*, larvæ of *Cucullia absinthii*, *Eupithecia jasioueata* and many other interesting species of *Eupithecia*. I also took *Leucania albipuncta* for the first time in the Isle of Wight. During December I have bred (in kitchen), from one batch of eggs, laid by an Isle of Wight ♀, 140 specimens of *Caradrina ambigua*, after giving away many larvæ. The species is evidently prolific, and no trouble to force; the larvæ were fed on dandelion. In Epping Forest last night I found all the Hybernias—*rupicapraria*, *leucophaearia*, one only, *aurantiaria*, *marginaria*, and *defoliaria*. I have never taken all at one time before. I took also *Phigalia pedaria* (several), and of course *Cheimatobia brumata*, which is still in countless thousands, chiefly pairs.—JOHN E. GARDNER, 204, Evering Road. *January 18th, 1902.*

SPREAD OF BUTTERFLIES INTO SUITABLE LOCALITIES.—Mr. A. H. Clarke in his note in the *Ent. Record* for January, on the spread of butterflies

into suitable localities, mentions *Polyommatus bellargus* as one of the species which has recently arrived at a locality near Marlow. This is of much interest to us here because the same thing has happened on the chalk downs to the south-east and east of Oxford. In former days all the Reading collectors went to Folkestone when they wanted the species, as it was utterly unknown in their district. About 1891 or 1895, after I had left Reading, a boy took a specimen at Streatley, and individuals in small numbers were taken in succeeding years. In August, 1899, I was collecting on the downs between Streatley and Blewberry, when I suddenly came on *P. bellargus* flying in abundance, and on ground which I used to visit regularly from Reading without ever seeing the species. Here and there in spots among the hills I met with them in plenty. Probably in the earlier days the species existed somewhere on the Berkshire downs, but beyond the reach of our visits, and has gradually increased its range until it now occurs right up to the point where the chalk is covered by the tertiary strata towards Reading, and also at Hardwick, in Oxon, having apparently crossed the river. In this way it may have continued along that side of the river, through Henley to Marlow.—W. HOLLAND, University Museum, Oxford. *January 28th, 1902.*

POLYOMMATUS BELLARGUS ON THE OXFORDSHIRE CHILTERN.—I am told that a record of my experience of the appearance of *Polyommatus bellargus* on the Oxfordshire Chilterns may be of interest. My home is within a mile of the little town of Watlington, and within a mile the chalk hills rise from the plain. Till I came here in 1890 I had never seen *P. bellargus* alive, and was anxious to make its acquaintance, I thought it likely to occur on the chalk, and, accordingly, was on the lookout for it, taking, I doubt not, hundreds of bright *P. icarus* on suspicion, but I never came across it, and was convinced that it did not occur with us. So matters went on till 1899. In that year, after being away for a holiday for the month of August, I came back at the beginning of September, and a few days after, looking over the catch of a schoolboy, who lives on Pyrton Hill, I saw on his board several specimens of *P. bellargus*, and in answer to my enquiry he told me that "they are all over the hill." I went out and almost immediately I came across a "blue" on the wing that I knew I had never seen before, and shortly afterwards others of the same species. Returning with my net I speedily caught half-a-dozen, and found them to be *P. bellargus*, both sexes. I could have taken many more but they were getting worn. Now I cross that particular hill about once a week on the way to another part of the parish, and had the butterfly been there in previous seasons I am sure I could not have failed to see it. I then went to two other localities on the hills, a mile or so off, which I thought likely, and found it in both. Every year since 1899 I have found *P. bellargus* in these spots in fair abundance.—(REV.) JOHN W. B. BELL, Pyrton Vicarage, Watlington, Oxon. *January 28th, 1902.*

CURRENT NOTES.

We have to apologise to some of our subscribers for an overcharge of postage on the last number. The number was of the usual size, and, as was thought, weight, but it appears that whilst most went through the post all right, others were surcharged as being "over

weight." We are exceedingly sorry. Errors also in the drawing of Plate i issued with the January number have made it necessary for us to duplicate it this month with an accurate one. Will our subscribers please cancel pl. i as inaccurate?

A most successful and enjoyable meeting of the Entomological Club, founded in 1826, was held in the Entomological Salon of the Holborn Restaurant on January 14th. It was the sixteenth gathering over which Mr. G. H. Verrall has presided as host, and a large number of guests was present. Among others we noticed—Professors Meldola and Poulton, Colonels C. T. Bingham, C. Swinhoe and J. W. Yerbury, Revs. E. N. Bloomfield, A. E. Eaton, F. D. Morice, C. F. Thornewill, Dr. T. A. Chapman, Messrs. F. C. Adams, R. Adkin, H. W. Andrews, E. E. Austin, C. G. Barrett, W. F. H. Blandford, W. Borrer, F. Bouskell, W. C. Boyd, R. C. Bradley, H. Rowland-Brown, E. Brunetti, H. A. Bryden, M. Burr, A. Cant, G. C. Champion, A. J. Chitty, F. Noad Clark, J. E. Collin, W. L. Distant, H. St. J. K. Donisthorpe, H. Willoughby Ellis, C. Fenn, F. W. Frohawk, C. J. Gahan, H. Goss, A. Harrison, M. Jacoby, O. E. Janson, J. H. A. Jenner, A. H. Jones, W. J. Kaye, W. F. Kirby, G. Lewis, H. Main, A. H. Martineau, F. Merrifield, C. Morley, B. G. Nevinson, W. Nicholson, P. Skinner, R. South, E. Step, J. Stevens, J. Tatham, W. H. Tuck, J. W. Tutt, C. J. Wainwright, C. O. Waterhouse, E. A. Waterhouse, and others.

Departing from his usual custom, the host discussed very fairly the election of the Council of the Entomological Society of London, by a ballot of the Fellows. He summarised the position of the Society by saying, "The Society as a whole is progressive, the Council is fossilised." He dubbed those who had taken part in the nomination of Messrs. Burr, Swinhoe and Tutt, "rebels," and offered to become the "arch rebel," if the rebels would withdraw from the contest and move the Council to amend its ways. Professor Meldola also urged withdrawal, Professor Poulton drew loud cries of dissent from the "rebels" when he insisted that the movement was a vote of want of confidence in the Council, and Mr. Goss was moved to sorrow rather than anger, at the rashness of his "rebel" personal friends. The "rebels" meanwhile, possessed their souls in patience.

There are two modes of being nominated for a seat on the Council: (1) To be nominated by the Council itself. (2) To be nominated by four other Fellows. Why the carrying out of these byelaws must be a "want of confidence vote" is difficult to understand, but so it was, and the insistence of this was very unfortunate, for it converted a straight-forward ballot for the best men, into what might have proved an intensely personal matter, for which certainly the "rebels" cannot be held to blame.

The contested election brings out in the result a point or two that must be noted, if the affairs of the Society are in the future to go smoothly. As the list drawn up by the Council was not adopted, it is clear that a majority of the Fellows, and possibly a considerable majority, looking to the curious way in which votes were split, were dissatisfied with the mode in which the Council had been hitherto elected, but suffered in silence, till a few bolder spirits took the bull by the horns. The Council must afford the Society at large a voice in the nomination, this may be done under the present bye-laws, provided the Council bear it in mind every year at the proper date. But the Council would

do well to consider whether something further, involving alteration of the bye-laws, may not be necessary.

The movement was represented as a rebellion of the younger Fellows against fossilisation, but the ballot may, and possibly will by some, be held to show that younger Fellows had no chance against the older and best known names. It was also clear that the younger Fellows themselves strongly supported some of the Council's nominees, and it simply became a contest between the weakest of the Council's nominees, and the strongest of the "rebels," and here the voting was near enough. We hope the Council will devise means of avoiding such a contest in future, since, however desirable it may have been from some points of view, it is to be very much regretted, that as omelets cannot be made without breaking eggs, so the cost here involved making a scape-goat for the Council of a gentleman who was personally in no way to blame.

The Council might be fairly asked why—as all the nominations were strictly legal—they were not printed alphabetically in a single row. It is surely not well to ear-mark any *bona fide* candidates by separating them as "goats" from the Council's "sheep."

Another point comes out in the matter of nominations. The bye-laws direct the Fellows who wish to make a nomination to strike out one of the Council's nominees and replace with the name of their own candidate. This makes an election personal at once, and we were grieved to hear that one of the first entomologists of the day had a suspicion that some animus had been shown because his name had, to satisfy the bye-laws, been struck out. We want some simple rule by which Fellows can add names to those proposed by the Council, the whole to go to ballot, without any individual being prejudiced by the mode of his nomination.

The Council did a commonsense, but possibly illegal, thing in not putting up all the nominees to the vote, including officers. To say that the officers, as such, were not objected to is beside the question. The latter hold their posts for a year, they are nominated for a seat on the Council, and must be elected thereon before they can be elected as officers. Failure to be elected on the Council might render it impossible for their nomination as officers to stand, and the appointments would have to be filled by the Council. This only for consideration when an alteration of the bye-laws is being considered.

We have no doubt that the members of Council will be on their mettle this year. We would only ask that they attend the ordinary meetings as well as make an attendance at the Council meetings whenever at all practicable.

The following gentlemen were elected Officers and Council for 1902. President, the Rev. Canon Fowler, M.A., F.L.S.; Treasurer, Mr. Robert McLachlan, F.R.S.; Secretaries, Mr. Herbert Goss, F.L.S., and Mr. Henry Rowland-Brown, M.A.; Librarian, Mr. George C. Champion, F.Z.S.; and as other Members of Council, Mr. R. Adkin, Professor T. Hudson Beare, F.R.S.E., Mr. Arthur J. Chitty, M.A., Mr. W. L. Distant, Mr. F. DuCane Godman, D.C.L., F.R.S., the Rev. Francis D. Morice, M.A., Professor E. B. Poulton, D.Sc., F.R.S., Mr. Edward Saunders, F.L.S., Dr. David Sharp, M.A., F.R.S., and Colonel C. Swinhoe, M.A., F.L.S. The President announced that he should appoint Mr. F. DuCane Godman, F.R.S., Professor E. B. Poulton, F.R.S., and Dr. D. Sharp, F.R.S., as Vice-Presidents for the Session 1902—1903.

The Presidential Address delivered by the Rev. Canon Fowler, dealt chiefly with the question of Protective Resemblance and Mimicry in the case of the Coleoptera, a branch of the subject concerning which but little has been recorded, although Mimicry in this order is quite as important as in the case of the Lepidoptera; as a matter of fact beetles are protected in many ways: By a hard integument—by the assimilation of colour or form to environment—by adopting colours in strong contrast to environment (warning colours)—by protective attitudes—by warning attitudes—by warning sounds—by the secretion of distasteful juices or odorous substances—by resemblance to unpleasant substances such as the droppings of birds—by resemblance to well-protected insects other than Coleoptera such as ants, bees and wasps—by imitating other genera and species of the same order which are plainly distasteful. In the course of the Address it was pointed out how easily it can be proved that beetles form a large part of the food of birds, as their hard elytra or wing-cases remain for some time entire in their stomachs; in this way it can be proved which species are most liked, and which are disliked or rejected; it is an interesting fact that many of the rapacious birds devour large numbers of beetles, and that a systematic examination of their stomachs proves that the damage done to game is much less than is usually believed, for many of the most persecuted species are mainly, or to a very great extent, insectivorous; it would be well, therefore, on all grounds, that the indiscriminate slaughter of our few remaining birds of prey should be rigorously discountenanced.

Professor Sven Lampa, the well known President of the Swedish State Entomological Department, in one of his valuable articles on economic entomology, takes occasion to point out (*Ent. Tidskrift*, xxii., p. 130) "that Linné's and Bjerkander's descriptions of the appearance and mode of life of their *Noctua tritici* agree entirely with those of *Hadena basilinea*, Fab.," and on the strength of this he uses the synonymy *Hadena tritici*, L., Bjerk. = *basilinea*, Fab. et Auct. It is highly probable that Professor Lampa may be right with regard to Bjerkander, but as we cannot reconcile Linné's description of *tritici* in the *Systema Naturæ* with any known form of *Apanca basilinea*, and as the extant Linnean type is a normal *Agrotis tritici*, we think it would be very rash to accept the correction (?) without much stronger evidence than has yet been offered.

The Annual Meeting of the Lancashire and Cheshire Entomological Society was held at the Royal Institution, Liverpool, on January 13th. The following Officers were then elected to serve during 1902:—President, Mr. S. L. Capper, F.L.S., F.E.S.; Vice-Presidents, Rev. R. Freeman, M.A., and Dr. H. Dobie; Secretaries, Messrs. Frederick Birch, and E. J. B. Sopp, F.R.M.S., F.E.S.; Treasurer, Dr. J. Cotton, F.E.S.; Librarian, Mr. F. C. Thompson; Council, Messrs. R. Wilding, F. N. Pierce, F.E.S., A. Tippins, H. Tonkin, and W. A. Tyerman. In the absence of the President the retiring Vice-President Mr. R. Wilding, delivered a most interesting address, reviewing in an exhaustive manner the general entomological work and literature of the first year of the century, with special reference to several matters of local importance.

We learn that Mr. C. O. Waterhouse has "seven," not "two," years to serve at the Natural History Museum before reaching the retiring age.

PRACTICAL HINTS.

Field Work for February and March.

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

1.—By the middle of February, the pupæ of *Dimorpha versicolora* kept in a warm room, will commence to emerge from their cocoons, often coming right out and lying exposed for a few days before the emergence of the imagines. Many pupæ go over to a second or third year. All those that will emerge this year are fully formed some time before emergence; the rest are still fluid.

2.—The females of *Dimorpha versicolora* should be allowed to pair more than once, otherwise a fair number of eggs will be sometimes found to be infertile; the ova should be kept in the shade or not exposed to the full rays of the sun until they begin to hatch.

3.—In confinement place fertilised ♀s of *Dimorpha versicolora* on birch twigs; they bungle badly sometimes in attempting to lay in a cardboard box, but go ahead steadily, laying their eggs in little batches, on a large fresh birch-twig.

4.—The eggs of *Dimorpha versicolora* found in the woods, are laid in little batches of six to eight or so, in double rows on small outside twigs of birch, 2ft. to 4ft. from the ground; the eggs are pale yellow at first, but after a day or two, darken to a purple-brown colour, just the tint of the birch twigs.

5.—*Brephos notha* occurs in March on the outskirts of a wood near Broxbourne, in which are a few aspens, they begin to fly about 10 a.m., at which time they are, like *B. parthenias*, very sluggish and easy to capture; at midday they retreat into the wood but about 2.15 p.m. they appear again in numbers on the sheltered side of the wood (Battley).

6.—The sap exuding from freshly-cut dogwood stems proved of such superior attraction to the usual sallow-loving insects, that the sallows were practically blank, and each stem of cut dogwood was covered with moths (Thornhill).

7.—The larvæ of *Leucania albipuncta* feed only at night, but may be found by day concealed on the ground, under leaves of low plants — mullein, hemlock, teasel, &c. (Brahm).

8.—*Polia nigrocincta* is reputed to be difficult to breed in confinement in the south, but has been fed up in the open on potted plants of narrow-leaved plantain (Whittle), and on sallow (Bower), the moths emerging in September.

9.—As a substitute for the usual food-plant of larvæ of *Tiliacea aurago*, which sometimes hatch very early, it may be noted that sycamore buds are very acceptable, the larvæ feeding on them without hesitation (Butler).

10.—The larvæ of *Geometra papilionaria*, sleeved out on birch, nibble the bark and buds in March, as do those of *Boarmia roboraria*. They want removing to a new branch early, as their nibbling often tends to kill the twigs.

* PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST, recently published, contains 1250 similar hints to these, distributed over every month in the year. Interleaved (for collectors own notes).—Ed.

11.—The ♀s of *Phigalia pedaria* and *Nyssia hispidaria*, which are comparatively seldom seen in the daytime, may sometimes be taken freely by examining the trunks of trees in woods with a light after dark in February and March (Porritt).

12.—*Boarmia repandata* is a very interesting species to breed, the larvæ may be found on mild evenings in early spring, feeding on all sorts of low-growing plants—ivy, honeysuckle and bramble appearing to be those most frequently selected (Mason).

13.—Roots of *Achillea ptarmica* growing in a damp spot in Epping Forest in early March, contained larvæ of a bone-white colour with light brown head, the imagines from these appeared in June, and proved to be *Dichrorhampha alpestrana* (Thurnall).

14.—*Leptogramma scotana* is to be found on birch trunks in spring; by sleeving the ♀ on birch trees long series may be bred. It is a mistake to let the larvæ spin up in the muslin, as they are long in turning and ichneumons sting them through the meshes.

15.—The larvæ of *Chrysophanus phlacas* are sometimes very common on *Rumex pulcher*, in February and March: they are difficult to see as their bodies are about the same size as, and the crimson dorsal line and broader spiracular stripe render them very like, the young curled-up leaves in the centre of the plant (Bate).

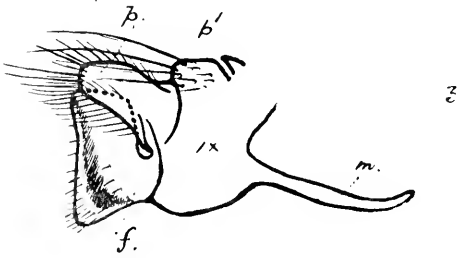
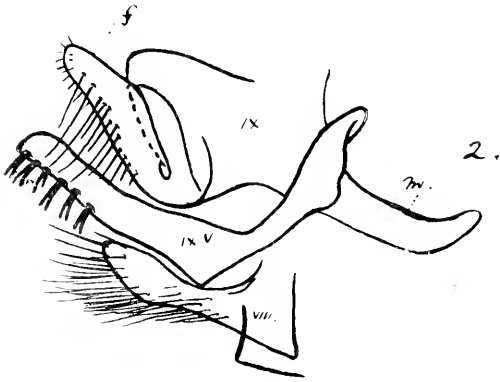
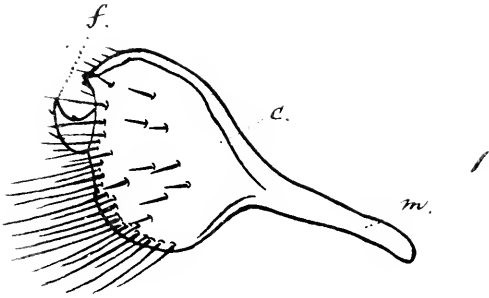
SCIENTIFIC NOTES AND OBSERVATIONS.

EMERGENCE OF *CLOSTERA* HYBRIDS.—For some years now I have bred a good number of the hybrid *Clostera reclusa* ♂ × *curtula* ♀, and have always had a good percentage emerge in the late autumn from September to October, and even November; this year, however, they have beaten all previous records. From a large brood, they started emerging in September, about ten during the month, in October about the same number, whilst November produced five, and December eight. Three fine specimens emerged one day when there were twelve degrees of frost. All the pupæ have been kept out of doors. On the 6th of January three fine specimens of the hybrid *C. curtula* ♂ × *reclusa* ♀ emerged, these likewise have been out of doors all the winter.—L. W. NEWMAN, Bexley, Kent.

PRESERVATION OF EGGS OF LEPIDOPTERA.—Can any lepidopterist give me any directions for the successful preservation of the eggs of lepidoptera? or references to any suggested methods of preservation in the periodicals?—J. W. TUTT.

VARIATION.

ABERRATION OF *LASIOCAMPA QUERCUS*.—I have recently acquired a fine ♀ *Lasiocampa quercus*, which measures just $1\frac{1}{2}$ inches from apex of wing to centre of thorax. The colour is dull chocolate, darker within the band, with just a little warmth of colour in band of hind-wings. I understand that the larva (found at Shoeburyness) was of the same colour as the moth.—F. G. WHITTLE, 3, Marine Avenue, Southend. December 7th, 1901.



NEW NEARCTIC FLEAS.

The type specimen of *Phalaena-Bombyx atra*, Linn.
= *Acanthopsyche opacella*.

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

Mr. Prout called my attention to the type specimen of *Bombyx atra* in the Linnean collection at Burlington House, and suggested that it should be examined. He informs me that it is the only Psychid of any sort in the whole collection, carrying a Linnean label. My examination of the specimen affords the following facts: The specimen has a small label "*atra*" in the writing of Linné, and a larger one of Sir J. Smith's, "*atra* 823," 823 being the page in the *Systema Naturae*, ed. xii., in which *B. atra* is described.

As a cabinet specimen, the example is in deplorable condition, few, if any, scales are left on it, the left wing apex is gone, the abdomen is eaten away by mites or otherwise, so that only a few hollow rings are left. On the head are empty shells, either of mites or of Tineid eggs. As a type specimen, however, to be recognised and identified, the specimen is excellent. Except for some damaged pectinations, one antenna is perfect to the tip, all the legs are present, and the front ones well displayed, and the neuration of both upper and lower wings is as easily seen as if the wings had been specially mounted for the purpose.

The specimen belongs to the species we at present know as *Acanthopsyche opacella*, H.-S. It has the same robust structure as compared with any *Oreopsyche* (*angustella* or *plumifera*). The antenna has 29 countable joints, as *opacella*, H.-S., has. The front tibia carries a spur precisely like that of *opacella*, and, what is distinctive and final, the neuration agrees in every detail with that of *opacella*. This neuration is widely different from that of *Oreopsyche*, and distinct enough from that of any other Psychid, except probably some other species of *Acanthopsyche*, with regard to which no question can arise.

One other point may be referred to. Linné says his specimen was taken near Upsala by Thunberg. *A. opacella* occurs throughout a large part of Sweden, but I have not heard of any species of *Oreopsyche* having been taken in Scandinavia. The identity between *atra*, L., and *plumifera*, O., was assumed by Dr. Heylaerts, who, in his essay on the Psychides (*Annales Soc. Ent. Belgique*, xxv) remarks that the true *Phalaena-Bombyx atra*, L., has been found, and refers to a short paper of a couple of pages on the matter, which he contributed to the *Stettiner Ent. Zeitung* (1880, p. 186).

In this paper he recites that *hieracii*, Thnb., has been identified with *plumifera*, O., and proceeds to the point that interests us here, *viz.*, the identification of *atra*, L., with *hieracii*, Thnb., an identification that has since been accepted.

His position amounts to this, that Thunberg captured *hieracii*, Thnb.—somewhere—. Linné says that his *atra* was captured by Thunberg at Upsala. Thunberg having captured both insects, therefore they are the same. In the absence of any better information, there is a certain plausibility about this that might make it acceptable, though one cannot help thinking that Thunberg must have known that his insect was not *atra*, L., and, for that reason, gave it a separate name. Now that we know what *atra*, L., is, it is easy to see that the argument is of the flimsiest nature. It may be also that acceptance

of this conclusion came more easily, because *plumifera*, O., is not only one of the blackest Psychids, but also preserves its blackness in the cabinet better than most.

It is not to the credit of English entomologists that this identification comes so late in the day, and it is to be regretted that it was not made before the publication of Tutt's *British Lepidoptera*, vol. ii., and of Standinger's *Catalogue*, 1901, since they involve that present-accepted names will be dominant for another decade or two. That it comes even now is not to my credit, but to Mr. Prout's, who recognised the existence of this type specimen, my share being merely the, as it happens, very easy one, of determining what the insect is. Mr. Prout will, I hope, take his fair share of the odium attaching to alienating a name with half a century's recognition from a well-known insect. Luckily the present determination seems to be likely to be definitive, and leaves no loophole for further revision.

Accepting the synonymy given by Standinger (1901), the changes required are:

4446. ATRA, L.S.N., ed. xii., p. 823. *Opacella*, H.-S., 102, ii., p. 20, &c.

4478. PLUMIFERA, O., iii., 175; H.-S., 103, &c. *Hieracii*, Thnb., Diss., iv., 53, *nec Fl.* *Atra*, Heyl., Stett. Ent. Zeit., 1880, p. 186, *nec Linn.*

A fifth season among the Swiss butterflies.

By G. WHEELER, M.A.

A very late and prolonged winter caused the season of 1901 to be somewhat backward, and, in some instances, insects appeared at most unusual times, though in other cases they were well up to time, or even a little early. My own season was a short and mostly uneventful one, and the principal interest of my notes for this year must, I regret to say, centre in other people's successes. When the frost and snow at last left us, I found it impossible to do anything worth noting till well into May, though a fortnight's visit to Aigle, beginning on April 20th, gave me the opportunity of visiting Leysin, Vernayaz, Martigny and Charpigny, only to return in each case without any captures worth mentioning. A visit to Bouveret on May 13th produced only a single specimen of *Polyommatus icarus* ♀, of the form known here as var. *arcua*, which has on the inner margin of the underside forewing a long curved black streak bordered with whitish, uniting the last of the antemarginal spots with the lowest of the basal spots. This form, which is not confined to the ♀, is to be found throughout this portion of the Rhone Valley, and is common at Charpigny and elsewhere round Aigle (Can anyone inform me whether it is identical with the "ab. ♀ *melanotora*" of Standinger's last *Catalogue*?). *Cupido sebrus* was unusually abundant this year, and swarmed, for instance, on the Charpigny road near St. Triphon station, on May 15th, and was common at Veytaux and in good condition till the end of the month. On May 20th, I took a short expedition up the Rhone valley. Leaving Veytaux early, I went as far as Martigny, walking thence across the valley to Branson. Here *Polyommatus orion* was out but not in great numbers, though Mr. Fison on the same day took a good supply further on towards Fully; it is to be found principally on the rocks at the side of the meadows and vineyards. *Eceres* ab. *coretas* was also in fair numbers, but little

else was to be seen. A flying visit to the *Collutca*, however, showed that the bushes had all sprung up again quite thickly in spite of their complete scorching up during the previous summer. In the afternoon I went on to Sion in the hope of finding *Nomiades melanops* or *Anthocaris helia*, the former in consequence of a letter from Mr. Elwes, and the latter because of Trapp's reported capture, though I cannot help a suspicion that, in the former case, *N. cyllarus* var. *blachieri*, and, in the latter, *A. var. ausonia* were the actual captures. In the former case I should have no doubt, had it not been that Mr. Elwes was himself the captor, and it seems too presumptuous to suggest that so high an authority is mistaken, though on the other hand I believe his captures were made before *N. var. blachieri* had been described. Soon after arriving at Sion the sun went in, and I took nothing of any importance. After spending the night at the Hôtel Terminus (which, though rather primitive, I strongly recommend for its admirable cooking and glimpse of real Swiss life), I went down to the Rhone meadows again and searched for some distance, but only found *Melitaea aurilia* in some numbers, the specimens being larger than those from Visp, and a few *N. cyllarus*, after which I took train to Saxon and walked across the valley to Saillon in search of *N. var. blachieri* on the higher ground above. It is a most interesting old place, but, entomologically, the expedition was unsuccessful, a matter of less importance since I afterwards took the variety both at Veytaux and Aigle. It is like *N. melanops*! but the much greater amount of blue on the underside, and the absence of the barely visible lunules from the outer margin of the underside hindwing distinguish it. On the 23rd I went over to Bouveret in search of the brown ♀ of *Plebeius argus*, almost all those farther up the valley being blue; *P. aegon* was out in great numbers, and, as usual in this locality, of large size, but as yet *P. argus* was not. On the following day, an expedition to S. Maurice and Lavey produced only the usual species of that locality, but included among the abundant specimens of *Cupido sebrus* and *N. cyllarus*, one specimen of the wholly brown ♀ (ab. *andereggii*) of the latter.

On June 1st began a five days' stay at the top of the Rochers de Naye, just then a mass of gentians large and small, anemones of various kinds, yellow auriculas and purple violas; but amidst this wealth of flowers there were but few insects—a single *Pararge hiera*, a few *Callophrys rubi* including one ab. *immaculata*, several *Erebia lappona*, mostly ab. *pollux*, and none with the striæ well-marked, and magnificent specimens of *Pieris* ab. *bryoniae* of the form known as *flavescens*, being the entire bag. On the 7th, the day after my return, *Coenonympha arcania* was out at Veytaux, and was fairly common, for the first time since 1897. On the 14th we went for the summer to Aigle, but before taking leave of Veytaux I have still two things to note, first, that the early brood of *Leptidia sinapis* almost universally tended this year towards the form which Staudinger now teaches us to call ab. *subgrisea*, and, secondly, that, at the beginning of May, I took a specimen of *Chrysophanus dorilis* ♂, having small purple spots on the upperside of the hindwings, inside the orange spots, exactly corresponding with *C. phlacas* ab. *caeruleopunctata*: in this particular specimen the underside is brightly coloured and the disc of the upperside forewing is just perceptibly tinted with copper, but on these points I lay no

stress, the small purple spots being the distinguishing mark; I have seen two other specimens, one a ♂ taken by Mr. Sloper near Les Avants this year, and the other a ♀, with the purple spots larger and lighter, taken some time ago by Mr. Fison; for this aberration I propose the name *purpureopunctata* (and I should be greatly obliged if any collector possessing specimens would let me know). These forms of *C. dorilis* and *C. phlaeas* are to me most interesting as showing the close connection between these species and *C. amphidamas*; I regard them as instances of "reversion to type." *C. amphidamas*, by the way, has twice been taken this year in this neighbourhood, viz., on the Rochers de Naye not far from Caux by Mr. Lemann, and above Clarens by Mr. Fison. While speaking of this insect it may be worth while to mention that Frey was quite mistaken in supposing that it was extinct on the Moleson in 1880. I have seen, in Professor Blachier's collection at Geneva, an excellent series from that locality taken in 1895.

At Aigle my searches both for *Thecla pruni* and *T. acaciae* were again this year unsuccessful, but, while looking for them on the 21st, I took a pair of *Polyommatus escheri* near Ollon, the first, I believe, found in any Swiss Canton except the Valais*. On the previous day I had been to Vernayaz, and found, amongst other things, a few *Brenthis daphne*, and the usual abundance of *Chrysophanus gordius* and *Polyommatus amanda*. Those who are interested in the "Tigers" may like to hear that I took on the same day *Callimorpha dominula* ab. *bithynica*, in which all the spots on the forewing are yellow. A search for *Lycaena iolas* at Branson, on the 22nd, was disappointing, but my wife took one ♀ so small that it was not until I came to set our captures that it was recognised. This was the only specimen seen at that time, but on visiting the same spot on July 27th I found both ♂ and ♀ in some numbers and quite fresh! On this latter date I took one *Lampides boetica* ♀. On June 26th, a second visit to Martigny produced *Brenthis daphne*, one *Erebia stygne* ♀, and some much-worn *Melitara berisalensis*. Here, also, I saw Mr. Sloper's captures of this year, the most interesting of which were a *Pararge megera* ab. *alberti* and *C. phlaeas* ab. *schmidtii*, both from Martigny. There was much rain during the summer, and when the sun came out afterwards, much steamy mud, which accounts for the fact that, on July 5th, on the Sepey road, I took six *Apatura iris* (all I saw that day) and one *A. ilia*, which is very scarce in that locality.

The next week was by far the best of the season. On Monday, the 8th, we went to Bérisal, and by leaving the "diligence" at the second refuge (Schallberg) I renewed my acquaintance with *Polyommatus lycidas*, which was still in good condition. *Polyommatus escheri*, *Syrichthus carthami*, and many other things were to be found at the same spot, and thence to the Ganter Bridge. Tuesday was spent at the fifth refuge, where at last I obtained *Parnassius delius* (♂s only, that day); I also took *Polyommatus pheretes*, a very fine specimen of *Colias palaeno* ♀, with the ground colour quite as bright as in the ♂, *Polyommatus eros*, ♂ and ♀, and various commoner things. On Wednesday we drove to Simplon village, over the appalling scene of desolation caused by the fall of half the Rossboden Glacier last March, and then walked on to the Laquinthal to look for *Erebia christi*, but

* Found in Ticino, in the Grisons.—T.A.C.

this search was destined to go unrewarded, a few *Erebia mnestra* being the nearest approach found. *Erebia ceto* var. *obscura* and a form of *Coononympha arcana*, closely resembling Rätzer's var. *insubrica*, were, however, abundant. Thursday was spent in the Steinenthal. On the way up *E. ceto* (type) was swarming, and a number of belated *E. erias* were also in evidence, some in fairly good condition; *Plebeius argus* var. *aequidion* and *P. aegon* var. *alpina* were also abundant, and *Lycaena alcon*, very fresh, was also in fair numbers, both ♂ and ♀. *Polygonatus orbitulus* was not quite so numerous as it no doubt would have been later, but *C. palaeno*, in all its Swiss forms, and *Pieris callidice*, were abundant, and I also took some large specimens of *Parnassius mnemosyne* in excellent condition at this unusual height (some 7000ft.), though at Bérisal they were beginning to be worn. Friday I spent again at the fifth refuge, where my captures were much like those of Tuesday, except that I took several *P. delius* ♀. On Saturday, by walking down early to Breig, and, taking train to Leuk, I got some hours in the Pfywald, my object being to find *Lycaena melceger* and *Apatura ilia* ♀; I took two of the latter and three or four of the former, but the *Orobis niger* was not yet in blossom, and so there was no special attraction to bring *melceger* together in any numbers.

After my return to Aigle I did but little. The usual species were there in their usual abundance, but I saw no specimen of *Dryas* var. *calcsina* this year. At Villeneuve, in the middle of August, I took a very good ♀ *A. iris* on the wing; *Zephyrus betulae* was common there, but very difficult to get, as it flew unusually high.

Soon after my return to Veytaux I saw Mr. Fison's captures of this summer in the Grisons. They included a number of *Melitaea matura* var. *wolfensbergeri* from Davos, several *Argynnis adippe* var. *cleodora*, and a few *Limnitis populi* from Poschiavo, five *Libythea celtis* from Brusio, a number of *Erebia criphyle*, and a set of seven *E. flavofasciata* from the neighbourhood of Pontresina, six ♂ and one ♀, all but the last being in splendid condition. On November 13th I again examined his collection, in company with Chanoine Favre, and M. Wullschlegel; one of the most interesting specimens is a hybrid between *C. palaeno* and *C. phicomone*, taken some years ago, but the locality of which he has unfortunately not noted. In the same week I had also the pleasure of seeing the magnificent collection of Colonel Agassiz, at Lausanne, in company with Mr. Sloper.

A visit to Geneva at the end of the month procured me the acquaintance of Professor Blachier, who most kindly put both his own collection and that of the University Museum at my disposal for examination, notes, &c., and who also gave me much information and offered lists and dates of his captures. One piece of information received from him is of special interest to collectors in Switzerland, viz., that a few *Lampides telicampus* are now taken every year in the gardens in and near Geneva.

May I add that I should be greatly obliged if any other readers of the *Ent. Record* would send to me, at the Pension Masson, Veytaux, lists of localities and dates both for Switzerland and the other Alps of Central Europe, as I hope, if possible, to include the latter in the handbook on which I am at work. Varieties and local forms have a special interest. Resident entomologists, both native and foreign, have been most kind. Much of the pleasure of the entomological year has been

due to the hours spent with Chanoine Favre, Professor Blachier, Colonel Agassiz, Messrs. Fison, Sloper, Wulschlegel, Lemann, and others, who have put time and information and collections at my disposal.

Some New Nearctic Fleas (with plate).

By THE HON. N. C. ROTHSCHILD, B.A., F.L.S.

Pulex ursi, sp. nov. (Fig. 1).—The rostrum reaches to the middle of the trochanter, and the end segment of the palpus is about twice the length of the preceding one, being a little longer in the male than in the female. The head, which is clothed with short hairs, is feebly but evenly rounded in the male, but angled in the female. There are four long bristles between the eye and the maxilla, standing in a row, preceded by a series of three shorter ones. Near the posterior edge of the head there is a series of long bristles, and between these and the antennal groove there are two series of four and three (or three and two) somewhat shorter ones. The prothorax bears no comb, having only a subapical series of bristles; the meso- and metanotum bear in addition to the subapical bristles, a postmedian series. The metathoracic episternum bears a number of bristles, and the epimeron is furnished with a subapical series of nine, which are placed close together, the series being preceded by one or two less regular rows. The plates of the abdominal segments are small, the tergites bear two rows of bristles, sometimes exhibiting some irregularly placed hairs in addition; the series is reduced in number, however, on the distal segments. The seventh tergite lacks the dorsal apical hairs usually present in so many species. The eighth tergite of the female is completely divided in the mesial line, it is, moreover, large, dilated ventrally, and rather densely clothed with hairs above and below the stigma, as well as upon the broader ventral portion. The anal tergite of the female lacks the two processes usually present in *Pulex* and other genera. The eighth sternite of the male does not essentially differ from the seventh, while in the female it is reduced to a mere chitinous strip. This resemblance between the seventh and eighth sternites in the male of the present species is most peculiar; in fact, in this character, the present species differs from all other members of the group Siphonaptera that I know of. The sternites bear a single row of hairs. The mid- and hind-coxæ are densely clothed with hairs in front. The femora bear two stout spines at their ends, and in addition to the rather long hairs on their dorsal edges, there is a more or less regular longitudinal ventro-lateral series on each side. The tibiae bear six pairs of very stout spines at their dorsal edges, and exhibit, besides, a lateral row of bristles. The tarsi are clothed with stout bristles, their segments being short, except the apical one—the fore-tarsus, the first four segments gradually decrease in size, the first being a quarter longer than it is broad; the bristles on all of these four tarsal segments are subapical; the first segment, moreover, has, in addition, an externo-lateral pair of bristles in the middle; the fourth segment is calyx-shaped, with strongly rounded sides. The mid-tarsus is similar to the pro-tarsus, except that its first four segments are somewhat longer, the first segment being about half as long again as it is broad. The basal segment of the hind-tarsus is about twice as long as it is broad, the fourth segment is barely different in size and shape from that one of the mid- and pro-tarsus. The end segments of all the tarsi are of nearly equal size, being about twice as long as they are broad; they have four stout spines on each side and an apical hair, with two apical ventral bristles in addition. A portion of the genital armature of the male is drawn in fig. 1. The elasper (e) is broad, rounded ventro-distally, and covered with numerous bristles at its ventral and distal edges, with a few on the disc as well. The manubrium (m) curves slightly downwards at the end, while the movable finger (f) is small and shaped like half a crescent.

I have received a large series of this fine new species from Mr. G. F. Dippie, taken from the Grizzly Bear (*Ursus horribilis*) on April 29th, 1901, 45 miles west of Calgary, Alberta, Canada.

Typhlopsylla grandis, sp. nov. (Fig 3).—A very large species. The head, the frontal and dorsal portions of which are covered with short hairs situated in punctures, bears two genal spines of unequal length. The pro-notal comb consists of 20 teeth. The first four abdominal tergites bear rudimentary combs of two or

three spines on each side dorsally. The other tergites bear, in addition to the usual two rows of hairs, a third anterior row of short bristles. The seventh tergite has—placed on each side at the apical margin—three long hairs; in the female the middle hair is the longest, the uppermost hair being longer than the hairs of the subapical row. (In the male they are, unfortunately, broken off.) The sternites are rather hairy ventrally, the hairy area extending basad beyond the middle on each segment. The legs are very characteristic, having 7 or 8 pairs of spines at the dorsal edges of the tibiæ.* The first pair is short, consisting of a spine and hair, while the second one consists of one long and one short spine. The longer spines gradually increase in length distally, the last being by far the longest. There is a single intermediate spine between the sixth and seventh pairs. The first segment of the fore-tarsus is equal in length to the fifth, the first segment of the mid-tarsus is about one and a half times as long as the last, while in the hind-tarsus this segment is twice as long as the last. The eighth sternite is large, being clothed apically with thick hairs. Process (p) of the ninth tergite (fig. 3, ix) is tongue-shaped, with numerous hairs at its edge, the ventro-distal hairs being prolonged. The process (p. 1) is less projecting, bearing long hairs besides several small ones. The manubrium (m) is slender, long, and not dilated at the end, though slightly curved, while the movable finger (f) is boot-shaped, with the apex rather truncate, its ventro-distal margin being compressed cariniform and clothed with hairs (fig. 3). The ninth sternite is boomerang-shaped, bearing numerous hairs ventrally of varying size, the more apical ones being spiniform.

I have received several specimens of this very distinct species from Mr. G. F. Dippie, taken on *Tamias striatus*, at Branchtown, Ontario, Canada, on September 20th, 1899.

Hystrihopsylla dippiei, sp. nov. (Fig. 2).—This distinctly new species is allied to *H. talpae* (Curtis) (which is figured in *Ent. Rec.*, xii., p. 257, 1900)†. The present American species differs from *H. talpae* in its smaller size, and in being generally less hairy, and, moreover, in having the genal spines six in number. *H. dippiei* bears two small pre-oral spines at the anterior ventral angle of the head in the male, and one in the female. The genal region, moreover, is more prolonged, and the genal spines are more ventral in position. The pro-thoracic comb consists of 36 teeth. On the second, third and fourth abdominal tergites there are also combs, but these are markedly different from the combs similarly placed in *H. talpae*, as they consist of 8, 4, and 3 teeth respectively on each side. The teeth of these abdominal combs are very small, stout, and wide apart, the first comb differs, moreover, from that of *H. talpae* in being incomplete, i.e., in there being no spines towards the mesial line. The sternites are not quite so hairy as they are in *H. talpae*. The eighth sternite of the male differs from that of *H. talpae* in not being so strongly dilated distally, and in being much more hairy (fig. 2, viii). The ninth tergite (fig. 2, ix) of the present species, as opposed to that of *H. talpae*, lacks the short, strongly chitinised spines on the inside of the upper distal angle; the finger is broader and more conical in shape than it is in *H. talpae* (fig. 2, f). The ninth sternite is similar to that of *H. talpae*, but smaller, the spine at its ventral edge, some of which are short, are arranged in six pairs (fig. 2, ix. c).

I have received a male of this peculiar species from Mr. G. F. Dippie, taken on *Putorius longicaudatus*, at Alberta, Canada, on September 21st, 1900, and a female from Mr. Allan Brooks, at Chilliwack, British Columbia, taken from *Luticola energamos*, on January 2nd, 1900. The *Hystrihopsylla* described by Mr. Baker as *americana* (*Ent. News*, x., p. 37, 1899) is said to have 14 genal spines, and about 50 teeth in the pro-notal comb. The abdomen of this species, moreover, appears from the description to be very different from that of *H. dippiei*.

DESCRIPTION OF PLATE II.

1. *Pulex ursi*, sp. nov. ♂. Clasper.
2. *Hystrihopsylla dippiei*, sp. nov. ♂. Genital armature.
3. *Typhlopsylla grandis*, sp. nov. ♂. Genital armature.

* 7 fore-tibiæ, 8 hind-tibiæ.

† In consequence of a regrettable oversight on my part, the fore-tarsus of *H. talpae* is drawn as having only four segments.—K.J.

Butterfly Hunting in Greece, in the year 1900.

By MARGARET E. FOUNTAINE, F.E.S.

(Concluded from p. 35).

To the butterfly collector in Greece *Colias heldreichi* is the one prize before all others, to be sought after and looked out for. And this butterfly I had been given to understand only occurred on the high and lofty mountains—such as the Parnassos—always above the tree-line, at an elevation never lower than 7000ft. Judge, therefore, of my surprise and delight, when one day about the middle of June, not more than a few hundred feet above the village of Soudena, on the lower slopes of Mount Chelmos, as we were riding steadily on, intending to reach the summit, I saw a large dark *Colias*, hovering rapidly over the scrub and brushwood, but, as I found, on consulting my aneroid, that it was only an elevation of about 4000ft., I was not sufficiently sceptical of the information I had received, even then, to dismount and catch one, till one of the men who had come with the horses, and was amusing himself by brandishing about my net, suddenly brought for my inspection what I saw at a glance was unmistakably a magnificent female of *Colias heldreichi*. I was soon on my feet and in hot pursuit of every one I saw, which was no easy task over this rock-strewn mountain-side, but the males of this lovely butterfly were flying in every direction, so that I had soon secured several, not to mention another fine female. A day like this is a day to be remembered in the life of an entomologist. It is one which stands out quite distinct, leaving an impression never to be forgotten. The long, toilsome climbs of other and less successful days beneath a blazing sun, the long hours of thirst and fatigue, which have so often brought in the end little or no results, are all compensated for in the joys of the one day, when the enthusiastic butterfly hunter meets for the first time a treasure such as this, flying everywhere in wild reckless profusion, alluring the excited biped to run heedlessly over ground of the roughest description, now jumping, now slipping, maybe even sometimes falling, but never pausing in the hot pursuit of the fascinating little insect, that will make such a grand acquisition to the collection at home.

My companions on this occasion (an American gentleman and a Greek, who spoke no language but his own) were neither of them entomologists, but fortunately both were extremely good-natured, and also apparently supplied with a good stock of patience; otherwise—well, otherwise—I suppose I should have been left behind. I have since been told that I am the first British entomologist who has ever taken *Colias heldreichi*, or seen it alive; and may I add that it is a sight worth seeing. It began to appear, as I have already said, at about 4000ft. and ceased above 5500ft., at least, such was the case with this colony of them in the month of June. In July I have no doubt that it would occur, as Herr Krüper had said, above the tree-line and over 7000ft. To reach this much favoured spot was a three hours' ride over the mountains each way from Kalávryta, that being the nearest village that could boast of an inn of any sort or kind. And they were long tiring days; but they left nothing to be regretted when, in the late afternoon, beneath the lengthening shadows of western mountains, Marens and I would be riding home both with our pocket-boxes well

filled with *heldreichi*: at least, nothing to be regretted, as far as I was concerned; but, as is the case with most things, people are either born entomologists, or they are not, and with Marcus I fear this was no latent undeveloped gift. I could never get him to be more than spasmodically interested in the pursuit, or to take a really serious view of it and realise the importance to be attached to a new capture. He always persisted in treating the matter more or less as a joke, but unfortunately the boys of Kalávryta turned the joke against himself, and he was so grievously upset that, I believe, for a short time these children made his life almost a burden to him. They would persist in following him down the street, calling after him "Pettalutha! Pettalutha!" (Butterfly! Butterfly!). They also tormented him with samples of crushed specimens which they had spent the whole of their playtime in catching, till, I regret to say, Marcus completely lost his temper, and was constantly appealing to me to devise some means of relieving him from an annoyance to which, through following in my steps, he had found himself exposed. It was in vain that I begged him to treat the whole affair with the indifference due to such an insignificant matter as the ridicule of a few children, he would nevertheless work himself into a state of agony, concoct all sorts of unnecessarily strong measures to be adopted, all of which I vetoed as being only calculated to make matters worse. "You don't know Greek," he would tell me "so you don't understand what they say. Why, what do you think two grown-up men remarked to each other as we rode into that village to-day? 'Surely it is not so hot yet, but those two people seem ready to go to Corfu.'" This required an explanation, which was that the Island of Corfu is the chosen site for a large lunatic asylum, and is, in fact, quoted in Greece, in the same way as in England we should mention Bedlam for an insinuation of this kind. It was useless to tell Marcus that it was their ignorance in not recognising a scientific pursuit, not our madness in pursuing it, that prompted these remarks, the few sparks of enthusiasm which I had hitherto been able to ignite in him were now entirely extinguished by the ridicule of his own countrymen, and what little love of the thing I had been able to inspire in him completely vanished after "this business with the boys," as he was pleased to term it, till it became extremely evident that Marcus, though a most excellent courier and interpreter, would never develop into a full-blown entomologist.

Notwithstanding, it still remained an unsolved problem in my mind—as I believe it to be, more or less, in the minds of all entomologists—why everyone in the world is not of the same persuasion as themselves, for, to them, indeed, is life worth living, spent in long, sunny hours of healthy exercise, inhaling the pure mountain air, free from the ties and tyrannies of civilised society. For all day long the song of the summer wind is in their ears, the very soul of the summer is theirs; they have felt the slow pulsations of her warm, throbbing heart. Then comes the evening, and as they watch the day dying over the mountains, and the sun which has shone unceasingly all through its long bright hours, sinking beneath some distant summit, and the warm, short twilight of the south, spreading her shadowy arms across the valley, there comes, may be, into the hearts of these travellers of science a wonderful sense of gratitude for this glorious

earth, over which it is their privilege to wander, and whose unknown loveliness unfolds itself before their eyes, in the pursuit of their chosen pastime, as the hidden secrets of nature—so reserved and reticent in her revelations—are revealed to them one by one.

The following is, I believe, a complete list of the insects captured: *Parnassius mnemosyne*, L., only on Mt. Chelmos above 5000ft., in June. *Aporia crataegi*, L., common on all the mountains. *Pieris brassicae*, L., at Delphi, etc., May and June; a very fine form. *P. krieperei*, Stgr., near Delphi, in May, 1st and 2nd brood flying together; at Loutraki, in May, 2nd brood only, also up a gorge near Kalávryta, in June, worn specimens of the first brood only. *P. rapae*, L., near Delphi, &c., in May and June; some of the specimens very large. *P. ergane*, H.-G., in the mountains above Kalávryta and near Delphi in May. *P. daphnice*, L., generally distributed; some of the females were numerous. *Anthocaris helia* var. *ausonia*, Hüb., just outside Ægion and at Delphi in May, remarkably large and fine. *Euchloris cardamines*, L., near Kalávryta in May. *E. grœveri*, H.-S., in certain localities on the mountains near Kalávryta and Delphi in May. *C. hyale*, L., fairly common in most places. *C. hebbreichi*, Stgr., very common on Mount Chelmos the last fortnight in June; three specimens of the white form were taken. *C. edusa*, F., widely distributed, also the var. *helice*. *Gonepteryx rhamni*, L., Kalávryta in June, not very common. *G. cleopatra*, L., near Loutraki, &c., May and June; much commoner than the preceding. *Callophrys rubi*, L., worn specimens near Kalávryta in May. *Chrysopa ottomanus*, Lef., near Mesolonghi, second week in June. *C. phlœas* var. *elcus*, F., near Mesolonghi, &c., in June. *Polyommatus zephyrus*, Frv., on the lower slopes of Mount Chelmos (4000ft.): fairly common end of June. *P. baton*, Berg., near Kalávryta in May, not common. *P. astrarche*, Bgst., generally distributed. *P. icarus*, Rott., common in most places. *P. cunedon* var. *privata*, n. ab., only on one spot in the mountains above Delphi; it differs from the type in having the arrow mark on the hindwings underneath entirely, or almost entirely, missing. *P. amanda*, Schn., near Kalávryta in May, also at Delphi, less common. *Nomiades semiargus* var. *helena* and var. *parnassia*, Stgr., the former near Kalávryta the latter near Delphi in May; I also took one typical *semiargus* at Zachlato, a short distance from Kalávryta, at a lower elevation. *Polygonia egea*, fairly common in several places. *Eugonia polychloros*, L., near Kalávryta in June. *Aglais urticae* var. *turcica*, Stgr., I only took one specimen of this variety on Chelmos in June, all the rest I saw appeared to be typical; they were flying at an elevation of 6000ft. to 7000ft. *Euranassa antiopa*, L., common near Mesolonghi, &c., in June. *Melitaea cinxia*, L., Kalávryta in May. *M. phoebe* var. *caucasica*, Stgr., only one worn specimen, near Kalávryta, in June. *M. didyma* var. *græca*, Stgr., two males only on Chelmos, end of June; I had seen the type earlier in the spring. *Branthis euphrosyne*, L., near Kalávryta in May. *Argynnis lathonia*, L., widely distributed. *A. niobe* var. *cris*, Meig., near Kalávryta in June. *Dryas pandora*, S.V., at Tripolitz, and on Chelmos, in June. *Danais chrysippus*, L., I saw one specimen only at Mesolonghi in June. *Melanargia larissa*, H.-G., common at Loutraki end of May and near Kalávryta in June. *Satyrus semele*, L., at Delphi in May. *S. amalthæa*, Friv., at Loutraki in May and Kalávryta in June. *Pararge roreclana*, Cr., at Mesolonghi and Kalávryta in

June. *P. egeria*, L., Mesolonghi in June. *Epinephela ianira* var. *hispulla*, Hüb., near Athens in May. *Syrichthus phlomidis*, H.-S., one specimen only near Kalávryta in June. *S. orbifer*, Hüb., near Athens in May. *Nisoniades tages*, L., common near Kalávryta in May. *N. marlogi*, B., only found by me on the top of one mountain near Kalávryta in May. *Hesperia thaumas*, Hufn., *H. actaeon*, Esp., *H. sylvanus*, Esp., and *H. nostrodamus*, F., all at Mesolonghi in June.

Notes on the British Myrmecophilous fauna (excluding Coleoptera).

By HORACE DONISTHORPE, F.Z.S., F.E.S.

(Concluded from p. 40).

MYRIAPODA.—Wasmann (*loc. cit.*, p. 192) states, that one often finds, in the ant-hills of *Formica rufa*, etc., in ants' nests under stones, and under bark with *Lasius brunneus*, species of Myriapoda, though he doubts if they belong to the true "lodgers."

Blanululus guttulatus, Gervais (= *Julus pulchellus*, Leach).—I often find this species in the nests of *Formica rufa*. It was very abundant in a nest of *Lasius fuliginosus* at Oxshott. Mr. F. G. Sinclair, who kindly named the specimens for me, writes as follows:—"I think the reason of their frequenting the ants' nests is very likely the quality of the earth they get there for making their nests. They make regular receptacles for their eggs, built up of little balls of earth that they moisten with their saliva and roll up between their front legs, and it is not every soil that is suitable for this process."

ARACHNOIDEA.—PSEUDOSCORPIONINA.—*Obrisium muscorum*, Leach.—I have taken this Chelifer several times in the nests of *Formica rufa* at Weybridge and Oxshott.

Chthonius rayi, L. Koch.—I have taken this species in the nest of *Lasius fuliginosus* at Oxshott.

Chthonius hahnii, C.L.K.—I have taken this species in the nest of *Lasius fuliginosus* at Oxshott. Wasmann (*loc. cit.*, p. 193) remarks that one often finds species of the genus Chelifer in ants' nests.

ARANEINA.—*Thyreosthenius biorata*, Cambridge.—I took a ♀ of this small spider in April, 1900, in the nest of *Formica rufa* in Guestling Wood, near Hastings. It had not been found in Britain before. I have since found it in numbers (both sexes) in the nests of *Formica rufa* at Weybridge, Oxshott, and the Blean Woods. Wasmann (*loc. cit.*, p. 193) gives its normal hosts as *F. rufa* and *F. pratensis*. It is found in the heart of the nest. On April 26th, 1901, I brought up from Oxshott six specimens of this spider from a nest of *F. rufa*, and introduced them into my "observation nest." They at once entered the galleries, the ants paying no attention to them. I did not see any of them again till June 23rd, when a ♀ came up accompanied by a number of young ones, so they must have bred in my nest. After this specimens were observed on June 25th, 27th, 30th, July 18th, 21st and 27th. On September 19th quite a number were walking about in my nest. The last specimen observed was on November 26th. When they meet an ant they spring with great quickness to one side.

Tetrilus arietinus, Thor.—The Rev. O. P. Cambridge (*Ent. Record*, 1900, p. 163) writes: "I have received from Mr. Donisthorpe an adult and an immature ♂ of a most remarkable spider of the family

Agelenidae, *Tetrilus arietinus*, Thor. One of these examples was domiciled in the nest of *F. rufa*, the other in that of *Lasius fuliginosus*. The spider was first described from ants' nests in Sweden, by the late N. Westring, under the name of *Hahnia pratensis*, C. L. Koch . . . This is its first record as a British spider." I took these specimens at Oxshott in the nests of the ants mentioned by Mr. Cambridge. Wasmann (*loc. cit.*, p. 194) gives the same two hosts.

Drassus troglodytes, C.K.—I took a very young ♀ *Drassus*, probably this species, in the nest of *Lasius fuliginosus* at Oxshott. Wasmann (*loc. cit.*, p. 194) records it from ants' nests.

Phrurolithus festicus, C.K.—I have taken this spider in the nests of *Formica rufa* and *Lasius fuliginosus* at Oxshott. Wasmann (*loc. cit.*, p. 184) gives *L. niger*, *L. brunneus* and *L. fuliginosus* as its hosts.

Harpactes hombergi, Sep.—I continually take this species in all its stages and both sexes, in the nest of *Lasius fuliginosus* at Oxshott. Wasmann (*loc. cit.*, p. 195) records it as being found with the same ant.

Cryphocca dirisa, Cambridge.—I took a ♂ of this very rare spider in the nest of *Lasius fuliginosus* at Oxshott. Mr. Cambridge tells me that only one other example, a ♀, is known.

Micaria scintillus, Cambridge.—Cambridge (*Spiders of Dorset*, p. 13) writes: "The grassy slopes where this spider occurs (at Portland) are also numerous frequented by a large blackish ant, to which the spider bears so close a resemblance that, even after much practice, it requires a close examination to distinguish (before capture) between the ant and the spider, both have also a similar habit of running hurriedly now and then up a grass stem, as if to get a larger range of view—or it may be that both are in search of the same prey; both again, on the first inkling of danger, betake themselves to the shelter of the tangled grass, and to the stems and roots of other low herbage." I would suggest that this is a case in which the ant is mimicked by the spider, the mimicry being largely dependent on the similarity of the movements of the two creatures (active mimicry).

Micaria pulicaria, Saund.—I took several specimens of this spider in the nest of *Lasius niger* at Mickleham. It is also very like the ants with which it occurred. The spiders were rapidly running about in the nest and the "runs" of the ants, and were very difficult to distinguish from them.

Microneta innotabilis, Camb.—I have taken this species with both *Lasius fuliginosus* and *Formica rufa* at Oxshott.

Microneta riaria, Bl.—I have taken this spider many times in the nest of *Lasius fuliginosus* at Oxshott, and also with *F. rufa* in the same locality.

ACARINA.—*Glyphopsis coccinea*, Mich.—Michael ("Notes on the Uropodinae," *Jour. R. Micro. Soc.*, 1894, p. 310) records the capture of several specimens by Bostock at Buxton, in the nest of *Formica fusca*, as well as by himself and Bostock with the same ant at the Land's End, Cornwall.

Glyphopsis lamellosa, Canestrini.—Michael (*loc. cit.*, p. 304) records taking a considerable number of this species in the autumn of 1892, in a nest of *Formica fusca* near the Land's End.

Glyphopsis bostocki, Mich.—Michael (*loc. cit.*, p. 303) mentions that Bostock took a pair, ♂ and ♀, in the nest of *Lasius flavus* near the Land's End.

Glyphopsis formicariae, Lubbock.—This species was described (*Ants, Bees and Wasps*, p. 429) from a specimen taken by Sir John Lubbock in a nest of *Lasius flavus*. Michael (*loc. cit.*, p. 311) writes that, in 1892, he took a considerable number at the Land's End in a nest of *Lasius flavus*.

Uropoda ricasoliana, Berl.—Michael (*loc. cit.*, p. 307) records two specimens, ♂ and ♀, found in an ants' nest near the Land's End. Wasmann (*loc. cit.*, p. 199) records it with *Lasius fuliginosus* in Holland.

Antennophorus uhmanni, Hall.—Michael tells me he took two specimens in an ants' nest at the Land's End, Cornwall. Of this species Wasmann says: * "Another myrmecophilous mite, *Antennophorus uhmanni*, occupies a most extraordinary position. Janet observed it in France in the nest of *Lasius mixtus*, and I have studied it in Holland, at Limburg with *Lasius niger* and *flavus*. It is generally on the ant, in most cases on the underside of the head. It makes use of this favourable position, to tickle the sides of the ant's head with its front feet, which are like antennæ—hence its name "antennæ-bearer"—till the ant lets fall a drop of food which the parasite licks up. The ants tolerate the impudent rascal simply because they are unable to get rid of it. I have often seen them make desperate attempts to knock it off." This species is here first recorded as British.

Leolaps myrmecophilus, Berl.—Michael tells me he has taken this species plentifully in nests of *Formica fusca* at the Land's End, Cornwall. Wasmann (*loc. cit.*, p. 198) records it with *F. rufibarbis* var. *fusco-rufibarbis*, For., in the Rhine district; with *F. rufa*, in Holland; and with *Aphaenogaster barbara*, L., at Oran.

Leolaps equitans, Mich.—On May 11th, 1901, I took a number of small mites which I found on and among the egg-masses of *Formica rufa*, in a nest of that species in the Blean Woods. I afterwards found it again on the egg-masses in a nest of *Formica rufa* at Oxshott. I sent specimens to Mr. Michael, who writes to me as follows: "In my opinion they are *Leolaps equitans*, they are a trifle narrower than my Corsican specimens and the hairs on the back are a trifle shorter than those of my specimens . . . they have not hitherto been recorded in England." Michael took his specimens with *Tetramorium caespitum* var. *meridionale* in Corsica. He tells me they most frequently rode upon the ant, but were sometimes upon the eggs and pupæ.

CRUSTACEA.—ISOPODA.—*Platyarthus hoffmanseggii*, Brdt.—Sir John Lubbock (*loc. cit.*, p. 75) writes: "Another very common species (in ants' nests) is a sort of white wood-louse which enjoys the rather long name of *Platyarthus hoffmanseggii*. André only mentions *Platyarthus* as living with *Formica rufa*, *Myrmica scabrinodis* and *Leptothorax acervorum*. I have found it also with *Lasius niger*, *L. flavus* and *Formica fusca*. It runs about and is evidently at home among the ants. Both *Platyarthus* and *Beckia*, from living constantly in the dark, have become blind; I say 'have become,' because their ancestors no doubt had eyes. In neither of these cases have I ever seen an ant take the slightest notice of either of these insects. One might almost imagine they had the cap of invisibility." I have taken it with the following

* See translation of Father Wasmann's "The Guests of Ants and Termites" (*Ent. Record*, vol. xii., p. 150).

ants, *F. rufa*, *fusca* and *sanguinea*, *L. flavus*, *fuliginosus*, *niger*, *umbratus* and *alienus*, *Myrmica scabrinodis*, *laevinodis* and *sulcinodis*. On April 23rd, I introduced specimens taken at Portland with *Lasius niger* into my "observation nest" of *F. rufa*. They all entered the nest, the ants paying no attention to them. Specimens were afterwards seen on April 24th and 27th, May 14th and 15th, and July 19th. Wasmann (*loc. cit.*, p. 201) records it with the following ants, *Formica rufa*, *pratensis*, *sanguinea*, *fusca*, *cinerea*, *Camponotus ligniperdus*, *Lasius fuliginosus*, *niger*, *alienus*, *flavus*, *umbratus*, *brunneus*, *emarginatus*, *Myrmica laevinodis*, *Tetramorium caespitum*, *Leptothorax acervorum* and *Aphenogaster structor*.

A few weeks' entomologising in Spain.*

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

Spain is a large country, appearing on the map as not far from a square of 500 miles across. It presents, therefore, many different districts and features. That aspect of the country best known to the English tourist, personally conducted and otherwise, is based on a certain number of towns and centres of historic fame, which are now well arranged for by railways, hotels and other facilities for the comfort of the ordinary traveller, who likes to stick to the beaten track.

In making our excursion to Spain last summer, Mr. Champion and I did not regard this more hackneyed phase of a tour in Spain, but determined to visit that district which is most remarkable in its entomological features. Though we did, indeed, visit Madrid, Toledo, and some other points, our time was chiefly spent a day or two's journey away from railways, where foreigners' and especially Englishmen's visits are of the rarest, and everything is purely Spanish. The district was that of the Sierra Albarracin, rendered notable a quarter of a century ago by the Rev. Canon Zapater discovering two butterflies, one quite new and found nowhere else, *viz.*, *Erebia zapateri*, the other a large Satyrid, *Satyrus priewi*, which, though known from Africa, is found nowhere else in Europe. The insect fauna has since been well explored in several directions by a German entomologist—Professor Korb—but remained a *terra incognita* to Englishmen until four years ago, when Mrs. Nicholl, the most energetic and enterprising of all our collectors of butterflies, visited the district. I have not learnt that any English entomologist had been there since, until our visit. The district is about a hundred miles east of Madrid, and about half-way between the capital and the Mediterranean shore.

The country is hilly, but not mountainous in any sense that we understand that word, as applied to the Alps, the Pyrenees, Norway, or even to Scotland. It is to be remembered that a large part of Spain, including Madrid, is 2000 or more feet above the sea. The lowest portions of this hill-country are at an elevation of 3000ft. and this only in the river valleys; and the highest very little over 5000ft. except in one or two elevated ridges touching 6000ft. The greater part of the area is between 3500ft. and 4500ft., rough and irregular, cut into by valleys and gorges, and only occasionally presenting the aspect of an upland tableland of about 4000ft. elevation. This hilly country

* Read before the South London Entomological Society, Dec. 12th, 1901.

reaches from west to east, from Cuenca in Castile, to Teruel in Aragon, for perhaps about 60 miles, and for 30 or 40 miles from north to south, but is not definitely cut off from similar hilly country except by river valleys that are not always of any great breadth. Of course, we only sampled this large district at a few points, and any generalisations I may make are, of course, to be qualified by that limitation.

On our way out we stayed for a day or two at Arcahon, where Mr. Champion got a few beetles, and where the forests of *Pinus maritimus* present many interesting things to the entomologist. I took nothing, however, but *Sphinx pinastri*, a *Cuethocampa pityocampa* ♀, some very dark *Chrysophanus phluas* and larvæ of *Luffia lapidella*. We did not see *Melitaea athalia*, which abounded under the pine-trees on my first visit, many years ago, with some nice dark aberrations.

At Madrid we had the pleasure of meeting Señor Don Ignacio Bolivar de Cerrutin, so well-known as an orthopterist, and Señor Don Serafin de Uhagon, after whom are named sundry coleoptera, as well as the fine variety or dimorphic form of the female of *Satyrus priouri*. These gentlemen very kindly assisted us in various ways, and gave us several useful introductions.

We visited the Escorial rather as sight-seers than as naturalists, but we called on Señor Don Jose Hernandez Alvarez at the School of Forestry there, and learnt something of the insect fauna of the district. *Abraxas pantaria* was abundant, and I took *Satyrus julia*, *Bryophila muralis*, and several other species of equally little importance. We also visited Toledo, again as mere tourists, but received the impression that some good collecting could be done there. In Madrid itself various butterflies and other insects were seen, and a very large noisy Cicada was common in the public gardens.

All this, by the way. We now proceeded 125 miles by rail to Cuenca, entering here the fringe of the Albarracin Sierra. At Cuenca we found much interesting collecting-ground in the gorge of the little river Huecar and in the various side-gullies entering it, and in the uplands at Palomera and elsewhere towards the sources of the little stream. Cuenca itself is most picturesquely situated at the junction of the Huecar with the Jucar, occupying the precipitous rocks of the tongue between the two streams, though the modern town has spread down on to the level ground below. Below the town is a good deal of cultivated land. Here we saw *Choreutes hjerkaudrella* in swarms about the Cardon plants, and, on a flat by the river, where young poplar scrub was plentiful, I found the leaves freely populated by a *Phyllocnistis* larva, that attracted my attention as differing much in habits from *P. suffusella*, as met with in England and Switzerland. *P. suffusella* is much the more frequent on the upperside of the leaf and makes a long mine of perhaps six or even twelve inches in length, winding about on the surface of the leaf. The Cuenca species was on the underside of the leaf, rarely the upper, commenced its mine close to the petiole on the midrib, and mined along the margin of the leaf for a very short way, often only a bare half inch before pupating. The moth and pupa agree precisely with those of Herr Luder's *P. sorhagenella*. I do not know whether the difference of habit is characteristic of that species, or is attributable to climatic and other conditions. As in most other parts of the district, *Polyommatus astrarche* was exceedingly

abundant, and *Satyrus alcyone* was never out of sight. *Dryas pandora* was also common, in some spots really abundant, though it is a butterfly of which half a dozen make a good show. *Satyrus circe* was also not uncommon, though less so than at Tragacete. *Papilio podalirius* was also commoner here than elsewhere, probably because we were rather late for it, but also because fruit-trees were here more numerous. *Melanargia lachesis* was abundant, and, indeed, if we except the special Albarracin butterflies, and perhaps *Polyommatus admetus*, we found here all the butterflies that we met with in the other localities. One species, *Melanargia ines*, that we expected to see, failed us absolutely, but we took one very worn and faded *M. syllius*, a species that probably was in force six weeks earlier.

Many beetles were abundant, especially those such as *Mylabris* and others that affected flowers. *Mylabris* of several species, but chiefly, perhaps, *quadripunctata*, was found everywhere, but in places swarmed on the flowers, and was most conspicuous throughout the whole region. As Mr. Champion carefully exploited the beetles, I felt no regret at not being a coleopterist, but the number, size, and beauty of the Hymenoptera, and the abundance of many species of Orthoptera, including Mantids, walking-sticks, and other forms strange to us in England, certainly made one feel that attention to these orders would have been most interesting and profitable; but, unfortunately, time would not permit it, even had my education been adequate to the task. Diptera were not, by comparison, either so abundant or so attractive as I have seen elsewhere, but still sometimes forced us to notice them, as, for instance, when I captured at Tragacete a pair of large Asilids, of which the female carried a large *Buprestis* (*Ancylocheira*), transfixing her proboscis through the cephalothoracic articulation, and quite dead. How she captured this very active beetle, and how she introduced her proboscis into this joint, which the beetle can hold so firmly closed, was more than I could guess. On another occasion I found another fly of the same species carrying another beetle similarly transfixed.

Except along the banks of the two rivers, the neighbourhood of Cuenca was devoid of trees, and the uplands were bare dry limestone downs, with a sparse clothing of small shrubs and aromatic plants. A species of oak was here a very small shrub, though apparently one that is a considerable tree in places (as near Tragacete), it may, however, have been *Quercus coccifera*, a dwarf species. On these downs insects were much rarer than below, and, except *Papilio machaon* and *Satyrus alcyone*, and a few *Thecla spini*, and perhaps *T. ilicis*, butterflies hardly appeared. In the evenings, however, several species of micro-lepidoptera occurred, and Geometrids, plumes, and Tineids of several species were taken. The great ant-lion, *Palparex hispanus*, was frequent here, and is a most imposing creature on the wing, and one or two other *Myrmelconidae* occurred. A fair number of these and of other Neuroptera (dragonflies, &c.) were taken. These I have given to Mr. McLachlan, who will no doubt report on them, if any of them are worth the trouble.

The outskirts of the pine forests of the Albarracin Sierra are eight or ten miles from Cuenca, and here, as well as elsewhere, a mere visitor can only guess, but is probably not far wrong in supposing, that, where the country is now bare and arid, in the intermediate region,

the trees have disappeared under the demand for timber and firewood of such towns as Cuenca. Donkeys carrying loads of firewood proceeding to the town from the still-existing forest are constantly met on the roads up the Huecar and Jucar valleys. We did not see anywhere here any attempts at re-afforestation, but the School of Forestry at the Escorial shows that the subject is being energetically attended to, but no doubt the area affected is too large to be dealt with very rapidly.

At Cuenca we were introduced to Señor Don Juan Jimenez Cano, who accompanied us on several of our excursions there, especially to Palomera and the caves, a short way above that nicely-situated village, and afterwards went with us to Tragacete. We not only found his society pleasant, but we got from time to time much information of a general character, as well as that relating to the local geography and natural history. He studies Orthoptera and Coleoptera, but has too many other studies to devote any large amount of time to them.

If it be not poaching on Mr. Champion's preserves, I may say I was much interested from several points of view in hearing that a local chemist told him that last year he collected 3000 specimens of the Longicorn genus *Dorcadion*, which he forwarded to Germany. These were over at the time of our visit, and we only saw three or four of them.

(To be continued.)

Migration and Dispersal of Insects: Coleoptera.

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

Fabre notes (*Insect Life*, transl. pp. 202 *et seq.*) what he considers may have been two cases of migration in *Coccinella septempunctata*. In one, the chapel on Mont Ventoux was covered with such myriads of this species, that it looked at a few paces off like an object made of coral beads, and adds: "Certainly it was not food which had attracted these eaters of *Aphidæ* to the top of Mont Ventoux, some 6000 feet high." Another time in June he observed, on the tableland of St. Amand, at a height of 734 mètres, a similar, but less numerous, gathering of the same species. He writes: "At the most projecting part of the tableland, on the edge of an escarpment of perpendicular rocks, rises a cross with a pedestal of hewn stone. On every side of this pedestal, and on the rocks serving as its base, this beetle was gathered in legions. They were mostly quite still, but wherever the sunbeams struck there was a continuous exchange of place between the newcomers who wanted to find room, and those resting, who took wing only to return after a short flight. Neither here, any more than on the top of Mont Ventoux, was there anything to explain the cause of these strange assemblages on arid spots without *Aphidæ*, and no ways attractive to *Coccinellidæ*, nothing could suggest the secret of these populous gatherings upon masonry standing at so great an elevation. Have we here two examples of insect migration? Were these rendezvous, whence the cloud of ladybirds was to seek some district richer in food? It may be so, but it is very extraordinary. Why these gatherings at such heights? Why this liking for blocks of masonry?"

How much has this peculiar massing of ladybirds on the summits

of high mountains to do with the question of dispersal? In *Entom. News*, viii., pp. 49-50, Piper publishes an interesting paper on the massing of *Hippodamia lecontei* (under the name of *Coccinella transversoguttata*) on the summit of Moscow mountain, Idaho. He observes on the abundance of the species at Pullman, Washington, and states that, in winter, a hundred or more may be taken under a board or similarly sheltered, but this habit is an entirely different one from that observed in July, 1893, when, while collecting on the summit of the Moscow mountain, at an altitude of 5000 feet, he was astonished to find in the crevices of rock near the summit immense numbers of dead ladybirds of this species. As an illustration of their great numbers, a mass of their bodies over a foot square and two inches thick, was picked up in one piece from under a flat piece of rock. It contained, from estimates made later, the remains of over 10000 individuals; and a careful search of the vicinity failed to disclose any living ones. None of the plants in the vicinity were infected with scales or aphides, and none of them, to the observer's knowledge, are ever affected by these insects in sufficient numbers to furnish food for the hosts that had perished there. In October of the same year, Aldrich observed, on the same peak, living ones of the same species, and the phenomenon was reported to him as occurring on nearly all the neighbouring buttes, one of which, indeed, is called Ladybird Mountain. Aldrich states that the beetles were so abundant that he could gather them by the handful, but that he could detect no reason for their assembling. In July, 1896, while collecting on the Blue Mountains, Washington, Piper found the same ladybird on the barren rocky summit of a peak, 5000ft. high. The insects were crawling over the hot, bare rock, and upon being disturbed would circle about for a few moments and again alight. So great were their numbers that they made quite as much noise as a small swarm of bees, indeed, Piper says he heard them before he saw them, and actually supposed that he had disturbed a nest of yellow jackets. The summit of this particular peak was quite barren and could not possibly furnish food enough for the ladybirds seen. Furthermore, careful search of the vicinity failed to detect a single aphid or even trace of aphid work. That the phenomenon is not confined to mountain peaks appears from the observation of a correspondent in Kittitas county, Washington, who reports a ladybird, in all probability the species under consideration, as gathering in great numbers about a large boulder near his house. In view of these strange facts the question naturally arises as to the significance of the habit, and thus far no explanation has been proposed that will stand critical examination. A common opinion is that the insects seek the rocks for warmth and shelter. If this be so, why do they seek only the rocks near the summit of the peaks, and not those lower down? Again, why should they seek shelter on a hot July day? Finally, it would seem that the summit of Moscow mountain furnishes them not with a shelter but a graveyard. It must also be remembered that search for a shelter does not for a moment explain their assembling in such swarms. A second theory would explain the phenomenon as the result of air-currents carrying the insects up the peak. But if this be true, why are not other insects similarly affected? Even granting this, it does not explain their remaining there in perfectly calm weather. In this connection, one may state, that many insects are undoubtedly

carried up mountains by currents of air. What is the explanation of the significance of the habit? Following on Piper's note, Snyder relates (*loc. cit.*, p. 99) that he made a similar observation on the summit of a mountain in Utah, at an elevation of 9000 feet. On June 30th, 1893, about noon, while sitting down to put some of his captures in papers, hundreds of a species of *Coccinella* passed him going with the wind; it was a new experience, and never before or since has the insect been observed in such numbers (*Ent. News*, v., p. 168). Snyder goes on to say (*loc. cit.*, viii., p. 99) that he does not know what species it was, but that the insects were in such great numbers, that the impression made, of what seemed so remarkable a flight, will not soon be effaced. He then adds: "A similar flight on the part of *Cantharis nuttallii* would seem to prove that other insects do move in the same manner. . . . A reasonable inference would seem that the insects were in search of food, but were controlled by the wind and sometimes carried to destruction." Cook relates (*Ent. News*, ix., p. 117) that in Los Angeles Co., California, he has often seen the two species of ladybirds—*Megilla vittigera* and *Hippodamia ambigua*—so clustered that they could be gathered by the pint, and believes they cluster for protection from the cold. The same observer notes the swarming of *Serica mirta*, which does considerable damage to orchards.

The massing of the Coccinellids still awaits an explanation, and the details relating to the phenomenon at present available, neither answer the question whence the insects come nor whither they go. Nor are other observations referred to by the observers themselves, as undoubted dispersal movements, always so clearly detailed as to leave us with any definite ideas on the subject. Thus we find (*Natur. Verh. Holland. Maatsch. Wetens. Haarlem.*, ii., 1842, p. 298) that "the Cantharid, *Lytta vesicatoria*, also furnished us, in 1838, with an illustration of really prodigious numbers of an insect, which in its passage, offered no data by which the movement was fixed or regulated"; and again (*loc. cit.*, p. 300): "These occasional passages recall those which *Apion vernale* very often makes, moving from place to place in great numbers, and doing great damage by their voracity. In Montpellier, they passed in such numbers that one could collect them in large handfuls at once, the movement commencing with the cholera outbreak in May and June, 1832." More definite is the statement (*loc. cit.*) that *Atuchus sacer* and *A. laticollis*, which are sometimes very common on the shores of France, come from Spain or Africa, the waves often throwing up specimens that have fallen into the sea and been drowned whilst crossing. Schäffler notes (*Ent. News*, viii., p. 173) the occurrence of a swarm of *Aphodius inquinatus* in Delaware county, towards the end of March, 1897, the swarm was observed shortly before sunset, and they were flying from east to west across his path and across the wind; the swarm was estimated at fully a quarter of a mile wide. One suspects that this again was hardly a real dispersal movement, some British members of the genus, e.g., *A. sordidus*, being occasionally very abundant and collecting in swarms, but certainly not for the purpose of migration, *en masse* (see *Ent. Record.*, viii., pp. 143-4).

COLEOPTERA.

COLEOPTERA IN SURREY.—Early in July last I spent a fortnight at

Holmbury, St. Mary's, in Surrey, and although cycling took up a large part of the time a few beetles were met with worth recording. In the woods of Holmbury, under the bark of fir-stumps, *Hylastes palliatus*, *opacus*, and *ater* were very common, accompanied in lesser numbers by *Pithyophagus ferrugineus* and *Rhizophagus ferrugineus*; while *Tomicus laricis* occurred much more sparingly. At rare intervals *Sphindus dubius* was detected in powdery fungi with *Aspidiphorus orbiculatus*. Evening sweeping was very disappointing. Every evening that was at all favourable was utilised, and using a bicycle a wide area was covered, but the results were not of a high order. The best species obtained were *Thalycra scirica* (two), *Lissonus oblongulus* (two), *Lathridius testaceus* (one), *Anisotoma calcarata* and *dubia*, *Colenis dentipes*, *Miarus campanula*, and a single specimen of a *Smicronyx*; *Lissodema 4-pustulata*, *Scyphaenus elongatus*, and *Euplectes sanguinea* complete the list. Sandpits were also very unproductive, *Ilyobates nigricollis* (one), *Acalles turbatus*, and *Leptinus testaceus* being the only species worthy of mention. A single *Atemeles emarginatus* occurred among ants in a fir stump, and *Apion scutellare* was not rare on dwarf furzø near Shiere. *Cryptarcha strigata* and *imperialis*, *Soronia grisea*, *Thamiaraca cinnamomea*, and *Epuraca decemguttata* were all found at a small *Cossus*-infected oak, while *Apion hookeri* was abundant under *Matricaria*, and *Deinopsis erosa* rare at the edge of a small pond. A flying visit to St. Leonard's Forest yielded *Stenus fornicatus* and *Cissophagus hederae*. Mickleham, from which I expected much, was unaccountably unprolific, two visits on very favourable days producing nothing better than *Bolitochara bella* (four), *Ceuthorrhynchus asperifoliarum*, and four specimens of *Homaloptia ruficola*, two of which were of the black aberration. An old oak at Albury was found with a small colony of *Anitys rubens* (alive for once) but although the locality looked very promising nothing else was met with worth recording. A prolonged search on Leith Hill among the Lesser Dodder resulted in a single *Smicronyx* being found and on fir stumps in powdery fungi *Aspidiphorus orbiculatus* and *Liodes humeralis* also occurred.—W. H. BENNETT, F.E.S., 15, Wellington Place, Hastings.

CREYHALUS FAGI IN SURREY AND SUSSEX.—I met with this interesting little species in three different localities during my summer holiday in July last; and as so few records exist of its occurrence outside the New Forest it may be as well to add these to the number. In each case only dead specimens were observed, but the species had been pretty plentiful and a more lengthened search would have produced living examples. The three localities were St. Leonard's Forest (Sussex), Rammore Woods and Mickleham, Surrey.—IBID.

COLEOPTERA IN CUMBERLAND.—The past year has been fairly productive of beetles in this county, some of which are not unworthy of notice. Beginning with the *Carabidae*, the typical genus *Carabus* was represented by most of the species which regularly occur here. A visit to a favourite haunt of *C. glabratus*, Payk., in one of the deep valleys which radiate from Scaw Fell, was productive of very few perfect specimens, though imperfect ones were frequently seen. A single *C. granulatus*, L., always scarce here, was picked up on the Borrowdale Road in July. *Clivina collaris*, Herbst., was noticed in fair numbers on the sandy sides of streams, often associated with *Bledius subterraneus*, Er. *Dyschirius salinus*, Schaum., and *D. impunctipennis*, Daws., were

common on the mudbanks of the Solway. All the British species of *Bradycellus* occurred, except *B. distinctus*, Dej., and *B. verbasci*, Duft., and the capture of *B. collaris*, Payk., in tolerable plenty on the slopes of High Pike, and at a much less altitude on Wan Fell, was of interest, as it had been but sparingly met with in Cumberland previously. *Harpalus tardus*, Panz., was picked up on roads occasionally, and was the best of the genus to be taken. The genus is very badly represented in Cumberland. An interesting addition to the county list was *Pterostichus lepidus*, F., a specimen being obtained by Mr. Britten in the Eden Valley. *Amara fulva*, Dej., *A. consularis*, Duft., *A. bifrons*, Gyll., *A. orata*, F., and *A. lunicollis*, Schiod., was the best of the genus to turn up during the year. *Anchomenus* var. *moestus*, Duft., was common locally in a muddy place, but none of the typical form have so far been taken. The *Bembidina* taken were an interesting lot, and the county list now stands at 33 species, of which I have personally captured all but three. *B. doris*, Panz., previously only taken on the coast at Silloth, was noticed abundantly near Carlisle on the site of a pond dried up by the drought. *B. schüppeli*, Dej., so long connected with the River Irthing, was found in plenty on the banks of the Eden, and at a point many miles above the confluence of these two rivers. *B. nigricorne*, Gyll., was extremely abundant on bare places on the heather-covered Wan Fell in April. *B. bipunctatum*, L., occurred for the first time in any number by the Eden in Barron Wood, where *B. paludosum*, Panz., was common. A visit to the restricted habitat of *saratile*, Gyll., on the coast at Allonby, showed the species to be much scarcer than previously, perhaps it was over earlier than usual owing to the great heat; my visit was in August. The most interesting capture in this fascinating genus to me, however, was *B. affine*, Steph., which I took on the banks of the Irthing and Gelt, and was quite new to Cumberland. Three specimens were obtained. Two specimens of *Trechus discus*, F., were taken by Mr. Britten in the Eden Valley, and a single *micros*, Herbst., fell to my lot in the Petteril Valley. *Pogonus chalcus*, Marsh., considered scarce in the north, was very common under clods on Skinbarness Marsh. *Cymindis vaporariorum*, L., was again taken very sparingly. At roots of grass a few *Dromius nigricentris*, Thoms., were met with. The water-net was constantly in use and added some interesting species to the year's list of captures. *Brychius elevatus*, Panz., occurred rather freely in the Eden, clinging to mossy rocks in rather deep water, and *Deronectes depressus*, F., and *D. 12-pustulatus*, F., were both very common along with it. *Haliplus* was represented by five species, all common ones. *Laccophilus obscurus*, Panz., was obtained in numbers in a weedy pond. *Hydroporus rivalis*, Gyll., and *H. septentrionalis*, Gyll., were common in the Eden, the former also being observed in the Gelt, and in a stream at the foot of Cross Fell, where also *H. darisii*, Curt., was found. *H. lineatus*, F., *H. vittula*, Er., and *H. rufifrons*, Duft., were taken sparingly in boggy ponds with *H. memnonius*, Nic., *H. obscurus*, Sturm., &c., in abundance. A nice capture in this genus was *H. ferrugineus*, Steph., of which a dozen specimens were fished out of a tank for watering cattle. Twelve species of *Agabus* were taken, all of which I have recorded in previous years except *A. conspersus*, Marsh., and *A. uliginosus*, L., both of which now occurred for the first time in the county, the former on Burgh Marsh and the latter on Cross Fell,

in company with *A. arcticus*, Payk., and *A. congener*, Payk. *Rhantus eroletus*, Forst., and *R. bistriatus*, Berg., were occasionally taken. A few *Helophorus aequalis*, Thoms., were picked up in various localities, and *H. arvernicus*, Muls., was obtained very freely when once one knew how to look for it. This interesting species appears to be but semi-aquatic in its habits, indeed, I have never seen a specimen in water but always on the sand and mud bordering a fresh water stream, where sometimes as many as twenty specimens may be picked up on a square yard of ground or muddy rock. It is very sluggish and invariably thickly encrusted with dirt and consequently is easily overlooked. *Henicocerus cesculptus*, Germ., was taken in some numbers clinging to stones in a shallow stream on Cross Fell. *Octhebius marinus*, Payk., and *O. bicolor*, Germ., occurred on Burgh Marsh, *O. rufimarginatus*, Steph., on the sides of several rivers inland. *Hydraena gracilis*, Germ., was not uncommon in a stream on Cross Fell, and a specimen of what is probably *H. atricapilla*, Wat., was captured on a mossy stone in the Eden while working for the genus *Elmis*. A fair amount of work was done at the Staphs., though the material accumulated has not yet been thoroughly worked through. *Allocharya bipunctata*, Ol., and *A. morion*, Grav., were of frequent occurrence in dung; *A. succicola*, Thoms., in refuse; *A. cuniculorum*, Kr., sparingly near rabbit burrows; *A. obscurella*, Er., and *A. grisea*, under seaweed. *Homalota curvar*, Kr., was taken in some numbers near the head-waters of the Derwent; *H. insecta*, Thoms., *H. parvus*, Er., and *H. luridipennis*, Mann., on the Irthing. On a warm day in May I came across a numerous colony of *Tachyusa constricta*, Er., on a sandy bank by the River Petteril. This elegant little thing is a marvel of activity. One of the most interesting Staphs. occurring in Cumberland is *Placusa complanata*, Er., which was first found in the county two years ago by Mr. Britten, near Great Salkeld. According to Fowler it is very rare in the British Isles, a few specimens having been found in Scotland (*Col. Brit. Isles*, vol. ii., p. 161). I made a casual reference to its capture in Cumberland in this magazine in 1900 (*antea*, vol. xii., p. 331), but it will be worth while to say something more about it. It is very common in the Cumberland locality, and is to be found under fir bark in the burrows of *Hylastes* and other *Rhynchophora* upon the larvæ of which, as Fowler suggests, it probably preys. Undoubtedly it is very local, and I have not noticed it near Carlisle nor elsewhere in this county except in the locality already mentioned. *Gyrophæna manca*, Er., was taken in fungi with others of the genus. *Leptusa fumida*, Er., *Sipalia ruficollis*, Er., and *Bolitocharya obliqua*, Er., were obtained under bark. A nice capture for the north of England was *Euryporus picipes*, Payk., of which Mr. Murray and I each secured a specimen in moss in a wood near Carlisle. In the same place, but in putrid fungi, *Quedius lateralis*, Grav., was captured in numbers. The most interesting *Quedius* to be taken was *xanthopus*, Er., one specimen being found under bark in Wetheral Woods. *Q. umbrinus*, Er., *Q. auricomus*, Kies., were common in waterfall moss in the mountains. A single *Staphylinus stercorarius*, Ol., I took on the Silloth sandhills in a rabbit burrow. The genus *Philonthus* was fairly well attended to, with encouraging results. *P. intermedius*, Boisd., *P. proximus*, Kr., *P. carbonarius*, Gyll., *P. scutatus*, Er., *P. nigricentris*, Thoms., *P. ventralis*, Grav., and *P. nigrita*, Nord., were all new to me, though I had been taking *P. scutatus* for years

without knowing it. It occurs in moss along with the common *P. politus*, F. *P. nigri-ventris* I met with in dead birds in widely-separate localities. *Actobius cinerascens*, Grav., the first of the genus I have met with in Cumberland, was common on the margins of a pond with other Staphs. *Lathrobium quadratum*, Payk., occurred similarly near Silloth. *Stenus* was well represented, though nothing really rare was noticed, the best being *S. guttula*, Müll., *S. guymemeri*, Duv., *S. pallitarsis*, Steph., *S. bifoveolatus*, Gyll., *S. binotatus*, Ljun., *S. pubescens*, Steph., and *S. cicindeloides*, Grav. *Bledius opacus*, Block., and *B. pallipes*, Grav., occurred sparingly by the sides of streams, and the same may be said of the two species of *Ancyrophorus*. *Trogophloeus bilineatus*, Steph., and *ricularis*, Mots., were common. *Acidota crenata*, F., was taken on the wing and a fine series of *Deliphium tectum*, Payk., from dung, on Cross Fell. *Omalium planum*, Payk., was found on a sappy birch stump, and *deplanatum*, Gyll., in some numbers in a dry fungus. The Clavicorns were little worked, but still a few new county records were made. *Colon appendiculatum*, Sahl., was swept in a grassy place in June, and odd captures were also made of *Cholera angustata*, F., *cisteloides*, Fröhl., and *spadicea*, Sturm. *Scymnus nigri-nus*, Kug., was plentiful on some young Scotch firs. *Micropeplus staphylinoides*, Marsh., was occasionally swept. *Pityophagus ferrugineus*, F., was found under bark, and *Silvanus surinamensis*, L., in a flour mill. Fungi produced *Triphyllus suturalis*, F., *Mycetophagus 4-pustulatus*, L., and *M. multipunctatus*, Hellw. *Elmis acneus*, Müll., *E. volkmari*, Panz., *E. parallelopipedus*, Müll., *E. subriolaceus*, Müll., and *E. cupreus*, Müll., occurred on mossy stones in running streams, the first and last being common, the others scarce. On the salt marshes of the Solway Firth a few *Heterocerus britannicus*, Kuw., were picked up. *Sinodendron cylindricum*, L., occurred for the first time in any numbers, and *Aphodius pusillus*, Herbst, from sheep dung, was new to me in Cumberland. *Egialia sabuleti*, Payk., was found in limited numbers on sloping, sandy banks by the Eden, its habits reminding me of those of the common *arenaria*, F., on the coast. The *Sternori* produced nothing new to the district, though I was glad to get *Limonius minutus*, L., and *Adrastus limbatus*, F. *Ancistronycha abdominalis*, F., occurred again in the wooded valleys in the east, and *Telephorus obscurus*, L., on the grassy ascent to Sty Head Pass, where also *T. paludosus*, Fall., was met with. *T. darwinianus*, Sharp., also turned up again under clods on Skinburness Marsh. *Malthinus frontalis*, Marsh., was beaten from Scotch fir. *Longicornia* are scarce hereabouts, and it is always pleasing to meet with species for the first time. *Asenum striatum*, L., was taken in fir woods in several localities, and *Tetrops praeusta*, L., from various trees in Barron Wood. A single *Toxotus meridianus*, Panz., was taken by Mr. Britten. *Pachyta cerambyciformis*, Schr., was found by Messrs. Routledge and Murray in the Gelt Valley, a species Mr. T. C. Heysham used to get in Barron Wood 70 or more years ago. *Saperda populnea*, L., so common in 1899 and nearly absent in 1900 (I only saw one) turned up again in great force in 1901 in the old locality among aspen. *Donacia versicolorea*, Brahma, was met with for the first time in the Eden Valley, and *D. affinis*, Kunze, from Borrowdale, was also an addition to the list. *Clythra quadripunctata*, L., was met with again in its old haunts among the wood ants near Keswick, and *Hydrothassa hannoverana*, F., was also taken again, this time in fair numbers.

Attelabus curculionoides, L., was frequently taken, always on oak. A nice series of *Rhynchites cupreus*, L., was beaten from mountain-ash in Barron Wood, thus verifying Heysham's record. *R. uncinatus*, Thoms., and *Deporaus megacephalus*, Germ., were taken in several localities. The best *Apion* to be taken was *cerdo*, Thoms., an imperfect specimen, by sweeping. The pretty *Polydrusus chrysomela*, Ol., I found rather sparingly under clods on Skinburness Marsh, with *Tanymericus palliatus*, F., and *Phytobius 4-tuberculatus*, F. *Pissodes pini*, L., was common on the under-surface of recently-felled young Scotch firs. *Poophagus sisymbrii*, F., was swept in a marshy place, the rarer *P. nasturtii*, Germ., occurring once. *Hylesinus crenatus*, F., was taken in its burrows in ash, a single *H. vittatus*, F., being captured on the wing.—FRANK H. DAY, 6, Currock Terrace, Carlisle. *January, 1902.*

SCIENTIFIC NOTES AND OBSERVATIONS.

TERATOLOGICAL LEPIDOPTERA.—I have an example of *Anthroca purpuralis* taken wild, in which the right primary wing is remarkably shortened and widened; also an example of *Venusia cambrica* with an oddly-shaped left secondary. In neither is there any crumpling or want of extension of the wing membrane.—F. C. WOODFORDE, F.E.S., Market Drayton. *December 19th, 1901.*

I have a ♂ *Tephrosia consonaria* in which the wings on one side are shorter and smaller generally than those on the other.—(MAJOR) R. B. ROBERTSON, Southborne Road, Boscombe. *January 3rd, 1902.*

The season for *Asteroscopus sphinx* was very short last autumn and the number of specimens taken at light much below the average, and no ♀. The only example calling for notice was a ♂ with one antenna (perfectly formed) about two-thirds the length of the other, this being the second specimen only with a similar peculiarity that I have taken, among the several hundreds that have passed through my hands since 1892.—E. F. C. STUDD, M.A., F.E.S., Oxtou, Exeter. *January 22nd, 1902.*

It seems to me that misshapen wings with the normal markings accurate in position are due to some injury sustained by the larva. Some years ago when breeding *Dasygampa rubiginea*, I accidentally injured a larva very much on one side so that the vessels ruptured and exuded freely. Though I thought it impossible that the larva would live I continued feeding it, and shortly the injury was repaired and the larva pupated, producing in due course an imago which has the forewing on the one side partially amputated, at the anal angle and the margin somewhat sinuated, but with the markings normal. When breeding other lepidoptera, I have frequently come across similar abnormalities, e.g., I have two examples of *Angerona prunaria* ab. *sordidata* and one of *Spilosoma lubricipeda* in my cabinet thus misshapen, and I attribute them to injuries caused to the larva when changing food in a hurry and with many to look after. Though most of the forms may be thus accounted for, it seems to me probable that any internal deviation from the normal, causing localised imperfect nutrition, may account for others—possibly those where the difference is only one of size, like Mr. Woodforde's *Venusia cambrica*.—W. S. RIDING, M.D., Buckerell Lodge, Honiton. *December 30th, 1901.*

PRACTICAL HINTS.

Field Work for March and April.

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

1.—Females of *Polygonia e-album* captured in late March and early April, will lay freely on hop, currant and nettles, if carefully sleeved on plants that obtain a fair amount of sunshine.

2.—I can get the imagines of *Lachwis laustris* to emerge freely. I put the cage containing the cocoons in the sun in early March, and they will come swarming out like flies (Thornewill).

3.—At the end of March and through April *Dimorpha versicolora* is on the wing. The males fly till about 3.20 p.m., and will do so without sun if the temperature be suitable.

4.—The larvæ of *Tiliacea aurago* hatch during the last week of March, take to the buds of the beech from which the outer coverings have been removed; they creep into the buds, are practically invisible until they are at least three weeks old, and only show signs of their existence by frass.

5.—The young larvæ of *Tiliacea citrigo* live in the young lime buds in April, but in early May are to be found between two flat leaves of lime, fastened by silk: by standing under the trees, so as to get the leaves between the eye and the sky, the larvæ may be readily detected; they come out to feed at night and can then be beaten; the larva forms its cocoon in early June, but does not pupate for nearly two months after doing so.

6.—The imagines of *Hoparina croceago* pair after hibernation, come freely to sallows, lay their eggs on dried oak leaves and twigs (freely in confinement if fed with a little thin sugar); the young larvæ rest on the veins of the newly-developed oak-leaves and feed up readily if sleeved in gardens; full-fed at end of May.

7.—The imagines of *Taeniocampa populeti* come to willow bloom when the latter is near aspens, but they can also be obtained freely by searching the aspen twigs after dark.

8.—The eggs of *Catocala promissa* hatch in March and April and can be fed on split oak-buds until the early leaves are procurable.

9.—To obtain eggs of *Orrhodia vaccinii* and *O. ligula (spadicæ)* place ♀s captured in spring at willow in large chip boxes, which have been previously scored well with a penknife, or cracked so that they can find some place to hide their eggs in; they will then readily oviposit (Robertson).

10.—The eggs of *Anisopteryx aescularia* are laid necklace-like round a twig of birch, &c., each batch consists of some 200 or more eggs, and the whole batch is covered with down from the anal tuft.

11.—Larch plantations, especially if near or among beech and oak woods, are the favourite haunts for *Tephrosia histortata*.

12.—In March (late February in early seasons) *Nyssia hispidaria* is sometimes exceedingly abundant, between 9 a.m. and 2 p.m.; large numbers may sometimes be found drying their wings on tree-trunks in Epping and Chingford; they usually rest from 4ft.-5ft. up the trunks, some much higher. They press themselves very closely into crevices in bark, and are not easy to find; the majority rest on oak, a few on horn-

* PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST, recently published, contains 1250 similar hints to these, distributed over every month in the year. Interleaved (for collector's own notes).—ED.

beam, beech, &c., if a ♀ be on the bark one or more males are sure to be present, a period of seven weeks has been noticed as the time over which emergences are spread in some seasons.

13.—*Nyssia hispidaria* is easy to pair in captivity. A ♂ that has been out for a day or two, placed in a fairly large box with a freshly emerged ♀, is sufficient to ensure fertile eggs. Copulation usually takes place in the evening and does not last more than about fifteen minutes.

14.—The males of *Nyssia hispidaria* are readily obtained by assembling. Six or seven freshly emerged ♀s in a small gauze cage, about 5ft. from the ground, on a warm and windy evening, brought the first ♂ at 6.45 p.m., others following in twos or threes till 7.30 p.m., when they ceased: but the males became active again from 10.30 p.m.—11 p.m.

15.—The larvæ of *Nyssia hispidaria* feed readily on birch, hawthorn, and hornbeam in confinement, knowledge of this fact is often useful as these are usually earlier in forward seasons than oak in putting out their leaves.

16.—The best time to search for imagines of *Amphidasys strataria* is directly after 4 p.m., and for *A. betularia* after 5 p.m. (Bate).

17.—A freshly emerged ♀ of *Amphidasys strataria*, towards the end of March, suspended in a suitable "cage" from an oak, will on a good night attract a large number of males, usually before 9 p.m.

18.—The imagines of *Epigraphia avellanella* are common in March and April at rest on birch trees. Large numbers are obtained in Rannoch by the collectors who take the species when they are searching for *Petasia nubeculosa*.

19.—On March 25th, 1873, I went to Llanferras, Denbigh, and on Pen-y-garra Win and Pant Moen, took larvæ of *Agrotis ashworthii* and *A. cinerea* amongst mixed herbage. The latter seems to prefer *Festuca ovina*, feeding downwards from the extreme tips of the grass and stumping the tufts down that it has fed upon, afterwards hiding away in the tufts (Gregson).

20.—Working at night produced larvæ of *Leucania conigera* and *L. lithargyria* feeding freely at dusk; and near midnight larvæ of *Agrotis lucernea* were stretched at full length on rock-faces, one or two feet from the ledges on which their food grows. *Epunda lichenea*, larvæ of all colours, from light green to dark chequered brown-olive, and of all sizes from three-eighths of an inch long to full-fed, were feeding on *Sedum acre* and *S. reflexum*, or stretched out on various plants, or on the rocks (Gregson).

21.—Young larvæ of *Mimaeseoptilus scabiodyctylus* were plentiful in the "cases" of *Scabiosa columbaria*; and on the terminal shoots of *Tenerium scorodonia*, growing in sheltered corners, the larvæ of *Oxyptilus heterodactyla* (*teuerii*) were just beginning to feed (Gregson).

22.—Young larvæ of *Gracilaria tringipennella* were indicating their presence on *Plantago lanceolata* leaves in warm corners. The cases of *Coleophora virgauracella* were frequently seen attached to sticks and dead plant-stems, whilst I was searching among the wild marjoram and golden-rod, growing together, for the hibernating larvæ of *Leioptilus osteodactylus* (Gregson).

23.—From the catkins of a fine female plant of *Salix caprea* I took a large number of larvæ of *Eupithecia tenuiata* and with them plenty

of young larvæ of *Grapholitha nisana*, and, of course, no end of eggs and young larvæ of *Citria flavago* and *C. fulvago* (Gregson).

24.—Fill a bag with catkins and terminal shoots of *Alnus glutinosa*, in and on which larvæ of *Grapholitha penkleriana* are feeding (Gregson).

25.—Under the tufts of Tortulæ and Hypnum, which grow so freely round Llanferris, I obtained young larvæ of *Scoparia muralis*, *S. crataegalis*, and *S. mercurialis*; also a few Noctuid larvæ that were hiding there (Gregson).

26.—The eggs of *Ennomos angularia* commence to hatch in early April, not all at once, but in small numbers over a long period. The larvæ feed well on oak and birch, preferring the latter, and when full-fed spin a slight cocoon between the leaves of their food-plant (Lockyer).

27.—In collecting young larvæ from willow in early spring it will be found, upon examination, that the young leaf-shoots at the tops of the twigs almost invariably contain a larva. In this way I have bred *Tethea vetusa*, *Eurymene dolabraria*, and other species which will possibly not be gathered with the catkins alone (Dollman).

28.—At the end of March, we adopted the plan of cutting branches of the best willow bloom from the inaccessible parts of Bishop's Wood, and hung them up on the branches of trees in rides; on each of these the moths swarmed and we had an umbrella literally covered with Tæniocampids after each shake (Walker).

29.—A large American cheese box with the top knocked out, leaving a ring by means of which a piece of lino can be stretched over the bottom of the box makes a very good breeding-cage (Bate).

NOTES ON COLLECTING, Etc.

AQUATIC RHYNCHOTA AND COLEOPTERA AT BOLTON IN JANUARY.—On January 1st, the weather being very mild, I went in search of water-bugs and met with some success. I have been twice since, on the 11th and 17th, and the total number of species taken on the three days is ten, as follows: *Notonecta glauca*, three; *Conixa geoffroyi*, one on the 1st; *C. lugubris*, very common; *C. hieroglyphica*, one on the 11th; *C. linnaei*, not common; *C. striata*, fairly plentiful; *C. moesta*, one on the 11th; *C. fabricii*, and *fossarum*, very common; and *C. praeusta* and var. *wollastoni*, fairly plentiful. Along with these I have taken seven specimens of *Dytiscus marginalis* (three ♂s and four ♀s), one ♂ *Acilius sulcatus*, *Haliphus variegatus*, *Hydroporus geminus* and *palustris*, and *Lacophilus minutus*.—OSCAR WHITTAKER, Morelands, Heaton, Bolton-le-Moors. February 5th, 1902.

LEPIDOPTEROLOGICAL NOTES IN 1901.—*Sphinx convolvuli*: What an erratic insect this is! On August 18th and 23rd I took several specimens, but all worn. On September 8th and 9th I took several more quite fresh, while on September 7th I had a nearly full-fed larva brought me. Are there two broods, or only a series of very protracted emergences? *Eupithecia sobrinata*: This insect began to emerge with me on July 8th, and continued coming out till September 3rd, a period of over eight weeks. *Dianthoecia irregularis*: This insect was emerging from July 4th till August 5th. *Phigalia pedaria*: A male which emerged on March 2nd, and which I did not kill, but used for breeding, lived without food of any sort until March 31st, just 29 days.—PERCY C. REID, F.E.S., Feering Bury, Kelvedon. February 18th, 1902.

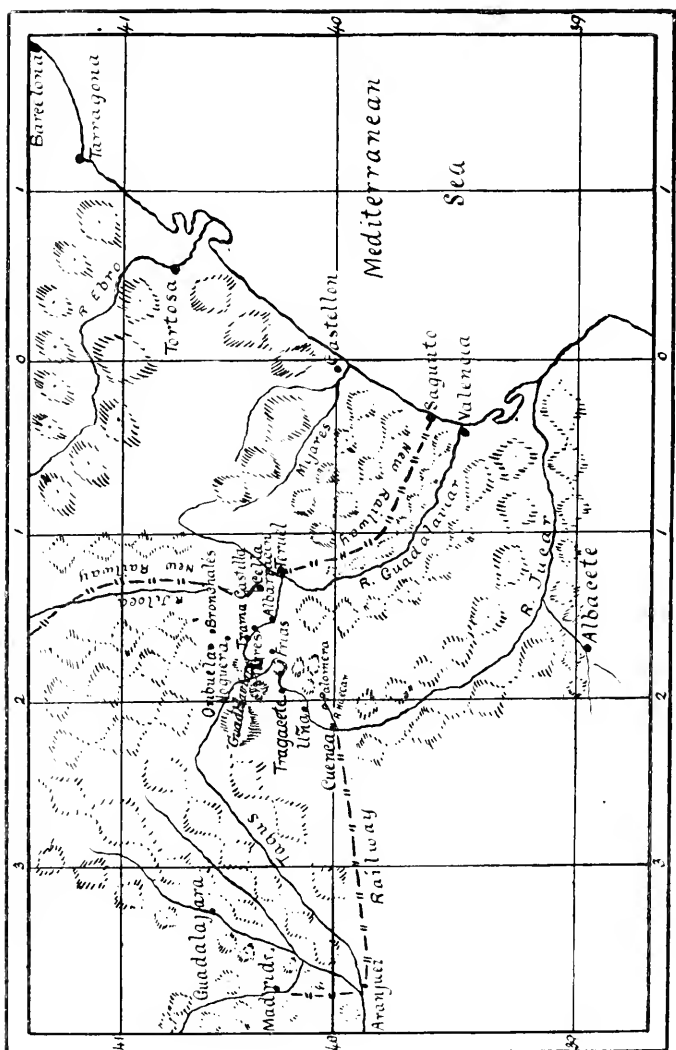
CURRENT NOTES.

The way in which varietal synonymy is accumulating, owing to our German lepidopterists working in ignorance of the literature of their subject, is appalling. Clark, in 1891, described and named (*Ent. Rec.*, i., p. 328, pl. A., fig. 1) the obsolete-banded form of *Mimas tiliac*, ab. *obsoleta*, and gave an excellent figure thereof. In spite of this, Bartel (*Die Palaearkt. Gross-Schmett.*, ii., p. 149), in 1900, renamed it *immaculata*, and Staudinger, in 1901, rechristened it *extincta*. This latter amazes one, as Staudinger positively quotes Clark's paper in his synonymy of the species. Bartel thinks that "no doubt examples of this aberration are to be found elsewhere, but owing to their rarity they appear not to have been often observed." One cannot help retorting, What is the use of observing them and recording the observations if an author does not trouble about the records? Similarly Clark describes and figures (*loc. cit.*, p. 329, pl. A., fig. 7) an ab. *centripuncta*, which Bartel, in 1900, and Staudinger in 1901, independently redescribe as *ulmi*, utilising wrongly Boisduval's name for the dwarf form of this species. Staudinger also calls the ab. *brunnea* of Bartel, ab. *brunnescens*. So much for the named forms of *Mimas tiliac* ! !

In the *Societas Entomologica*, xvi., p. 171, Schultz has renamed the melanic form of *Phaethra (Acronycta) runcicis*. As Curtis named it *salicis* some three-quarters of a century ago, and Gregson renamed it *nobilis* some forty years ago, it had already two names to go on with, and one wonders what it wants with the third, *lugubris*. Staudinger in his *Cat.*, 2nd ed., p. 77, erroneously referred it to *menyanthidis*, but has placed it accurately in the 3rd ed., p. 133. We have already given details of its history and its distribution in *Brit. Noctuae, &c.*, vol. i., pp. 25-27. We still live in hope that the German collectors will look up the literature of the subject before renaming any more Noctuid (and other) aberrations.

In an article on the "Forficole raccolte dal Dott. Filippo Silvestri nella Republica Argentina e regione vicine" (*Boll. Mus. Torino*, no. 418, February, 1902), Dr. Alfredo Borelli describes two new species, of which one is quite a curiosity. This is *Anisolabis cavca*, Bor., allied to the cosmopolitan *A. annulipes*, Luc., in which, as its name implies, eyes are totally wanting. This is the first instance of entire blindness known among earwigs, and the blindness is so complete that not even rudiments of eyes are to be seen. An adult female and an immature male were discovered under the ground, when the collector was searching for termites. The other novelty is *Gonolabis sylvestrii*, from Patagonia, which is the sixth known species of this interesting genus.

If the whole series of Wytsman's *Genera Insectorum* be up to the standard of the two fascicules now before us, the work will be one of the most valuable ever offered to the systematic entomologist. "Hymenoptera, Fam. *Franiidae*," by Kieffer, and "Coleoptera, Fam. *Gyrinidae*," by Régimbart, are the two parts just published. Both are quarto, excellently printed on good paper, the illustrations equally good with the text. Our leading entomologists would do well to support the work, particulars of the publication of which may be obtained of Mr. P. Wytsman, 108, Boulevard du Nord, Bruxelles.



THE ALBARACÍN DISTRICT OF SPAIN.

Entom Record, etc., 1902.

A few weeks' entomologising in Spain (*with map*).

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

(Continued from p. 73).

On leaving Cuenca we went northwards to Tragacete, staying a night on the way at the village of Uña, near which is a little lake, and after leaving Tragacete we again made a two days' journey to Albarracin. We set out on the theory that we rode on mules, and that our belongings were to be carried in the same fashion. We discovered, however, that we progressed quite as rapidly on foot, and with much more comfort and freedom. On a good animal the two days' journey would only be one, notwithstanding the roughness of the roads and their hilly character, and a good walker would similarly be able to shorten the time required. The pace, however, is set by our guide in charge of the baggage mule, so that it pays better to walk and even do a little collecting on the way. Throughout the country we so traversed, having Tragacete for its centre, wheeled vehicles are practically unknown, and everything is carried on mule or donkey back. Harvest was in full swing and we saw these animals carrying home the corn from the fields, often for distances of several miles. This imperative employment of the animals, made it difficult to obtain any when we wanted them. In driving his beast the Spanish peasant is continually urging it on with loud shouts and occasional blows—"Arre Burro," "Arre Mula," "Arre Cavallo"—are sounds that are as continuous in these Spanish valleys, as the roaring and babbling of the streams are in those of the Swiss mountains. Mules are, perhaps, the more numerous, but the donkey, perhaps, requires more encouragement, and consequently "Arre Burro," seemed to be constantly shouted. It certainly was a full half of all the Spanish I heard, but having learnt it, I was perhaps in error in believing that I knew half the Spanish language.

Between Cuenca and Uña, we passed over a rather high plateau, on which there was once a stratum of limestone some 30ft. to 50ft. in thickness, but of which there now remain only large isolated masses, with perpendicular or overhanging sides, in many remarkable forms, like houses, castles and churches, producing a most extraordinary and weird effect, and well bearing out the name of the "enchanted city" that has been given to the place. The limestone often stands out in similar forms in the escarpments of the valleys, but how it acquired them in very numerous, isolated masses, standing up on a level area, as it does here, implied some very special conditions of weathering. At Uña the little lake is quite an unusual feature in the scenery here, and afforded a swarm of *Hydrocampa nymphæalis* and some dragonflies. *Euchelia jacobææ* was on the wing here, elsewhere we saw only larvæ of all sizes, they were especially common at Tragacete on a species of ragwort. All the larvæ I saw differed constantly from those I have seen in England and elsewhere. The ordinary form has a black continuous belt right over the dorsum of each segment, but in these it was divided into four portions. It is broken through on the dorsal line, it then narrows down to a sharp point in front of the spiracle, this angular patch containing tubercles i. ii and iii. The next portion

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begins with a sharp point just behind the spiracle and includes the following tubercles. The narrowing of both portions of the black mark towards the spiracles, makes the gap more obvious, and look larger than it really is. In proceeding to Tragacete, we travelled some distance over an upland plateau, through pine woods, and descended a somewhat steep, and in places rocky, slope to reach the village. Tragacete is situated in a wide open valley, on the upper portion of the Jucar, which is here much reduced in volume, so that it can be crossed easily dryshod at various points. Between Tragacete and Cuenca the Jucar makes a double bend like an S, and our route was practically following the straight line between the two places, crossing the middle of the S at Uña. I would qualify this so far as to say that the statement must be taken very broadly, as, in fact, our road seemed to twist and turn interminably. The valley in which Tragacete lies is well cultivated. We did most of our collecting here by following up the Jucar, which comes down a lateral opening, more like a mountain stream than anything we found elsewhere, it has several lateral branches and leads to openings in the hills, of which, we were able to explore a few and these but partially. In no other direction from Tragacete was there any stream containing water, at the time of our visit. No doubt this circumstance made insect life much more abundant along this upper Jucar stream, both in species and individuals, than anywhere else. It is, however, possible, that, in adhering too closely to this outlet, we missed more interesting forms that might have been found on the open hillsides and tops. It is at any rate the case, that the species taken here were all of a somewhat general distribution and presented no special local forms, such as distinguish the neighbourhood of Albarracin. *Graellsia isabellae* was, perhaps, the most local of the species found; but this seems to occur throughout central Spain. I never saw greater multitudes of butterflies than occurred in some small patches of ground in this upper Jucar glen.

Away from the villages or little towns, it appears to be a rule or law, that any inhabitant of the township may plough up and cultivate any patch that takes his fancy, provided he is first on the ground, it also, however, happens that a very few crops exhaust the ground and it is then left to revert to a state of nature. We noticed patches of corn in various unexpected and remote places, and very many spots showing that they had been cultivated at some recent or remote period. In the Jucar glen were several such patches that appeared to have been abandoned for a few years and now supported a thick crop of a tall yellow-flowered, ill-smelling sage, that grew solitarily elsewhere, and that seemed to be immensely attractive to butterflies, and there they were by thousands and tens of thousands, a sight to take its place in the memory with the most notable swarms of insects that we have ever seen. Most of them were species of large size and of much variety of appearance. Most conspicuous, perhaps, were *Dryas pandora*, *Argynnis chlorodippe*, *Gonepteryx rhamni*, *G. cleopatra*, *Colias hyale*, *Satyrus semele* and *S. alcyone*, these two, perhaps, the most abundant of all, *Melanargia lachesis*, *Polyommatus* var. *corydonius*, *Melitaea phoebe*, *M. didyma*, *Pieris daplidice*, *Argynnis lathonia*, *A. hecate*, *Polyommatus astrarche*, *P. admetus*, and several skippers, *Coenonympha dorus*, *Epinephele ida*, *E. pasiphae*, *Satyrus circe*, *S. briseis*, and *Thecla spini*. All these were in more or less abundance, though some, such as *Melitaea phoebe* and *Epinephele*

pasiphæ, much worn. There were also others less numerous, such as *Papilio machaon*, *Aporia crataegi*, *Melitæa athalia*, *Lampides boetica*, *Aglais urticae*, *Argynnis aglaia*, *Pyrameis atalanta*, *Coenonympha arcania* and various others; nor were moths wanting, *Lithosia complana* and *Catocala conversa*, with *Plusia gamma*, &c., did not, however, add much to the total numbers. The plants were too large to be quite one to each square yard, but each plant had several, often a dozen butterflies, and each patch occupied several acres, so that it will be seen that my estimate of the total crowd is not exaggerated. It was in one of the side dingles here that I met with *Coenonympha iphioides*.

At Tragacete we met with *Vauessa io*, *Pyrameis atalanta* and *Leptidia sinapis*, but they were by no means abundant, larvæ of *Chariclea umbra* and *Panolis piniperda* were seen, as well as several of *Sphinx pinastri*. *Sesia (Macroglossum) stellatarum* was only occasionally observed. We stayed at Tragacete from July 18th to the 26th, at the Posada of Señor Indalechio Martinez, though I occupied a room in another Posada in the village where I got placed, owing to my arriving some hours before the rest of the party, who had lost themselves on the way. It may interest anyone who contemplates visiting this region, that the accommodation in these mountain villages here and at Uña, Guadaluviar, Bronchales, &c., was quite equal to that that used to find approval in the Swiss mountain inns before they all became modern hotels. The ground floor always included a stable, and the ante-room to this and to the house generally was not inviting. The guest-room is, however, upstairs, on a concrete floor, and is usually large, fairly airy, often very clean, and the bedding good and linen very clean. The usual pattern appeared to be a large room, with two beds, these usually placed in recesses and shut off from the room by curtains or even doors. The food was usually good, but rarely served quite as one would like it, and no doubt met our approval for reasons that pertained more to us than to it. Onions and garlic were hardly at all in evidence; a kind of dried pea or vetch called "carbanjas" was frequently served in stews, &c., and was very good—if you were hungry. The bread was much better than usually found in out-of-the-way places in the Alps of France, Switzerland, or the Tyrol. A supply of tea we took with us proved most useful, and enabled us often to make a breakfast with otherwise inadequate materials. I may add another item to my non-entomological details as to Tragacete, it is a large village of nearly 2000 inhabitants, and it does not appear to possess a glazed window of any sort; windows were closed with wooden shutters and canvas screens, to keep out the heat and exclude the flies. The result was fairly satisfactory, how it works in winter with snow on the ground for several months was not very clear to us. One of the inhabitants told us with some pride, that Tragacete contained no rich people and no poor people. I suppose that, according to a moderate standard of peasant prosperity, this was true, and probably all were much better off than an inspection of their dwellings would lead an English visitor to imagine, or than he would deduce from the fact that our entertainment which was according to the highest local standard of sumptuousness, cost 1s. 9d. per diem, and might by experienced chaffering doubtless have been had at a lower figure.

On leaving Tragacete we crossed various hills and valleys, in a

generally eastern direction, rising at one point to nearly 5000ft., to Guadalaviar, a small village situated near the source of the river of that name, and at the foot of the Muela de San Juan, a central summit or ridge of the Albarracin Sierra of a little over 5000ft., but not by nearly 1000ft. the highest in the group. On the way we crossed the source of the Tagus (Tajo). Leaving Tragacete we first traversed a hillside clothed with a forest of small oak trees, that would have repaid some collecting therein, especially, probably, earlier in the season. On the way I found a group of larvae of a *Cnethocampa* new to me, of which, unfortunately, only one pupated. These are probably *C. herculeana*. They had no web, and were on a *Pinus* that was not *P. sylvestris*. On the Guadalaviar slope of the last steep ridge we crossed, *Parnassius apollo* flew freely, as well as the very pretty little *Anthrocera fausta*. On this same ground, on an *Euphorbia*, probably *nicacensis*, common there, were many nests or families of all ages of an Acronyctid, of the *myricae* group. These were probably *Clidia chamaesycos*. Unfortunately this *Euphorbia* does not grow at Albarracin, whither I had to carry those I took, and they did not thrive on *Euphorbia serrata*, on poor specimens of which I had to feed them, and very few pupated. We were told here that *Erebia zapateri* occurred on the Muela de San Juan, but that mid-August was a more likely date to meet with it.

The following day we proceeded to Albarracin, crossing the hills for a space and striking the Guadalaviar lower down at Trama Castilla, and thence following the river past Torres to Albarracin, a walk of a dozen miles down the hot valley. For the last two miles of this, above Albarracin, the river runs through a gorge of inaccessible precipices for the whole distance. At Albarracin it makes a great bend nearly returning on itself. The peninsula thus enclosed is the site of the ancient town of Albarracin, protected thus by the river, on its own side by the precipices on which it stands, and on the opposite by similar but higher ones, whilst across the neck of the peninsula, the Moors constructed a great wall, running high up into the hills and with many towers at short intervals; much of this is still in very fair preservation. The old Moorish castle on the highest part of the peninsula is more ruinous. The present Albarracin is still largely within the old limits, but has also extended up and down the river beyond them. A very good road, some twenty years old, now runs up to Albarracin, passes through the neck of the peninsula by a short tunnel, and goes on to Noguera and Orihuela, where are certain baths. We found very tolerable quarters here at the Posada of Señor Jose Narro, situated in a new house, outside the lower end of the town. Señor Jose had been associated to some extent with Herr Korb in his collecting, but though he still supplies living pupae of *G. isabellae* to German dealers, he is not able to capture and preserve imagines successfully. He nevertheless knows the habitats of many of the species peculiar to the district, though he does not know their names.

We stayed at Albarracin from July 27th till August 8th, with the exception of three days occupied by an excursion to Bronchales on August 3rd, 4th and 5th. One of the first things we did was to call on Canon Zapater, who lives in a large rambling house just below the city. He received us very kindly and took us for a walk to the habitat, nearest to Albarracin, of *Satyryx prieuri*, and we there saw one on the

wing. The Canon told us this was the first walk he had taken for some two years, and we felt honoured accordingly. He has many interesting recollections of his entomological researches here and elsewhere, but he does not now do any serious collecting. He has a very extensive library, including some rare entomological books; it shows that, until his retirement to Albarracín, where he has resided for twelve or fifteen years, he must have had very active interest not only in many literary and theological subjects, but in many branches of science. We saw him several times afterwards, and his kindness and courtesy made a strong impression upon us. At Albarracín we collected chiefly in two localities or districts. These were probably the most profitable and interesting, but there were others time did not permit of our examining, and doubtless others of which we were in absolute ignorance. One of these was down the stream of the Guadalaviar some four miles, where a large affluent, absolutely dry during our stay, joins it from the left bank. The basin of this little stream seemed to possess more abundantly the species that affected a large area of similar country round about. It is a dry, stony, undulating region, in which the limestone rocks are very close to the surface. It grows savin trees of considerable size, up to perhaps 25ft. high. The *Ephedra nebrodensis*, a shrub rarely reaching 4ft. high, belonging to the *Ginetaceae* or joint-firs, but excessively woody, was also commonest here. Many spiny shrubs of much smaller size, papilionaceous chiefly, were also common. Here the splendid *Buprestis sanguinea* (see Champion, *Trans. Ent. Soc. London*, 1901, p. 379), was frequent on the *Ephedra*, and on the same plant, we took larvæ, apparently those of *Albarracina korbi* as well as larvæ of a *Cerostoma* not yet determined. Here also were apparently the headquarters of *Satyrus pricuri*, whilst *S. semele*, *S. julia*, *S. aleyone*, *S. actaea*, *S. briseis*, *S. circe* and *S. statilius* were (except *S. actaea*) more or less common. *Polyommatus corydon* var. *hispana*, was common here, as well as *Argynnis chlorodippe*. In the valley of the Guadalaviar itself, all these and other butterflies occurred, *S. julia* and *S. circe* being especially common, but *S. pricuri* was rare. In going down to this point along the Guadalaviar river we noticed the opposite bank to be clothed to a considerable height with a thick wood, chiefly of small oak trees. We much regretted that no opportunity of rambling in this occurred, since it was of a character so distinct from that of any other ground we collected in.

Our other excursions from Albarracín, were up a valley opening to the south, with a small trickle of water fed by springs, and leading onwards to Puerto de la Losillo, which we thrice visited. In this direction, one leaves, after a mile or two, the limestone, and gets amongst hills of a dark red sandstone, one also reaches a region in which pine forest still comes to within a few miles of Albarracín. The immediate neighbourhood of Albarracín, like Cuenca, is bare of trees, one supposes by human agency. Many species of butterflies are frequent in this region, *Satyrus pricuri* in the lower portions, and, on the higher ground near the Puerto de la Losillo, *Erebia zapateri* occurs. At one spot at least on the way up we found both species together: no doubt here the sandstone and limestone run side by side.

On the 3rd of August we went by cart to Noguera, where we lunched. The journey occupied nearly four hours, very much the

time in which we could have walked it, nor was it by any means the most comfortable method of travelling, but the only one available, except, perhaps, on mule-back, had we been able to obtain such animals. It saved us, however, some fatigue and shade from the sun during the journey. From Noguera we explored the hills and pine forest over towards Bronchales. This is, perhaps, a two hours' walk, but, of course, we took much longer. Our object in visiting Bronchales, where we stayed the two following nights, was to meet with *Erebia zapateri*. On this first day we went through some of the supposed best ground for the species, but saw no trace of it, and, in fact, all the butterflies we saw were of fairly common species. We had not, however, gone very far on our way from Noguera when I saw, after a little searching, a larva of *G. isabellae*, and we found several others afterwards. At Bronchales, on the following day, only one was found, this by Mr. Champion; towards afternoon, however, I picked up one very fresh *E. zapateri*, and just afterwards Mr. Champion came across several. On the 5th we had to return to Albarracin, and made a circuit on the way to Noguera, in the course of which we met with *E. zapateri*, but still, somewhat rarely. It was obvious that the species did not emerge before August 4th, and that our failure to find it on the 3rd, as well as at Puerto de la Losillo, on the 1st, was that it was not then out. I have little doubt that, could we have spent a few more days at Bronchales, we should not have had to complain of the rarity of the species. This was confirmed by finding the species on the wing at Puerto de la Losillo on the 7th, but it is obviously far from abundant in that locality. We also again noted on our return by Noguera that *G. isabellae* was much more frequent near that village. On August 6th we visited the *S. priouri* ground, and in the heat of the day were interested to note that, though the various Satyrids there were on the wing in fair abundance, instead of settling in the open as we had been used to seeing them, they almost invariably, and especially *S. priouri*, made for the shade close under some shrub or bush before settling. This was, I think, one of the hottest days we had.

In regard to the weather generally, I may say we had no rain, without giving any false impression, though, as a matter of fact, we did meet with a shower or two. Throughout this Albarracin district the corn is all thrashed very soon after it is harvested, and in a manner only possible in a very dry, nearly rainless, country, and which I had always associated with ideas of such eastern countries as Syria and Palestine, probably from pictorial and other illustrations with which most of us are familiar. The threshing-floor is a circular area, chosen as near to the village as may be, on a little hillock, or at the end of a ridge, or other situation exposed enough to meet with a little wind for winnowing. This is a level, but no very great pains beyond constant use seem to be taken to make it hard or smooth, it is, however, often on the bare rock. The corn is spread on this, and a flat sledge, armed with some slips of iron beneath, is drawn over it and round by one or two mules or asses. On the sledge is the driver of the animals, usually standing, often squatted down, and occasionally an old lady, seated on a chair, held the office. The winnowing is done by throwing the mixed corn and chaff in the air with a shovel.

In the pine forests we frequently saw trees apparently wilfully and uselessly damaged. It appeared as if some one who did not understand

the business might have been trying to cut the tree down and given it up half-way through; nearly half the thickness of the tree was removed from the ground to several feet up, and removed in rough chips, leaving, in many cases, a ragged surface. Sometimes there was comparatively little removed. We found, however, that these trees provided the means of artificial illumination. Apparently, a tree has first a superficial slice removed, and, after a time, the exposed wood becomes excessively loaded with resin, and is in turn chipped off as the required product, the same tree providing several successive crops of this sort. These highly-resinous chips of pine are burnt in a circular iron grid, supported on a stand about 3ft. from the floor, and give a very brilliant light; frequent replenishment is, however, necessary. They give off much smoke also, but being placed by the fire in the great chimney corner, this is no evil. The fireplaces, wood being the fuel, are flat hearths, under a wide chimney, perhaps 14ft. by 6ft., narrowing to perhaps 6ft. \times 1ft. at the outlet, and allow of seats at both sides, on the pattern still to be found in old English houses. The other usual illuminant was a tin or earthenware vessel of oil, with a wick lying in the spout, precisely the same construction as may be seen in any museum of Roman antiquities.

We had expected to have to make a long *détour* in making our way home, or else to face a prolonged diligence journey. It so happened, however, that the railway from Teruel to Saragossa was opened during our stay, and so placed a railway-station within sixteen miles of us, with a direct road home. Even so, the journey was a slow one. The opening of this railway brings this very interesting country, both Albarracin and Bronchales, which are entomologically the most important, within a few miles of a railway, running directly from France by Bayonne, Pamplona, and Saragossa. From Noguera to Teruel there is a good road down the Guadalaviar valley past Albarracin, and served by a diligence. There is already a project even to bring a railway from Teruel to the neighbourhood of Bronchales, where mining is becoming a very ætively industry. Without this, however, the district is now really very accessible, as near London, indeed, as much of the Tyrol, for example, and more so than Norway. It will not, therefore, perhaps remain much longer so unvisited by British entomologists.

(To be concluded.)

Notes on the breeding of *Amphidasys strataria*.

By J. C. DOLLMAN.

The ova are laid in irregular groups, at least, in captivity. Each egg is oval in form, with a very shiny surface, and covered with honeycomb-like markings in distinct relief. The colour is olive-grey, turning to a dark umber-green three or four days before emergence. The young larvæ appeared on May 3rd, and were at first about $\frac{1}{2}$ inch in length. The head, large and squarish in form, being dark sienna in colour, and shiny in appearance; the body was of a dull green-umber in colour, and heavily wrinkled transversely. Immediately behind the head was a sharp yellowish-white line, like a collar, and from this down the centre of the thoracic segments a broader longitudinal line of the same colour. On the dorsal region of each of the abdominal segments were two short longitudinal marks extending to the anal

termination. These got less important in scale and brightness as they approached the anal segment. Along each side, containing the spiracles, was a broad and fleshy line of the same light yellow-white tint as the markings on the dorsal area. Many small dark tubercles, which the creature's activity would not permit of being counted or located, were shown on this line—perhaps four or five on each side of every segment, each emitting a light bristle. There was a strong light bristle on each side of the head, pointing downwards. The legs, claspers, and ventral surface were of the colour of the body, only a shade lighter in tint. On May 9th the larvæ assumed a somewhat different appearance and were double the length that they were on their first appearance. May I be permitted here to advance a theory in connection with the change of appearance in larvæ at certain times, especially in the early stages of existence? There were nine emergences from the ova (all that were spared by the postal delivery) on May 3rd, and the young larvæ were under my daily examination with the microscope. Beyond developing in size no change whatever appeared until the 9th of the month, when there was a distinct alteration. What was my surprise on the 11th, two days later, to find a radical change in this aspect from what it had been on the 9th day of the month. Not one had died, and the larvæ all exhibited, at the dates named, the changes alluded to. Now it is hardly likely that such young larvæ would cast their skins within two days from a previous change. Is it not possible that change of coloration, and change of markings, may take place without the casting of the skin being necessary? It is, of course, very difficult to be exact about this, as, unless young larvæ are under constant examination, almost hourly, it is not possible to say to what a variation in appearance may be attributed. In this instance the variation as seen by the microscope was so continuous as to suggest that the development of form and colour was never at rest, and it was not possible to discover what part of it was due to change of skin or other agency. I give accounts of the appearance of the larvæ on certain dates, and must leave the method of attainment to more experienced opinion than mine. At all events, these young *A. strataria*, from possessing the appearance first described on May 3rd, had, on May 9th, a head of a darker brown, and had lost the bristle on each side of it. The body was now greenish-grey in colour, and shiny. A double dorsal line, of a bright yellowish-white extended along the back, accentuated in expression at every segment. This line was broader near the head and its two component parts fused into one, where it joined a collar of the same tint round the neck on the prothoracic segment. There was a broad spiracular line of this whitish-yellow colour, on which were the black spiracles. On the prothoracic segment, on each side, was a large brown blotch, and brown blotches on the anal flap and the back face of each of the anal claspers. The ventral surface and claspers were of the colour of the body, the legs black. The larva was heavily marked with fleshy transverse wrinkles, and had black warts from two to four in number on each side of every segment: these warts were all furnished with short black setæ, and the larvæ were now $\frac{1}{2}$ inch long. From this condition on May 9th I found, two days later, on May 11th, the following distinct alterations. The head sienna-coloured, large in size, and squarish in shape, with a deeply marked division on the crown. Body dark umber inclined to

black, with a sharp black line of definition behind the head on the prothoracic segment. Two fine dorsal lines of grey-green dotted markings, close together, along the back, and two broken subdorsal lines of light warts on each side, of the same tint. Body covered with greenish-grey warts, all emitting a black bristle. Spiracles dark and inconspicuous. Each segment sharply incised with a double transverse skinfold. Legs and claspers of the colour of the body, except the outer surface of the anal claspers, which, with the anal flap, were dull brown in colour. The length of the larva was now $\frac{3}{8}$ inch.

By May 16th the larvæ had assumed an approach, both in form and colour, to the appearance of the adult stage. The head was large and boldly shaped, constructed of two lobe-like forms sharply indented at the crown by the fleshy ridged point on the centre of the prothoracic segment. It was sprinkled with dark warts, with whitish setæ, and was dull chestnut in colour. The colour of the body was a compound of dull chestnut-brown and blackish blotch-like markings, with a sharp black line marking the edge of the prothoracic segment round the head. The thoracic segments were blackish merging into brown blotches on the 1st, 2nd, and 3rd of the abdominal segments. The 4th, 5th, 6th, and 7th abdominal segments were darker, and strongly accentuated at the segmental skinfolds with blackish bands. The 8th and 9th abdominal segments, with the anal flap and claspers, were dull chestnut-brown. A sharp dark edge ran round the anal flap bristling with short dark setæ. These blotchy colorations of the body were, more or less, distinctly marked in individual examples, but were to be traced in some degree, by careful examination, in all. Behind the head on the prothoracic segment were two distinct dull chestnut-brown spots, one on each side of the dorsal line, and below them two groups of small whitish warts. There was a dark dorsal line from the crown of the prothoracic segment to the anal flap, getting more broken in character as it approached the anal segment, towards which it was maintained only by isolated lozenge-shaped and elongated markings. On either side of the dorsal line appeared a subdorsal line of whitish, elongated, warty spots, and below this, on either side, three wavy and broken suprspiracular lines of similar spots, and again another line of the same character embracing the spiracles themselves. The spiracles were light, with dark centres, and could scarcely be distinguished from the spots before mentioned. The darker parts of the body were sprinkled with dark short setæ, growing from the light warty spots, and the lighter portions of the larva, the head and anal flap, were dotted with dark warts with light bristles. The legs were light, dark spotted, with black terminations. The claspers were dark, with light terminations. The size of the larvæ was now $\frac{1}{2}$ inch in length. On May 21st the general appearance of the larvæ was sienna-brown in colour, finely dotted all over with minute pale warts. The head was notched bluntly on the crown, forming two lobe-shaped lunules of a brighter sienna colour than the body. Below these lobes, across the upper part of the face, ran a light line, and beneath this a broad brown band above a light triangular blotch. There was a distinct dorsal stripe on the back, of a dark brown colour, accentuated on each segment, and starting from a dark spot between two white spots on the projecting edge of the prothoracic segment. This dorsal line was finely bordered, on both sides, by a thin light line of minute

spots or warts. The larva had now attained $\frac{3}{4}$ inch in length. On the 5th abdominal segment were two long ridge-like protuberances, obliquely placed, one on each side, and meeting in a V-shaped connection on the dorsal line, the point set forward. These were dark with a sharp white line on the crest. On the 8th abdominal segment were two dark spots, with white centres, one on each side of the dorsal line. In the same manner were to be found two elongated white spots, edged with black, on each of the other segments. There was a strongly marked, raised, fleshy line below the spiracles, very waved in character, and very angular in its waving on the 3rd, 4th, and 5th abdominal segments, and from the points of the angles on which there passed down and across the abdomen, three raised, dark, ridged bands. The spiracles were black and surrounded with a fine white ring. The legs and claspers were of the colour of the body, and, like that, finely dotted with dark and light minute warts, all bearing fine short setæ. The anal flap was bordered also with a fringe of minute bristles, but no longer had the dark line along its contour. On May 24th the larvæ were grown to fully $\frac{7}{8}$ of an inch in length, and, while resembling the appearance they possessed on the 21st, were different in aspect, inasmuch as they were now lighter in colour and more declared in their markings. The head was projecting and the prothoracic segment formed almost a hood-like framing around it. This segment and the mesothoracic were grey, the metathoracic and the 1st, 2nd, and 3rd of the abdominal segments were sienna in colour, with the white dots on each side of the dorsum developed into oblong, grey, ridge-like markings. The next segment, the 4th abdominal, had a large diamond-shaped grey blotch on the back, with lateral projections. The 5th abdominal segment had the oblique dark ridges more pronounced and these were still crested with a sharp white line. The 6th, 7th, and 8th abdominal segments were sienna-coloured, with the two dark warts and bearing white centres, more in evidence on the 8th. The 9th abdominal segment and anal claspers were grey. The dark dorsal stripe still appeared on the segments forward to the 3rd abdominal, expanding rather diamond-wise on each segment. At the 4th abdominal it became lost in the grey blotch, and from there to the anal end was only indicated by irregular markings. The three ridge-like bands at the 3rd, 4th, and 5th abdominal segments were more pronounced, and were very light, especially the central one, and edged with dark brown posteriorly. The underside, or ventral surface, from the 6th abdominal to the last segment was light in colour, and bordered with a fine bluish-grey line on the anterior edge of the anal claspers. On May 30th the larvæ were $1\frac{1}{4}$ inches long, and, while still bearing the same characteristics in appearance, had then a grey aspect as a whole. The lighter markings had spread in a suffused manner upon the body, and had gradually conquered the importance of the sienna colour until the larva became a dull grey with a sienna stain on the metathoracic and the first three abdominal segments, the sienna tint thus becoming secondary to the grey, a reverse of the arrangement in the earlier stage. The head was more sharply bifid, and the crest of the prothoracic segment inclined to form two points behind the crown of the head. These points were grey in front, and each had a sienna blotch behind. On the 4th and 5th abdominal segments the ridge-like markings had given place to strongly built lateral projections, the largest on the 5th. The

two white dotted warts on the 8th abdominal were now elongated, raised ridges, arc-shaped, dark behind and light grey on the crest. The claspers and legs were of the body colour, and the entire creature very minutely dotted with light spots, here and there of a larger size. The light spiracles were distinct and oval in shape, standing on end with a black ring round them. The edge of the anal flap was fleshy and still had hairy projections upon it. These were to be found sparsely scattered all over the larva, particularly upon the head. The ridge-like formations upon the abdomen at the 3rd, 4th, and 5th segments of that region consisted now of broken and irregular wart-like excrescences, and were yellowish in colour, spotted darkly here and there. The dorsal stripe had faded and become absorbed by the surrounding coloration, but could still be traced through the lens, forming a darkish diamond-shaped lozenge on the skinfold at the rear of the segments forward, and behind the grey blotch on the 4th abdominal, it showed faintly in the same manner on the centre of the segments. On June 1st the larvæ were $1\frac{1}{2}$ inches in length, and of a grey colour, exactly representing the bark of the oak. The head was large, notched on the crown, and sienna-brown in colour. From the crown to the mouth the front was a flat oval in form, and a tall triangular facet bent backward on each side. A light bar crossed the base of the face above the mouth. On the prothoracic segment were two sienna blotches, one behind each lobe of the head, and divided from it by a deep wrinkle with a light edge to it. On the metathoracic and the first four abdominal segments were diamond-shaped markings on the back, formed by minute dark brown warts, and, on the side of each segment at the lateral points of these diamond-shaped markings, there was a sienna blotch, at the base of which, and on the line of which, were the light oval spiracles standing on end and enclosed with a dark ring around them. On the 4th and 5th abdominal segments were the strongly marked projections of lateral warts, elongated in form and sienna in colour. Those on the latter segment were large and fleshy in character, projecting boldly from the body. On the dorsal area of the 8th abdominal segment were two warts also sienna in colour, and below them, on each side, a lateral and elongated wart of the same tint. The anal end and claspers were dull sienna in colour, the claspers very widely spread when clinging to a flat surface, and showing between those of the anal end, below the anal flap, three light fleshy projecting points. The body was strongly wrinkled transversely, the legs were sienna in colour, like the head and anal claspers, showing a dark division between the thoracic segments when they were extended. The claspers on the 6th abdominal segment were grey. The three raised rings on the abdomen at the 3rd, 4th, and 5th segments of that portion were sienna-coloured at the sides and lighter underneath. That part of the ventral surface between the claspers was a light olive-grey in colour, finishing with a fine whitish-blue line against the anal pair. The larva had short projecting setæ sprinkled irregularly about it, with a profuse supply upon the head and anal end. It was now very lethargic in its habit, and presented a strong contrast to its lively movements in the earlier stages of existence. The striking resemblance that it bore at this period to a second year's twig on oak was most noticeable. The projections from the sienna-coloured markings on the dull grey body could not more exactly correspond with the

young spurs breaking from the twig itself, while the notched sienna head and projecting prothoracic segment, made a crown of bud casings to the life. From this period until the going to earth of the larvæ there was practically no change in their appearance, but the warty character of the excrescences from the dorsal and lateral regions became more emphatic, and the entire creature grew stronger in character on the lines last described. It spent its time between the periods of feeding, which appeared to be principally nocturnal, in sitting at rest upon the woody part of the food-plant, firmly holding on by the claspers, the body springing from this attachment to almost an angle of 45° from the stem on which it rested. The legs were projected and rather extended, the head carried forward and tilted. From the head to a prominence on the food-plant above was spun a stiff and very visible thread, which was always taut when the larva was quiet. They lived in this condition until they had arrived at a length of $1\frac{3}{4}$ inches when they appeared to be full-fed and prepared to descend for pupation in the earth. There had been nine emergences from the ova and two casualties followed. The remaining seven descended in the following order. June 10th, two, 11th, four, 12th, one. They had been fed, airtight, in a roony tin case half filled with earth, and freely supplied with fresh oak twigs.

Some notes on the classification of earwigs.

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

The study of earwigs has been unduly neglected by all entomologists, except a few orthopterists, and most, even of these, have eventually given them up in favour of the other suborders of Orthoptera. The only real specialist who has as yet devoted himself entirely to their study, and that finally to the exclusion of all other insects, has been de Bormans. The reason may be that they are, as a rule, more or less unattractive insects, offering few really convenient characters, and practically no really stable or unvarying ones. The result is that generic distinctions are somewhat arbitrary, and often depend upon the personal views of the author. Several genera can only be recognised in the male, and though these may appear to be very distinct when, say, half a dozen species of each are examined, still intermediate forms are continually being discovered, which can be ranged appropriately in two, or perhaps, even three, genera.

The first character, for example, which is examined, is the scutellum, according to the presence or absence of which the Forficularia are divided into two groups, but yet this extremely important point cannot be depended upon. In one genus, *Pyragra*, the scutellum is normally not visible, and the genus accordingly is ranged in the second group, but, very frequently, the scutellum is free and easily noticeable; de Bormans has examined over 150 specimens, and found the scutellum present nearly as often as it is absent. In many subapterous genera, again, such as *Neolobophora*, *Chelidura*, &c., falling in the second group, owing to the incomplete development of the elytra a small space is distinguishable between the elytra at the base of the suture, which is, in fact, a scutellum, but this has to be disregarded in classification.

The most important, and apparently invariable, character, is the

form of the tarsi. In two curious genera, *Apachys* and *Tagalina*, the tarsi are curiously formed and very different from those of all other earwigs, but, in the remaining groups, the 2nd tarsal segment is found in two forms, either simple, cylindrical, and very small, characterising one great group of genera, or else flattened and lobed, characterising the other group of genera; in *Chelisoches*, it is not broadened but produced in a long slender lobe under the 3rd segment, while, in *Forficula* and the allied genera, it is dilated and heart-shaped. This is the only generic character which I have found to be invariable.

Another important point is the presence or absence of the lateral fold-like tubercles on the 2nd and 3rd abdominal segments, which appear to fulfil the function of stink-glands. Several allied genera are distinguished from each other by the presence or absence of these glands; for instance, they are present in *Diplatys* but absent in *Cylindrogaster*; present, often remarkably developed, in *Forcipula*, but absent in *Labidura*; present in *Brachylabis*, but absent in *Anisolabis*, and *Gonolabis*; present in *Chaetospania*, *Sparatta* and *Meccomera*, but absent in *Platylabia*. Very often, in these cases, these tubercles are large and noticeable, and there can be no doubt as to which genus the insect belongs, but it often happens that they are very faint, indistinct, and perhaps almost obsolete, in which case mistakes can be very easily made, and indeed often are.

The development of the organs of flight is notoriously an unstable character in many groups of insects; in Orthoptera and in earwigs this is especially so. *Carcinophora* is merely a *Psalis* without wings or an *Anisolabis* with free elytra, and *Neolobophora* is practically the same as *Opisthocosmia*, with no wings and rudimentary elytra.

From this it will be seen that it is very easy to range any species of earwig in the wrong genus, and, as a matter of fact, the generic position of several species depends purely upon the personal opinion of the writer.

The forceps, again, would appear to offer very good points of distinction, but they are so extremely variable in size, shape and development, that little weight can be placed upon them. Their general appearance alone can have any importance, and very often under-development will give an earwig the appearance of belonging to an entirely different genus. Thus, the genera *Anechura*, *Apterygida* and *Forficula*, are distinguished almost entirely by the form of the forceps of the male. If, therefore, one has only females to examine, the generic position is purely a matter of guess-work; nothing can be more severely deprecated than the habit of describing single females as new species, unless there be some particularly striking character. *Apterygida japonica*, de Bormans, has been placed at different times by different authors in all three of these genera. *Apterygida circulata* and *A. jagori* have been moved to and fro in the genera; in the latest work, de Bormans' monograph in *Tierreich*, they are placed in *Apterygida*, but doubtless before long they will be put back into *Anechura*. *Forficula silana* and *F. apennina* are at present in *Forficula*, before long they will very likely be restored to *Apterygida*. This state of things must continue; the only way out of the difficulty would be to unite the three genera into one, thus returning to Dohrn's arrangement. This again would appear unnatural, for no one would be likely to consider that *Anechura metallica*, Dohrn, *Apterygida arachidis*, Yersin, and *Forficula tomi*,

Kollar, should be placed in one genus ; but these are extreme forms and occupy remote positions ; still the female of *Anechura metallica*, on the one hand, may be easily confused with the females of certain *Opisthocosmia*, and there are two forms of *Apterygida ceylonica*, of which one would be ranged naturally with the typical *Forticula*, and the other with typical *Apterygida*.

All these three genera are comparatively large, and their fusion would form a genus too unwieldy for convenience, but, unless some new characters are discovered, a considerable number of species will be in a state of fluctuation as regards their generic position.

Fortunately, the specific characters are less disconcerting ; dimorphism, especially in the form of the forceps, is common, and once it is realised that the shape of the forceps, and presence or absence of wings are unstable, the species offer in reality, fewer difficulties than the genera. One of the most variable species is *Labidura riparia*, Pall. This is subdivided by de Bormans into six subspecies, but he places next in the genus four other species, which I am convinced will be sooner or later united with it. Under a variety of names, a very considerable range of variation is covered ; in size, they vary from 14 to 36 millimètres, in colour from pale yellow, almost white, to deep red and black ; in some the wings are absent, in some slightly developed, in others completely developed ; in some the forceps are toothed, in others they are unarmed ; in some the last abdominal segment is armed with sharp tubercles, in others it is smooth. In spite of all this I am of opinion that all these races, varieties, subspecies and aberrations, as they are variously and incorrectly called by different authors, must be eventually united into one.

Another genus offering considerable difficulties is *Anisolabis*. The leading point in this genus is the colour of the feet and antennæ ; in some of the species, especially the commoner ones, the feet may be strongly banded with black on femora and tibiae, or may be entirely pale testaceous ; the antennæ may be ringed with white, or unicolorous. *Anisolabis annulipes*, Luc., one of the commonest and most widely distributed species of the genus, is variable in these points ; as it is a cosmopolitan species occurring, more or less domesticated, in every part of the world, it may be almost taken as a rule, in determining the smaller species of *Anisolabis*, "When in doubt, call it *annulipes*."

As mentioned above, in earwigs, and in Orthoptera generally, colour is notoriously not to be depended upon. In the red and black species of *Sparatta* and *Platylabia*, the distribution of these two very distinct colours varies very considerably ; in some the head, pronotum, and elytra are shining jet black, and the feet and abdomen bright brick-red, but often by variation, the head, or the pronotum, or elytra, or all three, may appear with the reverse coloration. Very likely the freshness of the specimens may have something to do with this, for specialists have never seen any of these species alive, as they are purely tropical forms, and often, perhaps, the red may turn to black after death. Some authors have based new species on the arrangement of the colours in the genera, many of which have been united by de Bormans, and very likely a further detailed examination of the types will lead to the fusion of several more.

 COLEOPTERA.

ON A BLUE ABERRATION OF *CALOSOMA INQUISITOR*, L., FROM THE NEW FOREST.—British specimens of *Calosoma inquisitor* are usually of a bronzy-red, with the lateral margins of elytra brassy-green; some specimens are of a darker red than others, and individuals not infrequently occur which may fairly be described as castaneous. Amongst a number of *C. inquisitor* taken by myself, near Brockenhurst, at Whitsuntide last year, however, I found a single specimen which differs completely in the coloration of the upper surface from our ordinary reddish forms, and Mr. R. W. Lloyd has kindly sent me, for examination, a specimen also from the New Forest, which, in colour, almost exactly resembles mine. These two specimens may be briefly described as follows:—Head and thorax dull aeneous, with the lateral margins of the latter in Mr. Lloyd's specimen, but only the basal angles in mine, blue; elytra blue, with an obscure aeneous tinge on each side of suture towards base, margins rich deep blue; sculpture of elytra as in ordinary form. Both specimens are ♀s, mine being much larger than Mr. Lloyd's. On the Continent, *C. inquisitor* is well known as a variable species in colour. Schaum, in Band I, of the *Insekten Deutschlands*, describes it as being of a "lighter and darker bronze-colour, with the margins of the thorax and elytra green, more rarely quite bronze-green, bluish, or blackish." Ganglbauer, in his fine work on the Central European *Carabidae* (1892), after describing the ordinary red form, adds "or wholly bronze-green, bronzy-brown, violet-blue, or black." Bedel (*Col. Faune du Bassin de la Seine*) records the blue form as occurring with the type in the Seine basin, but more rarely. It may be worth mentioning, that, in 1883, Signor Ragusa described*, in *Il Naturalista Siciliana*, a "var. *coeruleum*" of *C. inquisitor*, which is characterised as resembling *Carabus lefebvrei*† in colour, and as differing from the type, not only in colour, but also in its large size, and by the elytra being "not punctate-lineate, and by having, instead of the lines, strong points." He had only a single specimen of this form, but remarked that Herr E. Reitter had communicated a specimen almost identical with it from Croatia. I find that this var. *coeruleum*, Ragusa, is included in a paper by Jaroslau R. von Lonnicki, on the *Carabinae* of Galicia (published in the *Verhandlungen der K.-K. z.-b. Gesells. in Wien*, for 1893), as occurring in the forests of the Austrian province of Galicia, but "more rarely" than the type. I am not at all clear as to what Ragusa's structural distinction really means, as in addition to the longitudinal striae of the elytra in the type, there are the "pores," possibly he intends to indicate that the elytra in the aberration are smooth, and impunctate with the exception of the pores, but the matter is doubtful. Ganglbauer, I may add, does not allude to this "var. *coeruleum*" in his work.—F. B. JENNINGS, F.E.S., 152, Silver Street, Upper Edmonton, N. March, 1902.

COCCINELLA 11-PUNCTATA VAR. *CONFLUENS*, N. VAR.—In 1890, in the *Ent. Mo. Mag.*, p. 199, Dr. Mason records, amongst other Coleoptera from Iceland, a form of *Coccinella 11-punctata*, brightly coloured and

* This description was kindly procured for me by Mr. Donisthorpe, and I am indebted to Mr. Malcolm Burr, for a translation from the Italian.

† A species coloured like our *C. intricatus*.

with the lower pairs of spots on each elytron confluent. This reminded me of a specimen sent for me to see by Canon Cruttwell some time ago. He now writes to me "It was taken in considerable numbers on a patch of sandy coast near Renvyle, co. Galway, in August, 1899, and quite apart from any colony of the ordinary form, though that also occurred sparingly on other portions of the same coast. I am quite certain of this, for I searched carefully on two occasions expressly to satisfy myself that the common type was really absent from the locality." Dr. Mason also mentioned that none of the type form were found. Mr. Gorham tells me it is the var. G, of Mulsant, and he further says, "I think it is a fact that the *Coccinellidae* tend to vary both ways, 'par excess,' or 'par defect,' at the extreme latitudes of their distribution."—HORACE DONISTHORPE.

CHANGE OF COLOUR DURING LIFE IN *COPTOCYCLA BISTRIPUNCTATA*, HERBST.—Last Christmas a foreign *Cassida* was brought to Mr. Heasler by a man who had found it on some apples purchased at Reading. He wrote to me about it as follows, "It is still alive and is normally a very brilliant golden colour, but after being stirred up, worried, etc., it turns to a metallic green, then the wing-cases go brownish with a sort of iridescent purple tinge in certain lights, and finally the whole insect becomes a reddish-brown or testaceous with black spots on the elytra." The insect died shortly afterwards and Mr. Heasler gave it to me. I took it to the Museum and found it was a specimen of *Coptocyclus histripunctata*, Herbst. It is a native of Mexico, California, etc. Curiously enough amongst the specimens in the Museum is one brought to them by the Board of Trade, also found on an apple in England. I told Professor Poulton, who was much interested in the matter, about the changes in the colour during life, and he writes: "I feel sure the changes in the iridescence and from iridescent to brownish, are due to changes in the thinness of fluid layers between the chitinous lamellæ of the elytra." I do not think it is voluntary, but an indirect effect of contraction or expansion of the body, forcing a fluid, or abstracting it from the inter-lamellary spaces of the chitin."—IBID.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

LARVA OF *HYPERCHIRIA* 10 (1st instar).—Stout, plump, and Saturniid-like in appearance. Head large, shiny, bright orange in colour, with scattered thorny hairs. Body segments deeply cut, lateral flange suggested by coloration rather than actual development. Striking features are the tall fleshy horns on which the tubercular warts are mounted; they are nearly as long as the larva is thick. The dorsal and subdorsal tubercular warts on thoracic segments are bifid, the fork occurring about two-thirds up, whilst each fork bears a crown of spines. The abdominal ones are not forked, except the central one on the 8th abdominal, this is certainly formed of both the anterior trapezoidals; and the thoracic ones are almost as certainly composed of i and ii consolidated; the direction of the fork supports this view, as the thoracic forks are in a longitudinal direction, while those on the central line of the 8th abdominal are set transversely. On the abdominals i is mounted on a long stalk, while ii is represented by a simple single-haired button, the hair it bears is

rather long and thorny, iii is a stalked and horn-like tubercle (ending in a single brush of spines on abdominal segments, but forked on thoracic, which, I take it, denotes a double origin on meso- and meta-thoracic segments). This (iii) is a double-haired tubercle in *Sphinx*, and such species as Hepialids and Zeugzerids. So far as I can make out, a single post-subspiracular stalk or horn bears both iv and v, there being a large hair jutting out from the stalk about halfway up, which is probably v, the column of spines representing iv. There is also a central forked horn on the 9th abdominal as well as 8th. The larvae are processionary in habit when young.—A. BACOT, F.E.S., Bow House, 154, Lower Clapton Road, N.E.

YOUNG LARVA OF *ACTIAS LUNA* (ova received from Dr. Chapman, hatched July 2nd, 1901).—First instar.—Tubercles many-haired, except ii, this is minute and single-haired; i (anterior trapezoidals) on 8th abdominal segment, coalesced and developed into a single central horn; iv + v are placed on a crest of the lateral flange.—IBID.

OVUM OF *EACLES IMPERIALIS* (eggs laid by parents reared from pupæ supplied by Mr. H. G. Woolley).—A "flat" egg with three diameters, of a bright yellow colour, rather pearly in hue, and semitransparent, looking like those of the Sphingids and Dimorphids. A broad oval, nearly circular, as seen from above, but seen edgewise, of a lunular shape, something like a tabloid or long oval, with a tendency for the ends to be pointed. The surface is finely pitted and granulated. Measurement, 2.75mm. × 2.58mm. × 1.75mm.—IBID.

FORGING LARVÆ OF *EPUNDA LICHENEA*.—A batch of ova sent to me from North Wales at the end of September hatched nearly at the end of October. They fed freely on stonecrop in a bottle for six weeks. Before the second moult they were all green; after this moult they all, I believe, become brown with very indistinct darker markings. As time went on they became a rich brown with transverse black marks along the dorsal area. When six weeks old they were about an inch long and were then placed in a large breeding-cage with muslin sides and top, and three inches of soil, and supplied with a plant of stonecrop every three or four days about the size of one's fist. They fed up very rapidly, and now most of them have gone down. In the daytime they hid in the soil or under the plants, but, every afternoon, just as it began to get dark, they crawled up the sides and rested on the muslin for hours, most of them remaining motionless until midnight or later. Of the 30 larvæ I had, I counted on some nights 25, on other nights fewer, but never less than 16. In a state of nature they must necessarily, in bad weather, make long fasts. Was this habit of resting the result of hereditary habit of going without food and consequent inability to keep on feeding? The larvæ feed on stonecrop in a state of nature, I found several feeding on this plant at Wallasey, in April, 1892. It is an excellent winter food-plant for those larvæ that will eat it.—F. C. WOODFORDE, B.A., F.E.S., Market Drayton. *February 1st, 1902.*

FOOD-PLANTS OF *EPUNDA LICHENEA*.—With regard to the food-plant of *Epunda lichenea* I used to take the larvæ regularly on the sandhills on the Lincolnshire coast north of Mablethorpe some years ago, and invariably found them on *Cynoglossum officinale*, which then grew in some abundance along the banks on the landward side of the hills.

These I always fed up at home on dock, and, on one occasion, when an exceptionally heavy thunderstorm was gathering, the larvæ all came out to feed and were eating hard when the return of daylight as the storm passed away sent them hurrying back to the shelter of the moss and undersides of the dock leaves. Since then I have taken the larvæ in Cornwall feeding on stinging-nettle, and on the Isle of Man coast feeding on dock and *Plantago maritima* with an occasional individual on thrift. I never saw the larvæ feeding or moving in the daytime except on the one occasion mentioned, nor did I ever notice them exposed as described by Mr. Woodforde.—(REV.) C. D. ASH, M.A., Skipwith Vicarage, Selby. *February 18th, 1902.*

OVIPosition OF GORTYNA OCHRACEA.—Wishing to ascertain where *Gortyna ochracea* deposited her ova, I visited in December a field here, where I obtained several pupæ on August 25th last. The burdocks (*Arctium lappa*) being deciduous, and the female not surviving the winter, it rather puzzled me as to where ova could be during the winter. However, on cutting open the old dead stems, I came across the ova laid in batches of about 50, in the old burrows made by the larvæ. They are laid about half an inch down from the opening in that side of the stem from which a moth had previously made her exit. The young larva presumably feeds firstly on the old pith, and descends later to the new growth of the plant.—V. ERIC SHAW, F.E.S., 8, Moss Hall Grove, North Finchley. *February 2nd, 1902.*

NOTES ON REARING ENNOMOS FUSCANTARIA.—On May 23rd, 1901, eggs of *Ennomos fuscantaria* commenced to hatch (these eggs had been kept indoors during the winter months); eggs from other batches which had been kept out-of-doors hatched at various dates until early July. On July 12th the first larva pupated; on July 24th I had fully 70 larvæ still feeding; on July 28th the first imago emerged, a female, about 3 p.m. During August and September imagines emerged almost every day, on some days eight or nine would emerge in a day. On August 12th about twenty larvæ still feeding. On September 1st, two larvæ still feeding, from October 1st to 8th an occasional imago emerged. On October 11th two imagines (females) emerged out-of-doors, these were the last to emerge. All the larvæ were fed under the same conditions, *viz.*, sleeved on ash trees in my garden.—WILLIAM HEWETT, York. *March, 1902.*

OVUM AND YOUNG LARVA OF NONAGRIA CANNE.—*Ovum*: From September 1st-5th, 1900, a ♀ laid 85 eggs. Each ovum quite round, shining and smooth, and laid singly. Colour, dirty white, after a week changing to a pinkish hue. Remained as eggs all the winter, hatching between April 10th and 17th, turning deep purple before hatching. *Larva*: When first hatched, nearly 2mm. in length; head black; body dirty-white. When one week old the colour began to turn greenish; the head and prothorax black with reddish marking, prolegs black. When fourteen days old the body was getting quite greenish, the head paler, and in another week the body was quite green, the head pale brownish-green. The larvæ grew very slowly until three weeks old, when I turned them out upon some *Typha* in our pond. They fed well in the sheathing leaf of *Iris kaempferi* when young.—H. M. EDELSTEN, F.E.S., Forty Hill, Enfield. *December 23rd, 1901.*

VARIATION.

VARIATION OF *NOCTUA CASTANEA*.—I have taken many grey-coloured examples of *Noctua castanea* on sugar and on ling in the New Forest, as well as bred this form from the larval stage. I have not, however, found the red form there, though several specimens were somewhat intermediate in colour.—B. W. ADKIN, F.E.S., Morden Hill, Lewisham. *January 7th, 1902.*

CUSPIDIA (ACRONYCTA) MEGACEPHALA AB. NIGRA, N. AB.—A fine form of this insect is found at Manchester together with the type. The forewings are totally black, with the exception of the outer margin which has a slight white fringe, and the orbicular stigma which is slightly paler than the ground colour. Body black; hind wings as in the type. It does not seem to have yet been described, and I propose for it the name of ab. *nigra*.—V. ERIC SHAW, F.E.S., 8, Moss Hall Grove, North Finchley. *February 5th, 1902.*

VARIATION OF *LEUCANIA BREVILINEA*.—In *Brit. Noctuar and their Varieties*, i., p. 37. two forms only of this species are mentioned—*brevilinea*, Fenn, and *sinelinea*, Farn. Fenn describes the type (*Ent. Mo. Mag.*, i., p. 107) as follows;

Forewings rather sharply angulated at the junction of the costal and hind apical margins; brownish-ochreous, with numerous scattered black scales; a sharply defined short black dash from the middle of the base; a curved row of small black dots reaches from the costa to the inner margin beyond the middle apical veins (rays) conspicuously paler than the ground colour, apical margin unspotted; hindwings grey, paler towards the base, a very indistinct transverse row of black dots rather beyond the middle, uniform with those in the forewings.

In addition to this there are three dots between the middle and base of wing, placed transversely from the costa to the inner margin: also in some specimens there is a distinct central spot. Farn describes *sinelinea* as:

The form in which the line at the base of the wing disappears.

But in each of these two main forms a number of very interesting colour aberrations are to be found. These may be grouped as:

A. FORMA TYPICA = BREVILINEA.

α. Suffused with dark smoky-grey scales = ab. *typica-suffusa*.

β. Nervures 2-5 edged with black, making a longitudinal fascia, more or less connected with central spot and basal dash = ab. *typica-nigrofasciata*.

γ. Lower spot of each row of dots running into each other, making a black dash = ab. *typica-bilinea*.

δ. Powdered with scales of a light ground colour, especially along the costal margin = ab. *typica-pallida*.

ε. Ground colour of forewings reddish = ab. *typica-rufescens*.

B. FORMA VARIETAS = SINELINEA.

α. As in α of *brevilinea*, but without basal dash = ab. *sinelinea-suffusa*.

β. As in β of *brevilinea*, but without basal dash = ab. *sinelinea-nigrofasciata*.

δ. As in δ of *brevilinea*, but without basal dash = ab. *sinelinea-pallida*.

ε. As in ε of *brevilinea*, but without basal dash = ab. *sinelinea-rufescens*.

ζ. Ground colour of forewings light ochreous, slightly dusted with black scales. The usual row of dots slightly indicated, but no other markings visible—ab. *sinelinea-ochracea*.

Some of these forms appear to be unique—e.g., ab. *bilinea*, ab. *pallida*, ab. *ochracea*.—H. M. EDELSTEN, F.E.S., Forty Hill, Enfield. *December 23rd, 1901.*

INCREASE IN DARK ABERRATIONS OF *HYBERNIA LEUCOPHEARIA* IN THE KING'S LYNN DISTRICT.—I have seen little here in the way of lepidoptera, save a few very fine dark aberrations of *Hybernia leucophaearia*.

A few years ago, it would have been difficult to find such dark specimens here, but now the darker forms prevail.—E. A. ATMORE, F.E.S., King's Lynn. *March 7th, 1902.*

PRACTICAL HINTS.*

Field Work for April and May.

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

1.—At the end of April and in early May the eggs of *Cyaniris argyolus* are laid singly on the underside of the calyx of holly buds, so that when the flowers open the petals fold over the egg, hiding it altogether from sight: the young larvæ hatch in about ten days, commence at once to feed in the buds and flowers, afterwards attacking the young tender leaves and shoots upon which they thrive. The larvæ also feed well on young ivy leaves.

2.—In confinement the larvæ of *Melitæa aurinia* appear to be very susceptible to warmth, collecting in the hottest part of the cage, and becoming lively when the sun is on them. They are much better fed up, however, on a growing plant than in a breeding-cage.

3.—If the season be forward, start searching the beech trunks for *Stauropus fagi* the last week in April. If a fertile ♀ be then found, a second brood should be obtained in late July and early August. By forcing these, there should be a fair chance of getting through a third brood by November (J. Clarke).

4.—The females of *Dimorpha versicolora* should be allowed to pair more than once, as frequently one pairing is insufficient to fertilise all the ova. The species can be inbred for a few years, but fresh blood should be introduced, otherwise the moths gradually dwindle in size and become less fertile.

5.—Careful searching in Wyre Forest generally gives a few small batches of ova of *Dimorpha versicolora*, ten or a dozen being placed in a little cluster at the end of a thin twig.

6.—To obtain the best results in breeding *Dimorpha versicolora*, cut off the twigs on which the ova are laid and tie such twigs to the living birch; some 18 to 24 ova will be sufficient to place in a yard muslin sleeve (Clarke).

7.—The larvæ of *Dasychira fascelina* can be sleeved on sallow in April and May, and will spin up, requiring no attention except that of moving the sleeve when a branch has been cleared. They commence pupating in the middle of May.

8.—Pairings of *Petasia nuberulosa* are not difficult to obtain if the moths be placed in a large box, and out in the open air or near an open window. The moths do not copulate till the fourth or fifth night after emergence: the eggs are scattered over the gauze covering of the box in which the moths are kept (Maddison).

9.—A female *Dasyampa rubiginæa* captured April 4th by beating sallows, placed in a large cardboard box and fed with thin syrup, laid, between April 18th and May 8th, 123 eggs, rarely more than from four

* PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST, recently published, contains 1250 similar hints to these, distributed over every month in the year. Interleaved (for collector's own notes).—Ed.

to sixteen a night. The first larva emerged April 27th the last May 19th, the egg stage lasting about ten days; the young larvæ fed well on apple (refused dandelion when young but ate it after second moult); they were full-fed in July, and remained some time in the cocoon without pupating, 71 imagines emerging between October 21st and November 9th, from noon to 4 p.m.

10.—Imagines of *Pachnobia rubricosa* are sometimes plentiful at blackthorn bloom in Portland (Partridge).

11.—The larva of *Mellinia gilvago* leaves the egg in April, feeds at first in the seeds of wych elm, then on the leaves, from which it can be beaten in May and June, and when full-fed its similarity to the larva of the much commoner *Mellinia circumcellaris* makes it difficult to distinguish from the latter.

12.—The larva of *Mellinia circumcellaris* hatches in April and May, and feeds on the seeds of wych elm, from which it is to be beaten in company with the larvæ of the much more local and highly-prized *M. gilvago* in May and June.

13.—The larvæ of *Noctua castanea*, common on heath, are to be obtained most freely by sweeping at dusk, yet many are to be obtained in the morning and late afternoon. During the middle of the day they appear to fall to the roots of the heather. They feed voraciously on hawthorn in captivity.

14.—The middle of April is the best time to work for imagines of *Alencis pictaria*, which may often be secured, although the blackthorn bushes may not yet be in blossom; they are best obtained by searching the low hedges about an hour after dusk with a lantern, although they may be captured in fewer numbers by dusking.

15.—In the first week of April larva-beating will give *Cleora lichenaria* (oak, &c.), *Metrocampe margaritaria* (elm, birch, oak, &c.), *Thera variata* (pine, Scotch fir), *Ellopiopsis prosapiaria* (Scotch fir), *Geometra papilionaria* (birch and alder), still in their brown coats, &c.

16.—Early imagines of *Eupithecia virgaureata* sleeved in April and May on hawthorn, lay eggs freely, the larvæ feeding up, pupating and producing a second brood of imagines in August (Vivian).

17.—In April, on sea-wormwood, cases of *Colophora maritimella* are abundant; they are studded with small particles of grit like those of *C. laripennella*.

18.—The long slender larval cases of *Taleporia tubulosa* are to be found on tree-trunks, fences, &c., in April, but the larvæ never come up from their ground winter-quarters until they are quite full-fed, and the cases are usually much more abundant the middle of May, when they may be collected for breeding purposes. The ♀s come outside the case for copulation.

19.—The larvæ of *Meesia richardsoni* live in a small case of the colour of the very fine powdery microscopic lichen on which they feed, the cases are to be found by turning over stones covered with this lichen in Portland, and are usually found on the sides or under the stones; the favourite haunt is among the loose piles which are so abundant in Portland. May be collected in April and May, the imago in July.

20.—Heathy ground, chiefly in northern localities, gives imagines of *Amphisa prodromana* which fly freely in the sunshine in April.

21.—In the early part of April the larvæ of *Lita instabilis* mine

the leaves of *Atriplex*, completely eating out the fleshy inside in patches, making the leaf appear whitish-green, also spinning up the leaves against the stalk to a slight extent.

CURRENT NOTES.

At the meeting of the Entomological Society of London, on March 5th, 1902, Mr. L. B. Prout exhibited on behalf of Mr. J. P. Mutch, of Hornsey Road, London, N. (a) *Vanessa (Eugonia) polychloros*, L., a ♀ bred by Mr. H. Baker from pupa from Stowmarket, Suffolk, the ground-colour much darkened and the black markings somewhat enlarged, etc., suggesting perhaps the influence of cold at time of pupation (compare *Tr. Ent. Soc. Lond.*, 1894, p. 431, etc.). (b) *Chrysophanus phlaeas*, L., an aberration (captured in the Isle of Wight, August, 1901) much suffused with the dark colour, especially at outer margin and on hindwings, only a very small patch of the red colour remaining at the inner angle of the latter. (c) *Agrotis puta*, Hb., a perfectly-halved gynandromorphous example, the right side ♂, the left side ♀, taken in August, 1901, in the Isle of Wight. (d) *Noctua sobrina*, Gn., an aberrant specimen with white antennæ and a somewhat hoary appearance on the forewings, taken in East Aberdeenshire, August, 1900.

At the same meeting Mr. A. Bacot exhibited a series of *Malacosoma castrensis* and a series of *M. neustria*, for comparison with a hybrid brood, resulting from a pairing between a male *M. neustria* and a female *M. castrensis* = *M. hybr. schaufussi*. Only a portion of the batch of from 200 to 300 ova that the female laid hatched. Of the ova that did not hatch, some were found to contain fully-developed, but dead, larvæ, while in other instances the eggs were quite empty. Continuing, Mr. Bacot said:—"The young larvæ were healthy and did not differ perceptibly from a brood of young *M. castrensis*, except in regard to their rapidity of growth. Either just before or just after their second moult the brood divided into two portions, one of which grew rapidly and the other very slowly, so that it became necessary to separate them for convenience of feeding. The 'forwards' were very healthy—I do not remember a single death—and they fed up at an unprecedented rate, producing the female specimens exhibited. The 'laggards' fed slowly, were unhealthy and weakly, the total number of emergences being seven out of some thirty that spun up; these are all males, and, judging by the size of the larvæ, the remainder of the 'laggards' that did not emerge were of this sex. The last of the females that emerged was three weeks ahead of the first male, and, most unfortunately, before any males of either of the parent species, so that the fertility of the hybrid females could not be tested. Their bodies apparently contain few, if any, ova. I have every reason to believe, however, that I obtained pairings between the males of the hybrid and females of *M. castrensis*, in addition to fresh pairings between males of *M. neustria* and females of *M. castrensis*, and, therefore, have hopes of continuing the experiment next summer."

At the same meeting Dr. T. A. Chapman exhibited cocoons of a Cochlidid moth from La Plata, with empty pupa-cases of a dipterous parasite of the genus *Systropus*, obtained from Herr Heyne, who unfortunately had no imagines either of the moth or fly. Dr. Chapman observed that "Herr Heyne was under the impression that the pupa-cases were those of the Cochlidid moth. I mention this, not as a

reflection on Herr Heyne, who would no doubt have recognised what they were, had he really examined them, but as showing what a close resemblance there is between the two pupa-cases; I have placed with them some genuine Cochlidid cases, with their cocoons, to illustrate this. The resemblance is, however, not merely of appearance, but functional also. The moth-pupa, *i.e.*, the moth itself inside the pupa-case, almost certainly by inflating itself with air, to secure greater size and a stiffened epiderm as a basis of muscular action, exerts an end-to-end pressure within the cocoon, and so forces off a lid. This lid is not prepared by the larva, in any special sense; the cocoon is brittle, and the form of the cocoon makes this lid the easiest line of fracture under the forces exerted. This is seen to be the case by the fracture being somewhat irregular and different in each cocoon, and may be proved experimentally, as I will immediately mention. The fracture is also determined at the precise line in which it occurs, and the forces acting upon the cocoon are intensified at one point, so as more easily to start the fracture, by the sharp beak (or 'cocoon-opener') with which the pupa is armed. This beak acts, not by cutting, but by bringing the strain on the cocoon to a more definite focus at one point. The experiments I refer to are simply this: if a sound cocoon be taken, and with say the point of a penknife, an attempt be made to remove such a lid, a fracture starts at the spot where the penknife is applied, and a lid at once breaks off. This lid is very similar to the one the moth makes, but is less symmetrical, and may be considerably larger or smaller than it is, and always starts at the point where a pressure is applied by the sharp implement. It is, therefore, similar to the lid the moth makes, but not the same lid, and shows that such a lid occurs wherever the forces applied determine, and not along a specially-prepared line. The experiment is, indeed, even more conclusive than this. It is not always easy to say of a sound cocoon, which end is which, and if the wrong end be attacked, a lid is removed just as correctly as at the right one. It is here that the beak or 'cocoon-opener' is useful as determining that the fracture shall be at the right end, making the lid split off here, under much less pressure than would be efficient without it, and leaving no chance for fracture to occur at the wrong end where pressure is equally distributed. The *Systropus* breaks off a similar lid, no doubt by similar end-to-end pressure to that exerted by the moth, Diptera having the habit of inflating themselves with air, at emergence from the pupa, highly developed. This pupa also has a beak very like that of the Cochlidid, but even stronger and sharper. I have put in the box a Bombyliid pupa-case from West Africa which is very like some British forms. The head armature is not a 'cocoon-opener' but an excavating or navvying machine, for use in burrowing a way out of loose soil, such as solitary bees' nests are found in. Prof. Westwood gave a monograph of the genus *Systropus* in our *Transactions* for 1876, and described and figured the pupa of an African species of practically the same habits as this South American one. Mr. J. E. Collin, in further illustration of Dr. Chapman's remarks, exhibited specimens of: (a) *Systropus*, sp.? from Buenos Ayres, parasitic on a Bombycid Lepidopteron (Cochlidid?). This he said was possibly the same as Dr. Chapman would have reared from his cocoons. The species was apparently undescribed, but most allied to *S. brasiliensis*, Meg. As Prof. Westwood noticed in 1876, the

insect is a very slender one to inhabit such a stout pupa-case. (b) *Systropus*, sp.? A large handsome undescribed species from Bigot's collection.

At the same meeting Prof. Poulton introduced a paper by Mr. Guy A. K. Marshall, entitled "Five years' (1897-1901) observations and experiments on the bionomics of South African Insects, dealing especially with warning colours and mimicry, with appendices containing description of many species by Col. C. T. Bingham and W. L. Distant." The paper was illustrated by many photographs projected on the screen, showing groups of South African insects of many orders, collected by Mr. Marshall, each with a common type of warning coloration. Some of these groups included mimetic species of great interest. An important section of the paper contained the description of a large series of careful experiments conducted upon the chief vertebrate and invertebrate insect enemies of South Africa. The number of new facts is so large, the experiments so numerous and complete, and the range of observation extended over so many orders, in addition to the much-studied lepidoptera, that this memoir places South Africa in the front rank as the country from which the chief evidence of any part of existing theories of mimicry, warning colours, etc., has been supplied.

On March 18th, Mr. J. C. Stevens sold part of the collection of the late Mr. Philip Crowley. There was a number of foreign types mixed with the British insects, and these evidently depreciated much the value of the actual British rarities in the collection, whilst few additions had been made to the British collection during the last 20 or 30 years. The best prices were as follows: *Euchloë cardamines*, gynandromorph, right side ♂, left side ♀, £4; *Chrysophanus dispar* ♂, £5 10s., ♂ £2 10s., ♂ £5 10s., ♂ £2 10s., ♀ £6, ♀ £3 5s., ♀ £7, ♀ £5 15s., ♀ £5 6s.; *Laelia coenosa* per pair, £1 and 12s.; *Cleora viduaria*, ♂ s, for two, 12s., 16s., 10s.; *Cidaria reticulata*, for four, £1., 16s., 10s.; *Agrotis subrosea* per pair, ♂ and ♀, £1 12s. 6d., and 16s. There were some remarkable prices, 5s. for 5 *Gastropacha ilicifolia*, 10 *Dimorpha cersicolora*, etc.; 6s. for 13 *Senta ulrae*, 5 *Nonagria sparganii*, and 11 *Meliana flammaea*. In one lot there were no fewer than 15 *Synia musculosa*, which went with 13 *Leucania brevilinca*, etc., for 14s. It is to be hoped that these *musculosa* will not get into any collection as British.

A meeting of the Entomological Club was held at 6.30 p.m., on March 18th, at "Wellfield," Lewisham, when Mr. R. Adkin, F.E.S., was the host. Tea was served by Mrs. Adkin, supper being timed for 8.30 p.m. Among the guests were Messrs. B. W. Adkin, C. G. Barrett, Borrer, H. Rowland-Brown, J. Collin, W. Distant, T. W. Hall, J. Jäger, A. H. Jones, R. McLachlan, G. T. Porritt, R. South, J. W. Tutt, and G. H. Verrall. A thoroughly enjoyable evening was spent, the last train to town finally bringing the meeting to a close.

Dipterists owe to Mr. Verrall as much as, or rather more than, did the lepidopterists of a half-century ago to Mr. Stainton. Whatever position the study of diptera has in this country is due almost entirely to Mr. Verrall's labours. Another edition of this author's *List of British Diptera* has just been published, and will be gladly welcomed by all dipterists. We trust that an increased number of students may soon make yet another edition necessary.

Barrett notes (*Ent. Mo. Mag.*) a Coleophorid species bred by Mr. W. C. Boyd from larvæ found on leaves of blackthorn, on which they were making very white blotches in October, 1900, at Danbury, Essex; only one imago was bred in the spring of 1901, and this Barrett identifies with the birch-feeding *Coleophora milripennis*, Zell. More material is evidently highly desirable.

Thonless adds (*Ent. Mo. Mag.*) a Coreid bug, *Pseudophylacus waltlii*, H.-S., a near ally of *P. fallonii*, to the British list; the specimen was taken on August 5th, 1901, at West Walton, Norfolk.

In the *Ent. Mo. Mag.* for March, Mr. E. A. Newbery records a specimen of *Tachys parvulus* which was taken by Mr. H. Heasler, in *Sphagnum*, in the New Forest, last June. This is a very remarkable capture; the species was only known in this country by one specimen, taken by Mr. J. H. Smedley, in 1884, at roots of *Parnassia palustris*, from Wallasey sandhills, till 1897, when Mr. Champion took the insect sparingly at Gerran's Bay, Cornwall.

At the meeting of the Entomological Society of London held on the 19th of March, 1902, Mr. G. T. Porritt exhibited two bred black *Larentia multistriaria* from Huddersfield, and said that the dark form was rapidly increasing in Yorkshire. Of those already emerged and reared from the same brood, three were normal and two dark.

We greatly regret to announce the death of Colonel F. Le Grice, which occurred, after a short illness, at Folkestone, on March 1st. He was an occasional contributor to the magazine. His collection of British butterflies has been left to the Folkestone Museum.

NOTES ON COLLECTING, Etc.

LEPIDOPTEROLOGICAL NOTES FROM THE SOUTHEND DISTRICT FOR 1901.—Some of the following insects had not been noticed by me in this district before last season, others have of course been already recorded, but the data may be of service:—*Lachnoides lanestris*, emerged April 5th, having been three, probably more, years in pupa; *Eugonia polychloros*, April 7th, two on the wing at Eastwood; *Eriocrania semipurpurella*, April 24th, not uncommon at Eastwood; *Nepticula pulverosella*, April 27th, two specimens only at Eastwood; *Sesia culiciformis*, April 28th, two pupæ and a fully-fed larva under birch bark, at Eastwood, first emergence May 31st; *Ornis betulæ*, April 28th, on a birch leaf at Eastwood; *Coleophora lincolna*, May 2nd, a few cases brought in with various low-growing plants, *Lamium*, *Ballota*, &c.; *Gelechia ericetella*, May 11th, rather common at Eastwood; *Lithocolletis viminiella*, May 14th, a single example in one of my pots; *Phycis betulæ*, May 19th, a few larvæ at Eastwood; *Chesias rufata*, May 29th, flying over broom at Eastwood; *Smerinthus ocellata*, *Pterostoma palpina*, *Hadenia genistæ*, emerged June 6th; *Eupocilia nana*, June 8th, at Eastwood; *Chesias spartiata*, June 8th, larvæ abundant at Eastwood; *Spilosoma urticæ*, June 9th, a pair near Great Wakering, from which I got ova, the larva from which, sleeved on elder, did fairly well, probably would have done better with a more varied diet; *Bucculatrix crataegi*, June 10th, netted near Prittlewell; *Taleporia tubulosa*, emerged June 14th; *Enicostoma lobella*, June 15th, netted at Prittlewell; *H. genistæ*, June 15th, at sugared broom; *Lacerna atrella*, June 27th, netted at Eastwood; *Coleophora limosipennella*, June 30th, cases on elm at North

Shoebury; *Parasia lappella*, July 1st, a few bred from burdock; *Telicia fugitivella*, July 3rd, beaten from elm near Hadleigh; *Coleophora maeniacella*, *Argyrolepis badiana*, emerged July 7th; *Mamestra abjecta*, July 8th, common on sugared blackthorn between Wakering Stairs and Havengore; *Aciptilia baliodactyla*, July 15th, one specimen at North Shoebury; *Depressaria arenella*, *D. flavella*, July 22nd, both bred from knapweed; *D. scopariella*, July 30th, bred from broom; *Ptocheuusa inopella*, August 7th, numbers of larvæ in heads of fleabane; tenanted flowers easily found as larva severs bases of florets causing them to wither; *Aglossa pingvinalis*, August 11th; *Coleophora troglodytella*, August 16th, a few cases on fleabane; *Coleophora virgaureae*, September 1st, *Solidago* gathered at Eastwood, from which crept up a crowd of larvæ, the cases of which are not easily detected among the flowers and seeds; *Cucullia asteris*, September 3rd, a late emergence; I bred my series between August 19th-28th; *Nomayria typhar*, larvæ in July, September 15th, empty pupa-cases at North Shoebury; *Pterostoma palpina*, September 18th, a larva of this species on sugared sallow at Prittlewell.—F. G. WHITTLE, 3, Marine Avenue, Southend. *March 21st, 1902.*

SPRING LEPIDOPTERA AT MARKET DRAYTON.—*Hybernia leucophararia* has been extraordinarily numerous this year. During the first week in March in one wood near here, there were sometimes six or eight moths on a single tree-trunk, and nearly every tree had one on it. They were in every form—dark brown, light brown, black, and black and white banded. *Phigalia pularia* was very scarce, and *Nyssia hispidaria* not to be seen. On the 16th, during a walk in the woods, I saw about a dozen *Asphalia flavicornis* at rest, and one *Brephos parthenias*, whilst towards dusk *A. flavicornis* began flying freely with a few *Anisopteryx aescularia* and *Hybernia marginaria*. The season is fairly early, though very few sallows are out yet.—F. C. WOODFORDE, B.A., F.E.S., Market Drayton. *March 22nd, 1902.*

SPRING LEPIDOPTERA AT SCARBOROUGH.—The hibernated Vanessids are now all very active and busy mating, whilst a large number of *Melitaea aurinia* larvæ from the Kerry coast are already feeding up rapidly. In the wood *Asphalia flavicornis* and the early Geometrids are now out.—H. W. HEAD, Scarborough. *March 17th, 1902.*

REVIEWS AND NOTICES OF BOOKS.

LIST OF HYMENOPTERA-ACULEATA OBSERVED IN LANCASHIRE AND CHESHIRE WITH NOTES ON THE HABITS OF THE GENERA, by Willoughby Gardner, F.L.S., F.R.G.S., F.E.S. [C. Tinling and Co., Printers, 53, Victoria Street, Liverpool].—We have long had a good list of the Lepidoptera of Lancashire and Cheshire, although it wants bringing up to date very badly, and now Mr. Willoughby Gardner has given us an equally good one of the Hymenoptera-Aculeata of these counties. The general introduction is interesting, the list itself is on the very best lines of a local list, and 166 species have been recorded out of the known 374 British species in this group. The short notes on habits are most interesting, and the map indicating the localities most useful. As illustrating the style of notes, the following, on *Colletes cunicularia*, will serve (pp. 29-30):—"This is one of the specially interesting bees of our district, the species being peculiar to

it as far as the British Islands are concerned. The first known capture was on the Wallasey sandhills on May 4th, 1855, by the Rev. H. H. Higgins, who, however, only noted it in his private diary. In 1867 several specimens of the bee were taken at the same place by Mr. N. Cooke, brother to Mr. Benjamin Cooke; the fact of the discovery of this addition to our British fauna by Mr. Cooke was announced by Mr. F. Smith in the *Ent. Mo. Mag.*, 1869, p. 276, but, owing to the specimens having been inadvertently transferred to a box containing some Isle of Wight captures, the locality was recorded as Ventnor. In 1870, Mr. Cooke found further examples of the bees at their burrows at Wallasey (*Ent. Ann.*, 1870). From that time to the present the insect has been taken freely in the same locality, where it is, in fact, abundant, making its burrows gregariously in various parts of the sandhills. It has also since been discovered to have a much more extended range in our two counties than was at first supposed. On the opposite side of the Mersey it occurs freely along the Lancashire coast, *e.g.*, near the Waterloo coursing grounds, among the sandhills at Crosby, and at Southport, while it has been taken as far north as Blackpool, by Mr. C. E. Stott. South of its "metropolis" at Wallasey, its range extends along the sandhills in Cheshire as far as Hoylake, where there is a large colony, and West Kirby, while inland a specimen has been taken near Rock Ferry, and another fifteen miles away from the coast, near Chester. Whether the two last-named captures represent distant wanderers from their seaside homes or belong to as yet undiscovered colonies located at these inland stations, has not yet been determined. On the continent, however, the insect has a wide range inland as well as along the coast line. *C. cunicularia* is a large, handsome species, the female about the size of, and much resembling, a honey-bee when on the wing; even when hovering over the sallow-bloom which it loves, however, it may easily be distinguished from the latter species by its thinner legs: in the honey-bee the broad flat hind-legs hang conspicuously below the abdomen in flight, identifying it at once; if our *Colletes* be captured and examined, moreover, it will be found to have a broad, short, double-lobed, flat tongue, like that of a wasp, instead of the long pointed tongue of the honey-bee; *C. cunicularia* is, in fact, the only British bee of large size which has a tongue of this description. *Sphæcodes pilifrons* has been observed frequenting its burrows, and is possibly inquiline upon it."

SCIENTIFIC NOTES AND OBSERVATIONS.

THE SPECIFIC VALUE OF *MALACOSOMA LUTEUS*, OBTH.—Kirby (*Cat.*, p. 832) makes this a *Lachneis*, and Staudinger (*Cat.*, 3rd ed., p. 119) makes it a var. of *Malacosoma franconica*. In *Brit. Lep.*, ii., p. 498, we have followed Kirby, but in iii., p. 226, we have followed Staudinger. A recent letter from M. Oberthür, makes it clear that both are wrong. He writes (*in litt.*): "*Luteus* is a distinct species, intermediate between *M. castrensis* and *M. franconica*; it is nearer the former than the latter. The ♀ *luteus* looks like var. *taraxacoides* but is darker (*lutea nec citrina*); the ♂ *M. luteus* differs from *M. castrensis* ♂ and *M. franconica* ♂, I believe it to be a distinct species and not a variety." I only regret that I had not this note before completing my list in *Brit. Lep.*, vol. iii., p. 226.—J. W. TUTT. February 28th, 1902.

GYNANDROMORPHOUS SPECIMEN OF *PORHETRIA DISPAR*.—An example of this species, bred on July 24th, 1901, with normal males and females, from larvae received from Captain Blaydes-Thompson (Barrett's strain).^{*} The colour, shape and markings are those of a ♀ but slightly smaller than others of same brood. Hindwings slightly crippled—right antenna ♀, left antenna similar shape, but much more heavily pectinated, about half as heavily as ♂.—E. F. STUDD, M.A., F.E.S., Oton, Exeter. *March 4th, 1902.*

MALE *TEPHROSIA BISTORTATA* PAIRING WITH FEMALE *T. BISTORTATA* AND *T. CREPUSCULARIA*.—A ♂ specimen of *Tephrosia bistortata* paired on February 6th, 1898, with ♀ of same species, and on February 8th it copulated with ♀ of var. *delamerensis*, of *Tephrosia crepuscularia* (*binudularia*), and again on February 10th with the same ♀ *delamerensis*. Both females (*bistortata* and *delamerensis*) laid eggs, which were fertile. The parent specimens were reared from eggs and the pupæ forced.—*IBD.*

DISTRIBUTION OF *HEMARIS FUCIFORMIS* AND *H. TITYUS* (*BOMBYLI-FORMIS*).—Possibly the continuous change in the synonymy of these species has had something to do with the doubt attaching to some of the recorded localities for these insects. First as to *H. fuciformis* (the honeysuckle species), Meyrick says, "Britain to Sutherland, rather common." This in my experience is nonsense, possibly Mr. Meyrick will answer that this opinion is simply due to my ignorance, which is probably the correct explanation of my present position. The only Scotch records I can unearth, however, are the following: Dumfries (Lennon), Renfrew, very rare (*Paisley Nat. Hist. Soc. Record Book*), Roxburgh, Hawick dist., rare—Goldielands (Guthrie), and I suspect not one of these records refers to our *fuciformis*. There are two records from Cumberland—Orton, Salkeld, common (Wilkinson); and one from Cheshire—Bidston, scarce (Brockholes). Do these refer to *fuciformis*? Otherwise Yorks, Lincoln, Northampton, Notts, Leicester and Warwick form the northern boundaries of this species in the British Islands, which appears also to be unrecorded from Ireland. Second, as to *H. tityus* (the scabious species), Meyrick says, "Britain to the Clyde, Aberdeen, Ireland, rather common." We have records, not only from Aberdeen, but from Argyle, Nairn, Perth, Stirling, as well as Wigton, Roxburgh and Renfrew. Strangely, only three Welsh counties, Glamorgan, Merioneth and Montgomery, give us records, yet one suspects that it is widely distributed there. There are now so many excellent lepidopterists in Scotland that one ought to have little difficulty in getting the necessary evidence as to the occurrence of *H. fuciformis* in the recorded localities, whilst the north of England lepidopterists should be able at once to say whether Cheshire and Cumberland do really produce, or have produced, *H. fuciformis*. I should be most grateful for the slightest scraps of information relating to the occurrence of these species in any part of Britain.—J. W. TUTT.

ERRATUM.—Page 66, line 15, for "numerous" read "enormous."

* We are in doubt as to what "Barrett's strain" of *Porthetria dispar* means. We can only say we are among those who do not believe in any British strain of this species. We questioned the matter more than a dozen years ago, when it was clear from the evidence that nothing of the kind was then in existence in Britain.—*ED.*

List of Species, Varieties, and Aberrations of Lepidoptera so far only recorded from the British Islands.

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

A request from Dr. A. R. Wallace, for a list of the various forms of the lepidoptera peculiar to our islands, for the new edition of *Island Life*, was not to be refused lightly, in spite of my being already overwhelmed with work. The sight of a "revised" copy of that in the preceding edition, made it appear desirable to get out an entirely new one, and a considerable search through the current literature resulted in a somewhat extensive compilation, so extensive that the exigencies of space in *Island Life* made it necessary to select only the most striking forms, to drop the notes which, to the lepidopterist, would make such a list interesting, and to simply print a partial and denuded section of it, in the work in question. The fact that one is continuously being questioned as to these forms by the latest additions to our ranks, and also the necessity of having such a list for the criticism of continental lepidopterists (many of the forms now only recorded from Britain having possibly a wide continental distribution) led me to suggest the publication of the list in the *Ent. Record*, a course of action that has met entirely with Dr. Wallace's approval. There are almost certain to be many sins of commission and omission in such a list, and we should be glad to have notice of any errors that may be detected.

PAPILIONIDES.—**THYMELICUS LINEOLA AB. PALLIDA, TUTT.**—A pale straw-coloured aberration, found occasionally in both sexes. Flies with the type.

CHRYSOPHANUS DISPAR, HAW.—This beautiful insect, formerly locally abundant in the fens of Cambridgeshire and Huntingdonshire, but now extinct, probably owing to extensive drainage, although its food-plant still grows in its old haunts, is peculiar to Britain as a local form. It is a large, brightly marked race of a widely distributed species known as *C. var. rutilus* on the continent of Europe, and *C. var. auratus* in Amurland. The specimens from Bordeaux and the Pontine Marshes are said to closely approach the British form, and Bethune-Baker has asserted that he has undoubted British *C. dispar* indistinguishable from the continental *var. rutilus*. On the whole, however, the British race is abundantly distinct and characteristic.

POLYOMMATUS BELLARGUS AB. PALLIDA, TUTT.—A pale blue form of the male, lavender-tinted, and much more nearly resembling *P. icarus* than typical *P. bellargus*. Only recorded at present from Kent, where it flies with the type. **P. AB. NIGRA, CKLL. (SUFFUSA, TUTT).** A dark leaden-blue form of the male, only recorded from Kent, where it has been captured with the type.

P. ICARUS AB. CLARA, TUTT.—A large bright blue form of the male, approaching that sex of *P. bellargus*. The fringes distinctly marked with black dashes (often extending half-way through them). The female also larger and usually well-marked with blue scales. On the underside the spotting is frequently restricted. The normal form in western Ireland and in some parts of Scotland, much rarer in England, where it occurs only as an occasional aberration.

P. ASTRARCHE AB. SALMAGIS, STPHS.—A form intermediate between typical south English *P. astrarche* and its *var. artarcees*. It has the central spot of the forewings on the upperside ringed more or less distinctly

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with white; the spots on the underside small, with white edging. Occurs in Durham with fairly typical specimens. P. VAR. *ARTAXERXES**, FAB.—A local race almost entirely confined to Scotland, the only English county from which it is recorded being Durham, where it occurs as a rare aberration with *salmacis*. It is blacker in ground colour, has a distinct white central spot on the upper side of the forewings, and the spots on the underside are white. It may be noted that the alpine form has the same intensely black ground colour, but never appears to develop the white spots on the upperside characteristic of this variety, nor are the spots on the underside modified as in this. P. AB. *QUADRIPUNCTA*, TUTT.—An extreme form of var. *artaxerxes* in which there is a white spot in the centre of the hindwings, as well as in the centre of the forewings. It is very rare, and has only been recorded singly from a few Scottish localities.

MELITEA AURINIA VAR. *PRECLARA*, KANE (? VAR. *HIbernica*, BIRCHALL).—Characterised by a straw-coloured transverse band and very vivid fulvous blotches; the ground colour darker than in the type. Chiefly confined to Ireland. M. VAR. *SCOTICA*, TUTT.—The ground colour very dark; the fulvous and straw-coloured areas much constricted; the fulvous colour giving place somewhat to ochreous, and the straw-colour darker than in var. *praeclara*. Confined to Scotland. M. AB. *BRUNNEA*, TUTT.—An extreme tawny form (no fulvous-red or straw-colour); the general tint resembling that of *M. cinicia*; occurs very rarely with the type.

EPINEPHELE TITHONUS AB. *ALBIDUS*, CKLL.—A white form. E. AB. *PALESCENS*, CKLL.—Pale buff ground colour.

MELAMPIAS EPIPHRON AB. *MNEMON*, HAW.—The band of the forewings broken up into four saffron rings; on the hindwings only two rings. [Given by Standinger as being confined to Britain. One suspects, however, that it will be found to be widely distributed on the continent.]

ARCTIDES.—LITHOSIA COMPLANA VAR. *SERICEA*, GREGSON.—A dark form occurring sparingly and very locally on certain mosses in Lancashire. Intermediate forms with an increased amount of dark lead-colour are occasionally taken in other localities with the typical form. [Considered by some lepidopterists to be a distinct species.]

CALLIGENIA MINIATA AB. *LUTESCENS*, CKLL.—Yellow instead of rosy pink.

ARCTIA CAIA AB. *LUTESCENS*, CKLL.—With yellow instead of red hindwings. [Almost sure to have been recorded on the Continent.]

NOLIDES.—NOLA CUCULLATELLA VAR. *FULIGINALIS*, STEPHS.—This is a melanic form, the ground colour of the wings being quite sooty-black, restricted almost entirely to the London district, where the moth is common resting on fences. Evidently the colour is a response to environment, and the form is becoming commoner as the London suburbs become more smoky.

NOLA STRIGULA AB. *MONACHALIS*, HAW.—Melanic or suffused form.

NOCTUIDES.—CRANIOPHORA LIGUSTRI AB. *NIGRA*, TUTT.—The whole of the anterior wings uniformly black; all the normal pale markings absent. Very rare, Doncaster.

APATELA ACERIS VAR. *INTERMEDIA*, TUTT.—This is the ordinary

* Since this has been in type we have observed (in one of the earlier vols. of the *Entom.*, we believe) a record of this form as occurring in the Crimea.

British form. Of a more ochreous tint than the whiter continental type. *A. AB. INFUSCATA*, HAW.—A rare melanic form of *A. aceris*, the wings being strongly suffused with fuscous.

ACRONICTA LEPORINA AB. SEMIVIRGA, TUTT.—A rare aberration with the space between the undulated transverse line and hind margin suffused with black scales.

CUSPIDIA MEGACEPHALA AB. OCHREA, TUTT.—The ground colour of the anterior wings strongly suffused with ochreous. *C. AB. NIGRA*, SHAW.—Forewings totally black.

JOCHÆRA ALNI AB. OBSOLETA, TUTT.—The orbicular stigma entirely obliterated.

TRILENA TRIDENS AB. VIRGA, TUTT.—With a suffused band parallel to the hind margin. *T. AB. ROSEA*, TUTT.—The wings suffused with a delicate rosy tinge. *T. AB. BIDENS*, TUTT.—With the basal mark not produced beyond transverse line. *T. AB. QUINQUEDENTATA*, TUTT.—The basal mark with two bifurcations. *T. AB. JUNCTA*, TUTT.—With united stigmata.

T. PSI AB. VIRGA, TUTT.—With the areas directly outside the angulated line darker, forming a transverse band. *T. AB. (ET VAR.) SUFFUSA*, TUTT.—The whole of the ground colour suffused, the posterior wings also dark. Has now become the predominant race in the London district. Darkening due to protective needs. *T. VAR. BIDENS*, CHAPMAN.—The basal dagger having only two wings, and the outer line passing straight to costa instead of sloping towards base—in both respects resembling *P. menyanthidis*. *T. AB. ROSEA*, TUTT.—The whole of the anterior wings suffused with rose-colour. *T. AB. JUNCTA*, TUTT.—With united stigmata. *T. AB. BIVIRGÆ*, TUTT.—With two partially developed transverse bands.

ARCTOMYSCIS EUPHORBÆ VAR. MYRICÆ, GN.—The British form is suffused, much darker than the lowland type of the continent, but very close to the mountain form var. *montiraga*. The type does not occur in Britain.

PHARETRA MENYANTHIDIS AB. OBSOLETA, TUTT.—With faint and indistinct markings. *P. VAR. SCOTICA*, TUTT.—Larger, brighter, and more distinctly marked than the type. *P. AB. SUFFUSA*, TUTT.—A suffused and melanic form; some of the Yorkshire specimens are nearly black.

PHARETRA AURICOMA AB. SIMILIS, HAW.—More ashy than the type. *P. AB. MENYANTHIDIS*, HAW.—The ψ -like mark largely developed.

PHARETRA RUMICIS AB. SALICIS, CURT.—A melanic form, with most of the white markings absent.* *P. AB. EUPHRASIE*, ST.—Paler than the type.

ARSILONCHE ALBOVENOSA AB. OCHRACEA, TUTT.—The ground colour reddish-ochreous, the winggrays pale ochreous.

LEUCANIA CONIGERA AB. INTERMEDIA, TUTT.—Redder than the type. *L. AB. SUFFUSA*, TUTT.—The ground colour dusky ferruginous-red, not bright yellow-orange like the type. *L. AB. FLAVIPUNCTA*, TUTT.—The characteristic white spot on the forewings ochreous.

L. LITHARGYRIA AB. PALLIDA, TUTT.—Wainscot with a pinkish tinge. *L. AB. FULVESCENS*, TUTT.—Deep ochreous-fulvous, almost ochreous-brown. *L. AB. EXTRALINEA*, TUTT.—An additional transverse line between the reniform and the dots parallel to hind margin. *L. AB.*

* Since recorded by Schultz from Germany, see *Ent. Rec.*, xiv., p. 84.

MARGINATA, TUTT.—Hindwings silvery-grey in colour, bordered on the outer margin by a broad dark band. Warrington.

L. TURCA AB. LUTESCENS, TUTT.—Brighter and more yellowish than the type. L. AB. LIVIDUS, TUTT.—Greyish in colour. L. AB. OBSCURA, TUTT.—Obscure smoky-grey tinged with dull coppery; the central white spot and transverse lines indistinct.

L. IMPUDENS AB. RUFESCENS, TUTT.—Anterior wings bright rosy-red, no ochreous.

L. BREVILINEA AB. SINELINEA, FARN.—Without the characteristic line at base. L. AB. SUFFUSA, EDLSTN.—Suffused with dark scales. L. AB. NIGROFASCIATA, EDLSTN.—With longitudinal fascia. L. AB. BILINEA, EDLSTN.—Lower spots uniting into a black dash. L. AB. PALLIDA, EDLSTN.—Paler, especially along costa. L. AB. RUFESCENS., EDLSTN.—Ground-colour reddish. L. AB. OCHRACEA, EDLSTN.—Light ochreous.

L. COMMA AB. SUFFUSA, TUTT.—Much suffused with fuscous: dark longitudinal wedge-shaped marks near outer margin. Chiefly from north of England and Scotland. L. AB. NIGROPUNCTA, TUTT.—With a distinct black spot at end of discoidal cell. L. AB. OCHRACEA, TUTT.—Brownish-ochreous, tinged with reddish.

L. STRAMINEA AB. OBSOLETA, TUTT.—Forewings and hindwings unspotted. L. AB. INTERMEDIA, TUTT.—With a transverse row of black dots. L. AB. RUFOLINEA, TUTT.—Reddish-ochreous with pale nervures. L. AB. NIGROSTRIATA, TUTT.—Ground colour thickly suffused with black scales, nervures white; posterior wings much irrorated with dark scales.

L. IMPURA AB. PUNCTINA, HAW.—Red ground colour. L. AB. PUNCTILINEA, TUTT.—Row of black dots parallel to hind margin of forewings.

L. FAVICOLOR, BARRETT.—Closely allied to *L. pallens*. Only taken in Essex. Possibly a distinct species.

L. PALLENS AB. ARCUATA, ST.—Posterior wings with a row of black dots on the nervures. L. AB. SUFFUSA, ST.—Reddish form, forewings suffused with dark shades.

L. PHRAGMITIDIS AB. RUFESCENS, TUTT.—Suffused with rich red. L. AB. PALLIDA, TUTT.—Whitish-ochreous with a slight greenish tinge.

TAPINOSTOLA FULVA AB. OCHRACEA, TUTT.—Bright yellow-ochreous in colour. Yorkshire to Perth. T. AB. CONCOLOR, TUTT.—Whitish, resembling the true *T. concolor*, Gn., in colour. Deal, Warrington. T. AB. PUNICEA, TUTT.—Pale grey tinged with pink. Yorkshire and Lancashire to Perth. T. AB. PALLIDA, ST.—Pale ochreous. T. AB. PYGMINA, HAW.—Deep red inclining to rose-colour. T. AB. NEURICA, ST.—Deep brownish-red with longitudinal shades.

T. CONCOLOR, GN.—A very local species, quite distinct, confined to Cambridge, Huntingdonshire, and Essex.

CENOBIA RUFAB. PALLESCENS, TUTT.—Whitish-grey in colour.

NONAGRIA NEURICA AB. ROSEA, TUTT.—The anterior wings suffused with a rich rosy colour.

CALAMIA LUTOSA AB. RUFESCENS, TUTT.—The ground colour reddish or reddish-ochreous; the markings practically obsolete. C. AB. CANNÆ, ST.—Reddish-ochreous, with transverse row of dots.

HYDRECIA NICTITANS AB. PALLIDA, TUTT.—Anterior wings pale yellowish- or greyish-red. H. AB. ROSEA, TUTT.—Bright red form, the orbicular inconspicuous. H. AB. ALBICOSTA, TUTT.—With a clear white longitudinal mark along the costa. H. AB. OBSCURA, TUTT.—Very dark brown colour, with only slight trace of ferruginous.

H. PALUDIS, TUTT.—A quite distinct species, but closely allied to *H. nictitans*, chiefly confined to coast districts of the south-east of England. *H. AB. INTERMEDIA*, TUTT.—A darker ochreous form. *H. AB. BRUNNEA*, TUTT.—Ground colour deep brown. *H. AB. GRISEA*, TUTT.—Grey with a greenish tinge.

H. MICACEA AB. LUTEA, TUTT.—Ground colour yellowish-red. *H. AB. RUBIDA*, TUTT.—Rich red with a purplish tinge. *H. AB. BRUNNEA*, TUTT.—Deep brown in colour. *H. AB. GRISEA*, TUTT.—Pale shiny greyish-white.

XYLOPHASIA MONOGLYPHA (POLYODON) AB. BRUNNEA, TUTT.—Intensely deep brown forewings, almost unicolorous. *X. AB. ETHIOPS*, STAUD.—Black.

X. SUBLESTRIS AB. PALLIDA, TUTT.—Ground colour whitish-ochreous.

X. RUREA AB. ARGENTEA, TUTT.—White with the faintest trace of markings. Ballachulish. *X. AB. FLAVORIFA*, TUTT.—Unicolorous yellowish-red. York to Rannoch. *X. AB. NIGRORUBIDA*, TUTT.—Unicolorous reddish-black. Hebrides.

APAMEA BASILINEA AB. PALLIDA, TUTT.—Ground colour pale ochreous grey without reddish clouds. Sligo. *A. AB. UNICOLOR*, TUTT.—Dark reddish brown, slightly tinged with purple. *A. AB. CINERASCENS*, TUTT.—Dull ashy-grey.

A. GEMINA AB. RUFESCENS, TUTT.—Reddish- or brownish-grey.

A. UNANIMIS AB. SECALINA, HAW.—Dark amber-brown.

MIANA FASCIUNCULA AB. SUFFUSA, TUTT.—Greyish-black, the transverse markings obsolete or faintly-indicated, closely approaching *M. strigilis ab. latruncula*. Armagh.

M. STRIGILIS AB. LATRUNCULA, HAW.—Unicolorous ashy-grey. *M. AB. UNICOLOR*, TUTT.—Unicolorous reddish-black. *M. AB. ETHIOPS*, HAW.—Unicolorous black.

M. BICOLORIA AB. ALBICANS, TUTT.—Unicolorous white. *M. AB. HEMERIALIS*, HAW.—Unicolorous greyish-fuscous. *M. AB. TERMINALIS*, HAW.—Unicolorous reddish-brown. *M. AB. (ET VAR.) REFUNCULA*, HAW.—Unicolorous red, with the faintest traces of three pale transverse strigae. Norfolk, Howth.

PHOTHEDES CAPTIUNCULA AB. (ET VAR.) EXPOLITA, DBLDY.—Unicolorous grey.

CELENA HAWORTHII VAR. HIBERNICA, ST.—A local form, chiefly found in Ireland. *C. AB. LANCEA*, ST.—A small form, apparently more usually found in marshy localities. Ballycastle, Norfolk Broads, Whittlesea Mere, &c. *C. AB. TRIPUNCTA*, CURT.—Both stigmata and a patch joining them, distinct and pale.

MAMESTRA ABJECTA AB. UNICOLOR, TUTT.—Uniform brownish-grey with a faint ochreous tint and no markings.

M. SORDIDA AB. OCHRACEA, TUTT.—Pale yellow-ochreous strongly tinged with red.

M. ALBICOLON VAR. CINERASCENS, TUTT.—This is the English form which is much greyer than the continental specimens.

M. BRASSICÆ AB. UNICOLOR, TUTT.—Anterior wings almost unicolorous dull blackish-grey. *M. AB. ALBIDILINEA*, HAW.—Black with distinct white markings.

CRYMODES DIFFLUA (MALLARDI) VAR. ASSIMILIS, DBLDY.—Dark rich amber-brown, almost black form, with purplish gloss. Practically confined to the Rannoch district.

HELIOPHOBUS HISPIDA AB. ARGENTEA, TUTT. AND *AB. PALLIDA*, TUTT.

Pale aberrations from Portland, where they practically form a local race. H. AB. OBSOLETA, TUTT.—With no markings between the reniform and outer margin.

APOROPHYLA AUSTRALIS VAR. PASCUEA, CURT.—The ordinary British form, ashy, more variegated and distinctly marked, than the continental specimens.

LUPERINA LUTEAGO VAR. BARRETHI, DELDY.—A somewhat melanic form, dropped by Staudinger as synonymous with ab. *argillacea*, HB., an absurd result. L. VAR. FICKLINI, TUTT.—A greyer form restricted to Cornwall.

LUPERINA TESTACEA AB. OBSOLETA, TUTT.—A pale ochreous-grey form, almost unicolorous. L. AB. CINEREA, TUTT.—Ashy grey with distinct markings. L. AB. NIGRESCENS, TUTT.—Blackish-grey markings, indistinct. L. AB. INCERTA, TUTT.—A greyish-fuscous form; referred by South to *nickerlii*, FRR.

(To be continued.)

A few weeks' entomologising in Spain (with map).*

By T. A. CHAPMAN. M.D., F.Z.S., F.E.S.

(Continued from p. 91).

A few of the butterflies taken may perhaps bear a few individual notes! Some species appeared to be smaller than one is used to seeing them, others decidedly larger. *Papilio machaon*, very large, exceeding 3½ ins. in expanse, in the form *aurantiaca*. *Parnassius apollo*, which I exhibited at a recent meeting of the Society, an extremely large form, reaching 3½ ins. in expanse, very similar to, if not identical with, the Asiatic variety *hesobolus*; the ground colour dense and with a creamy tint, the antemarginal, scattered, black scales wanting on the hindwings, and diminished on anterior wings, as in Swiss *P. delius*; the black spots much diminished in size, yet frequently with red nuclei, the one towards anal angle of the forewing never quite absent, however; altogether, except in size and antennal scaling, very like *delius*, some of the females with the red spots of hindwings of enormous size. *Aporia crataegi*, apparently common, but nearly over. *Melitaea phoebe* seemed to be large, whilst *Argynnis niobe* var. *eris*, of which I only met with two poor specimens, are decidedly smaller than Swiss specimens. *Gonepteryx cleopatra* is nearly .25 in. less in expanse than those from the Riviera, no ♂s reaching 2.5 in. in expanse, whilst most of those from Cannes and Alassio exceed it. *Epinephele lycaon* presents a character of remarkable and splendid coloration, that I first observed in these specimens, but which I am inclined to think is not peculiar to them, but is a general character of the species. It is curious that I do not meet with any reference to it in the few authorities I have consulted. *E. lycaon* looks like a rather small, dull-coloured, shabby *E. janira*, but, if the male be held at a proper angle in bright sunshine, the central area of each wing, all, that is, except a border, is of a most vivid metallic green or blue, varying in colour with the angle, equalling, if it were possible excelling, any of our *Lycænas*,

* Read before the South London Entomological Society, Dec 12th, 1901.

† See also *Trans. Ent. Soc. Lond.*, 1901, pp. xix and xxii. and Mr. Champion's paper on Coleoptera, *Trans. Ent. Soc. Lond.*, 1902.

and more resembling that of some exotic Nymphalids, especially in the colour varying from green to blue. Something of this may be seen by artificial light, if it be bright enough, but sunshine is necessary to fully show it. No doubt this colour is well exhibited by the male when he makes his advances towards the female. The Satyrids vary a good deal in their habits of flight; *S. alcyon* is generally easily taken if it be not frightened or hurried, either on the wing or at rest; *S. semele*, if the day be only hot enough, is as difficult to capture as any of them, except, perhaps, *S. circe*, which rarely lets you approach it easily when it is at rest, and on the wing allows you to think you are sure of it, yet usually eludes the net without apparent difficulty. It is really a most strong and capable flier. *S. julia* is best taken on the wing, it is exceedingly wary when you attempt to stalk it at rest. *S. pricuri* is precisely the contrary, it flies straight and strong so that you cannot overtake it, at least, on the ground it frequents, but it never flies very far, but drops on the ground, and stays there, if you are not very rash, till you put the net over it, apparently trusting for escape to its resemblance to the ground about it. When covered, unless allowed to fly up into the net, it very quickly makes its way between the stones and plants from under the net. When it is very hot, it is perhaps a little less easy to approach, but has the curious habit of always settling in the shade. The aberration *uhagoni* of the female, is not at all rare, perhaps one out of four or five ♀s being of this aberration; it is very handsome on the wing, and easily distinguished from *S. semele*, ♀, which it a good deal resembles. The male is not quite so easy to distinguish from that of *S. briseis* when flying.

The two forms of *Polyommatus hylas* are very distinct, I did not take enough of the var. *nivescens*, nor recognise them on the wing sufficiently to say much about them, so far as I noticed, they occur with the type, at any rate in adjacent localities, but they are probably distinct races. The two forms of *P. corydon* taken, the violet-coloured form *corydonius* and the pale var. *hispana*, are very distinct, and no intermediate specimens were observed. They occurred on the same ground to some extent at Albarracin, but in reality they occupied distinct areas, and the cases of their occurring on the same ground was of the nature of overlapping. The var. *hispana* occurred on limestone, at Cuenca, and on *pricuri* ground at Albarracin, var. *corydonius* did not occur on limestone, it was not seen at Cuenca, was abundant at Tragacete, frequent at Puerto de la Losillo and Bronchales. *Polyommatus admetus* and *P. damon* are two closely allied species that occurred together, but, in spite of a few doubts founded on such facts as their constant association, and the identity of the male appendages, I think they are quite distinct species. It is otherwise with *P. dolus*, a south French form that seemed related to *P. damon* in precisely the same way that *nivescens* is to *hylas*, and *hispana* to *corydonius*, a paler yet larger and stronger form, with habitat on a limestone soil. The larger size shows that their paleness has nothing to do with albinism, but probably with the geology of their habitat. So far as *corydonius* and *hispana* are concerned it is difficult to say why they are not entitled to specific rank, there are no intermediate forms, no crossing, yet they frequently meet and mingle where their areas adjoin. I am aware of no evidence to show that either assumes the form of the other, if transferred to its environment, or act in any way other than as a distinct species, quite as much, perhaps more, than is the case of *P. dolus* in regard to *P. damon*.

Kirbia zapateri, from emerging so late this year, gave us a less opportunity of observing it than we might have wished. It seems confined to a comparatively small area; Puerto de la Losillo and Bronchales, where we saw it, and Guadalaviar, where we were told it occurred, are all within a circle of 20 miles in diameter. It is only to be found amongst the pines, and never on a limestone soil, at Puerto de la Losillo on sandstone, at Bronchales on some metamorphic strata. The elevation is about 4500ft. It seemed to occur in the dense pine forest, but more often in open places, but never out in wide grassy openings. It is not always associated with *Arctostaphylos ura-ursi*, with the growth of which Mrs. Nicholl identifies it. Nevertheless, this plant is characteristic of the pine forests of the Albarracin district where *B. zapateri* occurs, and is quite wanting near Cuenca or Tragacete, where otherwise very similar ground occurs, but from which *B. zapateri* has never been reported. It does not fly far and soon settles, and is easily caught, unless you alarm it, when it goes straight away and it is not very hopeful to follow it, unless the ground be more smooth and open than usual.

The districts covered by pine forest had usually a richer vegetation of a less specialised character, to some extent, no doubt, owing to the shade of the trees preserving moisture, but also, no doubt, very often to the soil not being so arid as on the limestone. In the open limestone country, thorny plants were especially common, and some of these were very attractive to insects, especially two species of *Eryngium* and a yellow-flowered composite, not unlike chicory. I several times observed butterflies, to escape capture, dive into such prickly plants, and moths did so also, whether they took any plant, or selected spinous ones, I could not say: Theclas and blues on *Eryngium* especially did this, making their escape when seated on the flowers by going through the plant instead of leaving it directly. A natural consequence of this abundance of spinous vegetation was that, quite apart from specimens being old and worn in species for which we were too late, a very large proportion of specimens, otherwise fine, had their wings torn and slit, obviously from these thorns.

The following is a list of butterflies taken:—*Papilio podalirius*, common at Cuenca, elsewhere scarce. *P. machaon*, frequent on all hilltops. *Parnassius apollo*, at all localities, most abundant at Bronchales and Guadalaviar. *Aporia crataegi*, Cuenca and elsewhere, nearly over. *Pieris brassicae*, not frequent. *P. rapae*, commonest at Tragacete. *P. napi*, not very common. *P. daphidiae*, common, often abundant. *Leptidia sinapis*, Tragacete. *Colias hyale*, common everywhere. *C. edusa*, less abundant. *Gonepteryx rhamni*, common at all localities. *G. cleopatra*, equally common. *Pyrameis atalanta*, not common, noticed at Tragacete. *P. cardui*, common everywhere. *Vanessa io*, noticed at Tragacete. *Aglais urticae*, frequently seen, not abundant. *Polygonia e-album*, frequent, not abundant. *Melitaea phoebe*, *M. didyma*, and *M. athalia*, common everywhere. *M. parthenis*, frequent, but I cannot definitely divide them from *M. athalia*. *Brenthis hecate*, not seen at Cuenca, common elsewhere. *Argynnis lathonia*, frequent everywhere. *A. aglaia*, frequent everywhere, nowhere abundant. *A. niobe*, two specimens at Puerto de la Losillo. *A. adippe* var. *chlorodippe*, common everywhere, often abundant. *Dryas paphia*, common, abundant at Tragacete. *P. pandora*, common, often abun-

dant. *Melanargia lachesis*, common, often abundant, seen at all stations. *M. japygia*, common, not noticed at Cuenca. *M. syllius*, one specimen at Cuenca. *Erebia zapateri*, Albarracin district. *Satyrus circe*, scarce at Cuenca, common at Tragacete and Albarracin. *S. alycone*, common everywhere, often abundant, even in swarms. *S. briseis*, frequent, sometimes common. *S. pricuri*, common in limited spots, frequent on all limestone near Albarracin. *S. semele*, common everywhere, sometimes in swarms. *S. statilius*, common. *S. jilia*, occurs everywhere on limestone, common in a few spots near Albarracin. *S. actaea*, locally at all stations. *Pararge egeria*, not common. *P. megera*, common at Cuenca, rarer elsewhere. *Epinephle jurtina* (*janira*), common, usually var. *hispulla*. *E. lycæon*, common, nearly everywhere. *E. tithonus*, less abundant than *ida*. *E. ida*, abundant everywhere, rather past. *E. pasiphæ*, usually abundant but nearly over. *Coconymphe arcania*, captured only at Tragacete. *C. iphioides*, very local at Tragacete. *C. dorus*, abundant, almost everywhere. *C. pamphilus*, scarce, not noted from Cuenca. *Lacosopsis roboris*, frequent at Tragacete, scarce elsewhere, worn. *Thecla spini*, usually abundant. *T. ilicis*, less abundant than *spini*. *Zephyrus quercus*, one specimen at Tragacete. *Chrysophanus alciphron* var. *gordius*, frequent, rather worn. *C. phlæas*, not very common. *Lampides boeticus*, usually common, mostly worn. *L. telicanus*, not very frequent, worn. *Plebeius argus* (*ægon*), usually frequent. *Polygonatus astrarche*, common, usually abundant, very variable in size. *P. icarus*, sometimes frequent. *P. hylas*, frequent; var. *nivescens*, Tragacete and Cuenca. *P. escheri*, not uncommon, all stations. *P. corydon* var. *corydonius*, common at Tragacete, scarce in the Albarracin district; var. *hispana*, frequent at Cuenca and Albarracin; these two forms occurred, *hispana* on limestone, *corydonius* on other formations, overlapping only at Albarracin (as *pricuri* and *zapateri* do). *P. admetus*, abundant at Tragacete, common at Albarracin, not at Cuenca (not emerged?). *P. damon*, everywhere, with *admetus*, but much scarcer. *Lycæna arion*, one specimen at Tragacete. *Cyaniris argiolus*, frequent at Albarracin. *Adopæa lineola*, one specimen from Tragacete. *A. thauwas*, Tragacete, common. This and the last-named species (or the latter) were frequently common, only a few were taken, and nearly all are *thauwas*, not recorded from the district. *A. actæon*, frequent at Cuenca. *Argiades comma*, common everywhere. *A. sylvanus*, Tragacete and Albarracin, not previously recorded from district. *Carcharodus altheæ*, common everywhere. *C. alceæ*, one from Cuenca. *Hesperia proto*, common at Cuenca, not seen elsewhere. *H. carthami*, frequent, Tragacete. *H. alveus*, common at Albarracin and Tragacete, not at Cuenca. *H. saò*, frequent, everywhere.

Mr. Wainwright has kindly given me the following names of diptera captured during the excursion:—At Arcachon, *Dasympogon diadema*, Fab., ♂ s; *Nemorus citripennis*, Mg., ♂. At Madrid, *Rhyncomyia rupeceps*, F., ♀. At Cuenca, *Tachina rustica*, Fall.; *Volucella inanis*, F., ♀; *Pangonia micans*, Loew, ♀; *Anthrax relutina*, Meig.; *Systoechus leucoplacus*, Mg., ♀; *Machimus chrysitis*, Meig., ♂; *Cyrtus gibbus*, Fab.; *Elyira*, Sp. At Tragacete, *Physocephala nigra*, Degeer, ♂; *P. chryso-rhoca*, Meig., ♂; *Volucella elegans*, Loew, ♂ and ♀; *Stratiomys chamelon*, Degeer, ♀; *Holopogon claripes*, Loew, ♂ s. The most interesting was a Tachinid of the *Plagia* group, with the characters of that group

greatly exaggerated, probably new. This was bred from the larvæ of *Albarracina korbi* we took, all of which were stung by it. The fly mentioned on p. 72 is *Laphria gibbosa*, L.

(To be concluded.)

A Proposed New Synonymic List of British Lepidoptera.

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

The inconvenience which has arisen from the fragmentary nature of the work of revision of the nomenclature of the lepidoptera, and the difficulty of access to the sources of the various corrections, must have been felt by all serious students of the order. The appearance of the new edition of Standinger's *Catalogue* containing very many important corrections, has further accentuated the inadequacy of South's "Entomologist" list, which was to a large extent adapted from edition 2 (1871), and the many monographic revisions of particular families by British and American authors, together with the biological discoveries of Dr. Chapman, Mr. Bicot and others, have still further increased the urgency of the need of a new reference list of the British species. It has not been found feasible to carry out to any large extent the editorial suggestion in the *Entomologist's Record*, xii., p. 252, partly owing to the comparative inaccessibility of the *Transactions of the City of London Entomological Society*, partly owing to the incompleteness of the London Fauna, therein catalogued, and partly to the haste with which some parts of the list were compiled, which necessitated in many cases the following of supposed "authorities," without completely testing them. The conflicting methods upon which these authorities have been working, have also, to some extent, influenced the revision which has thus far been carried out by the "Nomenclature Revision Committee" of the North London Natural History Society, not to mention the fact that the Committee has not yet attempted to publish anything beyond a first list of changes which seemed urgent in view of the discrepancies between our British books (*vide Entom.*, xxxii., pp. 59-63). The only remedy for the present condition of chaos seems to lie in a thorough and leisurely revision of the whole nomenclature upon a fixed code of laws, which will, so far as possible, work automatically, so that the results obtained may be comparatively permanent. If sufficient financial support can be obtained, the writer of this note and his collaborators will gladly carry out this work, for which a great deal of the necessary material is already in hand: and as Mr. J. Hartley Durrant has the so-called "Micro" families so well in hand, and has expressed his sympathy with our object, there is some hope that at no very distant date the needful assistance may be within the reach of our working lepidopterists.

Condition of *Lachneis lanestrus* during the pupal state (April, 1902).

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

The facts on this subject that I had observed up to the time they were written, will be found *Ent. Record*, vol. xiii., pp. 243-284, 1901. In the last of these notes I dealt with some English pupæ, kindly sent me by Mr. A. Russell. These afforded eleven pupæ on August 14th, 1901, that were quite undeveloped, these are noted below. There

were also eleven pupæ with imagines more or less developed at that date, of these two died, the rest emerged this spring. Of the German cocoons noted, 45 were opened, and of these only two contained undeveloped pupæ, these two are undeveloped still. Of the 43 more or less developed, all emerged except twelve, which were found to be dead, bearing out my anticipation, that opening the cocoons would prejudice the prospects of their inmates. The German cocoons left untouched have provided 118 moths, eight dead chrysalids, and four that are going over, being at present (April 1st) quite undeveloped. The mortality in these unopened cocoons is much less than in the opened ones, more than the present figures show, since dead ones were eliminated last September from the opened ones, but not from these, except by such rough test as weight in the hand afforded. The figures themselves are respectively 27 per cent. for opened ones, and only 6 per cent. for unopened. The deaths resulted, I think, in most cases from their being unable to emerge for want of a sufficient supply of moisture. This conclusion is supported by the fact that the opened ones presented also a much larger proportion of cripples, the wings failing to complete their expansion, though no cause of this was evident. It especially affected the hind margins and often only of the hindwings. The twelve (I say eleven, by some inadvertence, vol. xiii., p. 285) pupæ, of Mr. Russell's 1899 brood that were still undeveloped on August 14th, 1901, give a very interesting result. Mr. Russell writes me that of these there emerged "March 18th, three; 20th, one; 27th, one; 31st, one; five out of the six were well formed insects, and of the six remaining pupæ, five are apparently alive, and of the five, three show signs of development and two do not." Mr. Russell kindly handed me these pupæ on April 10th, when I got them home I found three moths emerged, cripples, possibly naturally, more likely from their confined quarters, one dead, and two pupæ quite undeveloped, but alive and healthy. From the sporadic emergence of the six moths whilst Mr. Russell still had them, there is no doubt these three moths were delaying their emergence till a little warmer weather, which the circumstances of their transit persuaded them had arrived. That these moths did not emerge at the same time as those that were already developed last August conveys unfortunately no lesson, as they were not kept together. This set of pupæ shows us, however, that in pupæ already two years old, development of the imago may be nearly complete by August 14th, or it may not have commenced, although they ultimately emerge the following spring. In the German pupæ none commenced any development after September 2nd.

These results seem to corroborate the conclusions I came to provisionally last year, and may be formulated somewhat as follows. A specimen that is going to emerge in the following spring begins its development within the pupa, at some time during the preceding summer, and is quite developed before winter sets in. If it means to remain over, no development occurs till the summer preceding the emergence. Different broods vary immensely in the proportions of early and late emergences, of some nearly all emerge the first spring (97 per cent. in one of these lots), whilst in others nearly all go over. There is probably some relation between a colder climate and more frequent "going over," depending perhaps on the larvæ not pupating early enough to get their development completed before winter. What

precise circumstances acting on the larva or pupa determine the point as to when the imago shall begin its development, especially in the case of those that go over two or more years, appears to be quite unknown.

Lepidoptera in the Swiss Alps.

By J. N. KEYNES, M.A., D.Sc.

The following record of butterflies caught in Switzerland during three weeks in August, 1901, may be of interest to entomologists who are contemplating a visit to Switzerland, but are unable to leave England in the more fruitful months of June and July. It should be said at the outset that the record has been written for the benefit of novices, not of experts. In the identification of specimens use has been made of Kane's *Handbook of European Butterflies* and Hofmann's *Die Gross-Schmetterlinge Europas* (both of which we took with us for reference) and Lang's *Butterflies of Europe* (which we have been able to consult only since our return home); at Bérisal we received assistance from Dr. Coulon; and the Rev. George Wheeler has been most kind in helping us to decide doubtful points. Our party consisted of six persons, but only three of us (sometimes only two) carried nets.

We reached Lucerne on August 5th. The weather on the two following days was dull and we did not see many butterflies. August 8th and 9th were, however, brilliantly fine, and we made a number of captures on the slopes of Pilatus, between Hergiswyl and the summit. Amongst the species caught on these two days were *Colias lyale*, *Zephyrus betulae* (a freshly emerged and very fine specimen), *Uncia w-album*, *Limnitis sibylla* (four specimens, all worn), *Polygonia e-album*, *Brenthis pales*, *B. dia*, *Argynnis niobe* (type), *Dryas papilia* (very abundant), *Erebia melampus*, *E. ligea*, *E. pronoe* var. *pitho*, *E. manto* and *Pararge marca*. We were surprised at not seeing more Lycaenids; the only species observed were *Polygonommatus icarus*, *P. corydon* and *P. damon*, and of these there were but few. On August 9th we also caught, near Lucerne, *Papilio machaon* and *Nisoniades tages*. August 10th and 11th were for the most part spent in travelling, and on the second of these days the weather changed again for the worse; between Spiez and Kandersteg, however, we caught a fine *Euranessa antiopa* and our first *Parnassius apollo*. On August 12th, which was spent at Kandersteg, it rained most of the day. On the following day we crossed the Gemmi, walking in cloud the greater part of the way to the top. This was disappointing as we had counted on getting several new species on the Gemmi Pass. August 14th was very fine, and the road from Leukerbad to Imden (about three miles) was literally swarming with butterflies, especially *Polygonommatus damon*, which settled in large numbers together by the roadside. Amongst our other captures on the roadside were *Aporia crataegi*, *Chrysophanus virgaureae*, *Polygonia e-album*, *Melitaea aurelia* and *Satyrus hermione*. On the same day we caught *Colias phicomone* and *Melitaea parthenie* var. *varia* in a field near Leukerbad, and *Chrysophanus dorilis* near Leuk Station. Whilst driving to Leuk we saw one or two specimens of what appeared to be *Papilio podalirius*, but we could not wait to go in pursuit.

Our next stopping-place was Bérisal, where we spent about ten days.

We had been attracted to this place chiefly by Mr. Wheeler's papers in the *Entomologist's Record*, and we found he had not said a word too much in its praise either entomologically or otherwise. August 15th and 16th were cloudy, windy and cold, and our captures were not numerous; but during the rest of our time at Bérisal the weather left nothing to be desired. On August 17th we walked to the top of the Simplon Pass, and amongst our captures were the following:—*Colias palaeno* (several, quite at the top of the Pass), *C. phicomone*, *Chrysophanus virgaureae* var. *zermattensis*, *C. hippothoë* var. *curybia*, *Polyommatus orbitulus*, *P. astrarche* ab. *allous*, *P. eros* (abundant near the fifth refuge), *P. cumedon*, *P. donzelii* (several, but at one spot only, between the fourth and fifth refuges), *Cupido sebrus*, *Nomiades semiargus*, *Lycaena arion* var. *obscura*, *Epinephela lycaon*, *Argynnis niobe* ab. *eris* and *Cocconympha arcania* var. *darwiniana* (several, but on one slope only, just beyond the first gallery). Erebias were abundant, but, so far as our captures went, limited to two or three species, *Erebia melampus*, *E. tyndarus* and *E. goante*. These butterflies show a beautiful green sheen when seen in the sun that renders them particularly attractive. On August 19th we walked down from Bérisal to the second refuge, a very hot and dusty walk, but prolific in butterflies. *Satyrus hermione*, a very fine insect when on the wing, was abundant, especially whilst we were having our lunch; it was apparently attracted by the food that we had with us. Most of the specimens that we caught were rather worn; but we got three or four good ones. Another fine insect that was fairly abundant, but also rather worn, was *Satyrus actaea* var. *cordula*. We also caught *Aporia crataegi* (a very fresh and fine specimen), *Polyommatus escheri* (fairly abundant, but local), *P. hylas*, and *Spilothyrus laraterae*; and perhaps our most attractive capture on this day was a specimen of *Dryas paphia* ab. *valentina*, which, although worn, was a very fine insect. On this road *Melitaea didyma* and *Melanargia galathea* were very common, and also some species of *Syrichthus*. On August 20th we walked on the Bortel Alp, nearly to the glacier. It was a very fine day, but butterflies were not abundant. There were some Erebias (*E. tyndarus* and ab. *caccodromus*, *E. goante*, *E. melampus*, *E. pronœ* var. *pitho*), and we took some fine *Pieris callidice* and (at one spot only) some *Cocconympha arcania* var. *darwiniana*. On August 21st we took a walk on the Wasen Alp but caught nothing fresh. On August 22nd we again walked to the top of the Pass and had an even more successful time than on August 17th. The most prolific spot was on the Bérisal side of the Kaltwasser gallery, where we caught many species of Blues, including *Polyommatus pheretes* (which we had not taken before). We also took three very fresh *Parnassius delius* and a particularly fine *Chrysophanus virgaureae* var. *zermattensis*, in addition to many other insects of which we already had specimens. We were rather fortunate in not having passed by the *P. delius* as being *P. apollo* (which was abundant, and to which we were not paying any attention). On August 24th we left Bérisal for Zermatt. On the following day we walked up to the Hörnli. The weather was favourable, but butterflies were not abundant. We took, however, some very fresh *Pieris callidice*, *Parnassius delius*, *Brenthis pales* var. *isis* (which was new to us), and a specimen as to which we have not yet decided whether it is *Melitaea asterie*, or a small *M. aurelia*. From August 25th to August

27th the weather was wet or cloudy, and we caught nothing except a very fine *Colias palaeno* and *Brenthis euphrosyne*. On August 28th we found a good many insects close to the Gorner glacier, but caught nothing fresh except *B. pales* ab. *napaea* ♀. On August 29th we travelled to Vevey, and on the following day had, on Mount Pélérin, our last catch. We took two specimens of *Satyrus circe*; both were a good deal worn, but we were glad to get them, even in this condition. *Argynnis latonia* was fairly abundant and in particularly fine and fresh condition; and the same may be said of *Polyommatus hylas*. We saw *Colias edusa* in the distance, but made no capture. Amongst our captures was a fine specimen of *Melitaea didyma* var. *græca*.

The following is a complete list of our captures from August 7th to August 30th:—*Papilio machaon*, *Parnassius apollo*, *P. delius*, *Aporia crataegi*, *Pieris brassicae*, *P. rapae*, *P. napi*, *P. callidice*, *Leptidia sinapis*, *Colias palaeno*, *C. phicomone*, *C. hyale*, *Gonepteryx rhamni*, *Zephyrus betulae*, *Thecla w-album*, *Chrysophanus virgauræe*, and var. *zermattensis*, *C. hippothoe* var. *eurybia*, *C. dorilis*, *Plebeius aegon*, *Polyommatus baton*, *P. pheretes*, *P. orbitulus*, *P. astrarche* and ab. *allous*, *P. eros*, *P. icarus* and ab. *icarinus*, *P. eumedon*, *P. escheri*, *P. corydon*, *P. hylas*, *P. damon*, *P. donzelii*, *Cupido sebrus*, *Nomiades semargus*, *Lycaena arion* var. *obscura*, *Limenitis sibylla*, *Polygonia c-album*, *Aglais urticae*, *Vanessa io*, *Euranessa antiopa*, *Pyrameis atalanta*, *P. cardui*, *Melitaea phoebe* and var. *occitanica*, *M. didyma* and var. *græca*, *M. aurelia*, *M. parthenie* and var. *varia*, *M. asterie* (?), *Brenthis euphrosyne*, *B. pales* and var. *isis* and ab. *napææ*, ♀, *B. dia*, *B. amathusia*, *B. ino*, *Argynnis latonia*, *A. aglaja*, *A. niobe* and ab. *eris*, *Dryas paphia* and ab. *valesina*, *Melanargia galathea*, *Erebia melampus*, *E. manto*, *E. tyndarus* and ab. *coecodromus* and ab. *dromus*, *E. gorge* and ab. *erynis*, *E. goante*, *E. pronoe* var. *pitho*, *E. aethiops* and ab. *leucotaenia*, *E. ligea*, *Satyrus hermione*, *S. circe*, *S. semele*, *S. actaea* var. *cordula*, *Pararge macra*, *P. megera*, *P. egeria* var. *egerides*, *Enodia hyperanthus*, *Epinephle lycaon*, *E. janira*, *Coenonympha arcania* var. *darwiniana*, *C. pamphilus*, *Spilothyrus lavateræe*, *Syrichthus fritillum* and var. *serratulae*, and var. *caccus* (?), *S. malvae*, *S. sao*, *S. carthami*, *Nisoniades tages*, *Hesperia thauwas*, *H. sylvanus*, *H. comma*.

This list includes some species not previously mentioned, either because of their not having sufficient interest or because we did not keep a record as to where we caught them. Our having caught a hundred species and named varieties in a little more than three weeks in the month of August must, no doubt, be, to a considerable extent, attributed to the exceptional lateness of the season. It may be added that for the most part the walks that we took were such as we should have taken had we not been entomologising. I have been many times to Switzerland, but never before in search of butterflies. Undoubtedly this new interest added considerably to the pleasure of the trip.

The habits and larva of *Graellsia isabellæ*, Graells.

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

One of the most interesting insects with which we met in our excursion in Spain was *Graellsia isabellæ*. I am under the impression that we were the first English entomologists to see it at home, but in

this I may be wrong. It has been known for more than 50 years, and for many years cocoons have been regularly supplied to Dr. Staudinger, first by Herr M. Korb, and later by local collectors. The species still occurs near La Granja in the Guadarama mountains, near Madrid, and we saw specimens at the Escorial that had that origin. Its acknowledged head-quarters, however, are much further east, at Bronchales—say 100 miles east of Madrid. Our first meeting with it was at Tragacete, about twenty miles south of Bronchales. No doubt the moth exists throughout a tract of country of about 100 miles from east to west, and something less from north to south, wherever *Pinus sylvestris* grows abundantly. This last proviso no doubt limiting its range to a number of isolated districts. We first met with it at Tragacete, where Mr. Champion beat two larvæ from Scotch fir. Later we found it between Noguera and Bronchales by inspection of the trees. A full-grown larva is very conspicuous, once you have got your eyes on it, but it is nevertheless very protectively coloured and easily escapes observation. It is probably more or less gregarious when young, as several often occur on the same tree, indeed, a local collector mentioned once having taken eighteen from one tree. He also told us that Mr. Korb had taken something near 500 in one season. The caterpillar varies from year to year in local abundance, doubtless like other species, in obedience to conditions of wind and weather during egg-laying and when the larva is young. In the neighbourhood of Bronchales, its supposed headquarters, we only found one larva, whilst an hour's journey off, near Noguera, it was by no means uncommon. The larva affects the lower and hanging branches of the tree, not apparently with any reference to their height from the ground, but because it likes the foliage of such lateral branches, which is very short jointed, and with smaller dark-green foliage, objecting to the more succulent and luxuriant twigs that mark the growing and ascending top of a tree. This is no doubt a matter of palate, but it is also important as facilitating the concealment of the larva. Such lateral branches are more bushy for one thing, their shorter joints give bits of red stem amongst the leaves, and they also carry cones. The cones have much resemblance to the larvæ in some angles and lights, and often demand a second look before one is satisfied it is only a cone. They are often bent down against the branch in larval attitude and their lighter green colour, with the brown tipping to each scale, give them, when partially hidden among the needles, just the aspect of a larva. The larva makes its cocoon, which much resembles that of *Saturnia paronia* but is larger and with a less elaborate exit, on the ground amongst rubbish and low herbage, it appears that it is not taken in this stage, and very rarely indeed as an imago. It passes the winter as a pupa, precisely as *S. paronia* does. LARVA.—From the 1st to 7th abdominal segments, white stripe down dorsal tubercles, which are white, and in the white stripes; between the stripes, dorsum brown with numerous paler hair spots, some only of which carry very small secondary hairs, the white stripes are free from hair spots, as are also white stripes through sub-dorsal (supraspiracular=iii) tubercles, which are also white. These stripes are broad, occupy about middle third of the segment and incline backwards and downwards, a longer diagonal white stripe below spiracle, including iv; the stripe is from front of segment backwards

and downwards, ending in iv, which is the most prominent part of the segment, sloping regularly to the front, but rapidly behind to the incision, the stripe occupies anterior three-quarters of segment, the area from this to the subdorsal stripe is brown, and includes the red spiracle; from the subdorsal to the dorsal stripe is also brown, but narrowed, the front and back portions of segments are bright green, the hair spots brighter and paler green. The 8th abdominal segment wants the dorsal white stripes, but the dorsal brown area is full width, a single dorsal tubercle on a slight hump, subdorsal and lateral stripes are on 1 to 7. Except lateral anterior edge of 9 green, 9 and 10 are brown, 9 with ii and iii, 10 with iii, white. The 1st thoracic has a deep black-brown plate and yellow anterior margin, green below with red spiracle. The 2nd and 3rd thoracics have no white laterally, are black in front, yellow in line of tubercles, and green behind, but the great dorsal brown stripe is present, slightly modified by the yellow and black rings. When the larva sits Sphinx-like these segments are puffed out into a large ball, and show their colours strongly. Head, deep brown-black with fine yellow-white marblings. The hairs of general surface are few and weak, those of tubercles, white, 2mm. to 3mm. long, except two or three on each tubercle, which are 6mm. or 7mm. Below white lateral stripe the colour is brown (chocolate) with paler hair spots, and a little green close to stripe on 1st, 5th, or 6th segments, prolegs paler, true legs reddish.

SCIENTIFIC NOTES AND OBSERVATIONS.

POLYGAMY IN *FIDONIA CONSPICUATA*.—The late Mr. George Jackson, of York, told me in January, 1898, that some years previously a male specimen bred from eggs had copulated with, and fertilised, three females, and that in every case the eggs laid by each female were fertile.—WILLIAM HEWETT, York. *March, 1902.*

ON AN ABNORMAL PROBOSCIS IN *MANDUCA ATROPOS*.—Some eighteen months ago, my friend, the Rev. C. R. N. Burrows, provided me with sundry imagines of *M. atropos*, including several cripples, as being of more use to me than to him. Amongst these was one that provides the specimen now recorded. The peculiarity of this proboscis is that one-half of it is much longer than normal, the other much shorter. The short one, however, may have been as long as the other as it is obviously shortened by fracture. Whether this fracture took place before or after the specimen came into my possession I do not know, nor whether it was the result of accident or whether it was broken of necessity in the escape of the imago from the pupa-case. Unfortunately the specimen had been devoted to other uses before I noted the malformation of the proboscis, nor was Mr. Burrows able to verify which pupa-case it had emerged from. It is, therefore, merely a guess that the specimen was a cripple from some injury to the pupa at an early stage of its existence, and that the malformation of the proboscis was due to the same cause. The normal length of the proboscis of *M. atropos* is about 16mm., in this specimen it is about 21mm. It has some irregularities about the middle, and beyond this is rather thin, weak and pale, looking very much as though it might have been stretched out. The extremity is thicker than normal. That it really is stretched out seems confirmed by the fact that, counting as well as I can, 1

make 36 rings in about 2mm. of this proboscis, against 47 in a similar length of a normal one. The interest of this specimen centres in its bearing on the phylogeny of *Manduca*, and generally on the relations of imaginal organs to their conditions in the pupal stage. The pupa of *Manduca* presents the same modifications of the head and maxilla that distinguish the *Sphingidae*, as compared with the *Amorphidae* (*Suerinthus*) and all other lepidoptera. This is essentially a backward rotation of the head to lengthen the space for the proboscis. *Manduca* then, belongs to a group, or we may say, is descended from ancestors, that had to strain every effort in the pupa to accommodate a long proboscis. *Manduca* has now, however, a very short proboscis. The pupal proboscis is 40mm. long, the imaginal only 16mm. The pupal proboscis is the imaginal proboscis at a certain stage of its development, all that is purely pupal is the chitinous sheath that is left behind when the imago emerges. In the early pupal stage, then, the proboscis of *M. atropos* is 40mm. long, but, beyond a layer of almost embryonal hypodermic cells and some nervous and tracheal cords, it is almost without structure; when the structure characteristic of the imago begins to develop, it does so throughout the whole 40mm. of pupal structure. The extremity of the proboscis develops at the end of the 40mm., and, as development progresses, at least towards the end of the process, the proboscis leaves the pupal sheath and shortens by contraction affecting its whole length, to the imaginal dimensions, the vacant space being temporarily filled with fluid. What does not occur is for the basal 16 millimètres of the pupal proboscis to develop into the imaginal proboscis and the remaining 24mm. in some vague way to do nothing. This specimen shows the process of contraction from the early pupal to the imaginal dimensions arrested at a particular point, probably as a result of some injury to the pupa, acting, perhaps, in some degree mechanically, and in some measure as a cause of diminished vitality.—T. A. CHAPMAN, Betula, Reigate. April, 1902.

TERATOLOGICAL EXAMPLES OF HYBERNIA LEUCOPHAEARIA.—Search for the spring moths on February 25th in Richmond Park resulted in the capture of four *Nyssia hispidaria*, *Phigalia pedaria*, two ♀s only; and many *Hybernia leucophaearia*. Two of the specimens of *H. leucophaearia* have the left hindwing missing, each being only represented by a stump. I have since bred two ♀ *Amphidasys strataria*, which are quite on the way towards being apterous, so small are the wings.—J. HENDERSON, 24, Birchln Lane, E.C. April 6th, 1902.

DISTRIBUTION OF HEMARIS FUCIFORMIS AND H. TITYUS (BOMBYLIFORMIS).—Referring to your note (*antè*, p. 112), my experience at Lincoln is that the honeysuckle species, *Hemaris fuciformis*, is fairly common and occurs in all the woods in the neighbourhood, 30 or more can easily be taken at rhododendron blooms from 10 a.m. to 11 a.m. on a sunny morning, and, while it lasts, at low flowers (*Ajuga reptans*, etc.) in the wood drives, by odd ones; the larva is easily found on honeysuckle. The scabious species, *H. tityus*, is very scarce and has only been taken in one wood (Newball) up to the present, it flies much earlier in the season and is partial to the barely opened blooms (in the drives) of *Ajuga reptans*. I have not taken the larva or pupa yet.—JOHN F. MUSHAM, Blenheim House, South Park, Lincoln. April 17th, 1902.

Seeing your notes *re* Beehawks, I might say the honeysuckle

species, *Hemaris fuciformis*, is common at Newball and Skellingthorpe woods near Lincoln, and is also found in some numbers at Hartsholme, all near Lincoln, but that the scabious species, *H. tityus*, so far as my experience goes, is found only at Newball, and that rarely. *Carterocephalus palaemon*, is always found with them at Skellingthorpe and Newball, but never at Hartsholme, the reason being that the two former localities are on clays (Oxford and Lias), and the latter on gravels (old bed of Trent). Lincoln entomologists (Messrs. J. Musham and C. Arnold) would I think verify.—W. D. CARR, Sandhurst, Oaklands Road, Wolverhampton. *April 24th, 1902.*

My records of *Hemaris fuciformis* (referred to *autca*, p. 112), certainly belong to the narrow-bordered species, *i.e.*, *H. tityus*. At Salkeld we net the imagines as they fly to patches of a small red flower, to feed at the blossoms, which they do, somewhat similarly to *Sesia stellatarum*, when on the wing; if once missed they are very bad to follow; the exact locality is a grouse moor known as Wan Fell. At Orton they come to the thistle flowers and are not so common as at Wan Fell.—G. WILKINSON, 55, Trinity Buildings, Wigton Road, Carlisle. *April 17th, 1902.*

Your note (*autca* p. 112) on the beehawks is of interest, and I may say that the only species which has been found in Cumberland is the narrow-bordered species, the scabious feeder, *H. bombyliiformis*, Esp. This is the species Mr. Wilkinson records from Orton and Salkeld, not the broad-bordered honeysuckle feeder as stated in your note (p. 112). I suppose the confused nomenclature of the two species is the cause of the error. I have seen a good number of Cumberland captured beehawks, extending back for nearly 40 years, and all have been the narrow-bordered species, and no one to my knowledge has had any different experience in this county.—F. H. DAY, F.E.S., 6, Currock Terrace, Carlisle. *April 18th, 1902.*

NOTE ON LEPTOTHORAX NYLANDERI, FOERST.—In my notes on the British myrmecophilous fauna (*Ent. Record*, vol. xiv., p. 16), I quoted what Mr. F. Smith wrote about *Leptothorax nylanderi* (*Ent. Ann.*, 1868, p. 94): "The *Leptothorax nylanderi* has never been found in any other situation than in ants' nests, usually those of *Formica rufa*." Mr. Saunders has pointed out to me that this is not the case, and that it regularly makes its own communities under bark, in bramble stems, etc., and that he has never taken it in ants' nests. Mr. B. S. Harwood, of Colchester, has also written to me that he has never seen it with other ants, and that he finds it in colonies like most species and far distant from any nest of *Formica rufa*. Although I have taken several specimens with *Lasius fuliginosus*, I did not intend to assert that what Smith wrote was correct, but only to quote what he said.—HORACE DONISTHORPE, F.Z.S., 58, Kensington Mansions. *April 14th, 1902.*

VARIATION.

PINK ABERRATION OF AMORPHA POPULI.—I have a nice aberration of *A. populi* taken here; it is suffused with pale pink over the usual markings. Is it a common form?—G. WILKINSON, Carlisle. *April 15th, 1902.*

BLACK SPECIMENS OF TENIOCAMPA PULVERULENTA.—I have taken at sallow bloom lately in this locality, a few most extraordinary black

specimens of *Taeniocompa pulverulenta*. On referring to the notes on this species (*British Noctuae*, vol. ii), I cannot find any reference to a form anything approaching the dark forms which I have taken.—JAMES C. HAGGART, St. Andrew Street, Galashiels. *April 8th, 1902.*

VARIATION AND RESTING-HABIT OF *HYBERNIA LEUCOPILEARIA*.—On January 22nd-23rd, just before the snow came, *Hybernia rupicaprariva* was very abundant near Knutsford. The day after the snow melted off the fields (February 23rd) *H. leucopilearia* appeared very plentifully in Tatton Park, near here, and continued till March 14th, the proportion of dark aberrations being much greater than usual. The insect varies here from unicolorous smoky-brown to the usually mottled light cream colour, with a good many of the strongly-marked black and dirty-white forms. In connection with this species, I noticed that it almost invariably rests on the tree-trunks in an oblique or horizontal direction with the tips of the wings pointing up and down (vertically), and as there are often splashings of white on the bark made by bird-droppings, it looks to me as if this were a case of protective resemblance. Of course the dark forms are protected by similarity of colouring to the bark.—G. O. DAY, F.E.S., Knutsford. *March 27th, 1902.*

NOTES ON COLLECTING, Etc.

LEPIDOPTERA AT BURGESS HILL IN 1901.—As a central position from which to work, Burgess Hill in Sussex would appear to offer great facilities to the lepidopterist who is desirous of studying and obtaining southern species. The wide extent of the South Downs, which are but four miles south of the town, stretches for miles on either hand—away to Lewes and on to Hastings, by Abbott's Wood, in the west; while eastwards is the grand sweep of rolling hills which are broken only by the valley of the Adur, to lie for miles, on past Chanctonbury Ring to Amberley by the Arun, and again, still on, eastward. This fine district can hardly be surpassed for the numbers and variety discovered of those species which find their home in a chalk district. It is, moreover, a free country over which to wander. Lewes is within easy reach from Burgess Hill, or rather Wivelsfield, which is the same thing, and is but a nine miles' ride by train. This is a locality which needs to have no comment made upon it, being so well known. To the north of Burgess Hill lies the splendid tract of the forests of Balcombe and Tilgate, the best way of approaching which is by train to Balcombe, some nine miles, and so on by walking through both forests, to return by train from Three Bridges. To the east of these forests lies St. Leonard's Forest, which can be easily approached from Balcombe Station, by a four mile walk through Handcross. Thus it will be seen that the lepidopterist who makes Burgess Hill his head-quarters will have a fine choice of fields for his labours. During the past year the writer had the pleasure of occasionally staying at this town for short or long periods, and it may perhaps interest the reader to have a summary of the result of investigations during these visits, which, while they may not record rarities and will include a variety of species, cannot be taken as a complete summary of the year, for, as will be seen, the localities were not visited during much of the best time. From April 4th until the 21st of that month things were fairly quiet, as weather was unpropitious both for the

insect world and humanity, cold and wet predominating very largely for the greater part of the time. *Gionepteryx rhamni*, in fresh condition after hibernation, was seen flying for the first time on the 7th of the month, and was constantly on the wing, during bright intervals until the last day of my visit, the 21st. At one locality—a rough field which had a ragged clover crop upon it the preceding autumn, and which had a wild hedgerow with buckthorn growing in it, surrounding the ground—this insect was to be seen by the half dozen or more at a time. On the 9th a single *Eugonia polychloros* was observed flitting about, *Vanessa io* put in an appearance on 18th, 19th, and 20th, but was only seen singly, one each day, and in ragged condition. On the same dates *Aglais urticae* was also to be observed, but in greater numbers, and much fresher in colour than the last named. The results of some half dozen visits to sallow at night, with light, were not very encouraging, though the bushes were in splendid bloom. The only insects present were found to be *Tacnio-campa gothica*, *T. stabilis*, *T. gracilis*, *Scopelosoma satellitia*, with *Aleucis pictaria* and *Anticlea badiata*. The larvæ beaten and found by light or search, were fairly numerous; but did not offer a great variety of species. They comprised the following:—*Arctia caia*, first time on the 16th, on which day also *Arctia rillica* was discovered nearly full-fed. *Lasiocampa querens* and *Cosmotriche potatoaria* were first found on the 14th fairly wellgrown, and on the 17th and 20th, *Entricha quercifolia* also about halfgrown. From the first day to the last of the visit, the larvæ next named were repeatedly, with few exceptions, stumbled upon—*Leucania impura*, *Apamea didyma*, *Noctua xanthographa*, *Tryphaena jimbria*, one only (this was a surprise, as several might have been expected from the number of the insect which came to sugar the preceding autumn), *Tryphaena comes* and *Phlogophora reticulosa*. Three visits to the South Downs to beat the bushes of *Clematis vitalba* for *Geometra vernaria*, respectively paid on the 9th, 19th and 20th of the month resulted in the obtaining of only a fair number, which were still very small, and in the dark skin of hibernation, for the leaf-buds had only just commenced to appear on the bushes. Subsequent experience, at a later date, proved that it is a mistake to beat for this larva too early in the season, as many things militate against success. In the first place the larva is so small, is so rigid and quiet in the tray, and so exactly resembles the immense mass of rubbish which falls with it, that searching is a most trying ordeal in the cold windy weather. Again, this quantity of rubbish which literally falls in heaps, so evidently injures many specimens, by the mortality shown later, that the net results are not adequate to the labour and discomfort involved. If operations can be deferred a few weeks later in the season, the rain and wind will have cleared the bushes naturally, and the beater has the pleasure of seeing the graceful, tapering, larva drop in his tray, made only too evident by its brilliant green appearance. With regard to the mechanical operation of the beating of this particular growth, I think it will be found that to insert the stick into the bush, and hustle it about, will yield a more satisfactory bag than to flog the delicate climber with the usual downward strong stroke. It is certainly more agreeable to the feelings of some to find that such a graceful object is not hopelessly ruined in appearance when we have worked our will upon it. Moreover, the larvæ obtained by this

procedure will not be injured nearly so frequently as by harsher methods, nor will they be shot into the air to fall anywhere but into the tray itself, for this larva falls readily with a sudden movement of its food-plant, and will respond quite freely to the sharp tapping hustle, as it really does not require a heavy blow to dislodge it, even if the bush would stand such treatment. I hope that I shall be forgiven for dwelling on this matter, for I really think it is a point we should take into our consideration. It is not a pretty sight to see a mangled, broken bush or tree with a dense litter on the ground beneath, and it is one which may prejudice outsiders, or owners of localities, from sympathy with the pursuit, and in the latter case may lead to our exclusion on other occasions. To strike the limbs of a tree, where they are firm in growth, is certainly the best method of dislodging larvæ which have a tight hold; and to jerk and stir up those things of a tender growth is really the only hope of success. By these methods we might avoid unnecessary wreckage and, to some extent, preserve our reputations. From May 24th to the 29th a visit to the locality found things much more advanced, and with beautiful weather the roadways and lanes were alive with the Pierids and *Euchloë cardamines*. A series of walks and explorations during this period brought one in contact with the following imagines: *Pieris brassicæ*, *P. rapæ* and *P. napi*, *Euchloë cardamines* (the brood seemed small in size), *Brethtis ephrosyne*, *Coenonympha pamphilus*, *Cyaniris argioides*, *Polyommatus icarus*, *Syrichthus malvae* and *Nisoniades tages*, *Heliaca tenebrata*, *Euclidia mi*, *Venilia macularia*, *Angerona prunaria*, *Iodis lactearia*, *Hemithea strigata*, *Strenia clathrata*, *Panagra petrarvia*, *Aspilates ochrearia*, *Melanthia ocellata*, *M. procellata*, *Melanippe fluctuata*, *Coremia designata*, *Campptogramma bilineata* and *Eubolia limitata*. Dusking produced examples of *Pterostoma palpina*, *Gonophora detersa* and *Leucania impura*. Larvæ of the species now named were found by search, beating, or light: *Pocilocampa populi*, *Lachnæis lanestræ* (two nests, each containing a large brood), *Malacosoma neustria*, *Lasiocampa quercus*, *Cosmotriche potatoria*, *Entricha quercifolia*, *Saturnia paronia* (a single example, fullfed, and lying injured in a roadway), *Trapteryx sambucata*, *Rumia luteolata*, *Himera pennaria* and *Hybernia defoliaria*. The large number of larvæ of *Aglais urticae*, on the beds of nettles, was noticeable and just at the last the fullfed larvæ of *Hylophila quercana* and *Asphalia diluta*, were found on oak in a manner which seemed to indicate that, if time had permitted, a large number could have been taken. The larvæ of both of these insects seem to affect those oaks where the foliage is large, profuse, brightly green, and succulent; particularly was this the case with the firstnamed species. A further try for larvæ of *G. vernaria* was made among the *Clematis vitalba* bushes skirting the downs, and some forty odd were found, nearly fullgrown. Promising as these larvæ looked they failed to produce a good average of imagines, for the food-plant procurable in, and near, London was very scarce and poor, and in a majority of cases the larvæ refused to feed when placed upon it, and calmly ceased to exist, in the manner so well known. I trust, all being well, to be more successful this year with plants now established in my garden. A further and longer stay in the neighbourhood, later in the year, from August 1st to September 16th, included visits to Tilgate and Balcombe Forests, and some interesting larvæ were taken. In the country immediately around, the lanes and

roads teemed with insect life, though mostly of common species. Sugar was, on the whole, a failure, many insects did not turn up at all, which had been strong in numbers the previous year. Among these may be mentioned *Tryphaena jimbria*, which did not make a solitary appearance, *Agrotis puta*, *A. saucia*, *A. segetum*, *A. nigricans*, *Noctua c-nigrum*, *N. rubi* and *N. baia*. All these had made a strong show during the last autumn, but only came now singly and intermittently. The following ordinary insects were to be seen almost nightly during the length of my visit: *Porthesia similis*, *Bryophala perla*, *Leucania lithargyria*, *L. impura* and *L. pallens*, *Hydroecia nictitans*, *Arylia putris*, *Xylophasia monoglypha*, *Cerigo matura*, *Luperina testacea*, *Mamestra brassicae*, *Apamea didyma*, *Miana strigilis* and *M. literosa*, *Noctua plecta*, *N. xanthographa*, *Tryphaena ianthina*, *T. interjecta* (one only August 6th) *T. comes*, *T. pronuba*, *Amphipyra pyramidea*, *Nacnia typica*, *Mania maura*, *Calymnia trapezina*, *C. affinis*, *Phlogophora meticulo-*
losa, *Gonoptera libatrix*, *Plusia gamma*, *Catocala nupta* (from the 17th), *Hypena rostralis*, *Boarmia gemmaria*, *Zonosoma porata*, *Timandra amatoria*, *Cabera pusaria*, *Abraaxas grossulariata*, *Melanippe fluctuata*, *Coremia designata*, *Campptogramma bilineata*, etc. On the 2nd of August, the first *Acidalia emarginata* was captured, and, though others were taken on subsequent days, the insect was not numerous this season. A likely place for this species seems to be a hedgerow adjoining a stubble field, where the food-plant, the dwarf convolvulus, generally runs riot. I find it can be easily dislodged by tapping the hedge and then taking it on the wing. On the 16th, one *Tetha ictusa* appeared at sugar, and towards the end of my stay, on September 7th, 12th, and 14th, *Anchocelis luosa* paid its first visits. On the 15th, *Anchocelis litura* with *Citria fulvago* and *C. flavago* showed for the first time. Of the Rhopalocera during this visit I find that the Pierids were present during the following periods: *P. brassicae*, August 2nd to August 7th; *P. rapae*, August 1st to September 7th; *P. napi*, August 1st to September 7th. *Colias hyale* was seen on two occasions, August 23rd and 24th, and three taken on each day. These were found by a low-lying undulating field that had grown a rough crop of clover the preceding year, but which had been ploughed up. The broad strip of grass-grown ground by the roadside, however, had a quantity of isolated clumps of clover growing in it, presumably wind-sown, so, if these insects can be supposed to have bred here, they probably were reared on this clover. There were no others in the locality, not even on the downs, nor was there a single example to be seen anywhere of *Colias edusa*. *Gonepteryx rhamni*, August 2nd to September 15th; *Argynnis aglaja*, August 3rd and 7th; *Eugonia polychloros*, August 5th, 6th, and 31st; *Aglais urticae*, August 3rd to 23rd; *Vanessa io*, August 2nd, 3rd, 7th, and 19th; *Pyrameis atalanta*, August 18th, September 3rd, and 8th, one on each day, the only ones seen, *Pararge megera*, August 15th to September 1st; *Hipparchia semele*, August 3rd to September 7th, on the downs; *Epinephela janira*, August 1st to September 7th; *Epinephela tithonus*, August 1st to September 8th; *Coenonympha pamphilus*, August 1st to September 13th; *Zephyrus quercus*, August 18th; *Chrysophanus phlaeas*, August 2nd to September 10th; *Polyommatus icarus*, August 1st to September 7th; *Polyommatus corydon*, August 3rd to September 7th. This insect, on August 3rd, was out on Ditchling Beacon in countless numbers, and made a beautiful sight.

It was drifting with the light breeze as far as one could see, and was in splendid condition, just out. Of *Polyommatus bellargus*, on the contrary, but one specimen was seen during the whole time, and that was in the neighbourhood of Lewes, on August 28th, though this locality teemed with the insect the previous year, while *P. corydon* was present only in limited numbers. *Cyaniris argiolus*, August 2nd to September 3rd; *Nisoniades tages*, August 3rd; *Hesperia sylvanus*, August 5th to 7th; *Hesperia comma*, August 3rd to September 7th; *Thymelicus thaumas*, August 3rd to 17th. On August 21st a visit was paid to Balcombe and Tilgate Forests, where *Anarta myrtilli* was out, with *Cidaria testata*, *Anaitis plagiata* and *Eubolia mensuraria*. Larvæ were found of *Hylophila prasinana*, *Euchelia jacobaeae*, *Dasychira pulibunda*, *Drepana lacertinaria*, *Lophopteryx camolina*, *Leiocampa dictacoides*, *Notodonta dromedarius*, *Cymatophora duplaris* and *Hypsipetes impluriata*. The next visit to the same localities was on September 3rd, when, in addition to the previously mentioned larvæ, the following were found—*Leiocampa dictata*, *Phalera bucephala*, *Triarna psi*, *Acronicta leporina*, *Cymatophora fluctuosa*, *Amphidasys betularia*, *Tephrosia punctularia*, *Geometra papilionaria*, *Iodis lactaeria*, *C. abera pusaria* and *C. exanthemata*. On September 7th a full-fed larva of *Mimas tiliae* was found on an isolated birch tree, in a hedge near the downs. There were no trees but this one, of any kind, for some considerable distance, and the hedge, in which the birch-tree stood, was of thorn and stunted oak, without a trace of lime or elm. Unfortunately this larva failed to pupate. On the 9th, Tilgate and Balcombe were resorted to, and more larvæ obtained of *Lophopteryx camolina*, *Leiocampa dictata*, *Notodonta dromedarius*, *Dasychira pulibunda*, *Drepana lacertinaria*, *D. falcataria* with *Cymatophora fluctuosa*, *Tephrosia punctularia* and *Geometra papilionaria*. The concluding trip to these forests was paid on September 13th, when the same species were again in evidence, and a few fresh ones fell to the stick. Among these were *Clustera pigra*, *Aplecta nebulosa*, *Numeria pulveraria* and *Macaria alternata*. On this occasion, too, a larva was beaten from birch which should be that of *Dicranura bicuspis*. It was different in character and coloration in many respects from the other two "kittens," was found on birch, and in a locality which is one of the most prominent of those connected with the species. Unfortunately the illustrations we have of this larva are so indifferent and the variation in the appearance of the larvæ of the three kittens so slight that, if the cocoon, which is in the breeding-cage at present, does not yield an imago soon, the subject is one that will always remain in doubt.—J. C. DOLLMAN. Hove House, Newton Grove, Bedford Park. April 14th, 1902.

EARLY EMERGENCE OF *PANOLIS PINIPERDA*.—May I record the early emergence of *Panolis piniperda*? I have one that emerged at 9 a.m. in the breeding-cage, on March 1st. I went the same day to the pine-wood and took two at rest on a fence. The latest date I have taken this species is July 6th. Does not this give it a long period?—JOHN F. MUSHAM, Blenheim House, South Park, Lincoln. April 17th, 1902.

PETASIA NEBUCULOSA FOUR WINTERS IN PUPAL STAGE.—Last spring I recorded (*antæ*, vol. xiii., p. 220) that some *Petasia nubeculosa* pupæ obtained from 1898 ova, had gone over for another year. A fine ♂ specimen emerged on the 13th inst., after having been four winters in the pupal stage.—G. O. DAY, F.E.S., Knutsford. March 27th, 1902.

SPRING LEPIDOPTERA.—I saw a specimen of *Phigalia pedaria* on February 8th in this neighbourhood, during the very cold weather, and on March 1st I bred a single specimen of *Nyssia hispidaria* from an odd lot of larvæ beaten out last spring. There seems to be a remarkable similarity between the larvæ of *N. hispidaria* and *Phigalia pedaria*, as I have frequently bred specimens of the former which I took at the time to be those of the latter.—A. W. MERA. 2. Capel Villas, Forest Gate. March 8th, 1902.

CRICKETS IN COAL MINES.—In visiting the coal mines of Mariemont, in Belgium, at the bottom of the pit St. Arthur, at a depth of 683 mètres (about 2219ft.), I was very struck to hear the chirp of a cricket. It must have been *Gryllus domesticus*. The song was only to be heard close to the engines near the bottom of the shaft, where they probably collected to obtain the warmth from the steam. There were no signs of them in the galleries or at any distance from the engines, as the cool ventilating draughts would act as an effectual check upon these warmth-loving creatures. The majority of insects occurring in mines are undoubtedly introduced by the timber; longicorn beetles, *Sirex gigas*, and other wood-borers are not uncommon.—M. BURR, B.A., F.E.S., Dormans Park. March 31st, 1902.

LEPIDOPTERA FROM THE HARLECH DISTRICT.—The following butterflies I know certainly to be found in the Harlech district:—*Pieris brassicae*, *P. rapae*, *P. napi*, *Gonepteryx rhamni*, on the road, at Harlech-Talsarnan, in spring and July. *Leptidid sinapis*, June, in woods near Harlech-Talsarnan and Llandbedr, reported to me by Mr. D. Jones. *Euchloë cardamines*, abundant in spring. *Colias edusa*, saw one on links, Harlech, August 22nd, 1900. Caught in some numbers there by Messrs C. Rogers and J. Bert, in August, 1901. *Vanessa io*, *Aglais urticae* and *Pyrameis atalanta*, abundant. *Polygonia c-album*, caught near Roman steps by J. Bert, August 7th (?), 1901. Several persons say they have seen this species. *Eugonia polychloros*, locally common; I caught a specimen April 10th, 1902, on Harlech-Talsarnan road. *Brenthis euphrosyne*, *Argynnis aglaia*, *Dryas paphia*, abundant (I believe *Brenthis selene* and *Melitara aurinia* occur, but must make certain this year). *Apatura iris* is said to have been seen on the school, in July, 1901. *Coenonympha pamphilus*, *Pararge aegeria*, *P. megera*, *Hipparchia semele*, *Epinephle tithonus*, *E. janira*, *Enodia hyperanthus*, common. Of the Lycanids, so far, I have only seen *Polyommatus icarus*, *Cyaniris argiolus*, *Chrysophanus phlaeas* and *Callophrys rubi*. Of the Heterocera, I have myself observed at Harlech, *Sesia stellatarum*, in early August, 1901; larvæ of *Amorpha populi*, on Llanbedr road, early August, 1901; *Smerinthus ocellata* taken on the golf links at Harlech, on the same date. Mr. C. Rodgers also has bred specimens successfully, from larvæ obtained in different years from these quarters. *Sphinx convulculi* was caught near Harlech, in late August, 1901; I have seen the specimen, which is in the hands of Mr. D. Jones. *Ayrotis cursoria* was caught by Mr. C. Rodgers on the links, Harlech, August, 1900.—P. P. GRAVES, Red Branch House, Lauriston Road, Wimbledon. April 17th, 1902.

SPREAD OF BUTTERFLIES INTO SUITABLE LOCALITIES.—My earliest specimens of *Polyommatus bellargus* came from the Berkshire hills, where I took a few, further along the downs from Streatley, in 1869, which will account for the present incursion of the species about

Reading, and on to Marlow (*antè*, pp. 50-51); they were the early (spring) brood, and my collecting in those days consisted chiefly of schoolboy excursions after birds' eggs, of which I have kept marked and dated specimens. The hills beyond Streatley were a favourite hunting-ground with me in the sixties and early seventies, and my records bear out Mr. Holland's supposition that *P. bellargus* did exist, but very sparingly, in the Berkshire district, before his notes were collected.—JOHN HENDERSON, 24, Birchin Lane, E.C. April 3rd, 1902.

SESIA STELLATARUM IN SUSSEX AND DEVON.—I saw *Sesia stellatarum* in my garden at flowers of *Aubretia* for the first time this spring to-day.—W. H. B. FLETCHER, Aldwick Manor, Bognor. April 13th, 1902.

I saw a specimen of *Sesia stellatarum* flying swiftly along the front at Torquay on April 1st. I saw none at the flowers.—J. W. TUTT.

A specimen of *Sesia stellatarum* was knocked out of a bush at Bournemouth in February last.—(MAJOR) R. B. ROBERTSON, Boscombe. April 15th, 1902.

SPRINGIDS IN THE CARLISLE DISTRICT.—Both *Amorpha populi* and *Smerinthus ocellata* are common in the district. Recently I saw a picture-maker, with some 40 of each, bred specimens, in his possession. I also saw a specimen of *Hippotion celerio*, taken at Springfield, near Gretna, in 1900. I am not sure whether it was taken on the Scotch or English side of the border.—G. WILKINSON, 55, Trinity Buildings, Wigton Road, Carlisle. April 17th, 1902.

PRACTICAL HINTS*.

Field Work for May and June.

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

1.—In early May the ♀ *Gonepteryx rhamni* lays her eggs on *Rhamnus*, choosing the underside of a leaf, or the twig itself, or a bud. When a bud is chosen, only a single egg is laid as a rule on each; a terminal bud is frequently chosen, and occasionally the upper-side of a leaf (Grover).

2.—In order to secure cross-pairing for purposes of hybridisation, place the individuals that you wish to cross in one cage, and a ♀ of the same species as the ♂ in an adjoining cage, near enough for the ♂ in the first cage to be affected by the scent diffused by the ♀ in the second.

3.—During May and early June low marshy ground in which *Scabiosa arvensis* is growing should be worked for *Hemaris bombyli-formis* (*tityus*). *Pedicularis sylvatica* is, in such situations, a favourite flower to attract the species, so also is *Ajuga reptans*.

4.—A newly-emerged *Cerura furcula* or *C. bifida* should be placed on a tree-trunk at dusk in garden (or elsewhere). By dark one will often find a male paired with her.

5.—The larvæ of *Nudaria mundana* are to be found in May in colonies numbering thousands, feeding on lichens on beech-trees and stone walls in the Cheltenham district (Robertson).

* PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST, published last May, and already almost completely out of print, contains 1250 similar hints to these, distributed over every month in the year. Interleaved (for collector's own notes).—ED.

6.—Larvæ of *Hylophila bicolorana*, beaten from oak in May and June, may be sleeved out on oak, when they invariably spin a boat-shaped cocoon on the underside of an oak leaf and emerge satisfactorily (Moberly); in confinement they may be kept in cardboard boxes, and usually spin up well on the sides of the boxes (Studd); shut up in the dark with their food-plant they spin on the leaves and emerge without further trouble (Atmore).

7.—The eggs of *Nonagria sparganii*, to be found in the folded edge of leaves of *Iris pseudacorus* all the winter, hatch in the middle of May, the young larvæ immediately commencing to mine the leaves of the foodplant.

8.—About May 15th, when the bearberry (*Arctostaphylos uvaursi*) is in bloom at the lower elevations, gather a large bundle of it and carry it to the hill-tops which *Anarta melanopa* frequents. Lay a long line of small bunches of the flowers on the ground and visit these bunches as you would patches of sugar. Sometimes the insect will be visible on the flowers, but more often it is well inside the bunch, and the best means of capture is to quickly place the net flat on the ground over the bunch of flowers. A bright sun is necessary to make the insect move freely (P. C. Reid).

9.—Just about sunset search the borders of rock, especially where the heather has been recently burnt, and you will find *Anarta cordigera* at rest, sometimes singly, but generally *in cop.* The latter are easy to box, but the former is often extremely wide awake, and should be quickly netted. About May 15th (P. C. Reid).

10.—The eggs of *Halena glauca* are laid in batches on sallow in May, hatching in about a fortnight, the larvæ changing as they get older from green to deep brown and fall to the ground if disturbed; they pupate just below the surface of the ground in a loose cocoon of silk and earth.

11.—The larvæ of *Catocala sponsa* and *C. promissa* feed high up on the oaks, and are rarely beaten from the lower branches, but when there is a very great storm of wind one finds the larvæ occasionally climbing up the trunks afterwards.

12.—*Leucania littoralis* is a long time on the wing, often from late May until well into July, and full-fed larvæ are also obtainable from the beginning of May until well into June. For the latter shake the sand-grass growing on the sandhills and keep them in a large tub with a glass covering: a muslin covering is useless, as the larvæ bite holes through and escape.

13.—The larvæ of *Cucullia chamomillae* feed on *Pyrethrum maritimum* during May and June; whilst young they require to be carefully searched for, owing to their resemblance to the flower-buds and to their habit of curling themselves round the stem of the food-plant; they prefer low-growing, flat plants, and feed up very rapidly, and one may find half-fed larvæ on plants which they have searched in vain a fortnight before (Still).

14.—The cases of *Whittleia retiella* are attached to a wiry grass (? *Poa maritima*) that grows in patches on the open marshes about the estuary of the Thames. The imagines also occur among this, more rarely among *Plantago* and *Atriplex*, the receptacle of a dead flower-head of *Aster tripolium* being strikingly like a ♂ *W. retiella* at rest.

15.—*Scopula decrepitalis* occurs in May from Kilmun to Lochgoil-

head, more often in damp places near the shore, usually seen sunning itself, its wings stretched fully out on the bracken.

16.—The larva of *Lita suavellella* burrows among the fleshy leaves of the *Suaeda*, which are something like thick, short pine-needles, spinning them down to the stalk in May. At the end of May it leaves its burrow to spin up in the sand or wood under the plant on which it has fed.

17.—The larva of *Lita plantaginella* feeds on *Plantago cornopus* in May; it may be found burrowing in the root to the depth of nearly half an inch, feeding on the substance of the root, spinning together the central leaves of the plant to conceal itself from view, and changing to a pupa in its burrow.

18.—*Apidistis bennettii* larvæ are noted by Richardson as being common on *Statice auriculacifolia* at Portland; they feed on *S. limonium* on the Medway marshes.

CURRENT NOTES.

In the *Transactions of the Entomological Society of London*, Mr. W. F. Kirby gives an account of the "*Locustidae*" collected in the Transvaal by Mr. W. L. Distant. Mr. Kirby's "*Locustidae*" are the "*Acridiidae*" or "*Acridiidea*" of most authors, meaning the true grasshoppers and locusts with short antennæ. Mr. Kirby differs from most writers in his views of the nomenclature of the orthoptera and he has the boldness to restore *Acrydium* for *Tettix*, sinking the latter name. He very properly restores *Acrida* for *Truxalis*, but he retains "*Tryxalis*" (= *Acridella*, Bolivar) for the second half of this genus, and also "*Truxalis*" for the American genus, which Brunner prefers to call *Metaleptea*; this latter name cannot stand, for the American genus must be *Truxalis*, but the retention of both forms of this one word for distinct genera is bound to lead to confusion, and the separation of "*Tryxalis*" from *Acrida* seems quite unnecessary. Even though Mr. Kirby restores *Loensta* for *Pachytylus*, Fieber, he could well retain the name *Acridiidae*, or any form of it, for the name of the suborder, which contains both *Acrida*, *Acrydium*, *Pachytylus*, *Truxalis* and *Tryxalis*. Great care, however, must be exercised to keep distinct the names *Acrididae* (= *Truxalidae*) and *Acridiidae* (*Acridiidea*), *Acryliidae* (= *Tettigidae*), *Locustidae* (= *Acridiidae*), and *Locustidae* (= *Acridiidea*).

Those entomologists who have been with the Editor to "Newark," at Strood, will be grieved to hear of the death of Mrs. Ames. A sudden apoplectic seizure, on the evening of April 9th, terminated fatally on the 13th, without the deceased lady again fully recovering consciousness.

Twice at recent meetings of the South London Entomological Society it has been stated that the so-called genus *Acidalia* required subdivision, both on account of diversity of structure and of distinction of habits. Herrich-Schäffer commenced this nearly half-a-century ago! Chapman and others have long since pointed out the amazing differences in the eggs. Which of the South London men is going to study the group exhaustively and give us the necessary completed subdivision? There has been enough talk about this; we want someone now to work.

Sir J. T. D. Llewelyn, Bart., has just been elected for the twelfth

time, President of the Penarth Entomological and Natural History Society. At the meeting of the Society, held April 20th, he urged the members to collect for the purposes of study, deprecated mere collecting, and recommended the members to make careful observations of the animals they studied, under natural conditions. He particularly condemned the careless destruction of rare insects, plants and animals. The society appears to be the only purely entomological society in Wales. We trust that one of its early labours will be the compilation of a fauna of the county of Glamorganshire, if not a fauna of Wales, which is very badly needed at the present moment.

The 21st livraison of the *Etudes d'Entomologie** has just been published by M. C. Oberthür. It deals with the variation of the two American species *Heliconia thelxiope* and *H. resta*, with some incidental notes on closely allied species. To those who know the marvellous excellence of these *Etudes* one need only say that this volume is quite up to the standard of the preceding; to those who have not yet studied them we can only say that no better entomological work is produced, the letterpress and plates being alike excellent, and the get-up artistic in the best sense. The large number of coloured figures illustrating the variation of the species discussed, can leave no room for doubt in the student's mind, a statement that can rarely be made of the unillustrated works of many other authors. To all students of the Heliconiids, and to all interested in the general subject of variation, the work will be hailed with pleasure as an excellent summary of the facts relating to the variation of the species treated and so well illustrated.

Dr. K. W. Verhoeff has in two recent papers entirely rearranged the *Forficularia*, or rather, the *Dermaptera*, which he adopts as an ordinal name. The first paper, "Über Dermapteren," appeared in March last in *Zoologische Anzeiger*, Band xxv., no. 665, p. 181, followed by a supplemental paper in the *Sitzungs-Bericht der Ges. naturf. Freunde zu Berlin*, 1902, no. 1, p. 7. In these two papers he draws up an entirely new and original scheme of classification for the *Dermaptera*, temporarily postponing *Labia* and *Neolobophora*, and a few other obscure genera for further investigation; he divides the remainder into *Paradermaptera* and *Endermaptera*, the first containing the single family *Apachyidae*, and the single genus *Apachys*, Serville; the remainder he again divides into two, the *Endermaptera Monandria* and the *Endermaptera Diandria*. The species of the latter have the male genital organs induplicate, and include the families *Aisolabidae*, *Gonolabidae*, *Isolabidae*, *Diplatyidae*, *Pygidicranulidae* and *Labiduridae*. In the *Monandria*, with a single penis, ductus ejaculatorius, prænuptial sac and virga, he places the *Cheliduridae*, the *Forficulidae*, a new family the *Karschiellidae*, containing two new genera erected around *Pygidicrana büttneri*, Karsch. Another new family, the *Isolabidae*, falling next in order to the *Gonolabidae*, contains three new apterous African genera. A few new species are described and several new genera raised. The papers will be discussed in detail next month.

ERRATUM.—Page 112, line 16, for "Ibid" read "William Hewett, York."

* "Variation des *Heliconia thelxiope* et *H. resta*," *Etudes d'Entomologie*, livr. xxi., pp. 1-26 and pl. i-xi, par Charles Oberthür. Février, 1902. [Published at Rennes, Imprimerie Oberthür.]

The lepidoptera of Bosnia and Montenegro.

By (Mrs.) MARY DE LA B. NICHOLL, F.E.S.

June, 1901, was a terribly wet month all through southern Europe. I spent the last three weeks of it in Bosnia, with Mr. Elwes as my companion, without much success with the butterflies. It was a very late, as well as a very wet, season; insects were fully a fortnight behind their usual time, and a diary of our proceedings consists principally of a repetition of the depressing words, "wet," or "very cloudy."

We took a tolerable series of *Chrysophanus dispar* var. *rutilus* in the marshy Save valley, also a great many fresh specimens of *Coenonympha tiphon* on the marshes around the Lake of Jezero, which Mr. Elwes considers to be, in all probability, the most southern limit of this species. Our examples are all large, and remarkably brilliant in colour, differing considerably from the northern types of this variable butterfly. The Jezero marshes are about 1500ft. above the sea, in $44\frac{1}{2}^{\circ}$ N. lat. We got a good many *Argynnis hecate*, which is common all through the Balkans, and *Melitaea parthenie* var. *varia* in some abundance. These were not exactly like the var. *varia* of the Swiss Alps, where it is abundant at an elevation of 7000ft. to 9000ft. Its occurrence so far to the eastwards, and at so low an elevation (we found it at 3000ft. to 4000ft.) is remarkable. It flies in the meadows of the dry limestone plateaux, both in Bosnia and the Brda district of Montenegro. I feel by no means certain that it is not an unnamed var. of *M. aurelia*, and not *M. parthenie* var. *varia*. On July 1st, Mr. Elwes was obliged to return to England, and I was rather inclined to return to western Europe, but I was fortunate enough to secure the services of Herr Vejsil Curcic, an assistant at the National Museum of Serajevo, so I determined to remain in the Balkans, and started with him, July 7th, for Jablanica, in the Narenta valley, south of the dividing ridge between the waters of the Adriatic and the Black Sea. We took plenty of provisions with us, as we intended to spend three days at the new Alp hut on the Prenj, at a point which was quite inaccessible from the Narenta at the time of my visit in 1898, on account of the thick and pathless brushwood that clothes the precipitous ascent. The Prenj is a mass of very dry limestone mountains in the province of Hercegovina, containing many peaks, varying in height from 5000ft. to 7300ft., and covering a great tract of country, about fifteen miles from east to west and 30 miles from north to south. A wilder region would be difficult to find; it is all high, and very cold, the snow never melts from the higher peaks, most of the surface consists of bare rock, and water is very scarce. There is forest in the northern valleys and on some of the mountain sides; towns or villages there are none, only a few shepherd butts at spots where water can be found, and these are only inhabited from May to September. The roe and the chamois still haunt the glens, but the great lammergeier no longer breeds in the precipices, and the wolf and the bear are getting very scarce, since the railway from Serajevo to Mostar came up the Narenta valley and brought sportsmen from all quarters.

At Jablanica we hired ponies for July 8th, and after a very steep five hours' ascent up the good new path made by the local Alpine

JUNE 1st, 1902.

club, we arrived at the Alp hut, solidly built of planks, and beautifully situated 4000ft. above the sea, with a grand mountain view to the west and south, and the comfortable shelter of a beech wood to the north and east. Dr. Pentzner, the accomplished author of the index to Staudinger and Rebel's *Lepidopteren Catalog*, went up to the hut with us; he intended to establish himself there for a month at least, and collect at leisure.

July 8th was brilliantly fine, and I went up the Glogovo Prenj, a great limestone ridge over 6000ft. high, about an hour and a half of steep ascent immediately behind the hut. In the rough grass of the hollows, at an elevation of not less than 4500ft., and not more than 5500ft., I found many *Cœnonymphas* flying, which I believe to be the same as those which Mr. Elwes and I had taken in the Rilo (Bulgaria) two years ago. These were considered very interesting by Staudinger, and were named by him *Cœnonympha symphita* var. *typhonides*, being the western form of an Asiatic species (vide *Catalog*, new ed.). This insect, which I found on the Prenj, and also, later, on the Durmitor, is not so well marked, or so decidedly a var. of *C. symphita*, as the Bulgarian type, but Mr. Elwes and Dr. Rebel both considered it to be the same butterfly in its extreme western form. At the very top of the mountains, in the rocky hollows, I took a good many *Hesperia andromeda*, a butterfly which had not hitherto been found in this district; they were mostly in bad order, and very hard to catch. *Erebia gorge* and var. *erymnis* were flying in some numbers on one of the southern slopes of the summit, but did not pervade the whole mountain, as would probably have been the case in the Alps. They were in excellent condition, but I unfortunately failed to get any females, they were not out yet probably, as I saw none. Perceiving a shoulder of the mountain containing some nice green hollows—an oasis in the stony wilderness—I explored it, and found *Brenthis pales* flying there, besides quantities of *Erebia medusa* and *E. oeme*, the latter the fine eastern type, with a red flush on the underside of the forewings. I got one beautiful aberration of *Brenthis pales*, a male, with the forewings almost entirely brown on the upperside. The next day was stormy, then we had another nice day, and I again went up to the Glogovo Prenj, hoping to get females of *E. gorge* and *B. pales*, but although I took a good many insects, I made no important additions to my former bag. Next day I returned to Serajevo, taking some butterflies on my way down the mountain, of which some nice dark *Melanargia galatca*, and some very good dark females of *Melitaea didyma*, were the only ones in any way noticeable. I then spent a day at Serajevo, arranging for an excursion to the Montenegrin frontier, and we started on the 14th to drive to Focha, a beautiful journey of a day and a half, halting for the night at Gorazda. The road winds through a mountainous and well-wooded country, where so many butterflies haunt the roadside that we arrived very late at Gorazda. We took *Apatura iris*, *A. ilia*, and a beautiful bronzed aberration of *A. ilia* approaching *elytie*, *Argynnis adippe* and var. *elcodoza*, *Dryas paphia* in swarms, *Lycæna melæger*, *Polyommatus corydon*, *Heteropterus morphæus*, &c.

At Focha, where we left the high road, we found that the frontier was just then in a very unsettled condition, as there had been a smuggling row, about fifteen miles off, and a Montenegrin smuggler had killed an Austrian official. However, our credentials were so

unexceptionable that we were allowed to go on, and met with the utmost courtesy and kindness from all the officials, both military and civil, during our whole excursion.

On the 16th we rode out of Focha on a lovely summer's morning along the good bridle path leading to the military frontier post of Celebic, about six hours' easy going through an excellent butterfly country, forests alternating with mountain meadows, brilliant with flowers and swarming with insects. I took *Paruassius apollo*, *Apatura ilia*, *Limnitis populi*, *Vanessa io*, *Melitaea maturna*, *M. parthenie* var. *caria*, *Brenthis amathusia*, *B. ino*, *Chrysophanus virgaureae*, *C. hippothoe*, *Polyommatus amandus*, *Lycaena arcas*, *L. melaeager*, *L. arion*, *P. corydon*, *P. bellargus*, *Coenonympha iphis*, and many more common things, but the great prize of the day was *P. anteros*, a poor specimen, but quite unmistakable. It had never before been taken in Bosnia, and this is probably its western limit. It may very likely be abundant here earlier in the season, as it is a June butterfly (in Bulgaria). I presented my specimen to the museum at Serajevo. Celebic is finely situated on the top of a commanding height about 4000ft. above the sea, and is occupied by a company of Austrian infantry—a frontier guard. There is a good Fremdenzimmer kept by Government for travellers, and I was comfortably lodged and dined at mess! Next day we went on to the frontier gendarmerie post of Mestrovac, a most beautiful walk of three and a half hours along the edge of the tremendous Tara Gorge, which here forms the boundary between Austria and Montenegro, but it poured with rain, and we were glad to get into shelter at the little barrack. It rained all night and all the next morning, but the afternoon cleared a little, so Curcie and I started up the Radovina, a great grassy mountain about 5800ft. high, which rose immediately behind the gendarmerie, with the lower slopes well clothed with forest. The *Erebia*s flew notwithstanding the grey weather, and I got a great many *Erebia oeme*, rather small and red in colour, also *Erebia tyndarus* var. *bosniaca*, and *E. curyale*. Curcie saw a wolf quite near; with my usual bad luck, I was catching butterflies just on the other side of the hill.

The next day was very fine, and we started very early, escorted by a patrol of gendarmes, to ascend Ljubnica, a conspicuous mountain about 7000ft. high, on which is the boundary stone between Turkey and Austria. We first climbed up very steep forests, mostly of pine, and then came out into beautiful meadows, where the mowers were just setting to work on the hay. *Erebia medusa* and *E. oeme* were very common, *Brenthis pales* swarmed, and Curcie caught one *E. epiphron* (*cassiope*), which is a rare butterfly all through this country. Following a nice stream to its source, in the western flank of Ljubnica, we found two empty huts, sheltered by great fir-trees, overlooking a rich meadow which sloped down to the water. Here we resolved to encamp, so leaving the men and the baggage, Curcie and I and the guard went up to the summit of the mountain, about an hour above the huts. The view was splendid, and the day very fine, but entomologically it was a poor mountain; butterflies were very few and far between on and around the summit, though lower down *E. medusa* and the *Coenonympha*, which I had taken on Prenj (*C. symphita* var. *typhonides*), were common. Returning to camp, I spent the afternoon in the adjacent meadows, and got a great many nice insects, but nothing new excepting

four specimens of *C. arcania* var. *philea*, which was another novelty for the Serajevo museum; they had never found it before in Bosnia. That evening I found our following augmented by a splendid Pandour, or frontier guard, who had been sent to take care of us. This man was a Montenegrin by birth, and was pleased by my admiration of the mass of Durmitor, rising in tremendous precipices out of its forests, two days' march to the south of our camp. I had always greatly desired to explore this remote mountain, and finding my Pandour very willing to escort me, I resolved to make the attempt, hoping that my English passport would induce the officials of the Turkish and Montenegrin frontiers to let us pass—my Austrian credentials would be useless there. A more picturesque group than that assembled around the camp fire would be difficult to find, or a greater mixture of religions and nationalities. The Pandour was in full Montenegrin costume, and had with him a friend and countryman similarly attired; the two gendarmes were Croats, and these four were all armed to the teeth. Then I had two Turks with the horses, both attired in national costume, and Curcic, also a Bosnian Turk, in European dress, with a Fez; all these men were considerably above six feet in height, and about the biggest I have ever had with me. Next morning, half an hour's march brought us to the Turkish frontier, and here we took a Montenegrin with his horses, instead of the Turks, as the Montenegrin would have no difficulty in getting into Montenegro. We then rode down a steep and beautiful valley, where I got one or two more *Coccyonympha arcania* var. *philea*, but in very bad order. We next turned across a dry limestone plateau, mostly grass land, with a good many small villages and a few cornfields; butterflies not very abundant, but I saw several *Melitava parthenie* var. *varia* (or *aurelia* var.). About four hours' ride brought us to the Turkish frontier post, where we were most politely received by the Turkish captain, a grizzled veteran in a cuirass, with several medals; he gave us coffee, we stopped and baited our horses, and I looked for butterflies in the neighbouring hollows. I saw *Colias myrmidone*, but I could not catch him. The Turkish officer politely escorted us to the top of the Tara gorge, which is the Montenegrin frontier, and about two miles from his post. He left us looking down into its depths. It is one of the most remarkable places I have ever seen. The Tara cuts a trench 2000ft. deep in the high plateau, from which the Ljubnica, Durmitor, Maglij, Vlasuljak, and other mountains rise. This great trench extends for ten or twelve miles, and is joined by another similar trench, cut by the Piva at right angles to it, and these two enormous gorges guard the north-western frontier of Montenegro. In most places the gorge is too steep for any path, but here and there the ground falls at a less precipitous angle, and we found a way winding down amongst brushwood to the edge of the river. I have never seen a better butterfly corner, or one in which a greater variety of insects could be taken, from the cold lip of the upper plateau to the rich vegetation of the lower part of the gorge, sheltered from the cutting Bora and open to every ray of the summer sun. I should have liked to spend a week there, but time pressed so that I could but glance at the insects that rose at every step from the path. I got several fine aberrations of *Melanargia galatea*, one, the most remarkable I have ever taken, very black on the upper side, and quite

white beneath, also a remarkably fine dark female *Melitaea trivia*, like that we found in the Rhodope, and a striking specimen of *M. phoebe*, ♀, large and dusky, quite different from any other that I possess. It was trying to have to hurry on, when there was so much to induce one to linger, but it was impossible to delay, for we wanted to cross the frontier stream, and do three hours' journey in Montenegro that night. So, reluctantly, I went on, and came to thicker and less productive woodland close by the Tara, whose course we followed for about a mile till we came to the ford, and a gunshot summoned the ferryman from some remote hut, high up on the Montenegrin side. Down he came and crossed the still deep pool, whilst we waited impatiently on the rocks opposite, but all that we could say or do would not induce him to take us across; generally, one might go over, but since the recent row, nobody might cross without special leave from the local governor, who lived at the town of Jabliak, three hours away! So we resolved to encamp close by, and paid the ferryman to take my passport up to Jabliak, and see if the great man might not be persuaded by the sight of the royal arms to let us enter the country. Then we encamped in a lovely narrow meadow, between the rapid Tara and a great cliff, in which we could see, high up, many caves, formerly a stronghold of robbers, but now, fortunately, unoccupied. The Montenegrins kindly sent over a frontier guard, a friend of our Pandour's, to look after us, and he brought us some excellent potatoes. I spent the evening catching Micros, and regretting my haste in the descent of the gorge. Next morning leave to cross arrived, so we joyfully hastened back to the ferry, we and our goods crossed on the ferry boat (which consisted of three tree-trunks lashed together) and the horses swam. Then we began the ascent of the Montenegrin side of the gorge, which was rather less steep at this point than the Turkish side; with fine forest and very few butterflies. I scarcely caught anything. Arrived at the top, we found a grassy plateau, and occasional fir woods, just as on the Turkish side. About midday we reached the tiny town of Jabliak, built almost entirely of wood, on a small river coming down from the Durmitor, whose frowning precipices rise out of the forests about five miles west of the town. We interviewed the head man, a handsome young Montenegrin, named Urosh, in full costume, who could read and write Servian, but nothing else, and we had much ado to persuade him of our respectability. I think the lion and the unicorn on my passport carried the day, he understood that. He kept the only inn in Jabliak, and must certainly have made a good thing of our visit, for the whole population came to look at me, and to greet their friend and relation, the Pandour, who swore that I was everything that I should be. So finally we were given a nice old Montenegrin officer of gendarmes to look after us, and allowed to explore the Durmitor; we started about 4 p.m. We went into the forest at once, and scrambled along very slippery ways till 6 p.m. Then we encamped in the driest spot we could find, under an enormous fir tree, and had a very rough night with thunder, lightning and rain. Next morning was again fine, and we went up into the mountain, leaving the forest region far below us, and pitching my tent close to a newly-built and unoccupied shepherd's hut. This afforded a necessary shelter for the men, as we must have been quite 5000ft. high and the nights were frosty. Here we remained for four days, and

I regret that I could not stay longer, as I do not consider that I have by any means done what there is to do in the way of collecting butterflies on this great mountain. The highest point of Durmitor is more than 8000ft. high, and is surrounded by six or seven other points, but very little inferior to it in height. These peaks conceal numerous basins and hollows, several of which contain little lakes, clear, deep and blue, rather reminding me of the Bavarian Alps. This mass of mountains covers a tract of country about ten miles in length by eight in width (rather more than less); its great precipices rise abruptly from the flat tableland of the Brda, towering above all the neighbouring heights on the Bosnian frontier. The highest summit of Durmitor has only once been ascended, by an Italian. There is much pasture, but much grazing also; for stony slopes and precipices it is unrivalled, and great forests clothe its lower levels. It is a remarkably cold and late mountain. I found *Erebia melas* barely out on July 24th; and *E. gorge*, which is very rare here, was also only just making its appearance. I think that my time might have been more profitably spent, entomologically, on the lower levels; I wasted one glorious day for butterflies, in the ascent of the second peak of the mountain, which is moderately accessible, and commands so glorious a view, that I cannot regret the loss of time, though I literally took not a single butterfly, but I had the honour of being the first Englishwoman who had ever made the ascent, and the memory of one of those days which are marked with a white stone in one's calendar. The other three days were all more or less showery, and butterflies were not at all plentiful. I give my captures, all taken at 5000 ft. or over:—*Parnassius apollo*, *P. mnemosyne*, *Euchloë cardamines*, *Pieris rapae*, *P. napi*, *Brenthis euphrosyne*, *B. pales* (plentiful), *Cupido minima*, *Polyommatus eros* (one), *Erebia melas*, *E. gorge* (two only), *E. lappona* (very common over 6000ft.), *E. tyndarus* var. *bosniaca* (not above 4000ft.), *E. oeme*, *E. cassiope* (two), *E. eurycle*, *Coenonympha symphita* var. *tiphonides* (very common), *C. arcania* var. *phileta*, *Hesperia alveus*. Two very long days' march across the Brda brought us back to the Tara gorge, at another point from that at which we had crossed it before; I saw a good many butterflies in the dolinas, or hollows in the limestone plateaux—*Argynnis hecate*, *Melitaea parthenie* var. *varia* (?), *Chrysophanus hippothoe*, many of the commoner Lycenids, *Coenonympha iphis*, *Erebia medusa*, &c., besides several unmistakable *Colias myrmidone* (which I could not catch). Again we had to wait a good while before we could get re-admitted into Bosnia, as the gendarmes had to be fetched from their post, about an hour's walk from the ferry, before the ferryman would row us over, but they arrived in about two hours, and were most obliging when they did turn up, so we got once more across the Tara, and reached the gendarmerie barrack by starlight. This was the end of a most interesting excursion. I should much like to revisit Durmitor and the Brda, and spend a month there, the country was most beautiful, and the lepidoptera very little known. I should recommend any future traveller to start from Cetinje rather than cross the frontier. The Tara gorge, best of butterfly corners, is half in Turkey and half in Montenegro, but in ordinary times there would probably be no particular difficulty in crossing the frontier for a day's collecting for anyone who was known to the officials. The Turkish captain was remarkably civil.

List of Species, Varieties, and Aberrations of Lepidoptera so far only recorded from the British Islands.

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

HYDRILLA PALUSTRIS AB. *LUTESCENS*, FARREN.—Ochreous-brown form, comprising about one-third of the British captures. Very near the Lapland form. H. AB. *FUSCA*, FARREN.—Basal two-thirds of the forewings, blackish-fuscous. Very near the Amurland form.

CARADRINA MORPHEUS AB. *OBSCURA*, TUTT.—Deep greyish-fuscous, inclining to black.

CARADRINA TARAXACI AB. *SUFFUSA*, TUTT.—A blackish-fuscous form from Sligo.

RUSINA UMBRATICA (*TENEBROSA*) AB. *OBSCURA*, TUTT.—A deep unicolorous blackish-brown form. Occasionally in England; more common in Scotland, where it often replaces the type altogether.

PERIDROMA YPSILON AB. *PALLIDA*, TUTT.—The Hebridean form with the outer area of the anterior wings of a whitish colour.

AGROTIS LUNIGERA, a species confined to Britain, the south coast of France and Sicily, is now supposed to be specifically identical with the more widely distributed *A. truei*. The forms of *A. lunigera* peculiar to Britain appear to be:—*AGROTIS LUNIGERA* AB. *PALLIDA*, TUTT.—Pale whitish-grey, an extreme form of the male apparently confined to the chalkhills of the Isle of Wight. A. AB. *SUFFUSA*, TUTT. AND AB. *NIGRA*, TUTT.—Both melanic forms, the latter unicolorous black. A. AB. *RUFESCENS*, TUTT.—A rare aberration suffused with red.

A. *VESTIGIALIS* AB. *NIGRA*, TUTT.—A blackish-fuscous aberration. A. AB. *LINEOLATA*, TUTT.—With the cuneiform dashes extending to the hind margin of the wing.

A. *OBELISCA* VAR. *GRISEA*, TUTT.—The Isle of Wight race of this species, which is finely dusted with grey scales.

A. *NIGRICANS* AB. *PALLIDA*, TUTT.—Pale grey, almost unicolorous. A. AB. *RUFA*, TUTT.—A pale reddish obscurely marked form. A. AB. *QUADRATA*, TUTT.—With red-brown ground-colour, and dark quadrate spot; bears a superficial resemblance to *A. obelisca* var. *hastifera*. A. AB. *FUSCOVARIEGATA*, TUTT.—Dark reddish-brown with a purple tinge and ochreous transverse lines and markings, Kent.

A. *CURSORIA* AB. *CERULEA*, TUTT.—A very rare, pale, slaty-grey form. A. AB. *OBSOLETA*, TUTT.—Yellowish-grey with obsolete markings. A. AB. *OCIREA*, TUTT.—Yellowish-ochreous, with pale longitudinal markings. A. AB. *BRUNNEA*, TUTT.—Deep suffused reddish-brown, with the transverse lines ochreous outlined with fuscous. A. AB. *SAGITTA*, ? H.-SCH., TUTT. (*SAGITTATA*, STAUD.).—A beautiful streaked form from Scotland and Shetland Isles.

A. *TRITICI* AB. *OBSOLETA*, TUTT.—Pale grey with no distinct markings, very rare, Deal. A. AB. *CERULEA*, TUTT.—A pale slate- or dove-coloured form, very rare, Deal. A. AB. *PALLIDA*, TUTT.—Pale greyish-white, with the normal transverse lines edged with fuscous. A. AB. *NIGRA*, TUTT.—Unicolorous blackish, with still darker transverse lines. A. AB. *SUBGOTHICA*, HAW.—Greyish-fuscous with space between stigmata dark, no cuneiform spots, and pale costa. A. ABS. *SORDIDA*, HAW., *PUPILLATUS*, HAW., *OCIRACEA*, TUTT, *VALLIGERA*, HAW., *CUNEIGERA*, STEPHS., *ALBILINEA*, HAW., *LINEOLATA*, HAW., *VENOSA*, STEPHS., *HORTORUM*, STEPHS., *COSTANIGRA*, TUTT.—None of these forms of this

exceedingly variable species have yet been recorded from the continent.

A. AGATHINA AB. ROSEA, TUTT.—Suffused with rose colour. A. VAR. HEBRIDICOLA, STAUD.—Paler grey, scarcely red-tinged.

A. SUBROSEA, STEPHS.—The red type of this species was characteristically British. It is now supposed to be extinct. The continental forms are much greyer and are known as var. *subaerulea*.

A. CORTICEA AB. CLAVIGERUS, HAW.—Pale whitish-grey form. A. AB. VIRGATA-PALLIDA, TUTT.—Basal and outer areas black. A. ABS. SUBFUSCUS, HAW., OBSOLETA-FUSCA, TUTT. IRRORATA-FUSCA, TUTT.—FUSCIOUS forms not yet recorded from the continent. A. ABS. BRUNNEA, TUTT, BRUNNEA-VIRGATA, TUTT, VENOSA, TUTT, TRANSVERSA, TUTT, NIGRA, TUTT.—Suffused and melanic aberrations not yet recorded from the continent. Dark forms, however, are recorded from north-eastern Asia.

A. EXCLAMATIONIS AB. PALLIDA, TUTT.—Pale whitish-grey. One suspects the eastern Asiatic form, var. *serena*, Alph., to be close to this. A. AB. PICEA, HAW.—Blackish-grey. A. AB. RUFESCENS, TUTT.—Ground colour, reddish-grey. A. AB. OBSOLETA, TUTT.—Without transverse lines or stigmata.

A. CINEREA AB. PALLIDA, TUTT (TEPHRINA, STAUD.).—Clear ground colour, markings distinct, hind wings pale, often quite white in the males.

A. RIPE AB. BRUNNEA, TUTT.—Of a deep reddish-ochreous tint, Yorks. A. AB. GRISEA, TUTT.—Dark grey much suffused with blackish scales; Lincolnshire coast.

A. PUTA AB. NIGRA, TUTT.—An extreme female form of unicolorous black colour.

A. ASHWORTHII, DELDY.—This species is represented on the continent by var. (?) *candelarum*, Stgr. Schöyen records a very similar form to the British one from Scandinavia. The AB. VIRGATA, TUTT, has a blackish-brown transverse band crossing the wing.

A. LUCERNEA VAR. (ET AB.) RENIGERA, STEPHS.—A dark melanic race confined to the Pennines. Cumbrian mountains and Scotland.

A. SIMULANS AB. LATENS, STEPHS.—The most extreme melanic form of this species. [One suspects the western Asiatic form, *sibirica*, Staud., to be ab. *suffusa*, Tutt, or closely allied thereto.]

A. OBSCURA AB. SUFFUSA, TUTT.—Extreme blackish-fuscous form.

LYCOPHOTIA STRIGULA VAR. SUFFUSA, TUTT.—The large dark Shetland race of this species, larger, darker, without red.

TRIPHLENA COMES AB. RUFESCENS, TUTT.—Forewings unicolorous pale reddish. T. AB. RUFIA, TUTT, is an extreme development of a deep bright red colour, only found in Scotland. T. AB. CONSEQUA, CURT. (CURTISH, NEWM).—Another Scotch form, very dark brown in colour, with a distinct red costa. T. AB. NIGRA, TUTT.—An extreme melanic form found in Scotland, the posterior and anterior wings almost uniformly black. T. AB. VIRGATA, TUTT.—Reddish-brown, with a distinct dark central band.

T. PRONUBA AB. CERULESCENS, TUTT.—Slaty-grey ground colour.

EXORNIS AUGUR AB. HELVETINA, KNAGGS.—A very pale form of *augur* added to the British list by Knaggs, as the well-known continental species *helvetina*.

NOCTUA CASTANEA AB. PALLIDA, TUTT.—Pale ochreous-yellow ground colour with characteristic markings outlined in red. N. AB. XANTHE, WOODFORD.—Quite yellow ground colour.

N. BAIA AB. PURPUREA, TUTT.—Tinted with a delicate purplish or plum colour. N. AB. CÆRULESCENS, TUTT.—Ground colour with a distinct slaty tinge.

N. SOBRINA AB. SUFFUSA, TUTT.—The dull dark grey form from Rannoch.

N. GLAREOSA AB. (ET VAR.) SUFFUSA, TUTT (EDDA, STAUD.).—This melanic form is almost entirely confined to Scotland and the Hebrides.

N. BRUNNEA AB. RUFa, TUTT.—A bright red form taken with the type.

N. DAHLII AB. (ET VAR.) RUFa, TUTT.—A dark purplish red-brown form, occurring as a ♀ aberration in England, but as a local race in both sexes in western Ireland and in Scotland.

N. PRIMULÆ AB. GRISEA, TUTT.—A dark grey form, so far only obtained in Aberdeenshire. N. AB. CÆRULEA, TUTT.—Another Scotch form of a clear slaty or lilac colour. N. VAR. THULEI, STAUD.—The very distinct Hebridean form of the species. Occurs, however, in Iceland.

N. XANTOGRAPHa ABS. OBSCURA, TUTT, AND NIGRA, TUTT.—Melanic reddish-black and greyish-black forms almost entirely confined to Scotland.

PACHNOBIA HYPERBOREA VAR. ALPINA, HUMPH. AND WESTW.—The red Scotch form of this species.

P. LEUCOGRAPHa AB. SUFFUSA, TUTT.—A rare deep blackish-red form. P. AB. RUFa, TUTT.—The rare bright ochreous-red form of the species. Only recorded from Hereford.

P. RUBRICOSA AB. PALLIDA, TUTT.—A pale greyish-red form. P. AB. (ET VAR.) RUFa, TUTT.—The bright red local race found in the southern counties.

(To be continued.)

A Revision of the British Species of Bagous, Schoen.

By E. A. NEWBERY.

The need for a revision of the British species of this genus has long been admitted. I have been induced to attempt the task from having all the British forms in my possession, either in my own collection or lent to me by the kindness of my friends.

This paper makes no pretension to be a monograph of the genus, since detailed descriptions, both generic and specific, are omitted. In other respects it has been my aim to make it as complete as possible. Those students who require detailed descriptions will find them in our British handbooks and in Brisout's *Monograph*. The absence of these details has rendered a fuller analytical table necessary, but it is hoped that this will be no disadvantage.

The following works are either referred to, or may be usefully consulted:—

Herbst.—*Natursystem aller bekannten, etc., Insecten*, Herbst and Jablonski. Berlin, 1789.

Payk.—*Fauna Suecica Insecta*, Paykull. Upsalia, 1798 et seq.

Gyl.—*Insecta Suecica descripta*, Leon Gyllenhal. Scaris, 1808-18.

Schön.—*Schönherrii Synonymia Insectorum Curculionidae*. Paris, 1833-9.

Th.—*Scandinaviens Coleoptera*, C. G. Thomson. Stockholm, 1859-68.

Bris.—*Monographie des espèces Européennes et Algériennes du genre Bagous*, par Henri Brisout de Barneville. *Ann. de Soc. Ent. de France*, 1863, pp. 491 et seq.

Bedel.—*Faune des Coléoptères du bassin de la Seine*, Louis Bedel. Tome VI. Paris, 1885-8.

Cox.—*Handbook of British Coleoptera*, H. E. Cox, 1874.

Fowler.—*Coleoptera of the British Islands*, W. W. Fowler, vol. 5, 1891.

The descriptions in Herbst's and Gyllenhal's works are of very little scientific value. They may have been sufficient when but few species were known, but they are of so loose a character that they will often fit three or four of the now known species. Herbst's types no longer exist, and it is impossible, either from the text or figures, to be at all certain of the species to which this author refers. Gyllenhal's types still exist in the Museum at Stockholm, where also those of Schönherr and Boheman are preserved. Schönherr's work is much better, and the descriptions are often all that can be desired for identifying the species, many of them are written by Gyllenhal or Boheman. Brisout's *Monograph* is a very good one, and I believe it is the latest that has appeared on the genus. I am greatly indebted to Bedel's work for many of the best characters in my table. The author has the faculty of describing differences in a short but very lucid manner. The works of Cox and Fowler are in the hands of every student and need no commendation from me.

HABITS AND FOODPLANTS.—All the species are found on aquatic plants, but we know as little of the habits of these insects as in Brisout's time. Bedel mentions that all the species of which the habits are known live exclusively on monocotyledons. This would appear to be correct, but with the exception of *B. binodulus*, which is said to be found on *Stratoites aloides*, and *B. alismatis*, which feeds on the leaves of *Alisma plantago*, nothing is known of the foodplants of the British species. Some are subaquatic, others—*argillaceus* for instance—seem confined to salt or brackish water. All the species simulate death when disturbed, and remain quiescent for a considerable time. A good plan of capturing the subaquatic species is to rake the water-weed upon a piece of waterproof sheeting, drain off the water and shake the weed well. The beetles will fall on the sheet, but will be difficult to see on account of their death-shamming habits and obscure colours.

SEXUAL DIFFERENCES.—These are very little marked. The rostrum of the male is shorter and more pubescent than that of the female, with the antennæ inserted nearer the apex. The metasternal impressions are also more marked, and the hooks at the apex of the tibiæ rather more developed. In the female the rostrum is often bare and impunctate in front of the insertion of the antennæ.

MISCELLANEOUS OBSERVATIONS.—The distribution of the genus is peculiar; omitting the generally distributed *alismatis*, it will be found that almost all the records are from the south or east of England, or the London district. One species only has occurred in the west, *i.e.*, *B. nigratarsis*, at Candleston, Wales. Scotland claims but one species, *B. glabrirostris*, and only one specimen, *lutulosus*?, appears to have been found in Ireland. It is extremely probable that the want of attention paid to the genus by collectors is accountable for the limited range of the localities.

The time of appearance of the perfect insect appears to range from April to October, most of the recorded captures being in the former month. It is almost certain that these insects hibernate. They all vary greatly in size, our largest species is *B. nodulosus*, the smallest *B. lutulosus*, though some specimens of *B. claudicans* run quite as small.

The number of joints in the funiculus of the antennæ has been variously stated by authors. The antennæ are eleven-jointed in all the species, and the confusion in the number of joints in the funiculus has arisen from some observers considering the 7th joint as part of the club. It appears to me that this is the best way to regard it, since it is pubescent and much broader than the preceding joints. *B. petro*, however, is an exception with a plainly seven-jointed funiculus. These beetles are very often coated with an earthy crust which obscures the striae and markings, rendering their determination more difficult, but *argillaceus* is very rarely thus disfigured.

It is not my intention to go deeply into the synonymy, my references are confined to the works cited in my list. The names given in the table are those of the last European Catalogue (1891). For the reasons before given I believe it to be impossible to substantiate Herbst's names, but it is better to allow these to remain as they are in general use, since nothing is more mischievous than continual changes in nomenclature. Localities are given of those insects only which have been examined by me, except in one or two instances which are noted in the text.

TABLE OF THE SPECIES.

1. Club of antennæ with first joint glabrous.
 - Club indistinctly articulated and as long as the following joints united; thorax, very short, broad, enlarged and rounded behind apical constriction; elytra short and broad, strongly punctured; callosity near apex of fifth interstice absent.
 - B. petro*, Herbst (*Helminthimorphus Aubei*, Cussac).
- Club of antennæ pubescent from base. 2.
2. Antennæ inserted near basal third of rostrum.
 - Form, long and cylindrical; thorax nearly as broad as elytra, the latter without callosities; hind tarsi as long as tibiæ.
 - B. (Lyprus) cylindrus*, Payk.
- Antennæ not inserted near basal third of rostrum.
- Usually inserted near apex, more rarely in middle. 3.
3. Elytra with a small shiny prominence at base of first interstice on each side of scutellum.
 - Elytra with strong tubercles near apical third of both 3rd and 5th interstices.
 - B. bimodulus*, Herbst.
- Elytra without scutellary prominences.
- Tubercle on 3rd interstice wanting. 4.
4. Integuments shiny like varnish.
 - Elytra very feebly punctured with tubercles obsolete; size rather large (3½mm. to 4½mm.).
 - B. argillaceus*, Gyll.
- Integuments not shiny.
- Elytral tubercles more or less marked. 5.
5. Size large (4mm. to 5mm.), with well marked tubercle on the 5th interstice.
 - B. nodulosus*, Gyll.
- Size small (2mm. to 4mm.); tubercle reduced to a callosity or even wanting. 6.
6. 3rd joint of tarsi not bilobed, as narrow as 2nd joint. 7.
- 3rd joint of tarsi more or less bilobed, always much broader than 2nd joint. 13.
7. 2nd and 3rd joints of posterior tarsi distinctly longer than broad.
 - Tibiæ not flattened and dilated near the basal half; tarsi moderately long. 8.
- 2nd and 3rd joints of posterior tarsi subequal, as broad as long.
 - Tibiæ flattened and dilated near the basal half; legs short and thick; tarsi short, about half the length of the tibiæ. 12.

8. Striæ of elytra strongly punctured.
 Thorax much broader than long, with sides dilated behind the deep apical constriction and distinctly narrowed towards base, central furrow absent or obsolete; form short and broad.
B. limosus, Gyll.
 —Striæ of elytra feebly or not at all punctured (except in rare forms of *frit*).
 Thorax not as in *limosus*. 9.
9. Thorax with three more or less evident depressions in the well marked and deep apical constriction, the central depression connected by a broad shallow furrow with another deeper depression at the base of thorax, forming thus a broad central furrow; form rather broad.
B. brevis, Gyll.
 —Thorax without evident depressions or foveæ, and with at most a fine central furrow; apical constriction feeble. 10.
10. Scape inserted near middle of rostrum.
 Form elongate; thorax with fine central furrow; elytra with spots, a common transverse spot near apical third being the most conspicuous.
B. tempestivus, Herbst.
 —Scape inserted nearer to apex.
 Form less elongate; thoracic furrow obsolete or absent. 11.
11. Three first joints of posterior tarsi elongate and subequal.
 Elytra with finely punctured striæ and (in a fresh state) a whitish punctiform spot in the 3rd interstice behind middle; hind tibiae long, strongly and regularly curved at apex, with very long apical spur.
B. frit, Herbst.
 —Second joint of posterior tarsi distinctly shorter than first.
 Elytra with simple striæ and variable markings, which usually take the form of transverse spots, but are sometimes altogether wanting; hind tibiae shorter and thicker, less regularly curved with only moderate apical spur.
B. claudicans, Boh.
12. Surface of elytra varied with grey spots.
 Elytra slightly flattened, with alternate interstices raised.
B. lutosus, Gyll.
 —Surface of elytra of nearly uniform colour.
 Elytra convex with alternate interstices hardly differing from the others.
B. diglyptus, Boh.
13. Scape of antennæ inserted near the middle of rostrum; 3rd joint of tarsi broader than second, but scarcely bilobed.
B. tempestivus, Herbst var. *Heasleri*.
 —Scape of antennæ inserted near apex of rostrum; 3rd joint of tarsi distinctly bilobed. 14.
14. Upper surface of tarsi glabrous; prosternum excavated in front.
 A. Tarsi black. *B. glabrirostris*, Herbst var. *nigratarsis*, Th.
 AA. Tarsi red.
 a. Size smaller; 3rd joint of posterior tarsi as broad as long; interstices of elytra narrower and alternate ones more raised.
glabrirostris, type form.
 aa. Size larger; 3rd joint of posterior tarsi elongate; interstices of elytra broader, alternate ones scarcely raised.
glabrirostris, var.
 —Upper surface of tarsi distinctly pubescent; prosternum flat; elytral callosities obsolete.
B. (Hydronomus) alismatis, Marsh.

B. PETRO, Herbst, vi., 366.—Bedel, vi., 104 and 276. *Aubei*, Cussac, Ann. Soc. Ent. Fr., 1851, 206.—Bris., Mon., 508.—Fowler, v., 288.—Readily distinguished from all our other species by the apparently solid club of the antennæ. This peculiarity has led Aeloque ("Faune de France") to place it in the *Cossonidae*, a group with which it has no affinity whatever. The insect has only been

taken at Askham Bog, Yorks. The first specimen was taken by Canon Fowler some twenty years ago; subsequently the Rev. W. C. Hey took four more specimens in 1895, which are thus distributed—Messrs. G. C. Champion, B. Tomlin, and Dr. Sharp having one each, and one remaining in the possession of the Rev. Mr. Hey, to whom I am indebted for this information. The other localities given in Fowler refer to *limosus*, Gyll., and other species.

B. *CYLINDRUS*, Payk., iii., 241.—Bris, 497.—Bedel, 105 and 276.—Cox, ii., 193.—Fowler, v., 288.—The long cylindrical form and long rostrum are sufficiently characteristic of this insect, which, though local, occurs occasionally in great numbers. According to Stephens it is found on watercress, but this is unlikely to be its foodplant. Mr. Willoughby Ellis took over 200 specimens in a marsh near Leighton Buzzard, Bedfordshire, in August, 1901. All the specimens occurred in a spot about six yards square, and were obtained by shaking grass tufts. It is very probable that the insects were in search of moisture through the drying up of the pond. There was certainly no watercress near the spot. Mr. Bennett has taken it at Iden, Sussex. I know of no other recent captures.

B. *BINODULUS*, Herbst, vi., 247.—Bris, 501.—Bedel, vi., 105 and 278.—Cox, ii., 190.—Fowler, v., 288.—One of our rarest species which can only be confused with *nodulosus*, Gyll. I have heard of but four British examples. Mr. E. Saunders has a specimen taken in Horning Fen, in 1861, by J. A. Brewer. There is a specimen in Rye's collection, now in the possession of Dr. Mason, which is alluded to by Rye (*Ent. Mo. Mag.*, vi., 257) as having been taken by the Rev. H. Clark, probably near Arundel. I believe this locality to be an error; *nodulosus*, then called *binodulus*, was taken there in some numbers by Mr. S. Stevens and others, hence probably the mistake. I have seen both these specimens. A specimen exists in Dr. Crotch's collection at Cambridge, which Dr. Sharp has been good enough to examine for me, it has no locality label but is without doubt the insect alluded to by Rye in the same note as having been taken by Brewer in the Fens. Mr. Champion has a specimen from the Rev. L. Brown's collection, labelled "near Norwich." The two specimens in the Power collection are *nodulosus*. The Sandwich locality in Fowler also refers to *nodulosus*.

B. *ARGILLACEUS*, Gyll., Schön., iii., 552.—Bedel, vi., 105 (footnote) and 277.—Bris, 517.—Fowler, v., 289. *Inceratus*, Cox, ii., 193. *Encaustus*, Boh., Schön., viii., 211.—The comparatively large size and shiny integuments prevent this species from being confused with any other. It occurs in numbers where found, but is very local.—Sheerness (Walker, Champion, Power), Gosport (Moncreaff).

B. *NODULOSUS*, Gyll., Schön., iii., 538.—Bris, 502.—Bedel, vi., 105 and 278.—Cox, ii., 190.—Fowler, v., 289. *Binodulus*, Th., and old Brit. collections.—The characters given in the table are amply sufficient to separate this species from *binodulus*, which is the only one with which it can be confused. Mr. Bennett tells me this species is subaquatic, and runs on the weed under the water. Pevensey (Bennett); Beccles, Suffolk, in dykes (O. E. Janson, Piffard); Arundel (S. Stevens).

B. *LIMOSUS*, Gyll., iv., 566.—Schön., iii., 547.—Bris, 309.—Bedel, vi., 105 and 278.—Cox, ii., 192.—Fowler, v., 289. *laticollis*, Gyll.

Petro, Germ. *nec* Herbst. *Petrosus*, W.C.—This insect has some affinity to *frit*, but may be distinguished from it in addition to the characters given in the table, by its short tibial spur. It has been a source of much confusion to British entomologists, nearly all the localities given in Fowler for *petro* refer to this insect. The specimens in Dr. Power's collection as *limosus* must all be referred to *frit*, those under the name of *petrosus* being *limosus*. There is a variety in which the elytral striæ are much less strongly punctured than usual (var. *chorinaeus*, Boh.); *limosus* also is frequently coated with an earthy deposit which obscures the striæ. To determine these forms recourse must be had to the shape of the thorax. It is a very variable insect as regards size. It occurs in plenty at Sheerness (Walker, Champion), also at Southsea (Moncreaff); Scarborough (Lawson); Camber (Bennett); Rainham (Lewcock); Ipswich (Morley); New Forest (Heasler); Tring (Elliman).

B. brevis, Gyll., Schön., iii., 550.—Cox, ii., 101.—Fowler, v., 291.—This species has affinities with *limosus*, *frit* and *claudicans*. The almost impunctate striæ will separate it from the first, and the broad shallow central furrow, and strongly marked apical constriction of thorax from the two latter. The depressions or foveæ in this constriction are best seen when the head of the insect is towards the observer; they are shallow but fairly well marked. Fowler places the insect in the same subdivision as *lutulosus* and *diglyptus*; the tibiæ, however, are nearly cylindrical, and the tarsal joints are longer than in the insects in this subdivision, being very similar to those of *claudicans*. *B. brevis* was taken in some numbers at Woking and Horsell by Dr. Power, from 1872 to 1877. I know of no recent captures. Gyllenhal's description agrees well with our insect, which Mr. Bedel informs me is very rare in France.

B. tempestivus, Herbst, vi., 246.—Bris, 507.—Bedel, vi., 106 and 277.—Cox, ii., 192.—Fowler, v., 290.—The most elongate of all the British species except *cylindrus*. The antennæ are inserted in the middle of the rostrum, which is longer and more slender than that of its nearest allies. The thorax usually has a fine central furrow, and the elytra are generally spotted with grey, the most conspicuous spot forming a transverse band behind middle. The tarsi are long and usually the third joint is not, or very little, broader than the second. Mr. Heasler has, however, taken a variety having the third tarsal joint much broader than second, which I am compelled to place in the same section with *glabrirostris*, though it does not appear to differ otherwise from the type form. M. Bedel tells me that his own examples and those in the collection of C. Brisout have the third tarsal joint a little broader than the second, and that he has not seen specimens with this joint as narrow as in the specimens I submitted to him. These were typical specimens of our ordinary form, to which Brisout's "*tarsis gracilibus, penultimo articulo angustato*" applies well. It is, I think, impossible to regard these tarsal differences as sexual. Rather a common species. Southsea (Moncreaff); Gravesend (F. Smith); Camber, Rye, Bopeep (Bennett); Totnes (Edmonds); Nayland, Suffolk (Elliott). The variety (three specimens), New Forest (Heasler).

B. frit, Herbst, vi., 156.—Bedel, vi., 106 and 277.—Fowler, v., 290 (in part). *Subcarinatus*, Gyll., Schön., 543.—Bris, 502.—Cox, ii., 191, and of old British collections.—This species has affinities with

limosus, *brevis* and *claudicans*. It can be separated from the first two by the feeble constriction of its thorax, and from the latter by its long sub-equal tarsal joints and more or less punctured elytral striæ. In the fresh state the two punctiform spots on the third interstice are very conspicuous. The apical spur of the tarsi is very strongly developed, especially in the males. The elytral striæ are, in rare cases, very strongly punctured causing confusion with *limosus*, the different form of the thorax is, however, decisive. Brisout admits that the *subeariatus*, Gyll., of his monograph is very possibly the true *frit* of Herbst, according to a remark of Dr. Schaum's upon Germar's collection. Very local, but not uncommon—Sheerness (Champion, Walker); Camber, in sedge refuse; Rye, Iden (Bennett).

B. CLAUDICANS, Boh., Schön., viii., 2, p. 80.—Bedel, vi., 106 and 277.—*Frit*, Bris, 503.—Cox, ii., 191.—Fowler (in part), v., 290, and of old Brit. collections. *Adspersus*, Först (small form).—A very variable species both in size and markings. Its nearest ally is *frit* from which it can be separated by the characters given in the table. It is usually smaller, and the spots on the elytra more transverse and irregular, but it is sometimes unicolorous. The posterior tibiae are shorter and less cylindrical than those of *frit*, and much less roundly curved at apex. Rather generally distributed—Southsea (Moncreaff); Potter-Heigham, Norfolk, in dykes (O. E. Janson); Camber, Iden, in numbers (Bennett); Halton, Bucks; Tring (Elliman); Slapton, Devon (Keys). A specimen in Dr. Power's coll. labelled *petro* must be referred to this species.

B. LUTULOSUS, Gyll., iv., 568.—Bris, 506.—Bedel, vi., 106 and 278.—Cox, ii., 191.—Fowler, v., 290.—This species and *diglyptus* are very distinct by reason of their short tarsi, forming a little group by themselves. They may be distinguished from each other by the characters in the table. As far as I have seen, this is our smallest species. Rare, Guestling, Sussex, one swept in a dry lane (Bennett); Southsea (Moncreaff); Woking, Horsell (Dr. Power).

B. DIGLYPTUS, Boh., Schön., viii., 2, p. 82.—Bris, 505.—Bedel, vi., 106 and 278.—Fowler, v., 291.—The more even elytral interstices and usually larger size will distinguish this from the last species. One of our rarest species. I have only seen the two specimens taken by Mr. Claude Morley on the banks of the Gipping, near Ipswich, one of which he very kindly gave to me. One was taken by sweeping at dusk, the other in flood refuse (*Ent. Mo. Mag.*, xxxiii., 44). These and the two specimens taken at Burton-on-Trent (see Fowler) are, I believe, the only known British examples. M. Bedel tells me that it is extremely rare in France.

B. GLABRIROSTRIS, Herbst, vi., 254.—Bedel, vi., 106 and 279.—Fowler, v. 292. *Lutulentus*, Gyll., iii., 86 and iv. 565.—Bris, 512.—Cox, ii., 193.—A very variable species both as to size, markings and colour of the legs. Easily separated from all our indigenous species except *alismaticus* by its broad bilobed third tarsal joints, and from the latter by the absence of the distinct pubescence on the upper surface of the tarsi. The form with black tarsi has been considered a good species by Thomson and other authors, and they are very likely right, as it has some other points of difference besides the black tarsi. The large form which I have included in my table has but few constant characters to separate it. It has done duty for *lutosus*, Gyll., in British

collections until recently, when Mr. Champion (*Ent. Mo. Mag.*, xxxiv., 52) pointed out that these specimens were only a large form of *glabrirostris*, and that no authentic British specimen of *lutosus* was to be found. My investigations have led me to the same conclusion. One of our commonest species; Camber, Rye, Pevensy, plentiful (Bennett); Merton (Dr. Power). The variety *nigritarsis* is less common, Pevensy (Bennett); Candleston, Glamorganshire (Tomlin); Scarboro' (Lawson); New Forest (Heasler); Isle of Wight (Lewis). These last were mixed with *frit* in Dr. Power's collection! The large form has been taken at Rye and Pevensy (Bennett); Merton (Dr. Power) one specimen.

B. *ALISMATIS*, Marsh., *Ent. Brit.*, 273.—Bedel, vi., 104 and 279.—Cox (*Hydronomus*), ii., 193.—Fowler, v., 287.—The bilobed and pubescent tarsi easily separate this species, which is the commonest of the genus, and found in all its stages on *Alisma plantago* all over the kingdom.

In conclusion I wish to express my great obligations to M. Bedel for examining and corroborating types of all the British species, and also for much valuable information. I am greatly indebted to Mr. W. H. Bennett and Mr. O. E. Janson, both of whom have placed their collections at my service and given me many useful hints. I have also been helped with specimens or information by the following gentlemen, to whom I beg to tender my best thanks—Rev. W. C. Hey, Drs. P. Mason and D. Sharp, Messrs. H. Donisthorpe, E. G. Elliman, H. W. Ellis, H. Heasler, J. H. Keys and E. Saunders.

The New System of the Dermaptera.

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

Since referring in a previous number (*antè*, p. 96), to the unsatisfactory condition of the *Forficularia*, I have seen two remarkable papers by Verhoeff, in which an entirely new arrangement is adopted, and a variety of new characters used.

The first paper is entitled "Über Dermapteren, Aufsatz I, Versuch eines neuen, natürlicheren Systems auf vergleichend-morphologischer Grundlage und über den Mikrothorax der Insekten" (*Zoolog. Anzeiger*, no. 665, March 1902), the other is "Über Dermapteren, Aufsatz 2, Neue ungeflügelte Endermapteren-Gattungen" (*Sitzungs-Berichte der Gesellschaft Naturforschender Freunde*, Berlin, no. 1, 1901). In the first and more important, "Aufsatz," Dr. Verhoeff refers to the lack of naturalness in the existing system as set forth by de Bormans in his recent monograph, and discusses the unsatisfactory nature of the characters upon which this system is based. He then proceeds to erect an entirely new arrangement, based mainly upon the genital organs.

Earwigs, as a whole, are regarded as an order, *Dermaptera*, Brauer (1885), which is subdivided into two suborders, *Paradermaptera* and *Endermaptera*. The former includes the single family, *Apachyidae*, with the solitary genus *Apachys*, Serv. The suborder *Paradermaptera* is characterised by the form of the flattened pronotum, of the scutellum and elytra, the shape of the 10th abdominal segment, with the curious apical process with which is fused the pygidium, which he calls the "squamo-pygidium." And here we find characters which strike us as unfamiliar, for instance, pseudonotum, microthorax, parameres, and the vasa deferentia, penis, virga and prænuptial sacks.

which have not before been used in connection with the classification of carwigs. In the *Apachyidae*, the genitalia are in duplicate, that is, there are two vasa deferentia, two penes, prænuptial sacks, and virgæ; for the explanation in detail of the two latter terms, as also of parmeren, we are referred to the author's works upon the abdomen of the coleoptera, appearing in the *Archiv für Naturgeschichte*, 1894-1897, but the somewhat unfamiliar "microthorax" is explained in detail, and its form is discussed in connection with other orders in an appendix. The separation of *Apachys* is perfectly justifiable and will meet with approval from quarters where, doubtless, the other somewhat drastic changes may be less cordially received. The remaining genera, as the suborder *Endermaptera*, are divided again into two groups, *Diandria* and *Monandria*, according to whether the genitalia are duplicate, or whether one side is rudimentary or degenerate, and so single.

The *Monandria* contain three families; the first is entirely new, the *Karschiellidae*, with two new genera, *Karschiella* for *Pygidicrana bittneri*, Karsch, and *K. camerunensis*, Verhoeff, a new species, and *Bormansia*, with two new species, the whole being Ethiopian in distribution. None of these species are familiar to me, but they seem to resemble *Pygidicrana* in general appearance, but they are all nearly or entirely apterous; they are mainly characterised by the extremely thick antennæ with segments 4-6 very broad, and by the very robust first abdominal segment; lateral abdominal folds are absent; it is to be noted especially that the nymph of *Bormansia africana* has clearly segmented cerci, recalling *Diplatys*; very likely the curious genus *Anataelia*, Bolivar, from the Canary Islands, will fall within this family. The remaining families of the *Monandria* are the *Cheliduridae* and the *Forjiculidae*, the latter being used in a sense very different from that with which we are familiar. The *Cheliduridae* are divided into three genera, *Chelidura* auctorum, with *aptera*, Serv., and *pyrenaica*, Gèné, *Mesochelidura*, n., for only *bolivari*, Borm., and *Chelidurella* for *acanthopygia*, Gèné, and *mutica*, Krauss. The latter genus is distinguished by the outline of the abdomen, which is broadest in the middle and narrower at the apex, but the separation of *Mesochelidura* from *Chelidura*, *sensu stricto*, appears to be justified upon slenderer grounds, e.g.—

Chelidura; Zangen sehr weit von einander entfernt. Pygidium des ♂ ebenso wie die 10 Rückenplatte des Abdomens sehr breit, letztere mit schwachen Seitenhöckern. Pygidium von oben her nicht sichtbar, also nicht vorstehend, weil sehr flach. Subgenitalplatte des ♂ sehr breit. Zangen des ♀ hinter dem Grunde plötzlich verschmälert.

Mesochelidura. Zangen weit von einander entfernt. Pygidium des ♂ wenig breiter als lang, oben kantenartig deutlich vorragend und daher von oben sichtbar. 10 Tergit weniger breit, jederseits mit Höcker. Subgenitalplatt ebenfalls weniger breit. Zangen des ♀ sich allmählich verschmälern.

Both have the "abdomen des ♂ keulenformig."

This fine definition of new genera appears to me to be the weakest part of the new system, and we shall later find similar subtle distinctions made to bear as much, or more, weight.

Perhaps the greatest surprise of the paper, is the arrangement of the new family *Forjiculidae*, which is subdivided into seven subfamilies. The first is new, the *Nesogastrinae*, for *Nesogaster* and *Nesogastrella*, both new, each with one new species from the Oriental region. No illustrations are given, and it is difficult to form an idea of the

appearance of the insect from the mere descriptions, but they appear to be very distinct forms, characterised by the form of the antennal segments, and the thickened tibiae, especially of the anterior legs; the second subfamily is the *Ancistrogastrinae*, for the one genus *Ancistrogaster*: the third subfamily is *Spongiphorinae*, for the one genus *Spongiphora*: *Labia* is undoubtedly closely allied to *Spongiphora*, its position, however, is not examined, but postponed for a further notice. The fourth subfamily is a new one, the *Allodahliinae*, for the one new genus *Allodahlia*, erected for *Anechura hüggeli*, Dohrn, and *brachynota*, Haan; These two names are regarded by de Bormans, who in this is without question followed by authors, as synonyms of *A. macropyga*, Westwood, and *scabriuscula*, Serville; *Anechura coriacea*, Bormans, which is close to *A. scabriuscula*, Serville, will probably fall in this new genus. The fifth subfamily is the *Opisthocosmiinae*; here we have a new genus *Cosmiella*, erected for the species of *Opisthocosmia*, with rudimentary wings, *i.e.*, *dubia*, Bormans, *rebus*, Burr, and *aptera*, n. The sixth subfamily is the *Forficulinae*, which again is subdivided into four "tribes," *Chelisochini*, *Anechurini*, *Apterygidini* and *Forficulini*. The first includes the familiar *Chelisoche* and the new *Chelisocheila*, (why a diminutive termination for the largest species?) erected for the large species with metallic lustre. The *Anechurini* include the remaining species of the old genus *Anechura*, after the elimination of *A. macropyga* and *A. scabriuscula*, and also the new genus *Pseudochelidura*, in which he removes the remaining species of the old genus *Chelidura*, which do not fall into the new arrangement: so we have *Pseudochelidura sinuata*, Germ., *analis*, Ramb., *edentula*, Wollaston, *orsinii*, Gèné, and *rara*, Scudder. In the *Apterygidini*, he restores de Bormans suppressed genus *Sphingolabis* for "*corticina*, Dohrn" (a species entirely unknown to me), and *sansibarica*, Karsch; if this is restored for the large elongated African forms, it will include *mackinderi*, Burr and *huscinae*, Rehn, but the type of de Bormans genus is *furcifera*, Bormans, from which we cannot generically distinguish *bornensis*, Bormans, and *hawaiensis*, Bormans; either these Asiatic species must fall into Verhoeff's *Sphingolabis*, or else his arrangement must be altered. *Auchenomus* falls here also, and *Apterygida*, for *tanniata*, Dohrn, and *luteipennis*, Serville, but *A. media* Hagenb (= *albipennis*, Charp.), and *arachidis*, Versin, must be included in this genus, as the former is the type; the last genus of this tribe is the new one *Pterygida*, for *jagori*, Dohrn, and *circulata*, Dohrn. The tribe *Forficulini* has but one genus, *Forficula*, L. The last subfamily is the *Sparattinae*, which are moved up to a position near to *Forficula* in spite of the strongly flattened body, narrowed pronotum, and simple second tarsal segment, all of which would seem more naturally to remove it to a considerable distance. It includes also *Chaetospania* and a new genus *Sparattina*, for *flavicollis*, and probably *setulosa*, Burr, and *armata*, Burr, though he considers a new genus may be required for these. *Platyglabia*, which can be hardly discriminated from *Sparatta*, is not referred to.

We now come to the more primitive *Diandria*, in which the genital organs are fully developed in pairs, and not abortive on one side. Here he includes six families, namely, *Anisolabidae*, *Gnomolabidae*, *Isolabidae*, *Diplatygidae*, *Pygidicranidae* and *Labiduridae*. The first three of these families are entirely apterous and are dealt with in further

detail in the second paper quoted. The *Anisolabidae* contains *Anisolabis* and "perhaps *Brachylabis*"; considering the peculiar form of the antennæ, pronotum and abdomen, it seems likely that the latter genus will require a family for itself. The *Gonolabidae* contain *Gonolabis*, Burr, and *Gonolabina*, n., *kuhkatzi*, n., a new species and genus from Chili. The *Isolabidae* are a new family with three genera and four new species, all from Africa. They appear to resemble the *Anisolabidae*, but the head is much narrower anteriorly, the eyes are extremely large, the head has distinct impressions, the 2nd tarsal segment is larger, the lateral folds on the 3rd and 4th abdominal segments are very strongly developed, and the 10th segment is smaller than the 8th and 9th together, whereas in the *Anisolabidae* it is larger than these two together; the 10th tergite is distinctly emarginate posteriorly; the shape of the genital organs appears also to differ. The three new genera are *Isolabis* (*I. braueri*, n.), *Leptisolabis* (*usambarana* and *theoriae*, nn.) and *Ctenisolabis* (*toyoensis*).

In this second paper he refers again to the *Monandria* family *Cheliduridae*, which he here divides into two groups, *Chelidurinae*, for *Mesochelidura* and *Chelidurella*, and also *Isolabellidae*, for *Isolabella graeca*, a new genus and species from Greece, which make an interesting addition to the list of European earwigs.

The *Diplatyidae* follow in order, for *Diplatys*, *Nannopygia* and *Cylindrogaster*, three very closely allied genera; the distinction between the first and the latter is but small, and *Nannopygia* will almost certainly coincide with *Diplatys*. The next family is the *Pygidicranidae*, falling into two subfamilies, *Pygidicraninae* for *Pygidicrana* and *Tagalina*, and the *Pyragrinae*, for *Pyragra*, *Echinosoma* and probably *Echinopsalis*. The last family *Labiduridae*, calls for little remark, it includes *Labidura* and *Forcipula*, with, probably, *Psalis*.

There remain to be discussed, doubtless in some future paper, the genera *Labia*, *Neolobophora*, *Strongylopsalis*, *Carcinophora*, *Anataelia*, *Platylabia*, *Labidurodes* and *Meccmera*.

It has long been known that certain genera have very different genitalia from others; in the article dealing with earwigs in the *Cambridge Natural History*, i., p. 211, Dr. Sharp gives a figure from Dufour, showing the very different form of the ovaries in *Labidura* and in *Forcipula*, but no one has before made a comparative examination of nearly all the genera with a view to the establishment of a more natural system, and Dr. Verhoeff is to be congratulated upon the results of his preliminary publications; the distinction of certain of his new genera, e.g., *Sphingolabis* from *Apterygida*, *Cosmiella* from *Opisthocosmia*, appear to be somewhat arbitrary, and also the approximation of the *Sparattinae* to the *Forficulinae*, but when he further explains his "number of new characters and organs," and elaborates the new system which at present he has drawn up in outline, doubtless these points will be justified, though to one who is imbued with the old-fashioned arrangement they appear to be a little forced.

We are aware that Dr. Verhoeff has a third and fourth "*Aufsatz*" in the press, which will be discussed in due course, and a fifth is in preparation, dealing mainly with *Anisolabis* and its allies.

Unfortunately no figures are given, and from the descriptions alone, it is difficult to gather an idea of the general appearance of the insects in question. We hope that the author will shortly give

illustrations of the new characters and explanations in detail of the new terms used, so that the arrangement will be clearer and easier to understand. Although detail-figures are undoubtedly of the greatest importance, still when so many new genera are erected "Habitus-Bilder" would be very welcome. The new system has all the charms of novelty, but it will be easier to appreciate it at its true value when all the genera have been considered and the whole arrangement reduced to uniformity.

PRactical HINTS*.

Field Work for June.

By J. C. DOLLMAN.

1.—In late June carefully search seed-pod heads of cuckoo-flower, garden-rocket, etc., for larvæ of *Euchloë cardamines*. Examine those parts where the growth of seed-pods seems irregular, which will be owing to the feeding of the larva, and the latter will be found closely imitating the growth there.

2. In examining buckthorn for larvæ of *Gonepteryx rhamni*, place yourself so that the sunlight faces across the leaf, showing the shadowed side of the larva, when it is at once discovered. Otherwise it so exactly resembles the mid-rib along the centre of the leaf (where it rests) that many will escape notice.

3.—An umbrella is preferable to a tray in beating for *Zephyrus betulae*, as it can be fitted into the structural irregularities of the black-thorn more successfully.

4.—The low branches of oak, with thin growth of foliage, on isolated trees, will often prove the best to try for larvæ of *Zephyrus quercus*. Search the tray carefully, as the half-grown examples imitate the fallen bud sheaths exactly in colour.

5.—The larvæ of *Hylophila bicolorana* are most frequently found in thickly-grown, rich, green, oak foliage. It is best to rear each specimen separately, or the pupation of the earlier ones will be disturbed by those still feeding.

6.—Do not chase the imagines of *Nemophila russula* but mark them down and put the net over an insect, holding up the bag end of it. The specimen may thus be taken unbroken. The ♂ insects will often start from the low growth by half a dozen at the time; on such occasions search for the ♀.

7.—Be careful not to pass by the nest of *Lachneis laustris*, mistaking it for spider's web, which it closely resembles in the earlier stages of the larva.

8.—The young larvæ of *Malacosoma neustria* lie on the top of low hedges, sunning themselves, in a group. Before making any attempt at capture slip a net, cap, or sheet of stiff paper below the community, as on being disturbed, they immediately wriggle from their position with the activity of lizards, and drop to the ground.

9.—Beat the low boughs of ever-green oak for larvæ of *Asphalia diluta*, and, if found, keep industriously to the tree or trees. Also search leaves spun together. This larva is best fed separately, as it

* PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST, published last May, and already almost completely out of print, contains 1250 similar hints to these, distributed over every month in the year. Interleaved (for collector's own notes).—ED.

spins up in the food-plant. Separate rearing will be found the most successful treatment with all larvæ which have this habit. It is troublesome, but the results yield a harvest which will repay the exertion.

10.—If the larva of *Asphalia flavicornis* is lighted on, search the birch-tree or bush carefully, as it is often present in batches on the same growth.

11.—For setting small light-coloured Geometrid imagines, try a dark setting-board, preferably dark green. The correct placing of the wings can be arrived at much more easily than when a white ground is used, as their shape is sharply defined against the colour, even when seen through tracing paper.

12.—To kill delicate imagines, without producing *rigor*, try the following method. Place in the cyanide killing-bottle, and directly the insect is motionless, transfer to a glass pickle-bottle which has a wide mouth, with a large hollow-headed glass stopper. In the hollow head of the stopper have packed a closely rammed filling of bruised young laurel shoots. This is an excellent way of killing all insects, as they never stiffen, and will keep relaxed for days. It is most useful at sugar.

13.—If a breeding-cage in which pupæ are kept be of metal, like a wire-gauze meat safe, an excellent plan for keeping the pupæ just sufficiently damp will be found in having a double thickness of stout serge, or old flannel, which has been soaked in water and wrung half dry, tied round it. By this means the atmosphere is kept slightly damp, and provides as close an imitation of natural conditions as is possible. The damping and wringing of the cloth does not take more than a few moments, and can easily be done each day when the cage is examined. There is not the slightest chance of mildew occurring.

By PERCY C. REID, F.E.S.

14.—At the end of May or beginning of June, *Phaetrea menyanthidis*, *Arctomyseis myrica*, and *Hadena glauca* come to sugar, but one cannot always depend on a good "sugaring" night, and one often has an afternoon to spare, and (if on the Scotch moors) one may get them all three at rest on the rocks at the lower elevations, especially where the heather has been burnt within the last year or two, and is still small.

15.—From an elevation of 2500ft. and upwards *Pachnobia hyperborea (alpina)* and *Psodos coracina (trepidaria)* are flying from June 21st, onwards. *P. coracina (trepidaria)* flies freely if (which is not always the case) the sun is shining. *P. alpina* requires a night of hard cold work to secure. But all through June the pupæ of both can be easily obtained on the tops of hills of sufficient height, by turning over the moss and lichens which cover the ground, especially along the edges of foot- and sheep-paths, and round bare patches. *P. alpina* pupæ are hardly, however, to be got except in the "even" years, 1902, 1904, etc., while those of *P. coracina (trepidaria)*, though generally to be found, abound most in odd years, 1903, 1905, etc.

NOTES ON COLLECTING, Etc.

DISTRIBUTION OF *HEMARIS FUCIFORMIS* AND *H. TITYUS*.—If *Hemaris fuciformis* be the broad-bordered species, and *H. tityus (bombyliiformis)*,

the narrow-bordered, I venture to say that Lancashire, Cumberland, and Westmorland have never produced a specimen of *H. fuciformis*. In north Lancashire, Cumberland and Westmorland *H. tityus* is to be taken sparingly every season in suitable localities, but in over 30 years' wanderings and collecting in these counties, I have never seen, nor have I ever come across any collector who has ever seen, or taken *H. fuciformis*.—HERBERT MASSEY, F.E.S., Ivy Lea, Burnage, Didsbury. April 27th, 1902.

I have done my best to get information about the Hemarids recorded as *Hemaris fuciformis* from Scotland. The Paisley record (*autè*, p. 112) was accepted by the late Mr. Thomas Chapman in his MS. list, and the captor is doubtfully put down there as John Scott (*i.e.*, John Scott, the hemipterist, of Douglas). I am fully convinced that the late Mr. Chapman would not have accepted the record unless he felt sure about it. J. P. Duncan is also said to have taken both species in Ayrshire. The notes from Mr. Grimshaw and Mr. Service are interesting, Mr. Service's letter leaves no clear room for doubt that Lennon took both the species.—A. ADIE DALGLISH, F.E.S., 21, Princes Street, Pollokshields, Glasgow. May 1st, 1902.

We acquired Lennon's lepidoptera at the same time as his collection of beetles. In it there are four specimens of the narrow-bordered *Hemaris* (*i.e.*, *bombylififormis*, Esp. = *fuciformis*, Ochs.), but none of the broad-bordered or honeysuckle-feeder. There are no localities given with any of the specimens, so that I cannot give you any further information. Is it not probable that Lennon confused the two species? Mr. Service (of Maxwelltown, Dumfries) knew Lennon personally, and no doubt would know also where he obtained many of his moths.—PERCY A. GRIMSHAW, F.E.S., Science and Art Museum, Edinburgh. April 17th, 1902.

That my dear old friend Wm. Lennon took both species—*Hemaris bombylififormis* and *fuciformis*—there is no doubt, but he had only two rather worn and disreputable specimens of *fuciformis*. The former species he gave away freely as he did everything else. The two *fuciformis* I saw were taken at Castledykes, so far as my memory serves me. What became of them I know not, but probably they disappeared by natural decay. Very sorry I cannot give you any further information. Lennon collected most assiduously for over half a century, most of the time practically alone. Many of his haunts are gone—lochs drained, woodlands cut down, bogs reclaimed, the very spot where he told me he found *fuciformis*, once a beautiful flowery brae, is now covered with many acres of big trees.—ROBERT SERVICE, Maxwelltown, Dumfries. April 28th, 1902.

My memory is blank with regard to *Hemaris fuciformis* as a Scotch insect. We knew, however, *H. tityus* (*bombylififormis*) well, and, therefore, *H. fuciformis*. I know I held out against several of Duncan's things, until he proved his case up to the hilt, and I finally accepted his data, many of his insects having since been confirmed by others. I should think it highly probable that we actually saw Duncan's *H. fuciformis* before accepting it, and there is no doubt that his record must be accepted. That piece of Ayrshire coast produced a good many species that I then (with Lanarkshire and Argyleshire experience) had got to look upon as, and a few that really are, very southern

(comparatively) species.—T. A. CHAPMAN, Betula, Reigate. *May 3rd, 1902.*

Referring to your note (*antea*, p. 112), I have taken *Hemaris fuciformis* (broad-bordered) near Market Rasen, Lincs. It occurs in that district fairly commonly. I took the larvæ from honeysuckle on August 7th, 1899, and bred some nice specimens. I do not know if the narrow-bordered species occurs in Lincolnshire.—G. W. MASON, Barton-upon-Humber. *May 4th, 1902.*

SPHINGIDS AND ÆGERIIDIS TAKEN AROUND CARLISLE.—*AGRIUS CONVULVULI*.—One was brought to me on September 29th, 1901, having been found sitting on the grass by some children, near the Maryport and Carlisle Railway cottages, at Holme Head; it was a female, and the abdomen contained three ova. *THERETRA PORCELLUS*.—I took a fine specimen at Orton, at rest on grass, on June 8th, 1900. It was in splendid condition, I took another specimen at Carlisle at flowers of sweet rocket, on June 8th, 1901, it was also in very fine condition. *EUMORPHA ELPEGOR*.—Mr. J. HUNT, an old time collector, informs me he has taken one specimen of this insect at sugar in Peastree Wood, and has also frequently known it taken with the net at Cummersdale, at what, from his description, I understand to be flowers of the willow-herb. This was about twenty years ago. *SMERINTHUS OCELLATA*.—I took a fine female at rest on a fence at High Cummersdale, on June 3rd, 1901. I also find the larvæ very commonly every year on willow bushes, but more especially on crab-apple. In 1899 and 1900 it was exceptionally common. *AMORPHA POPULI*.—Although I have never taken the perfect insect myself, I have seen three taken at rest on a poplar trunk, at Carlisle. I take a good number of the larvæ each year on dwarf poplars and willows, and have also dug a good number of pupæ at foot of poplars during the last four or five years. My experience of digging for pupæ of this species is that, contrary to other species, they almost always occur on the south side of the trees. *SESIA STELLATARUM*.—I have taken two specimens of this species, one at Silloth, on July 19th, 1897, and one in the garden at my home, at wallflowers, in July, 1899. I have frequently noticed this insect flitting at flowers in various places around Carlisle, but have only been able to net the two mentioned above. *HEMARIS TITYUS* (narrow-bordered).—I took a fine specimen at Orton on June 28th, 1898. I also noticed seven or eight more flitting at flowers, but failed to net them. The only other specimen I have taken was a rubbed one at Orton, on July 17th, 1900. I have also noticed this species flying on the railway banks near Wreay, but owing to the steepness have always failed to net any there. *TROCHILUM BEMBECEIFORMIS*.—Although not a Sphingid, I may add that, whilst I have never taken an imago of this species, I took a larva from a willow-trunk in 1901, near Carlisle, which I unfortunately killed in extracting. At the present time I know of a willow-tree that is practically riddled with larvæ of this species.—J. E. THWAYTES, 8, Clement Place, Carlisle.

MANDUCA ATROPOS, L.—I captured a fine imago at Little Salkeld, at a bee-hive on June 1st, 1899; also a larva full-grown, but stung, on October 6th, 1900, from a potato field, Great Salkeld, another full-fed larva, October 14th, 1901, and one pupa and one larva just turning, October 16th, 1901. The last two both went down, the first emerged on November 18th. I heard of a lot of larvæ and pupæ having been seen

last season (1901) in the potato fields. *AMORPHA POPULI*, L.—Imagines, June 15th to 21st, 1898, a long series emerged in the breeding-cage; larvæ full-fed September 4th, 1898; imagines, May 30th, June 1st, 4th, 7th, 9th, 13th, 23rd and 28th, all emerged in the breeding-cage, 1899. Larvæ full-fed September 3rd, 1899. *SESIA STELLATARUM*, L.—Imago, April 21st, 1898, at flowers. Imago, June 4th, ♀ ovipositing on *Galium verum* on the roadside under a wall; by searching the plants carefully I got twenty ova, they began to hatch on the 11th, I have no record of the larvæ turning to pupæ, but they started to emerge on August 25th, and were all out by September 5th. The imagines swarmed in the end of May and beginning of June at azalea and rhododendron flowers in 1899. *HEMARIS TITYUS* (BOMBYLIFORMIS).—Imagines, June 10th to 22nd, 1897; June 16th and 19th, 1898, at Wan Fell, Great Salkeld. It visits the flowers of lousewort (*Pedicularis*).—HARRY BRITTON, Great Salkeld. *May 6th, 1902.*

CERURA BICUSPIS FROM TILGATE FOREST.—I have to record the emergence of a ♂ *Cerura bicuspis*, on May 15th, from a cocoon spun by a larva beaten from birch at Tilgate Forest, on September 13th, 1901.—J. C. DOLLMAN, Hove House, Newton Grove, Bedford Park, W. *May 16th, 1902.*

LOPHOPTERYX CARMELITA IN SOUTH OF SCOTLAND.—I was greatly surprised to find on April 19th last, that a female specimen of *Lophopteryx carmelita* had emerged in one of my breeding-pots, which contained pupæ, from larvæ collected in this locality during the last week in July, and first week in August, 1901. The larvæ were collected from birch and black Italian poplar. I knew that I had *Leiocampa dictaca*, *L. dictacoides*, *Notodonta dromedarius* and *N. ziczac*, among those larvæ, but never suspected that I had *Lophopteryx carmelita*.—J. C. HAGGART, Galashiels, N.B. *May 3rd, 1902.*

SPRING LEPIDOPTERA IN THE NORTH-EAST OF IRELAND.—The weather has been rather unfavourable owing to prevalence of east winds, but on the few favourable evenings at willows insects were fairly common. Near Belfast—*Taeniocampa stabilis*, *T. instabilis*, *T. gothica*, and *T. gracilis* were common, and two *T. opima*, with a sprinkling of hibernated *Calocampa retusta*, *C. exoleta*, *Scopelosoma satellitia* and *Cerastis racemii*. This week on the mountains near here *Pachnobia rubricosa* fairly swarmed at a few small willow bushes. By day *Vaessa io* has put in an appearance in considerable numbers, a surprise, as I have never observed this species in this district in the spring before.—T. GREER, Lisson, Cookstown, Co. Tyrone. *May 2nd, 1902.*

LEPIDOPTERA AT LYNDBURST.—On March 27th, I went to Lyndhurst to stay over Easter, and though the weather was cold and wet, did fairly well. The willows were out in full bloom in sheltered places and were very productive on two nights out of the five I spent there. *Panolis piniperda* was the most abundant of those insects taken, the common *Taeniocampa stabilis*, *T. instabilis*, *T. pulverulenta*, and *T. gothica* being as usual a nuisance, with a few *T. miniosa* and *T. munda*, whilst *T. gracilis* did not appear to be out; I also took four *Xyglina socia* (*petrificata*), two of which I have now alive, *Dasy-campa rubiginosa* ♂, and also *Xyglina rhizolita*, *Xylocampa lithoriza*, *Eupithecia abbreviata* was also common on some nights, *Tephrosia*

bistortata was much scarcer than usual, taken at rest on larch trees, *Lobophora lobulata* (one), *Anticlea badiata* and *A. derivata* (one) were also taken at rest. *Brephos parthenias* was seen, but only two worn ones were captured, and one *Pachygenomia hippocastanaria* and *Larentia multistriqaria*. We took a few ♂ *Amphidasys prodromaria* by sembling, our method being to tie crippled ♀s by a piece of fine cotton and then to tether them to a tree. (MAJOR) R. B. ROBERTSON, Forest View, Southborne Road, Bosecombe. May 2nd, 1902.

SCIENTIFIC NOTES AND OBSERVATIONS.

STRAY LEPIDOPTEROLOGICAL NOTES DURING 1901.—TILIACEA (XANTHIA) AURAGO.—Larvæ hatched, March 31st. These feed up on sycamore, in my experience, more rapidly and vigorously than on beech, and the former has the added advantage of being earlier in leaf. Larvæ full fed about May 8th, but lay as larvæ in their cocoons until about July 13th; emergence began August 4th, all the moths were of slightly greater wing expanse than the parent female.

CALOCAMPA EXOLETA.—Hybernated ♀, taken at sugar, April 9th; laid a number of ova after being kept in captivity for some weeks. All these proved infertile, however.

CYANIRIS ARGIOLOUS.—Pupæ that lay over from the summer of 1900, successfully emerged in April 1901.

PARARGE EGERIA.—A pupa from the first brood, 1900, also lay over, and produced a ♀ in May, 1901.

CYMATOPHORA RIDENS.—A moth, unindented, was seen to lay an egg on an oak-twig, about 9 p.m., May 3rd, by lantern-light, and subsequent searching next day revealed seven more ova, each egg being carefully jammed between a terminal twig and an unexpanded oak-bud. Eggs whitish when laid, soft and easily injured, beautifully reticulated with a raised net-work, scarlet towards hatching time. Ova hatched May 15th, and at an early stage discovered themselves as those of *C. ridens*. The moths emerged during April, 1902.

EUGONIA POLYCHLOROS.—This butterfly, as has been noted by others, was abundant about Dorking and Guildford after hybernation, and not rare at Reigate, where it is generally scarce, and where the freshly emerged butterflies were fairly common for a short period in July. Captured ♀s laid batches of ova when sleeved on sallow, and fed with syrup-soaked pieces of bark. On the whole, sallow-fed specimens were larger than elm-fed; although the reverse has been recorded where "willow" was the food-plant used.

SEZIA FUCIFORMIS (BROAD-BORDERED).—The only specimen I have ever seen here was captured flying on June 2nd.

AGROTIS CINEREA.—A very fresh ♂ of this species tapped for admittance on the window on the evening of June 6th.

CHÆROCAMPA PORCELLUS.—This species (both sexes) was attracted to a garden where early honeysuckle, white pinks, white tobacco and *Habenaria bifolia* were the more obvious inducements; nevertheless the flowers of *Vinca major* proved a surer draw than any of the others mentioned, which is interesting from its scentlessness (almost) to human senses. I have taken some of the Plusiids from the same blossoms, and other moths occasionally. *C. porcellus* appeared at early dusk from June 9th to 21st. A captured ♀ laid only one egg (June 13th), hatched 29th, full fed July 26th. Possibly a second pairing would

have occurred in nature, as the specimen was suspiciously fresh, and I have found a wasted specimen, on a previous occasion, to lay freely.

PLUSIA MONETA.—A cocoon of this species sent to me from a garden at Ewell, produced a moth on July 2nd, and three days later I netted a wasted male specimen at Reigate, from *Silene inflata*.

SMERINTHUS OCELLATA.—A few ova of this species were found by searching willow leaves, on June 13th, hatched two days later, full-fed about July 21st.

NEMEOBIUS LUCINA.—Ova laid by captured ♀, June 10th, hatched June 25th, one of the resulting pupæ, a ♀, produced a butterfly on August 22nd, the other pupæ hibernated as such.—R. M. PRIDEAUX, Reigate Hill, Surrey.

COLEOPTERA.

HYDROVATUS CLYPEALIS, SHARP, IN THE ISLE OF WIGHT.—I have much pleasure in recording a new locality for this very local and rare insect, it turned up (apparently in some numbers) near Sandown, on April 22nd and 23rd, and half an hour's work enabled me to secure a nice series and a few duplicates. It will be remembered that it was one of Mr. Moncreaff's captures; that gentleman found it abundantly near Portsmouth, but, as far as I know, except for one or two stray captures in the New Forest, it has never been found until now out of the Portsmouth district, and has not, apparently, been captured for many years. It is a pretty little insect and very distinct, so there is not much risk of its being passed over, its very short front legs render it a very troublesome insect to set neatly.—(PROFESSOR) T. HUDSON BEARE, F.E.S., 2, Heriot Row, Edinburgh. *May 6th, 1902.*

Hübner's "Tentamen."

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

Probably one of the most-abused and most-discussed publications that have to be considered by those who have tackled the question of the synonymy of the lepidoptera is Hübner's *Tentamen*. Possibly this resulted from two causes: (1) Its rarity, so few copies being available for reference when synonymy began to be considered under the present opposed methods. (2) The difficulty of fixing the date of its publication, which Scudder and others have since authoritatively settled was in 1806. Scudder, some years ago, reprinted the *Tentamen* from the copy in the Berlin Museum, we believe, and Scudder's reprint is in general use for reference, but even this is so rare, that workers at South Kensington are indebted to the courtesy of Sir George Hampson for reference to a written copy in his possession. It was, therefore, with much pleasure that I recently discovered, bound at the end of a copy of vol. iv. of Ochseneimer and Treitschke's *Die Schmetterlinge von Europa*, a set of which work I had purchased, an original copy of Hübner's *Tentamen*. Ochseneimer refers to the publication of the *Tentamen* in his preface to this volume of *Die Schmett. von Europa*, and, in the synonymic paragraphs, one finds unflinching reference to those species which Hübner has mentioned in his publication. With the idea of showing our readers Hübner's views of the classification of the lepidoptera as set forth in the *Tentamen*, we give a copy of the work, which, however, was issued as a quarto sheet. The columns are arranged exactly as in Hübner's paper.

TENTAMEN DETERMINATIONIS DIGESTIONIS ATQUE DENOMINATIONIS SINGULARUM
STIRPIUM LEPIDOPTERORUM, PERITIS AD INSPICIENDUM ET DIJUDICANDUM COM-
MUNICATUM, A JACOBO HÜBNER.

LEPIDOPTERA.

Phalanx I. PAPILIONES.

Tribus I: *Nymphales*.

I. Nerëides	Nerëis Polymania.	IV. Platypterices	Platypteryx Hamula.
II. Limnades	Limbus Chrysippus.	V. Echidnæ	Echidna Tau.
III. Lemoniades	Lemonias Maturna.	Tribus II: <i>Verae</i> .	
IV. Dryades	Dryas Paphia.	I. Herææ	Heræa Carpini.
V. Hamadryades	Hamadryas Jo.	II. Hipogymnæ	Hipogymna Morio.
VI. Najades	Najas Populi.	III. Leucomæ	Leucoma Anriflua.
VII. Potamides	Potamis Iris.	IV. Dasychiræ	Dasychira Pudibunda.
VIII. Oreades	Oreas Proserpina.	V. Melalophæ	Melalopha Curtula.
Tribus II: <i>Gentiles</i> .		VI. Hipocritæ	Hipocrita Jacobææ.
I. Rustici	Rusticus Argus.	VII. Hypercompæ	Hypercompe Caja.
II. Principes	Princeps Machaon.	VIII. Lachneides	Lachneis Catax.
III. Mancipia	Mancipium Brassicæ.	IX. Trichodæ	Trichoda Neustria.
IV. Consules	Consul Fabius.	X. Eutrichæ	Eutricha Quercifolia.
V. Urbani	Urbanus Malvæ.	XI. Heteromorphæ	Heteromorpha Cæru- leocephala.

Phalanx II. SPHINGES.

Tribus I: *Papilionoides*.

I. Zygæne	Zygena Filipendulæ.	I. Tereidines	Teredo Cossus.
II. Chrysaores	Chrysaor Statices.	II. Hepioli	Hepiolus Humuli.
III. Glaucopes	Glaucopis Phegea.	Phalanx IV. NOCTUÆ.	

Tribus II: *Hymenopteroides*.

I. Sphecomorphæ	Sphecomorpha Incen- diaria.	I. Apatelæ	Apatele Aceris.
II. Sesiæ	Sesia Culiciformis.	II. Diphtheræ	Diphthera Aprilina.
III. Thyrides	Thyris Pyralidi- formis.	III. Jaspidiæ	Jaspidia Spoliatricula.
Tribus III: <i>Legitimæ</i> .		Tribus II: <i>Genuinar</i> .	
I. Bombyliæ	Bombylia Stelia- tarum.	I. Miseliæ	Miselia Oxyacanthæ.
II. Eumorphæ	Eumorpha Elpenor.	II. Pyrophyllæ	Pyrophylla Pyrauidea.
III. Manducæ	Manduca Atropos.	III. Poliæ	Polia Flavicincta.
IV. Amorphæ	Amorpha Populi.	IV. Achatæ	Achatia Atriplicis.

Phalanx III. BOMBYCES.

Tribus I: *Sphingoides*.

I. Dimorphæ	Dimorpha Versi- coloria.	V. Graphiphoræ	Graphiphora Gothica.
II. Ptilodontes	Ptilodon Camelina.	VI. Agrotæ	Agrotis Segetis.
III. Andriæ	Andria Vinula.	VII. Glææ	Glææ Vaccinii.
		VIII. Xanthiæ	Xanthia Fulvago.
		IX. Cosmiæ	Cosmia Affinis.
		X. Bombyciæ	Bombycia Or.
		XI. Heliophilæ	Heliophila Pallens.
		XII. Xylenæ	Xylena Lythoxylea.
		XIII. Tribonophoræ	Tribonophora Umbra- tica.

- Tribus III: *Semigeometrae*.
- I. Plusiæ Plusia Chrysitis. II. Elophilæ Elophila Limnalis.
- II. Erotylæ Erotyla Sulphurea. III. Palpitæ Palpita Urticalis.
- III. Anthophilæ Antophila Purpurina. Tribus III: *Difformes*.
- IV. Heliothentes Heliothis Dipsacea. I. Idia Idia Bombycalis.
- V. Ascalaphæ Ascalapha Lunaris. II. Chlamiphoræ Chlamiphora Palliola.
- VI. Lemures Lemur Maura Phalanx VII. TORTRICES.
- VII. Blephara Blepharum Sponsa. Tribus I: *Lascivæ*.
- VIII. Brepha Brephos Parthenias. I. Hemerophilæ Hemerophila Pariana.
- IX. Euclidiæ Euclidia Glyphica. II. Olethrentæ Olethreutes Arcuana.
- Phalanx V. GEOMETRÆ. III. Archipes Archips Oporana.
- Tribus I: *Amplæ*. Tribus II: *Pigræ*.
- I. Hylææ Hylæa Fasciaria. I. Nyctola Nyctola Degenerana.
- II. Terpnæ Terpne Papilionaria. II. Pseudoipes Pseudoips Quercana.
- III. Eusarcæ Eusarca Elinguaria. III. Cochlidia Cochlidion Testudo.
- IV. Lars Lars Sambucaria. Phalanx VIII. TINEÆ.
- V. Eutrapelæ Eutrapela Lunaria. Tribus I: *Certæ*.
- VI. Erastriæ Erastria Amataria. I. Canephoræ Canephora Graminella.
- Tribus II: *Tenues*. II. Enyphantæ Enyphantes Gelatella.
- I. Cyclophoræ Cyclophora Pendularia. III. Brosees Brosis Granella.
- II. Spilotæ Spilote Grossulariata. IV. Setes Ses Pellionella.
- III. Sphæcodæ Sphæcodes Pusaria. Tribus II: *Incertæ*.
- IV. Chleuastæ Chleuastes Piniaria. I. Tetrachilæ Tetrachila Conchella.
- V. Sciadia Sciadion Furvata. II. Hyphantæ Hyphantes Evonymella.
- VI. Cymatophoræ Cymatophora Roboraria. Tribus III: *Mirabiles*.
- Tribus III: *Æquivocæ*. I. Elasmia Elasmion Geerella.
- I. Pachyes Pachys Prodromaria. II. Coleophoræ Coleophora Anati-pennella.
- II. Epirritæ Epirrita Dilutata. III. Phyllonoryctes Phyllonorycter Rajellata.
- III. Rheumapteræ Rheumaptera Hastata.
- IV. Hydriæ Hydria Undulata. Phalanx IX. LUCIDÆ.
- V. Petrophoræ Petrophora Mæniata. Tribus I: *Indubidatae*.
- Phalanx VI. PYRALIDES. I. Pterophoræ Pterophora Pentadactyla.
- Tribus I: *Geometriformes*. II. Ripidophoræ Ripidophora Hexadactyla.
- I. Erpyzones Erpyzon Barbalis.
- II. Salia Salia Salicalis.
- Tribus II: *Vulgares*.
- I. Heliacæ Heliaca Purpuralis.

Ne expectet quis, ordinem hunc nullam amplius correctionem, esse desideraturum verumtamen magis satisfaciet necessitati, quam præviis quivis. Familiis indicandis supersedere malui.

The Lepidoptera of Piedmont: Torre Pellice.

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

The historical associations of the Vaudois valleys will always attract many visitors, but so far as I know, next to nothing has been done entomologically by those who have visited the district. On paper, the Vaudois looks promising. It is situated considerably farther south than Susa, and is so far hilly in the lower parts abutting on the great plain of Piedmont, and mountainous as one gets further towards the French frontier, that one suspects there must be much wild ground eminently fitted for the haunts of many rare and local insects. Having found the mountains on the French side of Monte Viso fairly productive for lepidoptera, I determined to spend a short time on the Italian side among the same group of mountains, and accordingly arrived on July 30th, 1901, at Torre Pellice, the principal town of the district. Intending visitors will find the Hotel de l'Ours a very satisfactory stopping-place, but must be careful to make arrangements if staying *en pension*, as to wine, &c., or one will find himself saddled with extras not usual in the district. I may say at once that my visit, entomologically, was not a great success, due, evidently, to three facts: (1) The closely cultivated condition of the ground, leaving little in the shape of waste without long and tiring walks from Torre Pellice to reach any suitable collecting ground. (2) The time of my visit was much too late for the district. (3) I had no previous knowledge of the place, and, hence, had to do much more or less useless prospecting. For future visitors I would make the following suggestions. None of the recognised walks are of much use; that up the Valley of Angrogna is especially beautiful, but is much too highly cultivated, or too thickly covered with groves of chestnut or walnut for the greater part of its distance to be of much service entomologically, although here and there in the more open parts *Erebia athiops* was in large numbers, *Polygonia comma*, frequent, whilst *Brenthis selene*, *Melitaea phoebe*, *Chrysophanus phlaeas* and *Leucophasia sinapis* were common. *Polygonatus icarus* and *Dryas paphia* abounded, and, with the latter, var. *valesina*, whilst every head of *Eupatorium* was tenanted by newly-emerged *Callimorpha hera*, and frequently with *Argynnis lathonia* and *A. adippe* var. *cleodora*, and *Satyrus hermione* was commonly disturbed from the trunks of the chestnut trees. Strange to say, *Polyommatus corydon* was only just coming out, and only males were seen. The exploration of the higher parts above the Barricade and the Pra del Tor must be left to later visitors. Weather was against me the only time I made the attempt. I did not make the trip to Luserna and Rosa, for which I was afterwards sorry, as the landlord of the Hotel de l'Ours informed me later that it was really the wildest district within fairly easy reach of Torre Pellice, and, therefore, should have produced something. The low ground from Torre to Bobbie is worth one day's work, but one must keep one's eye open and explore all likely spots. I never have seen so many *Melitaea phoebe* as there were on August 2nd, on the curve of the road that one will find just beyond the hamlet of St. Marguerite (almost to be considered an outlying part of Torre). It had been wet the previous day, and the species simply swarmed on the road and the flowers at the roadside; one could easily have taken several hundreds had one so desired between here and Ricat in

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something over a mile. The stubbles on either side swarm with *Agrophila trabecalis*, *Cleodobia angustalis*, and other common species, whilst *Pyralis sticticalis*, *Phlyctenoides verticalis (einctalis)*, *Spilodes pulealis*, *Pyrausta purpuralis*, *Herbula cespitalis*, &c., were all noticed more or less abundantly. Fine examples of *Chryso-phanus phlaeas* ab. *eleus*, some of the males very dark, were everywhere, so also was *C. dorilis*, the females varying from dark to bright coppery, but most of the species observed were common. *Papilio machaon*, a single specimen only, *Gonepteryx rhamni*, just coming out, rich in ground colour, but no tendency whatever to develop the orange flush of *G. cleopatra*, *Colias edusa*, a few females only, *C. hyale*, males only, but both species in good condition, and, one suspected, only just appearing. *Leuco-phasisia sinapis*, dozens, some of the females quite pure white, and some males very large, *Pieris napi* and *P. rapae* in thousands, no *P. brassicae*, and only two or three *P. daphidice*. The Vanessids were strong—*Euran-essa antiopa* in lovely condition, *Pyranus cardui*, larvæ quite small to full-fed and newly-emerged imagoes, *P. atalanta* larvæ and imagoes, *Fanesca io*, just out, *Polygonia c-album* everywhere—wild hops abound in the hedges. It is strange to see this species in the early morning resting on the *Eupatorium* flowers, with the edges of its wings just touching the surface of the flower-head, reminding one of the way newly-emerged *Spilothyrus alceae* will rest, *Eugonia polychloros* one or two only, and no sign of *Aglais urticae*. Of the large fritillaries—*Dryas paphia* and var. *ralesina*, *Argynnis adippe* and var. *cleodora* and *A. lathonia* were common, but *A. adippe* worn and over. Mr. E. Harrison first, I think, recorded the fact that almost all the *A. adippe* of these valleys were of the *cleodora* form. All that I inspected (perhaps three or four dozen) were so except one specimen, a typically marked *A. adippe*. Single worn-out examples of *Melitava athalia* and *M. didyma* showed that these species were over, whilst the second brood of *Brenthis selene* was well out. The blues were most disappointing; *Plebeius argus*, *Polyommatus icarus*, *P. hylas*, *P. astrarche*, *P. corydon*, were the only common species, whilst a single *Cyaniris argiolus* on *Eupatorium*, near Villar, a single male *Polyommatus baton*, near Ricat, at water on the ground, and six large purple-black *P. orion*, between Torre Pellice and Villar, are all there appears to be to record. *Pamphila comma* was only just appearing, *Nisomiades tages*, a second brood, just out, abundant and in fine condition, but *P. sylvanus* and *Thymelicus thaumas* were in swarms, although quite worn out, *Syrichthus alceus* not uncommon at roadside puddles, a single *Spilothyrus malvarum*, and a worn *S. althaeae*, were all the skippers observed. *Hipparchia semele* was seen sparingly, near Villar, on *Eupatorium* flowers, *Enodia hyperanthus* was worn to shreds, *Satyrus hermione*, here and there on the tree trunks, *Melanargia galatea*, worn, *Epinephele ianira* and *E. tithonus*, were everywhere, so also was *Coenonympha pamphilus*, a worn *C. arcania* showed that this species also was over, *Pararge megera* rare, *P. maera* common on the stone walls. Cases of *Canephora unicolor* from which males had emerged, were found several times, empty cases of *Taleporia tubulosa*, *Fumica casta* and a *Luffia* with living larvæ were also observed frequently, the *Luffia*, however, only on one wet morning and on one restricted wall, a search later on a fine day was fruitless, *Bryophila muralis*, here and there on the walls between Torre and Villar. *Lasiocampa quercus* is strong here, males were flying at a tremendous pace from August 2nd-5th. In ground

colour they approach var. *sicula*, but the yellow band is normal and shows none of the specialisation that characterises the latter form. I need not add that *Callimorpha hera* was abundant everywhere on the *Eupatorium* flowers, and *Lithosia griseola* very frequent in similar places. Undoubtedly the best ground in the immediate vicinity of Torre is that on the right bank of the river. Cross the bridge (about five minutes' walk almost directly behind the hotel), and work through such open ground as can be found, and one can expect fair results. Here it is that *Neptis lucilla* lives, but one must come sooner. A worn one in the field to the right, directly after crossing the bridge, was the only one I saw that the storms of July 31st and August 1st had left, but no doubt it is common here a month earlier. In the same field, too, I took *Lycæna alcon*, whilst *Melitæa phoebe* and *Breuthis selene*, second brood, were very abundant there, and *M. athalia* two quite worn out and one very fresh, the latter almost suggesting a partial second brood but for its worn companions, *Breuthis dia*, one just emerged, also evidently the forerunner of a second brood, whilst worn *Coenonympha arcania* were very common. The southern fulvous form of *Pararge egeria* occurs here not uncommonly. The abundance of *Dryas paphia* and var. *valesina* is worthy of remark, as also is that of a fine large form of *Erebia aethiops*. One little corner not more than ten yards square, was covered with marjoram and *Eupatorium*, and the flowers of these seethed with insect life—perhaps a couple of dozen *D. paphia* and var. *valesina*, several *A. var. cleodora*, three or four dozens of *Callimorpha hera*, and double this number of *Erebia aethiops*, in the pink of condition, all kept busily on the move by an army of *Epinephele ianira*, *E. tithonus*, *McLanargia galatea*, *Chrysophanus phlæas* and *Polymmatius icarnus* was something to be remembered, but the greatest disturbance occurred when a busy *Colias edusa* got among them, and was apparently more startled than they. But these spots have to be found, one might work at Torre for a week and conclude there was nothing to be got there, if he simply waited for the insects to come to him instead of seeking them. Other species that occurred on the various journeys were *Anthrocera ochsenheimeri* and *A. loniceræ*, both nearly over, *A. carniolica* and *A. transalpina*, common locally, *Syntomis phegea*, occasional specimens here there and everywhere, larvæ of *Macrothylacia rubi*, crawling about the roads, *Acipitilia pentadactyla*, *Pterophorus monodactylus*, *Ematurga atomaria*, *Macaria notata*, *Timandra amataria*, *Acidalia ornata*, *Lithosia luridcola*, *L. pygmacola*, almost typical form, *Ebulca crocealis*, *E. verbascalis*, *Eunychia octomaculalis*, *Homocosoma sinuella*, *Crambus perlellus*, *Penthina sellana*, whilst, in one place, *Porthetria dispar*, sparingly distributed elsewhere, was exceedingly abundant, and here, among others, I captured a specimen flying in the usual mad male manner in the afternoon sunshine, which possessed many white female patches scattered over the wing, the unusual colouring making it most conspicuous.

Two new aberrations of *Noctua rubi*.

By S. WALKER, F.E.S.

1. Anterior wings rich chrome-yellow; some specimens with an orange tint on the costa; the stigma and transverse lines rather indistinct; the quadrate spot pale rosy, fringes yellow. Thorax and body yellow. Posterior wings greyish-yellow = ab. *flava*, n. ab.

2. Anterior wings dull buff, with stigma clearly outlined; transverse lines distinct; the quadrate spot reddish-brown. Posterior wings greyish-yellow; fringes paler = ab. *ochracea*, n. ab.

As no description of these aberrations appears to have been hitherto published, the above descriptions, together with the records of captured examples, and an account of breeding from ova obtained, with further notes on the subsequent pairing of the two forms themselves, and the results of emergence, may be worthy of notice.

Noctua rubi has been regarded as a species with a very limited amount of variation in this country. On the contrary continental varieties are known, for Mr. Tutt (*British Noctuae*, &c., ii., p. 124), quoting Guénée, says "it is very subject to variation," and again, "there is no fixity in its modifications." Whatever these continental variations actually are, the European series of this species existing in the South Kensington Museum collections discloses nothing whatever approaching the two yellow forms described above, which appear, so far as my enquiries go, to be confined to a district (Askham Bog) close to this city (York). The first record of ab. *flava* is in *British Noctuae*, vol. ii., p. 124. This specimen was a female (but I did not risk it for ova unfortunately, or results might have been obtained much earlier). Later come two other records which appear in the *Ent. Record*, both being taken on the same ground as my own specimen. The Allis collection in the Museum here, at York, contains one of the yellow forms, but there are no data attached, although presumably it would be an Askham specimen, where Allis did much work. A small collection formed by a Mr. Helstrip, in York, sold a few years ago, contained yet another example of the ab. *flava*, which I think is now in the collection of Mr. Maddison. Helstrip believes he took the specimen in Askham Bog. Last year in late June, the Rev. C. D. Ash netted a ♀ specimen on the same ground, but I forget which yellow form it is. She laid a number of eggs that resulted in every moth producing a typical *N. rubi*.

On June 27th I found two of the ab. *ochracea* together on a sugared thistle, and as it was a windy night I secured them with difficulty. Both turned out to be females, and I decided to keep one alive. During the first night she laid a good number of ova, which she increased in numbers the following night, the whole batch numbering 129. The ova hatched on July 23rd and 24th, and, being desirous of getting as many as possible through as a second brood, I kept the young larvæ at a fairly high temperature. However, the usual thing happened, a good proportion grew rapidly and reached the pupal stage, whilst the remainder resisted my efforts to push them on, and were still very small larvæ at the end of September, when I handed them over to Mr. Ash to hibernate, with what ultimate result we shall know in a short time. The first emergence was on September 8th, the specimen was hopelessly crippled on one side, but so differed from the parent, being of the richer chrome-yellow tint of the example of 1892, that it aroused special interest, as I had now evidence of the occurrence of two quite distinct yellow forms. Along with these the ab. (or var.) *quadrata* and typical *N. rubi* emerged. There is no need to give exact dates of the emergences which were spread over a long period, the last being on December 29th. I found when all were out that I had the following forms:—(1) Aberrations resembling the ♀ parent (the male of

course was unknown) nearly 25 per cent., (2) ab. *flava*, working out at about 14 per cent., the remainder being (3) ab. *quadrata* and (4) the usual second-brood form of the species in about equal proportions. The size of the specimens in almost every case was equal to those of the June brood, and, in some instances, the males were even larger, doubtless owing to an abundant supply of food. On September 12th a ♂ example of ab. *flava* having slightly rubbed its thorax in the cage, I decided to pair it if possible with one of its own form, should one emerge in time, but the next day a ♀ of the ochreous aberration appeared, and, fearing to miss a chance, although I should have preferred pairing it with an example of ab. *flava*, I kept this alive also in the same box. I noticed ova on the 16th and succeeding days, most of which hatched out on September 26th. Placing the young larvæ on dock and maintaining them at an ordinary room temperature, I was surprised after they had been feeding about a fortnight to find that a dozen were feeding more rapidly than the rest, and appeared likely, although then late in the year, to feed up. With this view I separated them from the rest, and, placing them in a warm position, with a liberal supply of fresh dock, they duly pupated during November. Of this third brood nine specimens ultimately came out, the first on December 8th, and the last on the 24th of that month (three dried up in pupa), with the result that all the nine followed in colour and markings either the male or female parent, not a single red specimen appeared. Three were of the male form, whilst six were of the darker yellow tint and had the markings of the female parent. By the success that attended the breeding of these two forms I appeared to get convincing proof of the existence of two very interesting and well-defined yellow aberrations of *Noctua rubi*. The remainder of the third brood larvæ have been successfully hibernated and are now in the pupal stage.

Migration and Dispersal of Insects: Diptera.

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

The actual records of the migration of diptera are very few indeed, and those that bear somewhat on the subject appear to refer rather to dispersal movements on a small scale than to definite migration. Wallace, however, notes (*Geog. Dist. Animals*, p. 32) a case in which a southerly wind brought flies in myriads to Admiral Smyth's ship in the Mediterranean when he was 100 miles distant from the coast of Africa? Scudder, too, made an observation on the movements of certain diptera, at Little Boar's Head, N.H. He states (*Psyche*, v., pp. 402-403) that, on the afternoon of July 27th, 1890, he was sitting on the shore there backed by a bank, when his attention was directed to the constant southward movement of small flies. There was practically no wind, but the flies moved swiftly in one direction for the space of two hours, forming a stream such as might readily pass through an open barrel. Their numbers varied, at times three or four would pass a given point every second, at other times hundreds, but, on the average, there were about as many in the given area as drops of rain in a smart shower, rarely one would be seen moving out of the stream, and then it was in a diametrically opposite direction, and just as swiftly. He adds that the direction was evidently influenced in part by the trend

of the low bluff at the base of which he was sitting, and that he did not go elsewhere to observe them. The stream was not more than three feet distant and only a few inches above the ground. The flies appeared to belong to a single species, as several were caught for identification, and proved to be a species of *Ilythea*, one of the *Ephydriidae*, and probably the European species *I. spilota* as that is the only one recorded from that part of the United States.

Douglas notes (*Ent. Mo. Mag.*, xviii., p. 142) that, in the *Shipping and Mercantile Gazette* of September 8th, 1880, there is the following statement: "The master of the schooner 'Topsy' informs us that at 10 a.m., on September 20th, while on a passage from Grimsby to London, the 'Topsy' became covered with swarms of flies, and so thick were they that the people on board were unable to remain on deck for five hours. There were millions upon millions of flies. The air became clear about 4 p.m., when the flies were thrown overboard by shovels full, and the remainder were washed off the decks by buckets of water and brooms." Interviewing the master of the "Topsy," Douglas said that he was informed that there was not the least exaggeration in the statement. The vessel was, at the time, sailing along the Norfolk coast, about a cable's length from the shore, the air was obscured by the flies as by a cloud, and they fell as thickly as snowflakes closely covering the rigging as well as the deck. Some of the specimens were given to Douglas who sent them to Meade. He reported that the examples were "females of *Dilopus vulgaris*, an exceedingly abundant species on sandhills, sometimes appearing in immense numbers or masses, in which the members of one sex usually greatly predominate over those of the other." He added that "some of the species of *Bibio*, to which *Dilopus* is closely allied, have the same habit."

Van Bemmelen records (*Handelingen Ned. Ent. Vereen.*, 1856, p. 96) that, in 1852, on a summer evening, a very large swarm of black flies, *Bibio*, flew rapidly past him near Warmond in South Holland, with a swift flight. It was blowing very strongly, and the observer's face and hands were covered with a quantity of the insects in a moment, but they disappeared immediately, and just as suddenly as they came, in pursuit of the troop before them. He further notes a great swarm of diptera, also supposed to be *Bibio*, which suddenly appeared in summer of 1854, outside the gates of Leiden, and which, he says, was brought by the wind. Further he notes (*antèd.*, p. 91) that, on July 13th, 1855, at 11 a.m., he was on the sea at a short distance from the shore at Noordwijk aan Zee when he saw an innumerable multitude of insects, coming flying over the sea, wildly and irregularly, at a considerable distance from each other. He distinguished among them *Pieris brassicae*, one or more species of sandwasps (*Sphex*), and certain flies, very like *Musca romitoria*, which flew with such amazing swiftness that when he returned to the shore it was impossible to catch them, and he was only able to knock down a sandwasp, and a fly, and even these escaped. As soon as the swarm had reached the dunes, they slackened their speed, some settled down, whilst others flew on. The flight was under observation for more than an hour, but as the observer could not stay longer on the beach he could not say how much longer it lasted. They flew from W.N.W. to E.N.E. The wind was W.N.W. and gentle.

Rowley observes (*Ent.*, vi., p. 143) that, on May 10th, 1872, the

Kemp Town end of Brighton was caught by a cloud of *Bibio marci*. These covered the pavements, windows, &c., in great numbers. They were not so numerous as was *Syrphus pyrastris* in August, 1864, but followed the same course.

Species of the genus *Syrphus* occasionally appear in vast swarms. Kirby and Spence note (*Introduction, &c.*, 7th ed., p. 295) that Curtis informs them that the aphidivorous flies, *Scara ribesii*, *S. pyrastris*, etc., like the ladybirds, at times, appear in myriads on the seacoast, all flying in one direction, and not even avoiding objects that lie in their path. Curtis himself observes (*Brit. Ent.*, fol. 509) that *Syrphus pyrastris* and *S. selenetica* sometimes appear in myriads on the seacoast, all flying in one direction and not even avoiding objects that lie in their path. He was informed that on July 30th, 1818, a very hot day, they quite covered the fishermen's boats at sea off Broadstairs; the next day was cloudy with several slight showers, when scarcely any were to be seen, the two days following were warm, and a few were observed flying about, but the next day they had entirely disappeared; on the 30th they were equally abundant at Ramsgate and at the Nore. In 1864, three species of Syrphids, *Syrphus pyrastris*, *S. arcuatus* and *S. balteatus* were reported as being exceedingly abundant on various parts of the south coast of England. Gibson records (*Ent.*, ii., p. 84) *S. pyrastris* as swarming in the Isle of Wight during the third week in August, hundreds of dead ones being observed on the 20th lying on the beach between Black-Gang and Atherfield. Seaman also records (*loc. cit.*) them from Northwood during the same week, as swarming everywhere, being found in great numbers on the seashore, and he notices that when on flight they appeared to travel from south to north. Walker notes (*Ent. Mo. Mag.*, i., pp. 136-140) that, "on August 13th, 1864, many thousands of *Syrphus arcuatus* were settled on Ryde Pier, and most of them were paired. Neither *S. pyrastris* nor *S. balteatus* occurred there, but, on the two following days, these species hovered in hundreds and thousands along the seashore near Cowes, and *S. balteatus* was more numerous than *S. pyrastris*. They mostly settled on the wet seaweed, to which they seemed to be very partial. *S. arcuatus* was less numerous, but occurred in greater abundance at a short distance from the shore, while the other two species preferred the sea-line. On the 16th, large numbers of *Syrphi* were passing through the air between Newport and Freshwater, and some of them became the prey of wasps. On the two following days, *S. pyrastris* appeared to be the most common species about Freshwater and Alum Bay. On the 19th and 20th the weather was cooler, and the *Syrphi* were numerous near Black-Gang Chine, in shrubberies and such like sheltered situations. During the following week at Ventnor, Shanklin, Sandown and Ryde, *S. pyrastris* and *S. balteatus* were scarce, but *S. arcuatus* was still tolerably common, and was accompanied by a few nearly allied species. Two individuals of *pyrastris* were of the variety *unicolor*." Walker then says: "It may be asked by what means the usual checks on the increase of the *Syrphus* race were diminished last year, and whether all the three species this year exceeded in numbers the excess of the average annual amount, and on what kinds of *Aphides* they were dependent. *S. pyrastris* prefers the so-called sycamore *Aphis*, which is limited to the maple, and does not belong to any of the migrating groups of *Aphides*. The flittings of the migratory *Aphides* are, I believe, very short, and are only voluntary in

very calm weather. In such weather, large swarms of the sycamore *Aphis* hover about the tree which it frequents, and the rising of the wind might sweep it away, and accumulate it in swarms at a distance from its native place. Last summer was very favourable to the sycamore *Aphis*, and its swarms are reported to have been as extraordinary as those of the *Syrphi*; and if the former was the only food of the latter, the usual numbers of them have been of no benefit to the crops." Again, in 1869, Horne observes (*loc. cit.*, iv., pp. 356-357) that, at Margate, a great number of Syrphids—*Syrphus balteatus*, *S. decorus*, *S. taeniatus*—as well as *Eristalis tenax*, arrived on August 24th, the wind then blowing from the east coast and the weather being very hot. The pier at Ramsgate on the same day was almost covered with them, and everyone said that they came from the channel. After that the wind was from inland, and, by September 9th, they had become quite scarce. The same observer notes that, some years previously, Mr. F. Smith saw the line of surf on the beach for miles at Bournemouth covered with the dead bodies of *Syrphus pyrastris*, so that they might have been taken up by shovels full, the insects having been drowned in the sea, and their remains thus cast ashore. The *Proceedings of the Ent. Soc. London* for November 15th, 1869, contain the following observations: "At Walton-on-the-Naze, on August 24th, Mr. Dunning fell in with a countless swarm of *Syrphi*, which appeared to have all hatched simultaneously, and to have at once commenced buzzing about in the hot sunshine in a foolish kind of way, without caring to take food, for most of them seemed to be mere shells without any substance inside. Noticing that Mr. Horne had recorded (*Entom.*, iv., p. 356) the occurrence of a swarm at Margate on the same day, which was said to have included specimens of *Syrphus balteatus*, *S. decorus*, *S. taeniatus*, *S. topiarius* and *Eristalis tenax* (?), Mr. Dunning placed in the hands of Mr. Verrall, for examination, a few remnants of the Walton swarm, and had been favoured with the following note: "Having looked closely through the diptera you sent me, I find that out of 56 or 57 specimens which I can recognise from the fragments, there are 27 *Syrphus ribesii*, sixteen *S. corollae*, eight *S. pyrastris*, two *S. luniger*, one *S. balteatus*, one or two *S. vitripennis* (?), and one *S. pyrastris* var. *unicolor*. This last variety is generally rare, but has this year appeared in tolerable abundance. Mr. Verrall added that *S. balteatus* was rare in swarms, *S. topiarius*, if British, was extremely rare, and did not occur in the collections of the British Museum or the Entomological club, and that, if *Eristalis tenax* occurred in a swarm of *Syrphidae*, it could only have got there accidentally as it might appear anywhere else from its universal distribution. He had once come upon the tail-end of a swarm of *Syrphidae*, and the stragglers seemed to be nearly all *S. auricollis* and its variety *maculicornis*. Rogers notes (*Zool.*, xxii., p. 9254) that *Syrphus pyrastris* was swarming at Freshwater from August 14th to 16th, 1869, in countless thousands; on the 15th they passed over Freshwater in an eastward direction in large masses. At other places they were seen continuously passing for six hours, and an orchard was completely covered; on the 17th at Freshwater Gate, the dead bodies of these flies formed a line on the cliffs more than four miles in length, *viz.*, from the Needles to the Monument; Colwell shore presented the same appearance, and millions were still flying there. At Yarmouth Bridge, when the rails were being painted, the rails were completely

covered with flies firmly fixed to the wet paint for a distance of 50 yards. The number of a mass of flies 50 yards wide, passing for six hours, seems almost incredible. Newman states (*loc. cit.*) that he was inundated at the time with notes on the subject. Smith observes (*loc. cit.*, p. 9273) that he saw *Syrphus pyrastris* in thousands at Bournemouth. On one of these days a line of dead flies extended from Poole Harbour to Christchurch Bay, a distance of not less than six miles; their numbers were really incredible. Symes observes (*loc. cit.*, p. 9273) that on August 16th, as he went to bathe a mile west of Bridport Harbour, he observed the flies (he calls them "bees") buzzing around him, and on swimming out about 100 yards he noticed them floating on all sides; on the same day his son, bathing about a mile to the east, observed a similar phenomenon, whilst a boat two miles out at sea was surrounded in like manner. There was a gentle breeze shifting from north to south, and a long drought had preceded the first day of their appearance. Many were noticed in gardens a mile and a half from Bridport on the 21st. Dutton observes (*loc. cit.*, p. 9333) that, in August, he noticed at Eastbourne many examples settling on flowers, but on August 18th while bathing about fifty yards from shore he passed through a line of them, dead and floating with the tide in an easterly direction; this line was about a foot in width and from the conformation of the coast at this part, possibly extended for many miles. A few days later on the shore near Seaford he saw a great number of the same insect which settled on any flowers at hand on the beach, and many on his own clothes whilst sitting down to rest.

In New Zealand the swarming of certain species of diptera have frequently been recorded, although, as to their actual migration little or nothing appears to be known, except in the case of a species of gnat known as *Culex argyropus*, which is generally accredited by the New Zealand entomologists with migrating habits. Smith observes (*Ent. Mo. Mag.*, xxvi., pp. 320-321) that, on September 19th, 1889, the *Lyttleton Times* describes a swarm as occurring about eighteen miles from Christchurch. It states that a train "passed through a wall of mosquitoes or midges, three-quarters of a mile in length, twenty feet high, and eighteen inches thick, whilst an entomologist at Ashburton records having observed swarms of less size. On January 15th, 1890, at Tinwald village (near the Ashburton river), the same observer noticed immense numbers of *Tipula novarae* in spiders' webs attached to trees and gorse hedges. Great numbers were flying about or moving slowly through the grass, whilst a considerable number were resting. This latter observation appears to us to point rather to an unusual local abundance than to a definite movement.

This large local abundance of Culicids is not confined to New Zealand and has been recorded from our own islands, although without any special reference to dispersal being noticed. Thus Haliday notes (*Zool.*, 1864, p. 8920), that *Culex pipiens* occurs at Holywood in Co. Down, "in multitudes, during the day among hedges on the seacoast, in the evening, in columns about the tops of trees, appearing like smoke at the distance of a furlong." Even in the London district such swarms are occasionally met, and Douglas describes (*Ent. Mo. Mag.*, xxxi., p. 239), how, in July 1895, for some ten days, Lewisham Road, in the South-east London

district was invaded by vast hordes of large Culices, the air thick with millions of them, at times charging in close column up the road like a squadron of cavalry, at other times engaged in dancing up and down after the manner of their race; whilst, at the same time, another species, possibly *C. detritus*, also already noted—Douglas says—as occurring in multitudes at Holywood by Haliday, are described by Douglas as “congregating in enormous swarms; at first appearing like a small black cloud curling about the ends of the branches, and soon, when the air is calm, rising in a dense column like smoke from a chimney for a distance of some 20 or 30 feet, the bulk gradually becoming more grey and attenuated until lost to sight in the upward progress. When a breeze is moving, the insects, always preserving close order, are blown out laterally, and after skirmishing with the wind, return to their cover among the top leaves of the tree. It is a wonderful sight.”

Sharp observes (*Insects*, ii., p. 467): “Swarms of various species of *Culicidae*, consisting sometimes of almost incalculable numbers of individuals occur in various parts of the world; one in New Zealand is recorded as having been three-quarters of a mile long, twenty feet high, and eighteen inches thick.” In *Insect Life*, i., p. 351, is a note to the effect that in the days just preceding March 28th, 1889, immense swarms of *Chironomus nigricans* appeared in that vicinity, coming from the Mississippi and forming in the air immense clouds, covering everything with which they came in contact. But Butler's description of “a mosquito night” in Dakota, in *The Great Lone Land*, gives one a most vivid idea of the movements of these insects in the warmer parts of America. He writes: “There came upon us dense swarms of mosquitoes, humming and buzzing along with us as we journeyed on, and covering our faces and heads with their sharp stinging bites. They seem to come with us, after us, and against us, from above and below in volumes that ever increased. As soon as the sun had dipped beneath the sea of verdure, an ominous sound caused me to gallop on with increasing haste. The pony seemed to know the significance of that sound much better than its rider. He no longer lagged, nor needed the spur or the whip to urge him to faster exertion, for darker and denser than on the previous night, there arose around us vast numbers of mosquitoes—choking masses of biting insects, no mere cloud, thicker and denser in one place than in another, but one huge wall of never-ending insects, filling nostrils, ears, and eyes. Where they came from I cannot tell; the prairie seemed too small to hold them, the air too limited to yield them space. I have seen many vast accumulations of insect life in lands old and new, but never anything that approached to this mountain of mosquitoes on the prairies of Dakota. To say that they covered the coat of that horse that I rode would be to give but a faint idea of their numbers; they were literally six or eight deep upon his skin, and with a single sweep of the hand one could crush myriads from his neck. Their hum seemed to be in all things around. To ride for it was the sole resource. Darkness came quickly down but the track knew no turn for seven miles. I kept the pony at a gallop, my face, neck, and hands, cut and bleeding. I took as but little time to rush over the gangway and seek safety from our pursuers within the precincts of the steamboat, but they were not to be baffled easily. They came in after us in millions, like Bishop Haddo's rats, they came in at all the windows and in at the doors, until in a very short space of time the interior of

the boat became perfectly black with insects. Attracted by the light they flocked into the saloon, covering walls and ceiling in one dark mass," &c. (*Ent.*, vi., pp. 310-312).

We may here observe that Van der Wulp records (*Herklots' Bouwstoffen*, i., p. 140 (1853), that *Chironomus lugubris*, Fries, (= *occultans*, Meig.), was to be seen by millions in March, 1852, in the ditches near the railway-station (? at Leyden) where the neighbourhood is generally under water in the winter, and in many places the water was black with the abundance of these midges. They cannot fly, but live on the surface of the water, over which they can glide with a quivering motion of their wings as if sailing, and meantime, their legs are stretched out motionless. From time to time they closely shut their wings, a movement that covers the abdomen like a roof, and then walk on the water just as another insect runs on a leaf. Out of the water they begin a more rapid pace, and run like small spiders swiftly in a circle very different from other species of *Chironomus*, which generally sit still, or walk forward slowly and clumsily. In the same magazine (*loc. cit.*, i., pp. 186-187 (1855)), is the following notice from Rijwijk, which was published in the *Handelsblad* of January 8th, 1855. Among the unusual phenomena of the present winter may be mentioned the innumerable multitude of black flies which have been found on the quay of the flooded land, living on the surface of the water, and which were brought by the south and southwest winds. They were not localised to a single spot, but extended as far as the length of the quay (for more than a quarter of an hour's walk), and, in several places, were equal to a palm in thickness. It was strange and wonderful to see them. The midges were apparently *Chironomus occultans*, Meig. (= *lugubris*, Fries). The preceding winter the same insect was found in innumerable multitudes on the flooded meadows in the neighbourhood of the Hague, and is probably always to be found in suitable localities in flooded districts in mild winters.

Sharp notes (*Insects*, ii., p. 505): "The species of the genus *Chlorops* are famous for the curious habit of entering human habitations in great swarms, many millions being frequently found in a single apartment. Instances of this habit have been recorded both in France and England, Cambridge being perhaps the place where the phenomenon is most persistently exhibited. In the year 1831, an enormous swarm of *Chlorops lineata* was found in the Provost's Lodge at King's College, and was recorded by Leonard Jenyns; in 1870, another swarm occurred in the same house if not in the same room. Of late years such swarms have occurred in certain apartments in the museums (which are not far from King's College), and always in the same apartments. No clue can be obtained whatever as to their origin; and the manner in which these flies are guided to a small area, in numbers that must be seen to be believed, is most mysterious. These swarms always occur in the autumn, and it has been suggested that the individuals are seeking winter-quarters." Attention may here be called to the peculiar swarming habit of *Atherix ibis* when ovipositing. For details see *Ent.*, xxii., p. 193, pl. vii., figs. 1-2.

Bearing on the question of the exportation of diptera into distant countries is an interesting paper by Osten-Sacken (*Trans. Ent. Soc. Lond.*, 1884, pp. 489 *et seq.*). He deals with the remarkable distribution of *Erystalis tenax*, its sudden appearance over a great area in

the United States in 1877, and makes an attempt to explain the same. He also deals with the importation of *Psilopus pallens* into America under most improbable circumstances; the importation of *Culex* into the Sandwich Islands, and lastly notices some of the remarkable peculiarities in the geographical distribution of *Syrphus pyrastris*, but this paper is rather outside our projected limits, and besides is easy of reference. We may, however, mention an interesting note on the introduction of *Eristalis tenax* and *Musca vomitoria* into New Zealand, which was published by Hudson (*Trans. New Zeal. Inst.*, xxii., p. 187), but much more important is that of Smith (*Ent. Mo. Mag.*, xxvi., pp. 240 *et seq.*) on *Eristalis tenax*, which, between 1888 and 1890, not only appeared in the country but spread in great numbers over the whole extent of the country on the east coast of the south island; he considers that its actual introduction was from the Pacific coast, and points out that the numerous intervening groups of islands would provide a ready means of dispersion if the necessary conditions for its larval stage existed in the islands, but he is inclined to suppose that it was imported direct by the mail steamers which ply monthly between San Francisco and Auckland. In 1894, Smith sent another communication (*loc. cit.*, xxx., pp. 54 *et seq.*) about the introduction of *Musca (Calliphora) vomitoria* and concludes that the transoceanic migration of nearly all the exotic diptera now flourishing in New Zealand has been accomplished artificially, and especially so by fast steamers during recent years. The genial climate of the islands with long summers and mild winters is extremely favourable to the habits and development of diptera from colder climes. It is possible that fresh immigrants of previously introduced species may continue to arrive especially if the fast steamers leave England or the ports of call during the summer months. The species here referred to as *M. vomitoria* is, according to Meade (*loc. cit.*, p. 136), *M. erythrocephala*, which is, in England, far commoner about houses and towns, whilst *M. vomitoria* is commoner in fields and country places.

The gradual extension of *Merodon equestris* in Britain is interesting. It was not known in Britain till a specimen was caught by Verrall at Denmark Hill, on June 8th, 1889, in a garden, where large quantities of Dutch bulbs were annually planted. Since then it has become abundant where the bulbs of *Narcissi* and allied plants are largely grown, and McLachlan (*Ent. Mo. Mag.*, xxxi., p. 114) notes that there is no doubt that *Merodon* is becoming more common than formerly owing to the large exportations of bulbs from the south of Europe. He states that a friend of his, a well-known horticulturist, never observed any signs of the ravages of the larvæ until after having purchased, in an unlucky moment, a bag of imported bulbs, since which time the species has caused considerable damage in his garden. The larva will feed on any kind of bulbs; recently it came under notice as destroying those of *Eurycles*, an Austalian genus. Bulbs of *Narcissus* (and probably of other plants) that have been attacked by the larva of *Merodon*, but not killed outright, are found next season to have divided themselves into a varying number of healthy smaller bulbs, so that to some extent, the attacks of a larva form a means of propagation.

The distribution of the Hessian fly (*Cecidomyia destructor*) during the last quarter of a century has been the subject of a whole library of

detailed facts and speculation which can be readily consulted by those interested in the subject.

A few weeks' entomologising in Spain (*with map*).

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

(*Concluded from p. 124*).

A few notes on some of the Heterocera may be of interest. We took several *Phryxus lirornica* on the wing in the forenoon at Tragacete, and an imago of *Hybicus pinastri* on a pine-trunk at Arcachon, the larvæ were frequent on pine at Tragacete and Bronchales. *Thaumtopoea pityocampa*, imagines taken at Arcachon and Tragacete; *T. herculeana*?, larvæ at Tragacete; *Eulepia grammica*, common everywhere, abundant at Bronchales; *E. cribrum*, one at Bronchales, reputed to swarm there some seasons; *Euthemonia russula*, Tragacete, &c.; *Callimorpha hera*, Cuenca, *Euchelia jacobaræ*, upper Jucar valley. *Lithosia complana*, Tragacete, &c.; *L. pygmacola*, Albarracin and Tragacete, small dark, and large pale forms; *Nudaria murina*, Tragacete, abundant at Albarracin; *Malacosoma castrensis*, imago frequent at Tragacete; *Albarracina korbi*, larvæ at Albarracin; *Orygia splendida*, frequent at Tragacete and Albarracin, *Oenogyne zoraida*, larva at Albarracin; *Dyspessa ulula*, Tragacete; *Adscita (Procris) geryon*, one specimen, Tragacete; *Anthrocera fausta*, Tragacete, Albarracin, abundant at Guadalaviar; *A. sarpedon*, Cuenca and Tragacete; *A. transalpina*, Tragacete; *A. loniceræ*, Cuenca and Tragacete; *A. achilleæ*, one worn, Tragacete; *A. trifolii*, Tragacete; *A. carniolica*, Tragacete and Cuenca, a large form, with the red spots confluent and involving nearly the whole wing; *Aglaope infasta*, Tragacete, common; *Egeria andreniformis*, Tragacete; *E. affinis*, Cuenca; *Catocala conversa*, Cuenca, Tragacete and Albarracin; *C. nymphæa*, Cuenca; *Triphaena fimbria*, Tragacete; *T. comes*, Tragacete; *T. orbona*, Tragacete; *Agrotis fimbriata*, Tragacete; *T. trunculenta*?, Tragacete; *Apopetes (Spintherops) spectrum*, Albarracin; *A. dilucida*, Tragacete and Albarracin, bred; *Mamestra chrysozona*, Tragacete; *Hadena ochroleuca*, Tragacete and Albarracin; *H. sublustris*, Tragacete; *H. scalis*, Tragacete; *Caradrina cubicularis*, Tragacete; *Cymatophora octogesima*, Albarracin; *Bryophila perla*, Albarracin; *B. muralis*, Madrid; *B. fraudatricula*, Cuenca; *B. raptricula*, Madrid; (*Clidia*) *chamaesyces*, larvæ abundant at Guadalaviar; *Plusia gamma* and *Rhizogramma detera*, Tragacete; *Erastria numerica*, Cuenca; *Thalpochares blandula*, Albarracin; *T. polygramma*, Cuenca and Albarracin; *T. ostrina*, Cuenca; *T. pura*, Cuenca.

I have handed the Geometers to Mr. Prout, amongst them is a specimen which he has not yet determined, taken at rest (with wings folded as in *Lophopteryx camelina*) on *Ephedra*, near the river at Albarracin, where arborescent vegetation existed. I am not at all sure that this may not prove to be a Notodont not very far from *Ithegmatophila*.

An odd specimen or two were picked up of the following Phycitids:—*Ephestia tephriella*, Cuenca; *E. clutella*, Tragacete; *Pterothrix rufella*, Cuenca and Tragacete; *Etiella zinckenella*, Tragacete; *Dioryctria splendidella*, Tragacete; *Alispa augustella*,

Albarracin; *Homocoscma nimbella*, Tragacete; *H. sinuella*, Cuenca; *Salebria semirubrella*, Tragacete; *Hypochalcia lignella*,? Cuenca.

The following Crambi were met with:—*Crambus pinetellus*, varying much in the degree of division of the white dash; *C. culmellus*, *inquinatellus*, *pratellus*, *falsellus*, *perlellus*, *saxonellus*, *craterellus*, *pascuellus*, *tristellus*. I appear to have brought home only two Scoparias, *S. crataegella* and *mercurella*, both from Cuenca.

The most abundant Pyrale was certainly *Pyrausta sanguinalis* which often swarmed. *Herbula cespitalis* was also common, *Pyrausta purpuralis* and *ostrinalis*, *obfuscalis*, *trinalis* and *flavalis*. The larvæ of *Botys repandalis* were common. *Noctuella floralis*, was common at Cuenca and at Tragacete; *Nymphula nymphacata* was abundant at Lago d'Uña, not seen elsewhere; *Pyralis farinalis*, Tragacete; *Evergatis politalis*, Tragacete; *Actaenia gadessalis*, Cuenca; *Pionca ferrugalis*, Albarracin and Cuenca; *institalis*, Cuenca and Albarracin; *fulralis*, Cuenca; *Odontia dentalis*, Tragacete and Albarracin; *Mecyna polygonalis*, Albarracin; *Metasia suppanlalis*, Cuenca; *Nomophila noctuella*, rather rare; *Cledeobia angustalis*, Tragacete and Albarracin; *moldarica*, Cuenca and Lago d'Uña.

Simarthis nemorana was met with at Cuenca, where also *Choreutes bjerkanvrella* swarmed, and was not rare at Tragacete. We neglected Tortrices shamefully, our list giving only eight species, viz., *Tortrix lafauryana*, Cuenca; *Conchylis lathoniana*, Albarracin; *respirantana*, Cuenca; *Grapholitha trimaculana* (?), *Sericoris lacunana*, Tragacete; *Penthina cynosbana*, *Phalonia lozoperoides* (Wlsm. MSS.); *Gypsonoma incunana* (?).

The plumes brought home appear to be:—*Oxyptilus distans*, Albarracin; *Cnemidophorus rhododactylus*, Tragacete; *Amblyptilia acanthodactylus*, Tragacete; *Alucita baliodactyla*, Tragacete and Cuenca; *A. tetradactyla*, this species was abundant almost everywhere; *Pterophorus monodactylus*, Tragacete and Cuenca; *Leioptilus ostcodactylus*, Tragacete; *Stenoptilia bipunctidactyla*, Tragacete.

Of the Tmeids one of the most abundant in the dry limestone region was *Butalis dissimilella*, a *Pleurota* with bright silver streaks was also common, this seems to be *honorella*, whether specimens varying to an absolute want of the silver streaks occur in the same species or not I do not know, nor can I separate them from some that appear to be *schlaegeriella*. Only one specimen of *Cerostoma trichonella* was taken at Albarracin, where also another species was bred from *Ephedra*, which is either *instabilella* or a new species. *Coleophora livella*, Tragacete; *C. fabriciella*, Tragacete; *C. fuscipunctella*, Tragacete; *Anesychia bipunctella*, Albarracin; *Dasycera olivella*, Albarracin; *Oecophora formosella*, Cuenca; *Symmoca signatella*, Arcachon; *Gelechia deurtella*, Tragacete; *G. hyoscyamella*, Albarracin; *G. scrivella*?, *G. terrella*?, Cuenca; *Depressaria nerrosa* larvæ were plentiful on *Carum verticillatum* at Tragacete, where also a smaller species was bred from leaves of *Oniscus*, &c.; *Glyphipteryx thrasonella*, Tragacete; *Gracilaria elongella*, Cuenca; *Phyllocnistis sorhagenella*, larvæ at Cuenca; *Nematosis fasciellus*, Tragacete.

VARIATION.

TÆNIOCAMPA PULVERULENTA AB. HAGGARTI, n. ab.—The form of *Taeniocampa pulverulenta* noticed by Mr. Haggart (*antèa*, pp. 130-131) is

quite new to me, and much darker than anything I have previously seen in this species. The following is a description of this form made from one of the examples which Mr. Haggart has kindly given me, and which I name *haggarti*.

TENIOCAMPA PULVERULENTA AB. HAGGARTI, n. ab.—♂ Anterior wings uniform dark brown; the costal edge narrowly yellowish the outline of the reniform, and orbicular, and the hindmarginal line yellowish, inclining to orange; the cilia distinctly divided into a dark basal area and a rather paler outer area by a longitudinal line. Posterior wings very dark grey, the basal area perhaps a little paler than the outer area; the cilia, grey intersected by a longitudinal line separating the inner and darker from the outer and paler part. Thorax almost of the tint of the forewings, but with a number of grey scales intermixed; the abdomen of the same dark grey colour as the hindwings. Galashiels. One example, March, 1901; three examples, March 27th, 1902. All four ♂ specimens on same willow bush.

It is to be hoped that Mr. Haggart will breed this form when opportunity offers. I was struck, on first looking at the specimen, by its superficial similarity in some aspects to one of the melanic forms of *Cleoceris viminalis* with which Mr. J. Harrison supplied our cabinets some years ago.—J. W. TUTT. May 7th, 1902.

ABERRATION OF ALEUCIS PICTARIA.—I have an aberration of *Aleucis pictaria*, taken here on April 19th last. The markings of the wings are the same as in the type, but the whole colour of the moth, which is usually of a smoky tint, is changed into buff. I should like to know if this form has been taken before.—(Miss) E. MILLER, The Croft, Rainsford Road, Chelmsford. May 23rd, 1902.

ABERRATION OF MANDUCA ATROPOS.—I also have a fine *Manduca atropos*, bred in the autumn of 1901, which has the outer band in the left hindwing very wide, and almost touching the inner band. The outer edge of the wing itself has two curves instead of one. It is quite a perfect moth and in no way crippled.—IBID.

NOTES ON LASIOCAMPA QUERCUS AND L. VAR. CALLUNÆ.—Is there any possible means of defining the differences said to exist between *L. quercus* and var. *callunæ*? I can find no real distinction except that of habitat, and I am inclined to think that this is the only one. I have read all the authorities to which I have access, and I have obtained the opinions of many correspondents as well as those of the members of the Birmingham Entomological Society. I have obtained the larvæ from various food-plants and different localities, and also imagines captured by means of "assembling" and otherwise. They have come from Jersey, Swanage, Starcross, Sutton Park near Birmingham, Cannock Chase, &c., and from larvæ found near Goole. Placing imagines from all these localities in a line with the so-called typical *L. quercus* at the top, and the well-marked var. *callunæ* at the bottom, one observes that a perfect gradation between the specimens, in spite of the difference between the extremes, exists, and one is quite unable to replace the specimens in their own sets again without reference to the labels. One finds from larvæ taken at the same time and place and from the same food-plant, both forms represented, and every rule that is laid down for their separation appears to fail when the specimens are critically examined. For example, if we consider the larvæ obtained in this district, we find that they usually hatch in August, they are then rarely to be seen till the middle of next April, when they may be found in some seasons freely by searching the heather, still in the second instar or just moulted into the third (easily seen in the latter stage). They are best obtained from 10 a.m. until

12 a.m., after which they are more difficult to find, crawling further down the heather stalks until 4 p.m., when they have gone down for the night. Taken home and transferred to whitethorn, which they eat readily, they will feed up on the new food, spinning in the latter part of May or in early June, the imagines appearing in July. Therefore, according to the rule that states that var. *callunae* goes over winter in the pupal stage, these must be *L. quercus*. Yet all my correspondents immediately refer them, on the imaginal facies, to var. *callunae*. It is also asserted that the ♀ *L. quercus* is pale yellow, var. *callunae* of a darker coloration, more nearly approaching the ♂, but I have a ♀ bred from a larva taken at Sutton in May, very nearly as dark as the ♂, yet this imago was the very first to emerge in the year in which I obtained the larvæ. To which form is this to be referred? Again, from a larva taken at the same time and place I bred a yellow ♀ admittedly of the tint of typical *L. quercus*. Larvæ from Cannock Chase produced pupæ that went over the winter in the pupal stage and produced very dark examples, which satisfy the usual conditions laid down for var. *callunae* in these respects, yet they altogether fail in the band, the yellow band of the hindwings not turning down, indeed, the bands are hardly visible. Again, I have taken larvæ on sallow between Dawlish and Starcross close to the sea, and the imagines therefrom appeared the same July, as they do here; the females, however, are more darkly banded than the admittedly typical *L. quercus*, though not much, yet here again, by the direction of the hindwing bands, the imagines should be var. *callunae*, for these turn more distinctly than any other imagines in my series. Having, therefore, reared larvæ taken on sallow, hawthorn, heather and bramble, and being unable to define the differences between the imagines except in the depth of the coloration, I am at a loss as to what really constitutes the vital differences between *L. quercus* and var. *callunae*. I may add that I have a dark ♀ bred from a larva found on a young ash some years since. It came out after a pupal period agreeing with that of *L. quercus*, in spite of its *callunae*-like coloration. I have taken larvæ on bramble as early as February and as late as September on heather, the latter fullfed, and these produced imagines in the next season. I have come to the conclusion that there is no real difference in the imagines of *L. quercus* and var. *callunae*, and am led to believe that such racial differences as there are, are due to habitat; at any rate, the breeding of both forms from our midland larvæ suggests that there is no real distinction between the forms.—J. T. FOUNTAIN, Birmingham. May 14th, 1902. [In *British Lepidoptera*, vol. iii., shortly to be issued, will be found an exhaustive summary of all the published facts to hand relating to *L. quercus* and its local races. The study of the racial peculiarities of this species offers possibly one of the very best lessons in the development of species that is to be found in our lepidopterous fauna, and there is no doubt that, when the various opposed facts are brought into comparison, our lepidopterists will get a step forward in understanding the phenomena presented by the variation of this interesting species.—Ed.]

COLEOPTERA.

THE COLEOPTERA OF THE VICTORIAN HISTORY OF CUMBERLAND.—
Mr. F. H. Day is responsible for the list of coleoptera of this county

in the Victorian series, and we do not hesitate to at once congratulate him and "the active though small band of resident collectors," who have already done so much to confirm the old records, and add largely to the number of species known to occur in Cumberland. Mr. Day estimates that about one-third of the species on the British list are now recorded from this county, and they are steadily adding to this number year by year; in 1900 alone, the list was increased by over 150 species by their zeal and industry. Some idea of the extent of these additions may be gathered by the perusal of the articles on Cumberland coleoptera in the *Ent. Record* for 1898, pp. 126-129, 1899, pp. 103-106, 1900, pp. 99-101, and 1902, pp. 76-80. Mr. Day expresses the opinion that close on 1700 species will ultimately be found in the county. In Mr. Morley's "Coleoptera of Suffolk," 1899, he gave the totals of species found in Norfolk and Suffolk as 1728 and 1763 respectively, so Cumberland need have no fear of being behindhand in this respect. The mountain species, as might be expected, are well represented, and, in fact, nothing appears to have been neglected that can help to swell the coleopterous fauna of this county. A few of the rarities taken lately may be briefly noticed, although we hardly think it necessary to refer to the old records, such as *Oberca oculata*, *Diaperis boleti*, *Lixus parraplecticus*, etc., preferring to wait till our Cumberland friends can retake and confirm such captures. One of the finest captures in this list is that of *Lebia cruce-minor*, taken by Mr. Day in a meadow near Carlisle, in 1899, this is just one of those instances which show what rare beetles will occur in new localities to the painstaking worker. *Bembidium schüppelli*, originally found in Cumberland, has been turned up again not uncommonly by our collectors. The rare *Aleochara ruficornis* has occurred on several occasions, and *Ancistronycha abdominalis* is found not rarely in the Gelt valley. *Hydrothassa hamorerana*, only previously recorded from Yorkshire and Hampshire, was taken in some numbers near Little Salkeld by Mr. Day. *Asemum striatum* is now recorded from Cumberland for the first time, and *Callidium violaceum* from Eskdale is its most northerly record up to now. *Pachyta cerambyceiformis* a species that used to be taken in this county (Barron Wood) by J. C. Heysham, some 70 years ago, has been taken by Messrs. Routledge and Murray in the Gelt valley. *Phyllodecta carifrons*, from near Carlisle, is not unworthy of notice. *Anthicus scoticus* occurring at Allonby is its only English locality at present known. Although not in this list we must here call attention to the capture since of *Sphaerites glabratus*, by Messrs. Britten and Day, near Great Salkeld (*Ent. Record*, 1901, p. 331), the only other record out of Scotland being a single specimen, taken at Wooler, in Northumberland. We think, however, enough has been said to show that this list was made as complete as possible at the time of its publication, and that the work of adding to it in the future is in the best of hands. We deplore the fact that there are no notes of habits, etc., to any of the species, as is the case with the other county lists in this series, but this we understand is not the fault of the compilers, but of the publishers.—HORACE DONISTHORPE, F.Z.S., 58, Kensington Mansions, S.W.

PROTECTIVE RESEMBLANCE IN BEETLES.—In my paper on "Cases of Protective Resemblance, Mimicry, etc., in the British Coleoptera," when

referring to Mr. Holland's capture of specimens of *Cleonus sulcirostris* of a reddish colour which were found on the red sands of Boar's Hill, I mentioned that I thought I had found a parallel case in *Limobius micetus* of which I had taken two specimens of a white colour among the white pebbles on the Chesil Beach, its normal colour when found amongst sand at Deal, etc., being yellow. I mentioned that further specimens were required to prove the case. These have now been taken by Mr. Forsyth, of Weymouth. I also stated my opinion that many such cases would be found when looked for. I see that Mr. Morley in the *Ent. Mo. Mag.*, 1896, p. 91, recorded a case in point of a *Hypera punctata* he captured in a sand-pit, its colour being the exact counterpart of its surroundings.—HORACE DONISTHORPE, F.Z.S., 58, Kensington Mansions, S.W.

COLEOPTERA OF GLAMORGANSHIRE.—Your reference (*antè*, p. 140), to the lack of Glamorganshire lists, leads me to say that I have been collecting material for one of the coleoptera for some years. I ceased to reside in the county two years ago, and am beginning to think of putting my notes together. I know of only one or two collectors who have recorded anything from the county. Perhaps a request in the *Ent. Record* for any records of Glamorganshire beetles will lead to a useful correspondence with other workers and to references to published notes. Of course there is Dillwyn's Swansea list to work on.—BROCKTON TOMLIN, F.E.S., 69, Liverpool Road, Chester. *May 16th*, 1902.

List of Species, Varieties, and Aberrations of Lepidoptera so far only recorded from the British Islands.

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

T. TENIOCAMPA MUNDA AB. *PALLIDA*, TUTT.—A pale greyish-white form. *T. AB. STRIATA*, TUTT.—With black longitudinal lines.

T. INCERTA AB. (ET VAR.) *CERULESCENS*, TUTT.—Of a pale slaty- or bluish-grey tint. *T. AB. ATRA*, TUTT.—An extreme melanic form. *T. AB. RUFÆ*, TUTT.—Unicolorous bright red; Lancashire.

T. OPIMA ABS. *BRUNNEA*, TUTT, AND *UNICOLOR*, TUTT.—Extreme melanic forms only recorded from Britain. *T. AB. GRISEA*, TUTT.—Extreme pale greyish-white forms with the usual markings almost obsolete.

T. GRACILIS AB. *ROSEA*, TUTT.—A rare aberration in England, commoner in Scotland and Ireland. *T. ABS. (ET VAR.) RUFESCENS*, CKLL. and *BRUNNEA*, TUTT.—Extremely dark forms, recorded, at present, from only some three or four localities in Britain.

T. POPULETI AB. *OBSOLETA*, TUTT.—Pale-grey with obsolete markings. *T. AB. NIGRA*, TUTT.—Another extreme melanic form.

T. GOTHICA AB. *PALLIDA*, TUTT.—Pale whitish-grey form. *T. AB. RUFÆ*, TUTT.—Bright red form culminating in ab. *brunnea*, which is deep red-brown in colour. *T. AB. PALLIDA*, TUTT.—Pale stone-grey in tint.

T. PULVERULENTA AB. *PALLIDA*, TUTT.—Pale greyish- or ochreous-white form. *T. AB. RUFÆ*, TUTT.—The bright red form of the species. *T. AB. HAGGARTI*, TUTT.—Melanic form from Galashiels.

T. MINIOSA AB. *VIRGATA*, TUTT.—Pale greenish-grey with red central band. *T. AB. PALLIDA*, TUTT.—Pale ochreous-grey, unicolorous.

DYSCHORISTA SUSPECTA AB. *NIGRESCENS*, TUTT.—An extreme melanic form, blackish-red, almost unicolorous. *D.* AB. *RUFA*, TUTT.—Unicolorous bright red.

D. *FISSIPUNCTA* AB. *VARIEGATA*, TUTT.—A rare variegated form occasionally taken in Kent with the type. *D.* AB. *NIGRESCENS*, TUTT.—A rare melanochroic form of the species somewhat widely distributed.

ORTHOZIA LOTA AB. *PALLIDA*, TUTT.—Whitish-grey form. *O.* AB. *SUFFUSA*, TUTT.—A melanic form only recorded as yet from Sligo. *O.* AB. *RUFA*, TUTT.—A red form of the species widely distributed with the type.

O. *MACILENTA* AB. *STRAMINEA*, TUTT.—A pale straw-coloured form occasionally taken with the redder type.

ANCHOCELIS PISTACINA AB. *BRUNNEA*, TUTT.—An extreme brown form, sometimes unicolorous.

A. *LUNOSA* AB. *OBSOLETA*, TUTT.—Pale reddish-ochreous form without pale nervures. *A.* AB. *BRUNNEA*, TUTT.—A dark red-brown form with pale nervures.

A. *LITURA* VAR. (ET AB.) *RUFA*, TUTT.—The dark purplish coloration of the forewings of the northern type is in this form bright reddish-brown in colour.

DASYCAMPA RUBIGINEA AB. *UNICOLOR*, TUTT.—Unicolorous reddish-brown.

HOPORINA CROCEAGO AB. (ET VAR.) *LATERITIA*, RAYNOR.—Dull red-brown, very local form.

TILIACEA CITRAGO AB. (ET VAR.) *AURANTIA*, TUTT.—Ground colour orange-yellow.

MELLINIA GILVAGO AB. (ET VAR.) *SUFFUSA*, TUTT.—A somewhat melanic form much suffused in the middle of wings.

PLASTENIS RETUSA AB. *GRACILIS*, HAW.—A red-brown form occurring with the type.

CALYMNIA TRAPEZINA AB. (ET VAR.) *RUFA*, TUTT.—Deep red, sometimes dusted with black scales. *C.* AB. *NIGRA*, TUTT.—A rare aberration deep blackish-grey in colour.

DIANTHÆCIA CARPOPHAGA AB. (ET VAR.) *PALLIDA*, TUTT.—A white form confined to chalk districts.

D. *CONSPERSA* VAR. *OCHEREA*, GREGSON.—The ordinary white marks ochreous; replaces the type in Orkneys, Shetland, Cornwall and Devon. *D.* VAR. *OBLITERÆ*, ROBSON (HETHLANDICA, STIGR.).—The extreme dark Shetland form.

D. *CÆSIA* VAR. *MANANI*, GREGSON.—A suffused race peculiar to the Isle of Man and Irish coast.

POLIA CHI AB. (ET VAR.) *OLIVACEA*, STEPHS.—Green-grey form peculiar to the north of England and southern Scotland. *P.* AB. (ET VAR.) *SUFFUSA*, ROBSON.—Suffused form peculiar to west Yorkshire. *P.* AB. (ET VAR.) *NIGRESCENS*, TUTT.—An extreme melanic form only recorded from the Huddersfield district.

P. *XANTHOMISTA* VAR. *STATICES*, GREGSON.—A very marked race from Cornwall and the Isle of Man.

CLEOCERIS VIMINALIS AB. (ET VAR.) *OBSCURA*, STIGR., AND AB. *UNICOLOR*, TUTT.—Very marked melanic race from the northern counties of England.

EPUNDA LUTULENTA VAR. *ALBIDILINEA*, TUTT.—A race confined to the Orkney Islands.

BRYOPHILA MURALIS VAR. *IMPAR*, WARREN.—A distinct inland race occurring in Cambridge. *B. AB. (ET VAR.) OBSCURA*, TUTT.—A dark brown-grey form occurring as a local race in some localities, but as an aberration with other forms in others.

MISELIA OXYACANTHE AB. CAPUCINA, MILL.—One of the most specialised purely British melanic forms, generally distributed with the type.

APLECTA NEBULOSA VAR. (ET AB.) *PALLIDA*, TUTT.—White with nearly obsolete markings; from Glasgow district. *A. AB. ROBSONI*, COLLINS.—A beautiful melanic form quite glossy black, only recorded from Warrington.

A. ADVENA AB. (ET VAR.) UNICOLOR, TUTT.—An unicolorous form.

HADENA PROTEA AB. (ET VAR.) VARIEGATA, TUTT.—Paler and more variegated than the usual forms.

H. PISI VAR. *SCOTICA*, TUTT.—Purplish-brown instead of red; a most marked race.

H. THALASSINA AB. HUMERALIS, HAW.—A grey form found in the south-eastern counties of England.

XYLINA CONFORMIS VAR. *SUFFUSA*, TUTT.—The deep violet-grey melanic form from Wales and the western coast.

X. SOCIA AB. (ET VAR.) RUFESCENS, TUTT.—From the southwest of England and south of Ireland.

CALOCAMPA VETUSTA VAR. *SUFFUSA*, TUTT.—Northern form—chiefly Scotch.

LITHOMIA SOLIDAGINIS VAR. *SUFFUSA*, TUTT.—Dark ashy-grey form from Aberdeen.

ANARTA MYRTILLI VAR. *RUFESCENS*, TUTT.—The usual red form in the south of England.

CATOCALA NUPTA AB. CERULESCENS, CKLL.—One of the most remarkable purely British forms, the red hindwings being changed to purplish-blue.

DELTOIDES.—*HYPENA ROSTRALIS AB. UNICOLOR*, TUTT.—Unicolorous greyish-fuscous.

NOTODONTIDES.—*NOTODONTA DROMEDIARIUS* VAR. (ET AB.) *PERFUSCA*, WHITE.—Smaller and darker; northern counties of England and Scotland.

STAUROPIUS FAGI AB. OBSCURA, TUTT.—Suffused form, locally almost as common as the type.

ARCTIIDES (*antè* p. 114).—*SPILOSOMA MENTHASTRI* VAR. *SCOTICA*, WHITE.—The ground colour ochreous not white.

CYMATOPHORIDES.—*CYMATOPHORA* OR VAR. *SCOTICA*, TUTT.—Pale form peculiar to Scotland.

C. DUPLARIS VAR. (ET AB.) *ARGENTEA*, TUTT.—A silvery white form, most frequently met with in Ireland. *C. VAR. OBSCURATA*, TUTT.—A melanic form confined to the northern counties of England and Scotland.

ASPHALIA DILUTA AB. NUBILATA, ROBSON AND GARDNER.—Suffused form from Yorkshire.

A. FLAVICORNIS VAR. *GALEANUS*, TUTT.—The pale yellow-green form, typical in the south of England.

A. RIDENS AB. INTERRUPTA, TUTT.—The band broken; occurs with the type.

(To be continued.)

PRACTICAL HINTS*.

Field Work for July.

By J. C. DOLLMAN.

1.—Ova of *Euthemonia russula*, obtained early, will produce a second brood in captivity, if fed up well upon living plants of broad-leaved plantain. Set the plants in earth in a good-sized box and keep in the sun with a cover of muslin stretched on a frame lying on the top. The ♀ oviposits freely in a chip-box.

2.—To give the "Emeralds" a favourable chance of preserving their colour while being killed, place them in the cyanide bottle until moribund, and then stab in the thorax between the second and third pair of legs with a steel mapping pen which has been dipped in a saturated solution of oxalic acid. The solution must be a saturated one, to kill. Drop the crystals into boiling water until no more will dissolve; pour off the liquid, and if, when cold, it precipitates any crystals, it is a saturated solution.

3.—Those who have tender skins should be wary of handling the cocoons of *Lasiocampa quercus*. The stinging power of these can be beaten by no living larvæ.

4.—In taking *Dryas paphia* and *Limnitis sibylla* with the net in the New Forest, it will be found, upon trial, that a useful proceeding is to wait until the end of the afternoon, when the setting sun shining through the tree-stems lights up the bramble bushes along the borders of the rides. These insects are then to be seen gently hovering and flitting from leaf to leaf, making capture so easy that selection can be exercised.

5.—If *Zephyrus quercus* be required, make a small hoop and net six inches in diameter, which will take the place of the top joint on a fishing-rod. The matter then resolves into the question of selecting your tree. This insect is extremely fond of flying around and sunning itself on ash as well as oak. Wait until it settles and sweep it off the leaf.

6.—*Hadena trifolii* ♀s will deposit ova without trouble in chip-boxes, and the young larvæ can be reared well, and quickly, on knot-grass.

7.—*Cucullia umbratica* has a remarkable talent for imitating a knot, or flaw, on a grey paling.

8.—*Pamphila comma* is restricted locally to particular spots on the South Downs. These are generally sunny and windy slopes. If one be found, keep to the place for a close examination in sunlight. The insect sits at rest during cloudy intervals.

9.—*Timandra amataria* will nearly always yield ova if boxed with a piece of dock, and the larvæ can be readily reared airtight on that plant.

10.—The larva of *Euclidia mi* can be swept from long grass by day. It is a long tapering larva, greyish or drab in tint, with two fine white subdorsal stripes. It has but two pairs of abdominal prolegs, and moves with a pseudo-geometrid action. It can be reared on couch-grass, or trefoil, but is very liable to be stung by ichneumons.

* PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST, published last May, and already almost completely out of print, contains 1250 similar hints to these, distributed over every month in the year. Interleaved (for collector's own notes).—Ed.

11.—*Geometra vernaria* can be taken between five and seven p.m. on *Clematis vitalbata*. It is at this time that the species emerges, and can be readily seen if present.

12.—If there is nothing you want on a tree when sugaring do not disturb the moths that are on the sugar. Even *Noctua xanthographa* and *Triphaena pronuba* will give confidence to more timid insects to come in spite of their greediness.

13.—Show no hesitation with the "Crimsons" at sugar, but get the bottle under them quickly and quietly, and keep the lamp from flashing on the bottle. *Catocala promissa* is sometimes particularly skittish, and it is best to let the light disc from the lamp only just include it, so that the bottle is in darkness up to the last instant.

14.—A favourable time to take the Lycanids is just before sunset on a fine day, when they can be boxed from the long grass or herbage upon which they have settled for the night. It is a good plan to pay particular attention to those patches of growth which catch the last rays of the departing sun.

15.—Where trees, by the roadside, in residential localities, are infected with *Cossus ligniperda*, the imago is quite as likely to be found drying off on the garden palings as on the trees. The larva, travelling to construct the pupal cocoon, will often enter the ground under the weather-boarding of a wooden fence.

16.—The larvæ of *Apatela aceris* may be found by standing under a young sycamore tree, and looking up at the undersides of the leaves, where larvæ can be seen at rest in a half-coiled position.

By J. C. HAGGART.

17.—Search the trunks of larch trees in Scotland in the afternoon, for the imagines of *Cleora glabraria*. At the same time the imagines of *Ellopia prosopiarva* (*fasciaria*) can be obtained by searching the base of Scotch fir-trees.

18.—About the beginning of July the full-fed larvæ of *Panolis piniperda* are to be beaten from the young Scotch fir-trees, sometimes in great numbers.

19.—Towards the end of July, the larvæ of *Craniophora ligustri* are to be found by standing underneath young ash-trees and looking up among the leaves, when the larvæ can be readily distinguished, stretched at full length along the midrib of the leaf; they feed up quickly and are not difficult to rear.

20.—Towards the end of July, by sugaring the posts of wire-fences which cross moors, *Mamestra furva* is attracted sometimes in considerable numbers together with *Noctua festiva*, *Characas graminis*, *N. umbrosa*, &c.

21.—By searching juniper bushes in July, with a lantern after dark, the imagines of *Eupithecia sobrinata* can be freely taken; the full-fed larvæ can be beaten in great numbers in early June.

22.—When sugaring in woods in July a careful watch should be made for specimens of *Triphaena subsequa*, which may be amongst the *T. comes* which come to sugar.

23.—In July the flowers of wood-sage are a great attraction to the imagines of *Agrotis lucerneæ*; the dusk of the evening is the best time to find them.

24.—I find the flowers of the common rush a great attraction to

the Noctuids in July, they are easily taken by searching with a light after dark.

SCIENTIFIC NOTES AND OBSERVATIONS.

SUCCESSFUL REARING OF *AMORPHA POPULI* ♂ AND *SMERINTHUS OCELLATA* ♀.—Later I propose publishing a full description, with figures, of an imago reared from a crossing of *Amorpha populi* ♂ with *Smerinthus ocellata* ♀, the reciprocal cross to *S. hybr. hybridus*, Stephs.,* so at present I merely propose stating the following bare facts leading up to the successful rearing of the same. In the year 1900, I obtained, between May 19th and June 16th, pairings between *Amorpha populi* ♂ and *Smerinthus ocellata* ♀, which remained together some twenty hours, *i.e.*, the normal copulation period of these species. A single pairing thereof, May 19th to 20th, 1900, yielded on June 4th, one properly developed larva, which came to grief through an unfortunate accident. Larvæ developed in several hundreds of eggs of this cross, but most of them only to a certain point, then they died without making an attempt to break through the shells. In the year 1901, I repeated the attempt, and obtained between May 20th and June 28th, eighteen pairings between *A. populi* ♂ and *S. ocellata* ♀. One pairing May 21st to 22nd, yielded, on June 7th, in all, six larvæ, all six monstrosities, which died off without taking any food. A pairing on June 25th to 26th yielded eighteen larvæ, thirteen of which, like the early six, were monstrosities and died without taking food. Five of the larvæ, however, fed normally (among them one, which, to a limited extent was a monstrosity). Of these five larvæ two pupated normally. On March 20th, 1902, one moth emerged, and the second on May 11th. The moths are nearer *Amorpha populi* than those resulting from the pairing of *S. ocellata* ♂ and *populi* ♀, but yet show unmistakable indications of the eye-spot of *S. ocellata*. For these experiments in the crossing of *Amorpha populi* ♂ and *Smerinthus ocellata* ♀, several thousand, mostly dug, pupæ were used.—(Dr.) M. STAUDFUSS, Zürich. May 17th. 1902.

CLASSIFICATION OF THE GRACILARIIDES.—Dr. Chapman, in a recent paper read before the South London Entomological Society, discussed the affinities of the "Gracilarian cohort," or, as we should term it, the superfamily GRACILARIIDES. His conclusions are summarised as follows:—

A. Superfamily: GRACILARIIDES.

Fam. 1: GRACILARIIDE.—Larva with Gracilarian trophi in first two or more stages. Pupa incomplete, 1-4 abdominal segments fixed.

Subfam. 1: GRACILARIINE.—First two larval stages Gracilarian.

Genus 1: *Gracilaria*.

Genus 2: *Coriscium (cuculipennellum)*.

Genus 3: *Ornix*.

Subfam. 2: LITHOCOLLETINE.—First three or more larval stages Gracilarian; 6 or 7 larval instars.

Genus 1: *Lithocolletis* (European group).

* We have already, in *British Lepidoptera* vol. iii., p. 390, named this cross *Amorpha hybr. inversa* (= *populi* ♂ × *ocellata* ♀), and have suggested that we have considerable doubt whether all the individuals recorded as belonging thereto had really this parentage. It is, therefore, with great pleasure that we received from Dr. Staudfuss a note to the effect that he had at last been successful in rearing this form.—Ed.

Genus 2: *Cameraria* (type *guttijinitella*).

Genus 3: *Leucanthiza* (*ostensackenella*, Fitch).

Genus 4: *Acrocercops* (type *brongiardellum*).

Subfam. 3: PHYLLOCNISTINÆ.—Three Gracilarian larval stages and one modified normal stage; 4 larval instars.

Genus 1: *Phyllocnistis*.

Fam. II: PHYLLOBROSTIDÆ.—Pupa does not leave puparium, but segments 5 and 6 free (also 7 in ♂). Larva normal (?).

Subfam. 1: PHYLLOBROSTINÆ.

Genus 1: *Phyllobrostis*.

Fam. III: LYONETHIDÆ.—Pupa immobile, fusion of parts feeble. Larva normal.

Subfam. 1: LEUCOPTERINÆ.—Pupa with appendages shorter than abdomen.

Genus 1: *Leucoptera* (*Cemistoma*).

Subfam. 2: LYONETHINÆ.—Appendages reach end of pupa, weakly fused.

Genus 1: *Lyonetia*.

Subfam. 3: BEDELLINÆ.—Appendages to end of pupa rather firmly fused.

Genus 1: *Bedellia*.

Of the genera usually placed among the Gracilarias, but having no real affinity thereto, Chapman instances *Bucculatrix* and *Tischeria*, neither of which is Gracilarian, and must be removed therefrom; neither have these genera any affinity *inter se*; both are more generalised than the Gracilarias, both in the larval and pupal stages. *Tischeria*, which is placed with the TINEÆ-ACULEATÆ by Spuler, is not an Aculeate, for it has no piercing ovipositor, nor has it spiculated wing-membrane. Among other genera not placed for want of knowledge of their earlier stages are *Oinophila*, *Opostega*, *Oenecrostoma*, *Palumbina* and *Oporogona*. Doubt, however, is expressed as to any of these being Gracilariids.—J. W. TUTT.

NOTES ON COLLECTING, Etc.

SPRINGIDS OF CUMBERLAND.—*MANDUCA ATROPOS*.—Imagines have been taken as follows—One in 1892; one, 1895; one, 1897; one, 1898; unfortunately I have no exact dates, all from Carlisle. *AGRIUS CONVULVULI*.—One, Maryport August 31st, 1897; one August 27th, 1897, at Carlisle. *HIPPOTION CELERIO*.—One, formerly in Mr. J. B. Hodgkinson's collection. Mr. Swainson, of Maryport, has one which he took himself in 1892. *SMERINTHUS OCELLATA*.—Taken in the Carlisle district, May 6th, 18th, 25th, 26th, 1898. *AMORPHA POPULI*.—Taken in the Carlisle district—June 19th, 1888; May 13th, 1889; June 19th, 1890; July 12th; May 17th and 20th, 1896; April 21st, 1898.—G. WILKINSON, 55, Trinity Buildings, Carlisle. May 8th, 1902.

KEEPING THE LARVÆ OF PHORODESMA SMARAGDARIA DURING THE WINTER.—I am so often asked how to keep the larvæ of this insect safely during the hibernation period, that it may be of general interest to publish a short note upon my experience, which has now covered a good many seasons. I have almost invariably found that the larvæ die if the attempt is made to keep them indoors during the winter, although this is, I find, contrary to the experience of several of my friends. When turned loose upon the food-plant, generally speaking, all disappear before spring, but when "bagged" out-of-doors, these difficulties disappear. The only question is what foodplant to select for winter-quarters. *Artemisia maritima* and *A. absinthium*, &c., die

down to the ground, and do not afford stems on which to place the bags. So I select southernwood, of which suitable branches are abundant, and have the great advantage of affording some, if little, foliage during the winter months, when protected by the bag. In this way I successfully hibernate every larva without loss. I will not give statistics, but have satisfied myself that this spring I have found in my bags, a few more individuals than I counted into them in the autumn.—(REV.) C. R. N. BURROWS, Mucking Vicarage. *May 3rd, 1902.*

SESIA STELLATARUM IN APRIL.—A worn specimen of *Sesia stellatarum* was observed at flowers of *Arabis* on April 16th, 1902, at Reigate.—R. M. PRIDEAUX, Reigate Hill. *May 12th, 1902.*

HIPPOTION CELERIO IN THE ISLE OF MAN.—Several specimens of *Hippotion celerio* were again seen on the evening of May 25th, hovering over flowers of *Silene maritima* on the Douglas coast.—H. SHORTRIDGE CLARKE, F.E.S., Douglas, Isle of Man. *May 31st, 1902.*

AGRIUS CONVULVULI AT BOXWORTH.—I took the larvæ of *Agrius convulvuli* here from August 19th to September 4th, 1901, nearly fullfed. These pupated in due course but only two emerged—forced. I captured imagines, however, at tobacco plants from September 23rd to October 1st.—E. H. THORNHILL, Boxworth, Cambridge. *May 23rd, 1902.*

PRESERVING RARE INSECTS.—I have a *tiny* wood and rough piece of ground, in which I am growing plants and trees in a perfectly wild state that belong to this country, and I want to make it a habitat of a few rare or uncommon indigenous creatures, moths, butterflies, beetles, spiders, or anything—especially anything that is likely to become exterminated. I am putting in *Helix pomatia* and *Cyclostoma elegans*. The soil is on chalk and very dry. I would plant there any tree or plant as food. Can you (or any of the readers of the *Record*) suggest one or two likely creatures, especially in the way of insects, which would be likely to succeed? If so, I should be greatly obliged. It is almost too small to hope to get any particular kind of bird or mammal.—(REV.) H. A. SOAMES, The Hawthorns, Otford, Kent. *May 15th, 1902.* [We know that many of our readers have tried similar experiments. Perhaps they will communicate with Mr. Soames.]

ABUNDANCE OF LARVÆ OF NUBARIA MUNDANA.—Seen more commonly than usual this spring in dry weather under (and just before rain, moving on the upper surface of the) stones of Oolitic freestone dry walls (built without mortar, hence, called “dry walling”) of our Cotteswold hills. I saw from between 30 and 40 of these larvæ singly on walls near here within half an hour the other evening. They are not easily seen unless looked for, as their protective colours resemble the lichen-blotches so numerous on the weathered surfaces of our local limestones. Mr. W. B. Davis of Stroud remarks of this species (in his excellent local list sent to me): “I have generally beaten these larvæ from blackthorn and also observed them on stone-walls.”—C. J. WATKINS, F.E.S., Kingsmill House, Painswick, Gloucestershire. *June 6th, 1902.*

CURRENT NOTES.

At the Royal Society's Conversazione at Burlington House, held on May 14th, some of the exhibits of interest were:—Mr. F. Enock,

F.L.S.—Living specimens of Oviparous parasites (*Mymaridae*), together with larvæ and pupæ, in the eggs of *Liburnia* (Froghoppers). Recent research into the economy and life-history of these microscopic insects, shows that they are most fastidious in their choice and identity of their "host eggs," one species of *Alaptus* ovipositing in the eggs of a certain species of *Psocus*, while the delicate *Anagri* make diligent search for the minute eggs of some of the Froghoppers. Examples of eggs of *Liburnia* were shown containing from one to six *Anagri* in an advanced state of development. (2) Lieut.-Colonel Bruce, F.R.S.—*Trypanosoma theileri*—a new species of parasite, discovered in the blood of cattle in South Africa. This new *Trypanosoma* was lately discovered by Dr. A. Theiler, who is in charge of the Bacteriological Laboratory of the Medical Officer of Health, Pretoria, Transvaal. The species can be at once distinguished from the *Trypanosomas* of Surra, Tse-tse Fly Disease, or Rat by its larger size, it being almost twice as large as any of the others. In general appearance it conforms closely to the others in possessing an oval protoplasmic body, a longitudinal fin-like membrane, and a single flagellum. It only infects cattle. Horses, dogs, goats, rabbits, and guinea-pigs are all immune, neither showing symptoms nor the presence of the parasites in the blood. (3) Mr. J. Everett Dutton, M.B., on behalf of the School of Tropical medicine, Liverpool.—Specimen of a *Trypanosoma* found in the blood of man. The *Trypanosoma* was first discovered in the blood of a European in Government employ at Bathurst, West Africa. The presence of the parasite was associated with symptoms closely resembling those occurring in animals suffering from tsetse fly disease. The parasite was again found in a preparation of blood taken from a native child at Bathurst. We noticed, among other entomologists present at the *Conversazione*, Messrs. A. J. Chitty, W. L. Distant, H. St. J. K. Donisthorpe, H. Druce, H. J. Elwes, H. Goss, R. McLachlan, H. Rowland-Brown, C. O. Waterhouse, Professors Meldola and Poulton and the Rev. Canon Fowler.

A meeting of the Entomological Club was held at 58, Kensington Mansions, on May 5th, Mr. H. St. J. K. Donisthorpe being the host, the guests being received by Mr. and Mrs. Donisthorpe. Among the guests present were Messrs. R. Adkin, F. Bouskell, M. Burr, H. Rowland-Brown, A. J. Chitty, J. Collin, T. W. Hall, W. J. Kaye, G. T. Porritt, G. H. Verrall, E. A. Waterhouse, and Colonel E. Swinhoe. After tea and coffee had been served the members adjourned to Mr. Donisthorpe's museum, where the host's collection of British coleoptera was inspected, and his system of labelling duly appreciated. His observation nest of *Formica rufa*, in which the life-history of *Clythra quadripunctata* has been worked out, attracted much attention. Mr. A. J. Chitty exhibited specimens of *Elmis violaceus* from Scotland, also *Dytiscus circumflexus*, etc. Supper was served at 9 p.m., and one was strongly reminded of the olden times when these meetings were so thoroughly enjoyed by an earlier generation of members. Altogether one of the pleasantest meetings that have been held, was the eulogy passed on it by the guests.

Messrs. Scudder and Cockerell give us a *First List of the Orthoptera of New Mexico*, in the *Proceedings of the Davenport Academy of Sciences, Davenport, Iowa, 1902*, vol. ix. In an interesting preface the authors discuss the geographical distribution within New Mexico, considering the life-zones and discontinuous distribution, also the food-plants;

seven species are considered as endemic, of which six are apterous or subapterous forms of *Melanoplus*. The fauna of New Mexico and that of New England are compared in some detail; there are thirty-two genera common to both, with eighty-seven genera found in New Mexico, and fifty-four that occur in New England but not in New Mexico. Of the species, New England has a hundred and one unknown in New Mexico, which in turn has two hundred and thirty not occurring in New England; twenty-two species are common to both. Only two earwigs are recorded to New Mexico, namely *Spongiphora brunneipennis*, Serv., and *Apterygida taciata*, Dohrn; there are only eight cockroaches and one is new. There are four *Mantodea*, but six *Phasmatodea*, two of which are new. *Acridioidea* are more numerous, and several new species and two new genera are described. There are thirty-two *Locustodea*, of which six are new; and only thirteen crickets, of which one is new; three good plates illustrate the novelties.

Dr. K. W. Verhoeff, in the *Sitzungs-berichten der Gesellschaft naturforschender Freunde*, Berlin, 1902, No 4, discusses the question of the systematic position of *Hemimerus*. This much-debated genus was originally placed by Walker among the Mole Crickets! whilst de Saussure, deceived by a bad preparation, gave it a separate order under the name *Diploglossata*, but later authors have considered it as a sort of detached appendix of the *Forficularia*. As such it was regarded by Dr. Sharp in the "Cambridge Natural History," and by Krauss in *das Tierreich*. It possesses considerable affinities with the *Blattodea* and Verhoeff regards it as a sort of intermediate form between earwigs and cockroaches, being more closely allied to the former. He finally places it as a suborder of the *Dermaptera* under the name *Dermodermaptera*, characterised by the following points:—Head broader posteriorly than anteriorly; eyes absent; tibiae very compressed, almost triangular; "microthoraxsternit" without "Vorplatte," ultimate segments of parameres asymmetrical; interior copulative organs consisting of one penis and two prænuptial sacks; cerci not developed into forceps, rod-like, hairy; vasa deferentia ("samenwege") meeting the prænuptial sacks posteriorly instead of anteriorly; viviparous birth and parasitic habits.

The *Thirty-second Annual Report of the Entomological Society of Ontario*,* 1901, has just been received, and, as usual, is full of excellent and useful reading. The President has chosen for his annual address—"The importance of entomological studies to the community at large." Some parts of this are rather too clerical for a scientific address. Dr. Fletcher has a short address on "The value of nature-study and education." Papers of quite general interest, apart from some of the more important Economic papers, are "The trend of insect diffusion in North America," by F. M. Webster; "The painted lady butterfly," by J. Fletcher; "The North American fall webworms" (with plate), by H. H. Lyman, a stupid title for a first-class paper on *Hyphantria cunea* and *H. texator*, and one that should be referred to by all those who are at work on the variation of our *Spilosomas*, especially as to variation in spotting. "Nature-study lessons on mosquitoes," by W. Lockhead, is useful as showing how general information on entomological subjects is gradually reaching the masses. Dr. Fletcher's suggestion of an "Entomological Record" for the year is good. It is an extension of our own idea of an annual "Retrospect"

*Published by L. K. Cameron, Toronto, 1902.

as crystallising captures made, work done, and publications to be placed in the entomologist's library. A photograph of the late Miss Ormerod and a sympathetic review of her work may be noticed. Mr. Moffat's note on *Anosia archippus*, entitled "*Anosia archippus* does not hibernate," is interesting. He eliminates the idea of the species hibernating in the true sense, and shows that the habits of this species are, indeed, very similar to those of *Pyrameis cardui* in southern Europe, the species being preserved in the warm parts of the southern United States, not by definite hibernation, but by a process of continued activity, flying when the weather is suitable, and ready for the duties of parentage with the first advent of the necessary vegetation in spring. Altogether a most interesting and instructive volume.

Cassell and Co. are publishing, in 7d. parts, a work on *The Butterflies and Moths of Europe*, with 54 coloured plates. The text is by Mr. W. F. Kirby, F.L.S. The first four parts, all that have yet been issued, are very satisfactory, and, as the work will include all the European butterflies, it is likely to have a wide circulation. Plate iii is, in our opinion, especially well executed; most of the plates, however, are really good, and the letterpress, of course, accurate. Our only objection is that there is not enough of it.

*Aide-Mémoire du Cecidiologue pour les Plantes d'Europe et du Bassin de la Méditerranée**, is the title of this little booklet of 68 pages. It certainly contains a great store of information on the excrescences found on plants in consequence of the reaction which is developed against the action of parasitical insects. The abbreviations used to determine what part of the plant is affected, by each species, materially assists the observer. This publication is far in advance of the subject it treats of, as may be seen on every page where we find the group named to which the insect belongs without the specific name. This is not surprising, seeing that the life-histories of some of these neglected orders have yet to be written. The groups mentioned in this publication as affecting plants are the following, arranged alphabetically:--*Anquillulidae*, *Aphididae*, *Bdellidae*, *Bruchidae*, *Capsidae*, *Cecidomyiidae*, *Cerambycidae*, *Cercopidae*, *Chalcididae*, *Coccidae*, *Curculionidae*, *Cynipidae*, *Eriophyidae*, *Harpacticidae*, *Hydratiniidae*, *Muscidae*, *Mycetophilidae*, *Orneodidae*, *Psyllidae*, *Pterophoridae*, *Pyralidae*, *Scolytidae*, *Sesiidae*, *Tenthredinidae*, *Tineidae*, *Tingidae*, *Tortricidae*, *Trombididae*.

The *Proceedings of the South London Entomological and Natural History Society*†, for 1901, have come to hand. The volume strikes one as being the smallest that has been issued for many years, yet the subscriptions to the "Publication fund" reach the round sum of £43 10s. 6d. Only two of the eleven papers read have been printed—"Fossil Insects," by W. West, L.D.S., and "Notes on rearing Lepidoptera," by A. M. Montgomery, F.E.S., the latter a most useful paper to the practical lepidopterist. We especially miss the paper read by Mr. W. Bateson, F.R.S. Reports of the Field meetings at Oxshott, Byfleet, Mickleham and Brasted, form interesting reading, and there is much valuable matter scattered throughout the Abstract of Proceedings (pp. 24-69). The Society maintains its great popularity, is in a first class financial position and retains an excellent membership.

* By G. Darboux and C. Howard. Published by Gebrüder Borntraeger, S.W. 46, Dessauerstrasse 29, Berlin. 1902.

† Published at the Society's rooms, Hibernia Chambers, London Bridge, S.E., Price 2s.



LARVA OF DICRANURA BICUSPIS.

The Larva of *Dicranura bicuspis* (with plate).

By J. C. DOLLMAN.

The plate of the two diagrams, representing the larva of *Dicranura bicuspis*, has been prepared from drawings taken of a larva which was beaten from birch in Tilgate Forest on September 13th, 1901, by a son of mine, while we were working for *Cymatophora fluctuosa*. It was on the lower part of a young birch tree, which was about ten feet high, and probably was descending for pupation to the main stem, for it spun its cocoon, in captivity, the following morning. The larva seemed an active, strong creature, and fed no more after capture, but roved restlessly about the box containing the samples of birch bark which were submitted for its selection. It was occupied in this way until the noon of the day after being taken, when it settled on a piece of bark, containing a depression, and therein quickly spun itself up, without any change whatever taking place in its coloration.

As is seen at a glance, the larva bears a strong resemblance to those of *Dicranura furcula* and *D. bifida*, but its appearance differs from theirs in many of the following respects. The general character of its form is longer, more cylindrical, and more worm-like. The texture of its skin is smoother, being free from the reticulated, or granular, surface shown in its relations. The segments are not so heavily accentuated, and it bears no lateral brownish-red ocellated spots or blotches. The head is smaller than the prothoracic segment, into which it can be withdrawn at will, and is of a rich chestnut-brown in colour, without any grey or purple tendency, the cheeks of the face being of a deep black. On the prothoracic segment, which frames the head, are two blunt points, one on each side, from which a bold triangular blotch is drawn to the dorsal summit of the mesothoracic segment, terminating at its posterior edge in a pointed projection. This triangle is of the same rich chestnut colour as the head, and it is divided by a white tapering dorsal line, running from the crown of the prothoracic nearly to the elevated point on the mesothoracic segment. The mesothoracic is the largest in diameter of all the segments, and gives a suggestion of tadpole-like proportions to the whole creature. On the dorsal area is a beautifully designed, elongated, saddle-shaped marking, which begins on the metathoracic segment in an isolated spot at its posterior edge, and which widens on the 1st abdominal segment; and again widens on the 2nd. On the 3rd it is wider still, with a dip towards the lateral area. On the 4th abdominal segment the saddle is at its widest, and extends downwards to the spiracular region, where it all but touches the spiracle placed upon it. On the 5th, 6th, and 7th abdominal segments it gradually tapers, to extend again on the 8th; where it forms a diamond-shaped lozenge; sharply finishing at the anal segment with a small black plate. This saddle-shaped marking is of a fine variegated chestnut tint, without any grey tendency, and is lightest in colour at its widest part, as it is darkest also at its narrowest. The edges of it are firmly accentuated by a bold rich line of red-brown, and from the 2nd abdominal segment, longitudinally across the widest part of the saddle, is a distinct dorsal line of a purplish colour, extending to the darker colour on the 8th. On each side of this dorsal line, on abdominal segments 2 and 3, is a light distinct spot, considerably lighter than

the ground colour. At the edge of these dorsal markings, both of the thoracic region and the abdominal, is a bold whitish-yellow border, which is only broken on the 4th abdominal segment; where it rests on, and encloses, the spiracle. The body, lateral and ventral surfaces, is of a bright, light, apple-green colour, very appealing in its quality owing to its smooth fleshy texture. The caudal horns are yellowish-red, with a red tip, and a red ring a little distance from the tip. They bear black setæ, not green as in *Dicranura furcula* and *D. bijida*, with red setæ. The spiracles are yellowish, with a fine black ring around them, and below each spiracle is found a fine brown spot. The legs are red, and the claspers are green, with a chestnut ring just above the feet; and they are finely dotted with dark brown. On the ventral surface there is a chestnut line on the last three segments from the anal end, finishing between the last pair of claspers.

The length of the larva, from the head to the anal plate, exclusive of the caudal horns, was $1\frac{3}{8}$ inch, and the cocoon it spun was considerably larger than that of either *Dicranura furcula* or *D. bijida*. The breeding-cage in which it was kept through the winter was placed in a glass-house, without heat, and was brought into a room with a fire in it, on April 3rd, where it was kept with a damp cloth tied round it. The imago, a perfect ♂ specimen, emerged on May 15th, 1902, about nine o'clock in the evening. I observed during that day, and also when I examined the cocoon on the previous afternoon, that the pupa could no longer be heard to roll in its interior, which had been quite a perceptible fact up to that date. It may be inferred from this that operations to achieve its liberty had been commenced by the insect fully 24 hours before its emergence.

On some Geometrides collected in Spain by Dr. Chapman in 1901.

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

I have been greatly interested in working out the collection of Spanish *Geometrides*, which have been kindly handed over to me by Dr. Chapman, being the fruits (so far as this superfamily is concerned) of his visit to Spain in 1901, which has been already reported in these pages. Unfortunately the small amount of material which I possess for comparison, combined with the weak representation of the fauna of South-western Europe in our National Collection, has placed considerable difficulties in my way, and I am not yet able to report quite exhaustively, but the collection is certainly of sufficient interest to merit some notice.

The collection consists of 155 specimens, comprising some 54 species. Perhaps the thing which strikes one most forcibly in looking through them is the same fact upon which Dr. Staudinger commented in writing of the lepidoptera of Greece—the strong representation of his genus *Acidalia*, and the very weak representation of his *Cidaria*. According to his recent *Catalog*, the former genus contains 179 Palearctic species and the latter (now called *Larentia*) no less than 205, notwithstanding the removal from it of *Asthena* and *Phibalapteryx*; yet this Spanish collection yields about 18 species of *Acidalia* and only 3 of *Cidaria*, in other words, the percentages are respectively 10 and $1\frac{1}{2}$ in relation to the entire fauna. The *Larentiidae*—if indeed they be a natural family as now classified by Staudinger and

others—are, however, further augmented by representatives of several of the outlying genera, such as *Lythria*, *Ortholitha*, &c. Of the so-called *Geometridae* (*—inae*), in other words the “Emeralds,” &c., we only find two species, but they are interesting and characteristic ones, of which I shall speak immediately. The *Boarmiidae*, also, are not very much in evidence, and the favourite genus *Sciadion* (*tinophos*) is only represented by single specimens of three species, if we except some aberrant members whose position in the genus has been challenged.

The Emeralds, just alluded to, are:—

Pseudoterypa coronillaria, Hb., 2 ♂s and 1 ♀ from Arcachon; the latter and one of the former are rather sharply marked, and the ♀ almost entirely lacks the usual discoidal spot. Notwithstanding the substitution of the clear grey ground colour for the familiar green of the family, the close relationship of this pretty species to *P. pruinata* is manifest even at first glance.

Euchloris (*Thetidia*) *plusiaria*, Bdv., 6 ♂s from Cuenca, 1 ♂ and 1 ♀ from Tragacete, nearly all in good condition, but showing no particular variation. This beautiful species is very poorly represented in our National Collection, and I was very pleased to get a series. Its affinities seem to me somewhat doubtful, and I can scarcely believe it can be congeneric with *Euchloris smaragdaria*, Fb., with which it has generally been placed; two or three friends who have seen my specimens have even suggested that it had Larentiid affinities.

The *Oenochrominae* (Hampson's classification) are represented by a single specimen of the variable *Aplasta ononaria*, Fues., from Albarracin; it is a female, in fairly good condition.

The “*Acidalias*” have proved somewhat beyond my present ability to determine, and a few of them still remain unnamed, although I have tried hard to trace them both in the British Museum collection and in the works of Millière. The longest series is of *Sterrrha sericeata*, Hb., 4 from Cuenca and 8 from Tragacete; the specimens on the average are rather fine and large. Next in point of numbers come two of our British species of *Ptychopoda*, namely *P. humiliata*, Hfn. (8 specimens) and *P. fuscovenosa*, Goeze (= *interjectaria*, Gn.) (7 specimens); neither shows any perceptible tendency to form local varieties, and any of the specimens might have been captured in our own country. The remaining species of the group are almost entirely in one, twos or threes; *Leptomeris marginipunctata*, Goeze, however, appears to be represented by 5 specimens, but some are a little worn, and I am not prepared to say positively whether some of them may be referable to its close allies—*e.g.*, one of the forms of the variable *L. luridata*, Z. Perhaps two of the most interesting species are *Craspedia concinnaria*, Dup., 3 nice specimens from Cuenca, and 1 *Ptychopoda subsaturata*, Gn., from Tragacete; the latter agrees well with the four in the British Museum collection, which are all labelled as from Spain; so far as is yet known this distinct little species has rather a limited range, being only recorded from southern France, Spain and north-west Africa. *Ptychopoda herbariata*, Fb., so evidently a mere casual importation in Britain, is at home in southern Europe, and was brought singly both from Albarracin and Tragacete. The single representative of *Emmiltis rubiginata*, Hfn. (from Albarracin), shows a somewhat unusual ground colour, not very reddish, and is strongly marked. The single *Sterrrha moniliata*, Fb. (new to my collection,

though not rare in many parts of Europe), is a male in perfect condition. The three *Cosmorhoë rusticata*, Fb., are interesting, one of the two from Tragacete being of the ab. *mustelata*, Rbr., which Staudinger has sunk as virtually a synonym of the type, but which should have been separated with the diagnosis "al. ant. fascia media abbreviata." It is worthy of note that Rambur's type was Spanish (Andalusia), and that one of the other specimens brought by Dr. Chapman shows a slight tendency in the same direction. Two specimens of the *ornata* group (from Tragacete) are not easy to name with precision from the material available to me; they are probably one of the forms of *Craspedia violata*, Thnb. (= *decorata*, Bkh.), though so weakly marked at the margins that I, at first glance, took them for *C. ornata*, Scop.; I cannot make them square with the ab. *aequata*, Stgr., which is recorded from Spain, but on the other hand they appear to agree entirely, unless it be in size, with the allied *C. congruata*, Z., which seems to be only recorded from Sicily, and of which Staudinger writes: "Sequ. (*violata*) an prae. (*ornata*) forma Darw., an var.?"

The specimens of *Emmiltis ochrata*, Scop., and *Ptychopoda rufaria*, Hb., are also a little puzzling. In their typical forms these two species are distinct enough, but these Spanish examples (Cuenca, Tragacete, Albarracin) look curiously intermediate, and without a close study of the leg-structure I really should not care to pronounce upon them positively. The three from Cuenca seem to be *E. ochrata*, but the central dots are rather distinct.

There are also a few specimens present which seem to be referable to the variable *Ptychopoda obsoletaria*, Rbr., though they are very different from my previous representatives of this species from Herr Bohatsch, of Vienna. A rather worn specimen of apparently *Hyria ostrinaria*, Hb., and another which I take to be probably *Leptomeres inornata*, Haw., though exceedingly small, complete my records in this huge and incongruous "genus."

Of the other genera which are at present placed in the same sub-family (or, rather, family), only one occurs in the collection, namely *Rhodostrophia*. Here, again, one meets with a series of allied species or forms, which are rather hard to work out without a somewhat close knowledge of the genus and an abundance of material for comparison. The 7 *R. vibicaria*, Cl., are all referable to the var. *strigata*, Stgr. (the usual southern form), although they vary somewhat *inter se*, and one of those from Cuenca has the central line considerably widened. The other 3 specimens are certainly either *R. sicanaria*, Z., or *R. calabra*, Pet. var. *tabidaria*, Z., but I confess I have not at present been able to make much out of the differences of the posterior tibiae. The only one of the three which is in good condition (from Albarracin) is very like my typical specimens of *calabra*, and has practically no central spot; the two from Cuenca are very worn, but the central spot is large and conspicuous, and I am inclined to make them *calabra* var. *tabidaria*.

In the *Larentiidae*, as I have already remarked, there is little to discuss. The species are: *Rhometra sacraria*, L., one ♂, Albarracin (broadly, brightly, and strongly marked); 1 ♀, Tragacete (narrowly, obscurely, and weakly marked). *Lythria (Botys) sanguinaria*, Dup. 1 ♂, 1 ♀, Albarracin, of the usual summer form, the ♂ perhaps rather weakly marked. *Plerocymia (Ortholitha) chenopodiata*, L.

(=*limitata*, Scop.), 2. *P. (O.) coelinaria*, Grasl., 1 ♂, Tragacete; 3 ♂ s, Albarracin, the former slightly different in tone, and less ochreous behind the central fascia, &c. *P. (O.) bipunctaria*, Schiff., 3 from Tragacete, rather dark, and well undulated. *Calocalpe (Encosmia) montiragata*, Dup., 1, Albarracin; 10, Tragacete. *Cidaria fulvata*, 1. *Cataclysmo dissimulata*, Rbr. (?), 1 Cuenca, 1 Albarracin, larger and decidedly different in appearance from the one I had before; *Campyogramma bilineata*, L., 3, the one from Tragacete more testaceous-tinted than the two from Cuenca. *Eupithecia subnotata*, Hw., two; and two unidentified species of the same genus.

Turning now to the Boarmiid section, I have to discuss probably the most interesting specimen, as it has certainly been one of the most puzzling in the whole collection; this is the *Notodonta*-like Geometer which Dr. Chapman has already mentioned (*anteà*, p. 181). The only Geometrid affinities which I could think of for it were with the aberrant genus *Endymia (Prosolopha)**, which belongs characteristically to southern or south-western Europe; and when I found that it did not agree structurally with that genus I was for a time altogether nonplussed. I find, however, that it either belongs to, or is an excessively close ally of, the Syrian *Phaselia deliciosaria*, Led., which Lederer and Staudinger rather absurdly retain in the genus *Synopsia*†, although Guenée pointed out that the differences were "numerous and important." According to Meyrick (*Tr. Ent. Soc. Lond.*, 1892, p. 122) the genus *Phaselia* only comprises three species, *serrularia*, Ev., *deliciosaria*, Led., and *strictaria*, Led., all belonging to south-eastern Europe, and south-western to central Asia. I am interested to notice that Eversmann, in erecting the first species (*serrularia*), compared it with *Endymia (Prosolopha)*, and that Meyrick (*loc. cit.*) writes that *Phaselia* is "doubtless a development from the *Prosolopha* group, but the actual point of connection seems uncertain." Guenée, on the other hand, places it in his *Boarmiidae*, far away from his *Ligidae*. The early stages are, I believe, entirely unknown. *Phaselia deliciosaria* was originally discovered at Beyrout, and has hitherto only been recorded from Syria and Palestine. There is, of course, just a bare possibility that our Spanish example was introduced by Mediterranean shipping, but the locality and the circumstances of its occurrence do not lend much colour to the idea. It is also possible to invent pretty little theories such as that it was accidentally introduced in some way by Phœnician traders two or three millenniums ago, and found a congenial climate; but the fauna of many parts of the Mediterranean coast is so insufficiently catalogued at present that it is quite possible its Spanish station is not really so thoroughly insulated as it now appears, and in any case it is well known that several Syrian species crop up again in Spain. There is no specimen of *P. deliciosaria* in our national collection, but my example seems, upon comparison with Lederer's figure and description, to be of a little less clear white than

* *Ligia*, Dup., a preoccupied name, was corrected to *Endymia* by Gistel in 1848 (*Naturg. Thierr.*, p. ix) and to *Prosolopha* by Lederer in 1853; the earlier, though less known, name must of course be restored. If Guenée was right in making this genus the type of a separate family, it will have to be called *Endymiidæ*.

† Lederer admits that this species and the allied *P. serrularia*, Ev., form a separate section of the genus.

is the type, and to have the acute angle at the margin of the basal area, between nervures 1 and 2, more produced.

Other *Boarmiidae* (*sens. lat.*) are as follows:—*Spilote* (*Abraxas*) *pantaria*, L., 2 from Escorial, 2 Albarracin, not variable; this conspicuous species, which was so long reputed British, was originally described by Linné from the Iberian peninsula (Portugal).

Stegania trimaculata, Vill., one good specimen from Albarracin; *Macaria* (*Semiothisa*) *liturata*, Cl., one from Tragacete; *Nychiodes lividaria*, Hb., one fine example from Cuenca; *Tephrosia sepiaria*, Hfn., one from Tragacete somewhat badly crippled.

In *Sciadion* (*Gnophos*) we have one *S. obscurata*, Schiff., from Albarracin, fairly light in colour; two rather worn specimens of the *variegata* group, the one from Cuenca apparently *S. mucidaria*, Hb., the one from Albarracin rather suggesting a small *S. variegata*, Dup., but reminding me more of the Croatian than the southern French form at the British Museum, yet in some degree intermediate. There is also a series of *S. respersaria*, Hb. (Tragacete 8, Cuenca 1), unfortunately all more or less worn, a species whose claim to a position in this genus does not seem absolutely assured. As to the aberrant little *S. asperaria*, Hb., which is represented by a single example from Albarracin, it looks ridiculously out of place among the "Annulets," and I prefer to record it as *Rhoptria* (Guenée, 1857) *asperaria*; Herrich-Schäffer actually placed it in the *Larentiidae*, Guenée in *Fidonidae*, and Meyrick has it in his very unnatural genus *Pseudopanthera*.

Of the pretty little *Anthometra plumularia*, Bdv., which seems to be confined to Spain, Portugal, and south-western France, there are two males, characterised by their short and very strongly plumose antennæ, and one female, all from Tragacete; one *Solidosema plumaria*, Schiff., also from Tragacete, apparently referable to the var. (ab.?) *pyrenæaria*, Bdv., yet not very unlike some of my least strongly dark-bordered New Forest examples; one *Itame* (*Thaumnomia*) *rinularia*, Hb., from Cuenca, in good condition; three *I.* (*T.*) *rauaria*, L., from Tragacete, rather small in size, but not otherwise remarkable; and four normal *Aspilates gilvaria*, Schiff., three ♂s from Tragacete, one ♀ from Cuenca; these complete the list with the exception of one or two odds and ends which have not yet been made out.

List of Species, Varieties, and Aberrations of Lepidoptera so far only recorded from the British Islands.

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

GEOMETRIDES.—*Zonosoma annulata* AB. (ET VAR.) OBSOLETA, RIDING.—Omicron absent on forewings; Devonshire. *Z. AB. BIOBSOLETA*, RIDING.—Omicron absent on both fore- and hindwings; Devonshire.

Ortholitha limitata AB. MONODII, TH.-MIEG.—Much darker than the type; Northumberland, Durham.

Lygris testata VAR. (ET AB.) *INSULICOLA*, STAUD.—Forewings narrower, dark reddish-brown; Shetlands and Hebrides.

Melanthia bicolorata AB. (ET VAR.) *PLUMBATA*, CURT.—All the wings darkened, the forewings with a complete fascia; northern England and Scotland. *M. AB. FUMOSA*, PROUT.—Wings uniformly deep smoke-coloured, all the markings obscured; northern England and Scotland.

MELANTHIA ALBICILLATA AB. SUFFUSA, CARRINGTON.—Entirely suffused.
MELANIPPE FLUCTUATA AB. (ET VAR.) THULES, PROUT.—All the wings strongly infuscated; Shetlands.

M. MULTISTRIGARIA AB. NUBILATA, TUTT.—Darker than the type; north of England.

M. MONTANATA VAR. (ET AB.) SHETLANDICA, WEIR.—Smaller than the type, ground colour much more ochreous; Shetlands.

M. SOCIATA VAR. OBSCURATA, SOUTH.—Much darker, Hebridean form.

OPORABIA AUTUMNATA VAR. FILIGRAMMARIA, H.-S.—Smaller, darker, wings narrower, especially in the ♀; northern England, Scotland, Ireland. Perhaps a quite distinct species.

LARENTIA FLAVICINCTATA VAR. OBSCURATA, STAUD.—Darker grey, central fascia hardly distinguishable; Scotland.

CAMPTOGRAMMA BILINEATA VAR. ATLANTICA, STAUD.—Smaller than the type, forewings more or less smoky; Shetlands and Hebrides. C. VAR. HIBERNICA, N. NOM. (INFUSCATA, KANE NEC GPPBG.).—Forewings almost unicolorous fuscous-brown, hindwings ochreous-brown; Kerry. C. VAR. ISOLATA, KANE.—Wings sooty-black; from a rocky islet off the Kerry coast.

EUPITHECIA PULCHELLATA VAR. HEBUDIUM, SHELDON.—Inner and outer transverse bands narrow, very dark brown; Hebrides.

E. VENOSATA AB. NUBILATA, BHTSCH.—Dark grey-brown, less sharply marked than the type; Shetlands.

E. JASIONEATA, CREWE.—Devonshire, Ireland, etc.

E. SATYRATA VAR. CALLUNARIA, DELDY.—A small moorland race, very characteristic and well-marked. E. VAR. CURZONI, GREGSON.—Narrower than the type, with well-developed transverse bands; Shetlands.

E. ALBIPUNCTATA AB. ANGELICATA, BARRETT.—Melanic form; Yorkshire.

E. SOBRINATA VAR. STEVENSATA, WEBB.—Paler than the type; Dover. Possibly a distinct species.

CHRYSOCYSTIS DEBILATA AB. NIGROPUNCTATA, CHANT.—Paler and less strongly marked than the type; Devonshire and Ireland.

EMMELESIA ALBULATA VAR. HEBUDIUM, WEIR.—Hebridean form; white without markings.

HYBERNIA MARGINARIA AB. (ET VAR.) FUSCATA, HARRISON.—All the wings deeply suffused with fuscous; north of England.

PIIGALIA PEDARIA AB. MONACHARIA, STAUD.—Unicolorous blackish; north of England.

HEMEROPHILA ABRUPTARIA ABS. BRUNNEATA, FUSCATA AND UNICOLOR, TUTT.—Darkened and more or less unicolorous (brown, sooty-fuscous and sooty-black respectively); north London.

BOARMA GEMMARIA VAR. (ET AB.) PERFUMARIA, NEWMAN.—Dark violet-grey, hardly speckled with fuscous; London, Huddersfield, etc.

B. RIBEATA AB. SERICEARIA, CURTIS.—Darker than type, almost black; New Forest, Box Hill, etc.

B. REPANDATA VAR. NIGRA, TUTT.—Deep inky-black; Huddersfield. B. VAR. SODORENSIUM, WEIR.—Smaller than type, much greyer; Hebrides.

TEPHROSIA CREPUSCULARIA AB. NIGRA, THIERRY-MG.—Black, with pale submarginal line; Wales.

PHORODESMA SMARAGDARIA ABS. UNILINEA, ALINEA, AND OBSOLETA, BURROWS.—Forms in which the ordinary markings are more or less obsolete.

ABRAXAS SYLVATA ABS. OBSCURA AND SUFFUSA, TUTT.—Melanochroic forms suffused with ochreous and slaty-grey respectively; Yorkshire.

PYRALIDES.—HOMEOSOMA NIMBELLA VAR. SAXICOLA, VAUGHAN.—Rather larger than the type and more ochreous in tint.

EPESTIA ROXBURGH, GREGSON.—Generally considered a dark form of *E. elutella*.

E. SEMBRUFA, HAW.—An obscure and little-known species.

MYELOIS CERATONLE AB. PRYERELLA, VAUGHAN.—A very marked whitish aberration.

EPISCHNIA BANKESIELLA, REIDSON.—Confined to the south coast. easily overlooked.

SCOPARIA CEMBRÆ VAR. SCOTICA, WHITE.—A Scotch form of this insect.

S. ULMELLA, KNAGGS.—A very distinct little species confined locally to the northern, midland and south-western counties of England.

S. BASISTRIGALIS, KNAGGS.—A well-defined species, recorded also with doubt from Germany.

S. DUBITALIS AB. TRISTRIGELLA, STPHS.—A dark form of the species. *S. VAR. (ET AB.) PURBECKENSIS*, BANKES.—An almost white form confined to the chalk cliffs of the south coast.

S. FREQUENTELLA VAR. PORTLANDICA, DALE.—A fine local race from Portland. *S. AB. CONCINELLA*, CURT.—Dark, almost unicolorous.

PTEROPHORIDES.—AMELYPTILIA ZETTERSTEDTII AB. TÆNIADACTYLUS, SOUTH.—Scarcely differs from type.

PLUTELLIDES.—THERISTIS MUCRONELLA AB. STRIATA, TUTT.—Streaked longitudinally with black.

TORTRICIDES.—PERONEA CALEDONIANA, STEPHENS.—By many supposed to be a moorland form of *P. aspersana*.

P. SCHALLERIANA AB. (ET VAR.) PERPLEXANA, BARR.—A dark form, sometimes occurring fairly commonly in Ireland.

CACECIA MUSCULANA VAR. MUSCULINANA, KENN.—A very distinct Shetland race.

CNEPHASIA PENZIANA VAR. BELLANA, CURT.—A very distinctly banded local race. *C. VAR. COLQUIHOUNANA*, BARRETT.—A melanic race largely confined to Ireland, Isle of Man, west coast of Scotland, and Shetland Isles.

C. OCTOMACULANA, CURT.—A distinct northern species.

LOZOPERA BEATRICELLA, WALSM.—Suffolk and Kent.

EUPECILIA GRISEANA, STPHS.—Formerly taken in Britain; awaits rediscovery.

E. ERIGERANA, WALSM.—South-east of England.

E. SUBROSEANA, HAWORTH.—Also recorded with doubt from Germany.

E. FLAVICILIANA, WILK.—Very marked species, taken in Isle of Wight, Oxford and Kent.

E. DEGREYANA, McLACH.—A local Norfolk species with narrower forewings than *E. ciliella*.

E. ANGUSTANA VAR. THULEANA, VAUGHAN.—A very specialised race inhabiting the Shetland Isles.

CONCHYLIS SUBBAUMANNIANA, WILK.—A distinct species, quite unknown on the continent.

EVETRIA PINICOLANA, DELDY.—Not distinguished from *E. buoliana* on the continent.

OLETHREUTES WOODIANA, BARRETT.—A very fine species confined to mistletoe.

PENTHINA SAUCIANA VAR. STANTONIANA, BARR.—A Scotch form.

P. VARIEGANA AB. NUBIFERANA, HAW.—A very marked, white-clouded, recurrent aberration.

SERICORIS URTICANA AB. RUFA, TUTT.—Aberration with red ground colour.

CATOPTRIA SCOPOLIANA VAR. PARVULANA, WILK.—A small race from the Isle of Wight.

GRAPHOLITHA CINERANA.—Closely allied but larger and possibly distinct from *G. nisana*.

PHOXOPTERYX SUBARCUANA, DOUGLAS.—Possibly an unicolorous form of *P. biarcuana*.

BACTRA LANCEOLANA VAR. (ET AB.) NIGROVITTANA, STEPHENS.—A large marsh form with a very distinct facies.

Corrections and Additions to the List of Lepidoptera of Keswick.

By H. A. BEADLE.

In the 6th volume of the *Entom. Record* (pp. 276 *et seq.*), I published a list of the lepidoptera of this district. I now give a supplementary list with some corrections:—

PAPILIONIDES.—*Euchloë cardamines*.—Common, no aberrations met with. *Colias edusa*.—One September 5th, 1900. *Coenonympha typhon*.—I found this species in a bog rather high up amongst the hills, it is much yellower than Lancashire and Westmorland specimens and not so strongly marked on the underside.

ARCTIDES.—*Nemeophila plantaginis*.—For several seasons I have taken ab. *hospita*. Larvæ are found on the mountains feeding on *Potentilla*. *Spilosoma fuliginosa*.—Common amongst ling on the hills, occasionally in the valley; all are var. *borcalis* or intermediates, none quite so large or brown as type. I noted an interesting case of assembling last season as I was collecting on the fells. I netted a nice ♂ and, while bottling it, another came to exactly the same place, which I also netted; this aroused my curiosity and, on searching closely, I found a cocoon containing a ♀, which, having been unable to force her exit, was stuck fast with her head and part of thorax out; in this position she had apparently given up the attempt to free herself and wished to mate; this was impossible, but, nevertheless, she was “calling,” and, for a time, males were attracted and netted as they came. In a short time the males ceased to come, so I took up the cocoon, freed the ♀ and moved her to another ling patch, when almost at once males began to come up again in ones and twos; the experiment of moving was repeated several times with the same result till about 4 p.m., when no more were attracted the ♀ having ceased “calling.”

NOTODONTIDES.—*Drymonia chaonia*.—One from dug pupa. *D. trimacula*.—Two netted.

NOCTUIDES.—*Tapinostola fulva*.—Common in boggy places, both

valley and mountains. *Chortodes arcuosa*.—Taken in several woods but not common. *Luperina testacca*.—Common. [*Mamestra abjecta*.—Inserted by mistake, not taken here.] *Mamestra furva*.—Fairly common. *Apamea unanimitis*.—A few each season, very local. *Grammesia trigrammica*.—Several at sugar 1900 and 1901. *Caradrina alsines*.—Rare. *C. taraxaci*.—Few each season at sugar. *Agrotis ajathina*.—Have since bred a few from Skiddaw, feeds on ling only. *A. lucerneæ*.—Found on Skiddaw. *Triphaena janthina*.—Very plentiful some seasons, never absent. *Noctua triangulum* and *N. stigmatica*.—Have taken a few at sugar several seasons. *N. baia*.—Very common, fine and variable. *Orthosia lota* and *O. macilenta*.—Since occurred plentifully at sugar. *Civria fulvago*.—The ab. *flavescens* and intermediates occur in some seasons, in other seasons the type only. *Cirrhoedia xerampelina*.—Taken at Friar's Crag. *Dianthocia capsincola* and *D. cucubali*.—Common at flowers of *Lychnis flos-cuculi*; larvæ of *D. capsincola* on *L. dioica*, there is no *Silene* within four miles. *Aplecta prasina*.—Common, very fine green forms. *Hadena adusta*.—Taken near head and foot of Derwentwater. *H. dentina*.—Very common. *Hyppa rectilinea*.—May be taken at sugar every season, but not plentifully, a very fine form, the markings being darker and browner than Scotch specimens. *Plusia festucae*.—Taken at flowers of *L. flos-cuculi*, June to July 6th, 1899-1900. *P. interrogationis*.—Fairly plentiful on the mountains where ling grows, I have tried breeding but cannot get it beyond pupal stage. *Phytometra viridaria*.—Very common on ling.

DELTOIDES.—*Hypenodes costaestrigalis*.—Fairly common in one place, a boggy wood.

CYMATOPHORIDES.—*Cymatophora fluctuosa*.—Found plentifully in a birch wood. *C. ridens*.—One this spring.

GEOMETRIDES.—*Urapteryx sambucaria*.—Generally distributed but not numerous. *Epione apiciaria*.—Not rare in one or two birch woods. *Venilia macularia*.—In several woods. *Ennomos erosaria*.—One ♀ at boat landing. *Tephrosia bistortata (crepuscularia)*.—Very common in larch woods in April and May, and very variable; some are suffused with leaden grey with few marks, others are very richly marked, some being very brown, others grey, there is also a banded form. *Acilalia fumata*.—Since found at Watendlath. [*A. immutata*.—Recorded by mistake, not found here.] *Bapta temerata*.—Found close to Derwentwater, east, west and north, large specimens. *Panagra petrarica*.—Common about brackens. *Numeria pulveraria*.—Found in several localities. *Larentia caesiata*.—Common on most hills, larvæ on ling. *Eupithecia satyrata*.—Common at Watendlath, on knapweed flowers. *Lobophora rivetata*.—Taken this season, April 27th to May 23rd. *Melanippe hastata*.—Found in two localities high up on the fells near birch and bog-myrtle. *Coremia quadrifasciaria*.—A visitor took some close to Derwentwater near Lodore. *Phibalapteryx vittata*.—Plentiful in three localities close to Derwentwater (both broods).

ANTHROCIDES.—*Adscita statites*.—Taken in Naddle Valley.

HEPIALIDES.—*Hepialus sylvinus*.—Common on Skiddaw and other mountains amongst bracken.

COSSIDES.—*Cossus ligniperda*.—One bred last season.

Migration and Dispersal of Insects: Social Insects—Hymenoptera, Termites.

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

We have already noted (*Ent. Rec.*, xiv., p. 174) that Van Bemmelen observed the migration of one or more species of *Sphex*, which came over the sea to the coast of Holland with a swarm of *Pieris brassicae*, *Musca vomitoria*, &c., but was unable to determine the species, whilst Kirby and Spence give (*Introd.*, ii., p. 10) an account of the migration of a species allied to *Athalia centifolia*. It is true that they do so doubtfully, with an admission that it does not rest on the evidence of entomologists, but only on that of fishermen, etc., who would not know one insect from another. They write: "It is the general opinion in Norfolk that these insects come from over the sea. A farmer declared he saw them arrive in clouds, so as to darken the air, and the fishermen asserted that they had repeatedly seen flights of them pass over their heads when they were at a distance from land, and on the beach and cliffs they were in such quantities that they might have been taken up by shovels-full. Three miles inland they were described as resembling swarms of bees. This was in August, 1782. Unentomological observers, such as farmers and fishermen, might easily mistake one kind of insect for another, but supposing them correct, the swarms in question might perhaps have passed from Lincolnshire to Norfolk." Did it stand alone, one might well doubt such a record, but Douglas notes (*Ent. Wk. Int.*, iv., p. 149) that, on July 31st, 1858, he observed on the road from Newhaven to Seaford, countless thousands of *Athalia centifolia*, which passed him going with the wind. Right and left, and upwards as far as could be seen, the air was full as when snow is falling thick. He further reports that, after a while, he saw hosts of ladybirds among the sawflies, chiefly the seven-spotted ladybird (*Coccinella septempunctata*), and they continued to fly after the sawflies had gone over. Presently, there was not an insect in the air, and the whole affair seemed like a vision. Another interesting note on these species comes from Deal. Harding writes: "The coast here is remarkable for its flights of various insects. I have never seen the same kind, however, two years in succession. On one occasion it has been a large flight of ladybirds (*Coccinella*), on another the large White Butterfly (*Pieris brassicae*), yet another, the air is filled with winged ants; last year with a species of diptera; this year (1859) with *Athalia centifolia*. On June 16th, with the day hot and still, the wind south-west, as is the case when these flights take place, I observed this last-named species (which had been resting on almost every kind of plant for some days before), at about 10 a.m., commence its flight, passing along in a cloud over the herbage and skirting the sea. At about 1 p.m. they came thicker and faster; by 1.30 p.m. they had all passed. I have not seen twenty since." An interesting note, extracted from the "Report on the Migration of Birds, 1884," is published by Cordeaux (*Ent.*, xviii., p. 267), and reads: "Under date of June 30th, Mr. Owen Boyle, of the Larigard lighthouse reports: 'A skylark followed by a string of bees. The plaintive cries of this poor bird first attracted my attention; it flew so close that I almost caught it; it was closely pursued by a large number of bees, and in its fright, took to the water followed by its pursuers. When last seen it was making for the Essex

coast.' July 31st, at 10.14 a.m., 'A cloud of mosquitoes pitched in this neighbourhood, similar to those seen in India; most of them were carried off at noon by a light breeze.' Mr. Chas. Williams of the Hanois lighthouse, Guernsey, says, under date of July 10th, 'A great quantity of large winged ants passing; a great many settled on the rocks and about the lighthouse. I have only once seen them before like this, *viz.*, when I was stationed at the South Bishop Rock, off the coast of Wales.' "

Fabre, in his *Souvenirs Entomologiques*, records (Engl. Transl., pp. 185-186) that, whilst ascending Mont Ventoux, at an altitude of 6000ft., he discovered under a big stone several hundreds of *Ammophila hirsuta*, a species that he had previously found isolated on banks along roads in the plain. He notes (pp. 193 *et seq.*) that they were almost as compact as a swarm of bees, that, as soon as the stone was lifted, the insects began to move about but without any attempt to take wing. He removed whole handfuls but not one seemed inclined to leave the heap; common interests appeared to unite them indissolubly, not one would go unless all went. An examination of the stone, the soil around, etc., gave no explanation of the strange assemblage. He discusses his observation at length. He points out that *Ammophila hirsuta* hibernates in the imaginal stage. He puts aside as improbable that they had taken up their winter-quarters in this unpropitious spot in August, and concludes that it was probably a temporary halt of the swarm which was migrating from the cold land of the Drôme to descend into the warm plains of the olive, and which, having to cross the deep wide valley of the Toulourene, and surprised by the rain, had halted on the mountain top. There is no positive evidence forthcoming on the point, but Fabre concludes that *A. hirsuta* has to migrate to escape the winter cold.

A South American wasp, *Polistes bipustulatus*, was taken at Ince, near Liverpool, during an excursion of the Liverpool Nat. Field Club, in the summer of 1875; the same species had been taken in the London Docks by Douglas, in 1868, whilst in *Ent. Ann.*, 1868, p. 87, and 1869, p. 68, the same Brazilian species is recorded as being taken at Penzance in 1866 and 1867, undoubted importations.

The migration of the social insects—Hymenoptera and Termites—is closely connected, however, with the necessity of their finding a new home, and, although the details of their "swarming," as their emigrations are called, are different, the result is somewhat the same. Ants and bees are well-known for their swarming habits, but, whereas the winged males and females of the former rise into the air in great numbers for the purpose of a nuptial flight and copulate on the wing, the swarm of the honey-bee, *Apis mellifica*, is accompanied by the already fertilised queen, and the phenomenon is usually stated to be due, in confinement, to the want of room in the hive. Layard, however, noticed at the meeting of the *Ent. Soc. of London*, May 7th, 1866 (*Ent. Mo. Mag.*, iii., p. 24) that, although it was generally supposed that the swarming of bees was caused by insufficient room in the hives, yet, in South Africa, where large numbers of wild bees, allied to the honey-bee, live in large caverns (the entrance to which they block up with a curtain of propolis), they invariably swarm, though there could scarcely be any want of space, but Tegetmeier said that, in England, it had been found possible to prevent the swarming of *A. mellifica* by adding to the size of the hive before the usual period

arrived. Sharp notes (*Insects*, ii., p. 65): "When a swarm of *Apis mellifica* leaves a hive it consists of the queen bee and a number of workers, these latter being, in fact, the surplus population that has been produced in the hive; the swarm is not a nuptial flight, as is so often supposed, but an act of emigration." He adds (*loc. cit.*, p. 67): "It is interesting to notice that, in confinement, when a swarm goes from a hive, it is the old queen that accompanies it, and this swarm, as a rule, settles down near the old hive, so that the queen bee, being already fertilised, the new swarm and its subsequent increase are nothing but a division of the old hive, the total products of the two having but a single father and mother. When a second swarm goes off from a hive it is accompanied by a young queen, who frequently, perhaps in the majority of cases, is unfertilised; this swarm is apt to fly for long distances, so that the probability of cross-fertilisation is greatly increased, as the fertilisation of the young queen is effected during a solitary flight she makes after the colony has settled down. But, in a state of nature, the colonies do not send off swarms every year or once a year, but increase to an enormous extent, going for years without swarming, and then, when their home is really filled up, send off, it may be presumed, a number of swarms in one year. Thus the phenomena of bee life in a wild condition differ considerably from those we see in artificial confinement." A rather remarkable occurrence is noted by Baly (*Ent.*, vii., p. 293) who observed that, in early October, 1874, a swarm of bees issued from one of his hives, and that, after remaining in the air for a few minutes, making the usual humming noise, they suddenly returned, clustering round the entrance of the hive for a little time before re-entering. The hive was not more than a third full of comb, the stock small, and examination of the hive gave no clue as to the cause of this movement. Smith states (*Trans. Ent. Soc. of Lond.*, 1868, p. 133), on the authority of Peckolt, that one of the stingless bees, *Trigona mosquito*, sends off swarms after the manner of the hive-bee in this country, and that, after searching six hives, only one royal female could be found in each. Von Ihering has recently shewn (*Ann. Nat. History*, (6), xix., 1897, p. 136) that social insects in Brazil may be divided into two great groups by their habits, *viz.*, (1) Summer communities lasting for one year, and founded annually by fertilised females that have hibernated—example, *Polistes*. (2) Perennial communities founded by swarms after the fashion of bee colonies—examples, *Polybia*, *Chartergus*.

The migration of ants, is, in many respects, analogous with the swarming of bees. The swarms of male ants, however, which are driven from the nests by the workers during the summer months, and which occasionally form dense clouds, and have frequently been described by various observers, are not of this nature. When queen ants migrate they usually fly off from the nest singly, although they have been found with workers (which are wingless) attached to their bodies, undoubtedly to aid them in the foundation of a new colony. The "swarming" of the males and the migration of the female ants take place, however, almost at the same time, whilst the number of males that may be produced in a single nest seems almost incredible. The winged males usually appear a day or two before the females of the same nest, and, forming a swarm, fly away from the near neighbourhood of their own nest, often uniting on their journey with similar bodies of ants

which have flown off from other nests. We have ourselves seen swarms of the males of various species of ants when their number has been legion. The largest swarms with which we have met that come readily to our remembrance are (1) On Ben Beulah (Argyle-shire), in August, 1893, when near the waterfall which may be seen from Lochgoilhead. (2) In the Dora Valley, on the slopes of Mont Courmet, at the back of the village of Courmayeur, in August, 1894. In the first case, we actually crossed the swarm, which caused the greatest discomfort, filling nose, eyes and ears in a few moments, whilst the rapid sweep of a butterfly net to and fro gave almost at once, quite half-a-pint of the insects, and the operation had to be again and again performed, until we had crossed the path of the swarm. In the second case the swarms were equally large, and two or three distinct swarms were to be observed on different parts of the mountain at one time. In both cases the ants were literally in myriads. Kirby and Spence also record (*Introd.*, ii., p. 54), that Frazer, on October 6th, 1813, was enveloped by a swarm of ants so numerous as entirely to intercept his view on the mountain called Pena de Aya or Les Quatre Couronnes. These authors assert (p. 51) that, when the autumnal swarms of ants leave their nests, the males rise, as it were by a general impulse, into the air, and the females accompany them. The whole swarm alternately rises and falls with a slow movement to the height of about ten feet, the males flying obliquely with a rapid zigzag motion, and the females, though they follow the general movement of the column, appear to be suspended in the air like balloons, seemingly with no individual motion, and having their heads turned towards the wind. Sometimes the swarms of a whole district unite their infinite myriads, and, seen at a distance, produce an effect resembling the flashing of an aurora borealis. Rising with incredible velocity in distinct columns they soar above the clouds. Each column looks like a kind of slender network and has a tremulous undulating motion, which has been observed to be produced by the regular alternate rising and falling just alluded to. The noise emitted by myriads of these creatures does not exceed the hum of a single wasp. The slightest zephyr disperses them. . . . After this "danse de l'amour" is celebrated, the males disappear, probably dying, or becoming, with the females, the prey of birds or fish. That many, both males and females, become the prey of fish, one of these authors is able to assert from his own observation. He writes: "In the beginning of August, 1872, I was going up the Orford river, in Suffolk, in a rowboat, in the evening, when my attention was caught by an infinite number of winged ants, both males and females, at which the fish were everywhere darting, floating alive on the surface of the water. While passing the river these had probably been precipitated into it, either by the wind or by a heavy shower which had just fallen." Bates gives (*Naturalist on the Amazons*, p. 15) the following description of the dispersal of the winged members of the Saüba ant of Brazil. He writes: "The swarming or exodus of the winged males and females of the Saüba ant takes place in January and February, that is, at the commencement of the rainy season. They come out in the evening in vast numbers, causing quite a commotion in the streets and lanes. They are of very large size, the female measuring no less than two inches and a quarter in expanse of wing; the male is not much more than half this size. They

are so eagerly preyed upon by insectivorous animals that, on the morning after their flight, not an individual is to be seen, a few impregnated females alone escaping the slaughter to found new colonies." Abbott writes (*American Naturalist*) that, on October 6th, 1873, at about 4 p.m., he was attracted to a part of the large yard surrounding his house by a multitude of large-sized insects that filled the air, and proved to be a brood of red ants, *Formica*, that had just emerged from their underground home, and were now, for the first time, using their delicate wings. The sky, at the time, was wholly overcast; the wind strong southwest; thermometer 66°F. Taking a favourable position near the mass as they slowly crawled from the ground up the blades of grass and stems of clover and small weeds, it was noticed that (1) they seemed dazed, without any method in their movements, save an ill-defined impression that they must go somewhere, (2) they were pushed forward usually by those coming on after them, which seemed to add to their confusion. As a brood or colony of insects, their every movement indicated that they were wholly ill at ease, and once at the end of a blade of grass they seemed even more puzzled as to what to do. If not followed by a fellow ant, as was usually the case, they would invariably crawl down again to the earth and sometimes repeat this movement until a new comer followed in the ascent, when the uncertain individual would be forced to use his wings. This flight would be inaugurated by a very rapid buzzing of the wings, after a short rest the violent movement would recommence, and finally losing fear as it were, the ant would let go its hold upon the blade of grass and rise slowly upwards, ten, twenty, or thirty feet, until caught by a breeze or by the steadier wind that was moving at an elevation equal to the height of the surrounding pine and spruce trees. So far as Abbott was able to discover, their wings were of the same use to them in transporting them from their former home, that the "wings" of many seeds are in scattering them; both are wholly at the mercy of the wind. Referring to Bates' account of the Saüba ants (*Ecodoma cephalotes*), already quoted, Abbott points out that Bates shows that the successful *début* of the winged males and females depends similarly upon the workers, there being considerable activity and excitement at the nest when the exodus of the winged individuals is taking place; the workers clearing the roads of exit and showing the most lively interest in their departure. But Abbott observes that, in the *Formica* migration that he witnessed, only a few wingless worker ants were discovered, and these took no interest whatever in the departure of their winged brothers, nor did examination of the nest show any marked movements connected with the exodus on the part of the workers. The flight appears to have commenced about 4 p.m., and lasted until nearly 7 p.m., or a considerable time after sundown, and the next morning there was not an individual, winged or wingless, to be seen above the ground, whilst the nest itself was comparatively empty, and the few occupants seemed in a dazed condition. As supporting Hübner's views, quoted by Duncan (*Transformations of Insects*, p. 205), Abbott considers that ants that leave the nest do not return again to the original nest.

The similarity of these winged hosts to smoke is sometimes very remarkable and well illustrated by the account given by a daily paper, of the occurrence of an immense swarm of ants around

the spire of a church in Coburg, in 1866, and referred to *Entom.*, vii., p. 14. So similar to smoke did this cloud appear that, as soon as it was observed, firemen prepared to make the ascent, and the whole neighbourhood turned out to see the fire. When the firemen reached the top of the tower, they were seen by the spectators below to be apparently warding off the attacks of something, and, rapidly descending, they reported that the apparent smoke was nothing more than millions of winged ants gyrating about the steeple. Mackay observes (*Insect Life*, vii., p. 52) of a swarm of *Prenolepis parrula* that appeared on August 24th, 1894, in the valley of the East River in the county of Pictou, Nova Scotia, that the cloud was dense enough on some occasions to intercept the light of the sun, that the ants did not appear to alight until dead, that they were visible during the whole afternoon until 7 p.m., and that their course appeared to be along the valley of the river in a direction from southwest to northeast. Fiske notes (*loc. cit.*, p. 280) that, in September, 1894, at Mast Yard, New Hampshire, a quantity of "smoke" was seen rising above a group of pines. Instant investigation was made, and it was found that the "smoke" was an immense swarm of winged ants. Smith observes (*Ent. Annual*, 1856, p. 94) a vast swarming of *Myrmica scabrinodis*, *M. laevinodis*, and *Formica rufa* during the third week of September, 1856, in the neighbourhood of Dover. On a calm, gloomy, and sultry day, clouds of winged Myrmicids (*Myrmica scabrinodis* and *M. laevinodis*) occupied the summit of the Shakespeare's cliff, but their hosts were surpassed by the countless myriads of *Formica rufa*, which hung like a cloud over the cliffs to the east of the town; thousands upon thousands of these were floating on the sea, in some places, in dark masses, four or five yards in length and breadth, whilst a marginal line of dead and dying individuals extended nearly a mile along the shore. Hall notes (*Ent. Mo. Mag.*, xxiv., p. 91) that, on August 7th, 1887, at Buckland, near Dover, the air was literally full of males, and the ground and walls covered by myriads of both sexes, of *Lasius alienus*. He observes that the evening was still and sultry, and that although he had previously seen the insect in great abundance on the Deal sandhills, he had never before witnessed anything to compare with the countless thousands observed on that evening.

As far back as 1814 another remarkable swarm was recorded by the captain of a hulk lying in the Medway, who noticed something black floating down the river with the tide. A boat was sent off, and a bucket full of the suspicious matter brought on board, when it was found that the floating substance was a mass of winged ants. The report states that the living mass was about five or six miles long, eight or ten feet broad, and six inches thick (Kirby and Spence, *Introduction*, ii., p. 53). We have never heard of any other instance of living winged ants being transported by water. Gatcombe vouches (*Ent.*, vii., p. 233), however, for the fact that, on August 20th, 1874, a yacht cruising off the Longships' Lighthouse, on the coast of Cornwall, about seven or eight miles from Falmouth, sailed through millions upon millions of winged ants, and that the sea was, for a long distance, black with them, indeed, the men on board amused themselves for a long time in dipping them up in buckets, and that the waves thrown off from her bow in dividing the water were black instead of white." At the same time (*loc. cit.*, p. 234) Gatcombe

gave a quotation from a Plymouth paper, in which the writer states that, driving along the road to Redruthan, he was surprised by a sudden gust of wind bringing with it an immense swarm of winged ants, too many of which settled upon himself and his friends for their comfort. Upon arrival at Redruthan a large portion of the sand was found to be darkened with dead ants, evidently drowned, and each receding wave left a wide mark along the beach. A somewhat similar occurrence is recorded by Bates, but in this case also the ants were dead. He notes that whilst travelling up the Tapajoz, near Point Catejuba, he noticed a large quantity of drowned winged ants along the beach. "They were all of one species, the terrible 'formiga de fogo' (*Myrmica saevissima*), the dead or half-dead bodies of which were heaped up in a line an inch or two in height and breadth, the line continuing for miles at the edge of the water. The countless thousands had been doubtless cast into the river while flying, during a sudden squall the night before, and afterwards cast ashore by the waves" (*Nat. on the Amazons*, p. 201). White observes (*Ent.*, ix., p. 234) that, towards the end of August, 1876, a swarm of ants, fourteen yards broad, which took half an hour to pass in a south-east direction, was observed by him whilst he was fishing in the Ouse, near St. Ives, that thousands fell into the river and were eagerly preyed upon by the roach and dace. Smith, remarking on this record, says that such swarms are common about the middle of August, that they generally take place after rain, and when the air is moist and warm, and usually belong to the *Myrmicidae*—*Myrmica scabrinodis*, *M. ruginodis* and *M. laerinodis*, being the best-known of the migrating species.

Some very interesting accounts of migration, or perhaps it would be more correct to say the movements of male ants, in America, have been recorded. Lawton Williams records (*Psyche*, vi., pp. 180-181) that, on the night of August 27th, 1891, Hornellsville, New York, was visited by a vast shoal of small Hymenoptera that came from the south, and which, as long as observed, moved in a northerly direction. They made their appearance about sunset, and, on the following morning, they had entirely disappeared. They were of minute size, possessed four membranous, glossy wings, and the abdomen was separated from the thorax by a narrow constriction. "The afternoon preceding the evening of their appearance was sultry and oppressive, and the sky was unclouded. Just before dusk, a vast mound-like cloud became visible south of the city. It had an apparent altitude of about two thousand feet, and was of the cumulus type. It shone with a semi-metallic lustre due to reflections from the western sky. A few minutes later the insects began to come from the direction of the cloud. It would be impossible to estimate their numbers. Probably there were, at least, hundreds of millions. There were places where they flew as thick as hail, and like hail in a common direction. When they had fully arrived the electric lights became the chief centres of their activity. They flew about the lights until exhausted, when they fell to the floors in such numbers that they were swept up by the merchants." Hornellsville is situated in a valley extending approximately north and south. One remarkable fact observed about this occurrence was that "these insects occupied a limited belt in the centre of the valley and did not extend to the elevated portions of the town on either side. There were no insects

about the electric lights on the hillsides, and further down in the valley the lights were frequented only by lepidoptera. Looking from the hillsides, a cloudy phosphorescence was seen to extend over the city in an irregular sheet with here and there patches and protuberances rising high above the common mass." "Comparing the position of this cloud at different times, from seven until ten o'clock, it was evident that the maximum density was moving northward, *i.e.*, in the same direction that the insects moved in the early part of the evening. There was no perceptible moisture in the air, and the appearance of the cloud must have been caused by the reflection of the city lights upon the glossy wing of these insects." Professor Saunders states (*loc. cit.*, p. 181) that a very similar cloud to that described above passed over Alfred Centre, a village about twelve miles southwest of Hornellsville, on the evening of August 6th, *i.e.*, eleven days before the previous swarm was noticed. The insects forming the cloud were "ants with deciduous wings, so that, after the cloud had passed, their wings were found very abundantly scattered over the ground." This cloud made its appearance about sunset and had passed over by dark. It came from a steep hill overlooking the town, and swept across the town in a narrow belt, leaving the upper and lower parts unmolested. Other clouds of insects had been observed by Professor Saunders in Florida during the same year, and he states that the inhabitants there are quite familiar with them. A rather remarkable cloud which he particularly observed in the month of May at Sisco, Florida, was composed of large insects with very glossy wings. The cloud began to form about eight o'clock in the morning and lasted half an hour. The insects seemed to rise from a flat meadow densely overgrown with grass. They ascended to an altitude of about twenty feet, and continued the rest of their course in a horizontal direction. The cloud seems to have been confined chiefly to a twenty acre lot and did not pass to adjacent parts. It was a warm bright day, and the reflection of light upon their wings gave the cloud a striking appearance. Their wings were deciduous and the neighbouring pools were pretty well covered with them. One suspects that this last record may refer to termites and not true ants.

May at the Italian Lakes.

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

Arriving at Brunnen, on the Lake of Lucerne, at the end of the first week in May, intending to stay there some time, we found the weather, which had been fine and warm as evidenced by the state of vegetation, had fallen into the same wintery phase as appears to have prevailed at that time over England and most of the west of Europe, and so, at the end of a week, things looking hopeless, a move was made to Locarno, where, for nearly a month, fine and sometimes summery weather was almost continuous. Cold and snow continued with thick downfall to Goeschenen; at Airolo all was bright and fine. At Brunnen, *Micropteryx ammannella* was on the wing on May 7th and 13th, two or three *Leptidia sinapis* ventured out during a few fine minutes on the 10th, on the 12th *Nemobius lucina* was flying, and a large ♀ *Agria tau*, who appeared to have laid all her eggs, was found at rest on a beech tree at Axenstrasse, though snow was thick on the

ground close by. *Hemaris fuciformis* was seen at *Ajuga reptans* on the 13th, and two or three common butterflies were seen. The impression received was that many insects would have been met with had the weather been favourable. Near Brunnen, cases of *Epichnopteria pulla* were frequent, these nearly all produced ♀s a little later, the two or three ♂s that emerged were very densely black.

A search was also made for larvæ of *Parnassius apollo*, and was so far successful that two were found, the object being to compare them with those of *P. delius*, if these could be met with later. To complete this item I may digress so far as to say that on June 8th an excursion in search of *P. delius* was made from Faido, where we were at the time. The train was taken to Goeschenen, carriage to Andermatt, and a walk thence as far as Oberalpsee. The temperature was pleasant at Faido, cool at Goeschenen, cloudy at Andermatt, misty and cold on Oberalpstrasse. Returning, the walk from Andermatt to Goeschenen was in face of an icy wind with hail and rain. The ground by the Oberalpstrasse, where *P. delius* is found, and where the larva must be abundant enough, was still under thick snow, as was everything at the Oberalpsee and about the hotel there. By a curious stroke of luck a small patch of *Saxifraga aizoides* was noticed beside a little stream on the sunny side of the road, and two larvæ of *P. delius* were at once seen on it. Not another scrap of *S. aizoides* free from snow, *i.e.*, absolutely none other than this little patch was seen, and so the search otherwise was in vain. The material for the comparison of the two larvæ was thus perhaps adequate or nearly so, but certainly not too liberal. A comparison of the two larvæ is made a little difficult by the *P. apollo* being now full-fed, whilst the *P. delius* are only about half their size and have still to grow. Both are very dark dull black, with shining black tubercles, the tubercles glistening so as to look steely blue against the dull black skin, in some lights. In both species, there is, just above the supraspiracular tubercles (iii) a row of yellow spots, three to a segment, on the abdominal segments, two smaller just above the tubercle, and a larger one behind these. The form of these spots varies somewhat, but I can see no specific differences in this item. On the thoracic segments 2 and 3 the same spots occur. In one *P. apollo* these only, in the other a trace of a further spot; in one *P. delius* this trace is much stronger, whilst in the other the fourth spot is nearly equal to either of the two smaller ones. This extra spot is on the first subsegment, in front of the two ordinary small spots. This spot is, therefore, better developed in *P. delius* than in *P. apollo*, so far as my material shows, but it affords no reliable specific character. The hairs on the tubercles and on the general surface (black, and about 1mm. long) are the same, both as to length and distribution, in both species. The only really definite point of distinction that I can detect, is the well-known and very obvious one, that the yellow spots in *P. apollo* are a deep yellow, almost orange, whilst in *P. delius* they are of a pale bright lemon-yellow. The two species would thus seem to have a colour character in the larvæ (the yellow spots) and a colour character in the imago (that of the antennal scales) as the only points of separation; yet so far as we yet know these are so constant as to be quite adequate to establish them. The larval food-plant is also apparently an existent character, though the Spanish *P. apollo* is said to eat a *Saxifraga*, as well as several species

of *Sedum*. On June 15th, one of these two *P. delius* larvæ assumed an orange tint, very nearly that of *P. apollo*, and contrasting with its fellow. Is this colour then a question of age as much as of species? I have handed the specimens to Mr. Bacot for further examination. An imago of *P. apollo* was seen on the wing in the Val Verzasca (Locarno) on May 28th, and three specimens were taken at Faido (1000ft. higher) on June 6th and 7th.

During the first few days at Locarno (May 14th and following days) butterflies were exceedingly scarce, contrasting markedly with the abundance noticed in early April in some previous years; the early species seemed to be over, the latter not out. This was true probably in some degree, but a larger element was probably the recently wet and cold weather, a day or two before there had been frost enough to nip the vine shoots in some places (ash shoots in the hedges at Brunnen were killed in many places). *Leptidia sinapis*, *Polyommatus bellargus*, one or two *Aglais urticae*, and a *Melitaea athalia*, with an odd specimen or two of some other species, would be all seen in the course of several hours' walk. Gradually specimens got more numerous, until various common butterflies were fairly numerous by the beginning of June. *Polyommatus orion*, fairly common in April, was absent except for one specimen worn to rags, and only one *Melitaea phoebe* was seen. *M. athalia* became quite abundant, as well as *P. bellargus*, *Aporia crataegi*, *Coenonympha pamphilus*, with frequent *P. astrarche*, *P. icarus*, *Plebeius argus*, *P. argyrognomon*, *Nomiades cyllarus*, *N. semiargus*, and one or two *Cupido minima*. *M. dilyma*, an odd one or two, as well as sundry other species as little worth mentioning. *Colias hyale* was frequently in evidence, always considerably worn, only one *C. edusa* was seen (not caught). *Gonepteryx rhamni* was fairly common, always worn, and continued frequent up to June 10th, when my observations terminated. Where were *G. rhamni* and the other hibernating species in the middle of May? At the end of May, *Aglais urticae*, hibernated specimens much worn, were common, larvæ hung up for pupation, and pupæ, were also seen, and a newly-emerged specimen or two were seen about June 7th. A brood of *Eugonia polychloros*, nearly full-fed, was seen on May 16th. *Vaessa io* was abundant at the end of May, very worn and tattered, each specimen keeping to its own beat, and often seen at precisely the same part of the road on returning home as it was noticed on going out. *Eucraessa antiopa* was not rare, half-a-dozen or more being seen in the course of a walk. A specimen full of eggs died after a few days, rather than lay them, when sleeved over a spray of sallow. *Pyrameis cardui* also was everywhere, often worn to a mere colourless shadow, everywhere means up to 4000ft. as well as at lake level. A very fresh specimen was noted in June, no doubt a locally bred one, but where, I repeat, were all these in mid-May? The weather was then fine and warm, though cool perhaps for Locarno, their greater abundance later, coinciding with an accession of July weather. Admitting the probability of *P. cardui* being a fresh herd of immigrants, it is impossible to suppose that the *E. antiopa*, *V. io*, *A. urticae*, *C. hyale*, and *G. rhamni* were, in the main at least, other than local specimens.

The *Psychidae* at Locarno are always items of interest, *Acanthopsyche atra*, Linn. (*opacella*, H.-S.), was over, no full male case being observed, though ♀ cases with eggs were abundant. It was this year

quite as abundant as usual, over all the low ground, and by the roads, and in the vineyards on the slopes up to Orselina and Brione. *Pachythelia villosella* was much rarer and more local, a good many cases were found that produced ♀s, but only one male was bred. *Staudjussia tenella* var. *zermattensis* was abundant as usual on all micaceous walls and rocks; hundreds of this and of *A. atra* might easily be collected; it was already largely over, but a few males were bred, and even larvæ only half-grown occurred; it clearly spreads itself by stragglers over a long period, prolonged, no doubt, by its wide distribution in elevation, larvæ occurring up to 3000ft. or possibly higher. *Ptilocephala plumifera* (*atra* Heyl. nec Linn.) was frequent on the wing at 3000ft. to 4000ft., but no cases were found. *Apterona crenulella* occurs everywhere, but very sparsely, nowhere in the swarms that occur on the Mediterranean coast, as at the mouth of the Var (near Nice), and in the Albenga Valley, near Alasio, where millions is perhaps nearer than thousands to the number of cases that may be seen. It had always been my luck, so far, to see plenty of cases of this species, but, in July, or at some time when they were all empty. I was fortunate enough, however, to hit upon a strong colony at Locarno that had just crawled up the vines and their supports, and bred a large number of specimens. I fancy that males were very largely in excess in the cases I collected. Its faculty for flying within a minute or two of emergence, and immediately denuding itself of all the, at best very meagre, clothing of hair scales it has, is quite extraordinary. I was also struck with its vagaries as to time of emergence. On one occasion they kept coming out all night, most abundantly at midnight; on another the emergence took place during the whole day. The normal arrangement is, however, I have little doubt, that to which they settled down, *viz.*, to emerge at dusk and for an hour or so after; the aberrant procedures must have been due to my treatment of them, either by way of moisture or heat, or more probably exposure to light. Most of the Psychids of which I know the habits emerge in the morning, and fly in the early hours of the day, or even all day. *A. crenulella* emerging in the evening is, therefore, exceptional; I cannot help associating with this habit a curious feature of the pupa, *viz.*, the great blackness of the face-parts, practically the covers of the imaginal eyes. What the connection is, is not very evident, but, exposed on a tree trunk, often to the full rays of the sun, inside a tolerably translucent case, these black eye-covers must have some function in protecting the eyes from light, or in absorbing heat. The Fumeas present two species at least, *Fumea casta* and a larger species, which is not typical *F. crassiorella*. These do not interbreed. A specimen was also bred that suggests *F. edwardsella*, but these have not yet been fully examined. *Taleporia tubulosa* (*pseudobombycella*) cases, with larvæ, pupæ, or empty, were in great abundance. *Bankesia alpestris* is frequent when the 2000ft. level is passed, the earliest specimens were emerging June 10th. The large parthenogenetic *Solenobia* was in evidence everywhere, but the eggs had all hatched by May 16th. *Luffia lapidella*, nearly full-fed, was common in many places (in April in previous years it had been difficult to detect). It occurred also at Bignasco, but the wall there providing *L. maggiella* afforded a comparatively small number of these, not yet half-grown, contrasting with full-grown *L. lapidella* on walls quite close by.

Perhaps the following are worth noting:—May 29th, Val Cento-

valli, *Setina aurita*, *Erebia evias*, *Arctomyseis myricae*. May 30th, Lago d'Elio and Pino, *Erebia medusa*. A beetle that very closely resembles the ovoviviparous *Orina tristis*, and on the same foodplant, was abundant on *Centaurea* at one spot; it cannot, however, be that species, as it lays ordinary eggs, whilst those of *O. tristis* are close on hatching when laid. June 8th, Oberalp, *Titanio schrankiana* was in some numbers settling on the road, although the ground was covered with the unmelted winter's snow close by.

NOTES ON COLLECTING, Etc.

SWARMING OF *HEPIALUS LUPULINUS*.—On the evening of July 11th, in my garden at Hale End, Walthamstow, I noticed a number of *Hepialus lupulinus* flying round a vegetable-marrow plant. They were all males, and evidently assembling, but on a careful search for the ♀ I failed to discover her. Their attention was chiefly devoted to the topmost leaf, which had been caught by the frost two nights before, and was discoloured and drooping, though the stalk was rigid. There must have been 30 or 40 *H. lupulinus* flying round and swarming over this leaf, in a very excited state, with upward-curved abdomina. I cut off the leaf and examined it. It had a faint hay-like odour, and there was nothing to be seen on it. I stuck it in the ground some distance away from the marrow plant, and the *H. lupulinus* at once swarmed round it again, having left the plant, and I boxed eleven of them at three attempts. Towards the end of the time of flight I moved it again to the other end of the garden. There were no *H. lupulinus* in sight here, but in two minutes there were a dozen or more round the leaf. This case seems to show plainly that, with these species at any rate, the attraction is exercised through the sense of smell, and not by any mysterious '6th sense' unknown to man.—R. W. ROBBINS, 19, Woodland Villa, Hale End, Walthamstow. June 12th, 1902.

SPRING LEPIDOPTERA.—The last few days of sunshine seem to have stimulated the butterfly-life of this district. *Gonepteryx rhamni*, *Vanessa io*, *Aglais urticae*, and *Eugonia polychloros* have been seen more or less commonly. *E. polychloros* is, in these parts regarded as far from common, so that the occurrence of four examples (two of them at sallows) in the course of a day's walk, is worth noticing. Cases of *Proutia betulina* have been found in increasing numbers on tree-trunks from March 30th to date. Two or three cases which appeared to me to be different from the rest inasmuch as they looked like something between *P. betulina* and *Fumea casta*, I thought might prove to be *P. eppingella*, but I find they are merely a form of *P. betulina*. On one tree-trunk that yielded a single *P. betulina*, I found three cases quite new to me. They were free from the dressing characteristic of *P. betulina*, were narrowed at the neck, and appeared to have a lateral flange. These I sent to Dr. Chapman, who wrote me on Friday last that one of the cases had produced an undoubted *Solenobia lichenella*. On an elm-trunk at North Shoebury I found on March 31st a small colony of *Luffia ferchaultella*. These I submitted to Dr. Chapman, who separated therefrom three cases, from which I am hoping to breed *Narycia monilifera*. *Asphalia flavicornis* is the only insect that has so far appeared in my breeding-cages; the first emergence took place on March 22nd, from an Eastwood larva.—F. G. WHITTLE, 3, Marine Avenue, Southend. April 23rd, 1902.

The sallows here were at their best at exactly the same date as last year, April 14th-18th, very late. On March 31st, the day being cold and cloudy, I found *Brephos parthenias* on the wing, and also at rest on birch, at Sandburn; *Lobophora lobulata* was just out, *Asphalia flavicornis* common, *Xylocampa lithorhiza*, &c. It was April 14th before I paid my annual visit to Bishop Wood, where *Pachnobia leucographa*, *Taenioecampa gracilis*, *T. munda*, and *T. populeti* were in extraordinary abundance; *T. munda* has never in my recollection been so common in Bishop Wood. On the 16th, the evening was milder than on the 14th, and I had a good time of it. *Pachnobia leucographa* was down at the first shake of the bush (I only worked one on my four visits), and altogether I selected about 60 before leaving, with a good proportion of females. The *Taenioecampids* as before, but with a singular absence of *T. stabilis*. On the 17th, the sport was good, till the moon made its appearance, and this effectively put an end to work. On this evening I found six black *T. populeti*, and one very fine aberration of *T. instabilis*, with a clear silvery-white ground dusted lightly with brownish. My fourth journey to the wood (on the 18th) was less successful chiefly on account of the bright moon; but, commencing almost in daylight, I got 25 *P. leucographa* and secured among other things worthy of note, a pink *T. gracilis*. Bishop Wood, as far as I know, seems to give more *P. leucographa* than any other place in the county, and when about 200 is the result of four nights' work at one bush the species must be in great abundance in the wood.—S. WALKER, 15, Queen Anne's Road, York. May 5th, 1902.

In this district there is nothing to report except the absence of both larvæ and imagines. I have been to the New Forest three times during the last seven days, and taken about half-a-dozen larvæ each of *Cleora lichenaria*, *C. glabraria*, and *Eonistis quadra* from lichen, and *Zephyrus quercus* from oak. Searching palings here has produced one *Cucullia chamomillae*, two *Eupithecia abbreviata*, one *Tephrosia crepuscularia* (*biunclularia*), and one *Selenia tetralunaria*, ♂, has been beaten out of oak. To-day there were sounds of a severe thunderstorm in the New Forest. Of over 100 larvæ taken last year on clematis, I had bred only two *Eupithecia coronata*, all the rest so far being *E. pumilata*.—(MAJOR) R. B. ROBERTSON, Forest View, Southborne Road, Boscombe. May 9th, 1902.

Easter in the New Forest produced all the usual species. The sallows giving plenty of species, and, of those found at the blooms *Taenioecampa munda* and *T. incerta* seemed more common than usual whilst *T. gothica* and *Panolis piniperda* were less so. Daywork, however, was slow, *Engonia polychloros* seems very plentiful this spring in Surrey and Hauts.—B. W. ADKIN, F.E.S., Brandon House, Morden Hill, Lewisham, S.E. May 15th, 1902.

In this district, insect life continues in a very backward condition, many species being fully a month behind-hand. My single capture so far worth recording, is a fair number of *Argyresthia praeocella*. These were taken in fine condition on the 21st inst. No *A. arcenthina* was out at this date, whereas generally the imagines would be becoming worn. *Plusia moneta* larvæ have most fortunately forsaken the *Delphinium* and *Aconitum* in my garden, but are as much in evidence as ever in many of those of my neighbours.—B. A. BOWER, F.E.S., Langley, Willow Grove, Chislehurst. May 23rd, 1902.

I have recently beaten a large number of cases (determined by my friend Mr. Bower as those of *Luffia ferchaultella*), from the extremities of the branches of a thorn tree much covered with lichen. It stands out quite alone by itself on a grass lawn. It is curious, but no case could be found by searching the trunk or large part of the branches, but they were beaten freely from the extremities. This is another illustration, I suppose, of the different habits moths themselves have here compared with those they seem to have in other counties, viz., sitting on branches instead of trunks. The uselessness of tree-trunk searching round here has been noticed by other lepidopterists besides myself.—E. F. STUDD, F.E.S., Oxtou, Exeter. May 24th, 1902.

During the spring of the present year I only got two fine days at *Brephos notha*, but on these occasions soon after the sun came out about midday, I found a good many sitting on the ground in damp places, and when so found they were easy to catch, but as soon as the sun got hot they flew high again. Sallows were of little use, the only insect really worth catching that I took being a *Taeniochema gracilis*, approaching the New Forest form, quite different from the type, although not reaching the deep red of the extreme New Forest form. Throughout May insects were extremely scarce, and only seven or eight *Eucosmia certata* were taken in my garden against over twenty last year, whilst in the woods, up to date, there is scarcely an insect to be seen. Even the commonest species are scarce, *Nola confusalis* being, however, an exception, and fairly numerous. A dozen *Macaria notata* makes a good day's catch as against the scores to be seen last year.—F. C. WOODFORDE, B.A., F.E.S., Market Drayton. June 9th, 1902.

BACOTIA SEPIUM, SPEYER, at CHINGFORD.—I have the pleasure of being able to confirm the old record of *Bacotia sepium* for Epping Forest (*vide* Tutt, *Brit. Lep.*, ii., p. 264). On May 25th last, when beating for Proutias in the Chingford section, I knocked out a single larva of this species; if I remember rightly it came out of a lichen-covered hawthorn, and was in the tray at the same moment as a larva of *P. betulina*; at any rate I took it at first glance for a strange variety of the case of that species, but was, of course, immediately undeceived on seeing the stout and very different-looking larva. We have thus three of our interesting and much overlooked Psychids—*B. sepium*, *P. betulina*, and *P. eppingella*—occurring in practically the same spot in Epping Forest. As Mr. Tutt does not appear to indicate the fact in his "synonymy," it may be not amiss to add that Mr. Barrett (*Lep. Brit.*, ii., pl. 86) gives two recognizable figures of the case of *B. sepium*—fig. 2b, the larva, under the name of *Fumca betulina*, and fig. 4a, the female sitting on case, under the name of *Fumca tabulella*; fig. 2c, *Fumca betulina*, pupa-skin and case, is an excellent representation of those of the true *betulina*, Zell.—LOUIS B. PROUT, F.E.S., 246, Richmond Road, N.E. June 19th, 1902.

LARVÆ OF BRYOPHILA MURALIS (GLANDIFERA).—I have never seen the larvæ of this reported as feeding on lichens on trees, but always on walls, and have often wondered why it should not do so. I have often searched but without result, until last week, at Folkestone, I found on a tree-trunk, a cocoon containing a full-fed larva, ready for pupation, and on two other trees I found two more larvæ feeding on the lichens, near their cocoons, to which they retire when not feeding. These trees were a long way from any walls. Can you tell me why this

insect is never found more than about ten miles inland, whereas *B. perla*, occurs in almost every town inland, even as near London as Dulwich, where I took them last year?—C. W. COLTHRUP, 127, Barry Road, East Dulwich, S.E. *June 14th, 1902.*

VENILIA MACULARIA TWO YEARS IN THE PUPAL STAGE.—FROM some ova of *V. macularia* which I had in 1900 the moths are just emerging, not one having put in an appearance last year.—(REV.) C. D. ASH, B.A., Skipwith Vicarage, Selby. *May 17th, 1902.*

SCIENTIFIC NOTES AND OBSERVATIONS.

THE NATIONAL COLLECTION OF BRITISH LEPIDOPTERA.—AS this collection in the Natural History Museum at South Kensington is now being rearranged, revised, and augmented, a convenient opportunity is afforded for making it what we all wish it to be, that is, thoroughly representative of the Lepidoptera of the British Islands. One very important improvement would be the addition, in as much detail as possible, of the early stages of each species. It is hardly to be hoped, however, that this desirable end could be attained in any way approaching completeness without the assistance of the entomological public. We therefore venture to ask our readers to help the Museum to effect this useful work by contributing whatever material, either living or preserved, they may have to spare. There are already larvæ and pupæ of a few species in the collection, but all the examples are not good, so that gifts of ova, larvæ and pupæ of any species would be acceptable. Lists of presentations, with names of donors, will be published in this Journal from time to time.—(SR) GEORGE F. HAMPSON, Bart., B.A., F.E.S., Natural History Museum, South Kensington, S.W.

PROTECTIVE RESEMBLANCE IN LEPIDOPTERA.—ANAITIS PLAGIATA.—I came across a splendid example of protective resemblance in this insect last August. I was scanning a hawthorn hedge when my eye lighted on a stump recently cut with most lovely graining, on examining it more closely I was surprised to find it was a specimen of the above. The stump had been cut in a slanting direction giving an elliptical surface, and just the space for the moth to rest on. EUCHELIA JACOBÆE.—I found this moth plentifully last week on a hawthorn hedge at Wimborne, Dorset, where it looked exactly like some of the leaves which had been attacked by some kind of gall-fly, which were shrivelled and of a crimson colour.—C. W. COLTHRUP, 127, Barry Road, East Dulwich, S.E. *June 14th, 1902.*

PRACTICAL HINTS.

Field Work for August.

By J. C. DOLLMAN.

1.—The larvæ of *Notodonta dromedarius* are to be beaten more frequently from an isolated and badly grown birch tree than from large healthy ones.

* PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST, published May, 1901, and already almost completely out of print, contains 1250 similar hints to these, distributed over every month in the year. Interleaved (for collector's own notes).—Ed.

2.—When one larva of *Acrionicta leporina* is found, others will probably be discovered in the close vicinity.

3.—If unacquainted with the larvæ of *Cymatophora duplaris* and *C. fluctuosa*, be careful that they are not tilted out of the tray under the impression that they are giant Tortricids by their behaviour and appearance.

4.—*Colias hyale*, in its early days, after emergence, often keeps to the restricted flight of a single field, and if one is netted others may be seen. Afterwards it takes to the downs, or open country, and then only solitary examples are met with.

5.—*Colias edusa*, as well as *C. hyale*, may be waited for, down wind, at the border of a clover field, which will facilitate capture, as the insect has to turn against wind to try back.

6.—*Agrotis puta* in the larval state feeds up rapidly on knot-grass.

7.—*Plebeius argon* can be conveniently boxed from the heather at the close of day.

8.—In localities where *Bryophila muralis* is found it may be sought for with increased prospect of success on "honey-dew" evenings, as the insect is strongly attracted by this condition of things.

9.—*Satyrus semele* is best approached down hill, as it nearly always flits quickly up the gradient, and consequently can be seen to rise and be netted *en passant*.

10.—*Calyptia affinis* is one of the least demonstrative of insects in appearance that is likely to be seen at sugar. It will often cling, closely appressed to the bark, some little distance from the sweets, and it is always best to give a glance around when the insect is likely to turn up, to make sure that it is not present.

11.—If the larvæ of the common Agrotids are kept in a fair-sized box or tub, with some inches of damp earth in the bottom for them to burrow in, and only sufficient food for the 24 hours given them at a time, they will probably thrive well.

12.—*Phibalapteryx vitalbata* may be beaten from *Clematis vitalba* by day, as well as be taken on flight at evening. It is a free layer and easily bred.

COLEOPTERA.

COLEOPTERA IN SCOTLAND.—The northern kingdom has never been very rich in resident coleopterists, hence, though certain districts like Rannoch, Dumfries, Braemar, etc., have been pretty well worked, and their beetle fauna determined, the greater part of the country still waits for someone with leisure and inclination who will systematically explore its insect wealth. As I am now resident in Edinburgh I propose to do my best to verify the old records, on some of which Dr. Sharp has thrown doubt, and to establish new ones for this corner of Scotland. Unfortunately, since my arrival in September last, the weather, until midsummer day, has been most unpropitious for field work, and the long continued bitter north-east winds have, I am afraid, been most destructive to insect life of all kinds. However, we are now enjoying a reasonable summer temperature, and I have been able to do a little work with the sweeping and beating net. On September 28th last I had an afternoon with the water net, in a small stream near Polmont station, in Stirlingshire, about 22 miles from Edinburgh, and in the "Forth" district of Dr. Sharp's catalogue.

Here several of the northern forms were common, and the following were taken:—*Brychius elevatus*, Pz., *Deronectes 12-pustulatus*, Ol., *D. depressus*, F., *Hydroporus rivalis*, Gyll., *H. darisi*, Curt., *H. lepidus*, Ol., *Agabus guttatus*, Pk., *Platambus maculatus*, L., *Elmis aeneus*, Müll., *Hydraena riparia*, Kug., and by sluicing the banks *Geodromicus nigrita*, Müll. I was not in the field again till early in January, when heavy floods in the Tweed, near Peebls, tempted me out on two wet stormy days (January 3rd and 10th). Unfortunately I was not able to tackle the refuse when freshly thrown up, so I probably missed many of the better things. The following is a list of the captures:—*Elaphrus cupreus*, Duft., *Pterostichus diligens*, Sturm., *Amara plebeia*, Gyll., *Anchomenus parumpunctatus*, F., *A. gracilis*, Gyll., *Bembidium lampros*, Hbst., *B. obtusum*, Sturm., *B. guttula*, F., *B. prasinum*, Duft., *Trechus obtusus*, Er., *Dromius 4-maculatus*, L., *D. melanocephalus*, Dj., *Oxyptoda lividipennis*, M., *Homalota graminicola*, Gr., *Courus littoreum*, L., *Tachinus collaris*, Gr., *T. marginellus*, F., *Mycetoporus splendidus*, Gr., *Quedius rufipes*, Gr., *Q. attenuatus*, Gyll., *Q. umbrinus*, Er., *Philonthus politus*, F., *P. varius*, Gyll., *Stenus declaratus*, Er., *S. picipes*, Steph., *S. picipennis*, Er., *Bryaxis juncorum*, Leach, *Chrysomela staphyloea*, L., *Hydrothassa marginella*, L., *Phyllodecta vitellinae*, L., *Cassida equestris*, F., *C. starcola*, Thunb., *Psylliodes napi*, E.H., *Aphthona nonstriata*, Goeze, *Longitarsus anchusae*, Pk., *L. melanocephalus*, De G., *Phaedon tumidulum*, Kirb., *Apion frumentarium*, L., *A. nigritarse*, Kirb., *Hypera punctata*, F., and *Halyzia 14-guttata*, L. Of the above *Longitarsus anchusae* is not recorded by Canon Fowler from Scotland (though Northumberland is given as a locality), and *Stenus picipennis* is said to be "very rare in Scotland, Forth district only," and one or two others are mentioned in his book as local and not common.—T. HUDSON BEARE, F.R.S.E., F.E.S.

CURRENT NOTES.

The Rev. W. F. Johnson and Mr. J. N. Halbert have added three species of Coleoptera to the British list—*Bembidium argenteolum*, Ahr., *Xantholinus eribripenis*, Fauv., and *Stenus argentellus*, Thoms.

The visit of the Council of the Entomological Society of London to Oxford this year was one of the most pleasant of these charming excursions. On July 5th the whole party met at the Museum, where they had the privilege of inspecting the various collections which, under the able management of Professor Poulton, are getting into very fine order. At night all dined, as the guests of Professor Poulton, at Jesus College, where a very pleasant evening was spent. On the 6th the Museum was again visited, and in the afternoon a very pleasant excursion was made up the river, where tea was served, and much enjoyed, in true gipsy fashion. In the evening many of the party were the guests of Colonel Swinhoe and Dr. Dixey at dinner at Wadham College, and later the beautiful grounds were explored. Monday saw the close of a very pleasant outing, which had been fully enjoyed by all the visitors, among whom were Rev. F. Morice, Professor R. Meldola, Messrs. A. J. Chitty, H. St. J. K. Donisthorpe, H. Druce, M. Jacoby, R. McLachlan, G. H. Marshall, H. Rowland-Brown, and Dr. D. Sharp.

An exceedingly well-worked and very important paper to lepidopterists, entitled "A revision of the North American species of the genus *Choreutis*, by W. D. Kearfott, has recently been published in

the *Journal of the New York Entomological Society*, vol. x., no. 2, June, 1902. Mr. Kearfott's acquaintance with the European as well as the American literature of his subject, augurs well for the stability of his work.

Volume iii of *British Lepidoptera* is at last completed. It contains much more material than either of its predecessors—almost double the amount of detail printed in small type. The index is in the printer's hands, and the binding has to be done. We have no doubt that most lepidopterists will prefer it to those already published, for it deals entirely with Macro-lepidoptera.

The new edition (3rd) of Dr. Alfred Russel Wallace's *Island Life* has just been issued. The veteran naturalist is to be congratulated on the excellent way in which he has brought the work up to date, and dealt with the mass of details for ever accumulating on the subject he has treated in so luminous a manner. Chapter xvi, on "The British Isles," has been largely recast, and his method of obtaining the help of well-known specialists in each branch of the fauna and flora treated, has worked remarkably well. The lepidoptera, coleoptera, and trichoptera peculiar to Britain, have been treated by Mr. Tutt, Canon Fowler, and Mr. McLachlan respectively.

REVIEWS AND NOTICES OF BOOKS.

HISTOIRE NATURELLE ET MŒURS DE TOUS LES PAPILLONS DE BELGIQUE, by L. J. L. Lambillion. [Published at Namur, Imprimerie Douxfils, vol. i., 329+cxiv pages. Price 6 francs, 1902].—We receive from the continent numbers of works on lepidoptera. As a rule they exhibit an excellence of illustration that cannot be approached in this country at the price, whilst the letterpress, both general and relating to the species, is utterly worthless. Here we have a book, based on the lines of the better British and American models, in which the general information is good and up-to-date, whilst the description of each species is worked out under various headings—Insecte parfait, Œuf, Chenille, Chrysalide, Plantes nourricières, Époque d'éclosion, Localités, Distribution géographique, etc. Such a book must leave its mark on its successors, and one may hope that a more scientific style of letterpress will become general in the near future. Considering the way in which British lepidopterists have, during recent years, extended their studies to the continental rhopalocerous fauna, and the endless stream of inquiries from would-be travellers abroad to which one is subjected, it is remarkable that not a single British lepidopterist figures among the list of subscribers. Possibly the fact of the publication of the work was insufficiently advertised, at any rate, we strongly advise our readers, who are in any way interested in European Rhopalocera, to invest 5s. in a book that will give them much interesting information about the whole of the species of butterflies belonging to the Belgian fauna, much food for reflection, and will enable them, perhaps, to explain why two countries like Belgium and Britain in the same latitude, and separated only by a few miles of water, should have such a different Rhopalocerous fauna, that of Belgium almost doubling that of the British Islands. We heartily congratulate the author on the completion of vol. i, and trust that the support he obtains will be such as to urge him to continue the succeeding volumes without delay.



Entom. Record, etc., 1902.

Miss Taka Nawa.

Entomological Japan (with photograph).

By THE HON. N. C. ROTHSCHILD, B.A., F.L.S.

Great Britain's alliance with Japan has certainly occupied no small share of public attention, so possibly no apology need be made for the above title. Many of us from time to time have eyed with wonder the outside of the neat little Japanese magazine, *The Insect World*, published by Mr. Y. Nawa, in Gifu, Japan, and have speculated as to the nature of its contents. The journal in question, it will be remembered, is printed in Japanese, and bears on the cover a portrait of *Luchdorjia japonica*, the Gifu Cho* of the country to which it belongs.

Japan recognises but one chief authority, the Mikado, and similarly that country claims but one entomologist, Mr. Yiomachi Nawa, of Gifu. True there are others who collect, but should the stranger wish to see the recognised authority, a visit to the Nawa Entomological Laboratory is essential. The present writer being in Kyoto, Japan, on April 7th last, determined to see the institution in question: his experiences there being some of the most charming he has yet experienced, he has ventured to publish them on the chance of their being of interest to others.

The town of Gifu itself is well worth a visit; situated amongst mountains covered with dense pine forests and blossoming cherry trees, it presents in early spring a scene of extraordinary beauty. Close by is the river Nagara, where, in the summer, the curious spectacle of fishing with tame cormorants may be witnessed. Those, also, who desire excitement have the same provided, for earthquakes occasionally completely destroy most of the houses in the main street.

Half a mile from the hotel is the Nawa Laboratory. Mr. Nawa and some six assistants and pupils were there to give the writer a more than cordial welcome. First of all a fine collection of Japanese lepidoptera was exhibited. All the specimens were nicely labelled with dates and localities, and, in some cases, the photograph of the captor is preserved with a great rarity. All localities were at the stranger's disposal, and the ardent collectors were anxious to show the writer the exact haunts of *Luchdorjia japonica* and other local specialities. Another room was filled with breeding-cages containing larvæ and pupæ; a roving larva of *Papilio sarpedon*, in fact, had been allowed to pupate on the door, not finding the scanty space originally allowed to its taste. Outside the house we visited many acres of growing cereals and other plants. These Mr. Nawa experiments upon for economic purposes. The writer was presented with a very beautiful set of photographs illustrating the life-histories of most of the Japanese insects injurious to agriculture. Each photograph is a small work of art in itself, and the whole collection, bound in a neat octavo volume, must, coupled with Mr. Nawa's excellent notes, be of immense value to the farmer and horticulturist. In the town of Gifu there is a large building resembling a wooden warehouse, built with the characteristic Japanese taste. "This," said Mr. Nawa, "is the insect exhibition." It is a large building completely filled with

* Cho=Butterfly, in Japanese.

entomological exhibits, which is financed and organised too by the energetic Mr. Nawa and a small ring of enthusiastic followers.

A painting on wood, some three feet across, of the Gifu Cho* (*L. japonica*), and some beautiful paintings of butterflies and flowers were specially noticeable. These are the work of Miss Nawa, Japan's foremost lady entomologist, whose portrait is reproduced in this number. Miss Nawa's christian name is Taka, *i.e.*, Ladybird, her parents thinking that the daughter of such an enthusiast as Mr. Nawa should have an appropriate name. In England wives and daughters, so at least it is rumoured, look upon insects as undesirable, but not so in Gifu. Here the whole family strive to outdo each other in entomological research.

In Japan the maxim is, "Treat your guest as you would be treated," so in the evening the Nawa family entertained the writer at an entomological dinner party. Seated on cushions round charcoal braziers in the tea-house of a million pines, and eating with chopsticks, we did honour to the insect world. Two Geisha girls sang of spring, its flowers and its insects, and we drank to the prosperity of Japan, its flora, and its fauna, in Sake.

Lepidoptera in Haute-Savoie—Annecy, Chavoire.

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

Annecy, in the Haute-Savoie, delightfully situated on the Lac d'Annecy, at an elevation of 1470ft., is apparently, so far as can be judged from a stay of three days, July 29th-31st, not a good centre for lepidoptera, although, on the other hand, it would appear to be a perfect paradise for the odonatist. The district is exceedingly fertile and highly cultivated, factors that are against success in the pursuit of Rhopalocera. Few examples, even of the common *Pieris rapae*, are to be seen about the cultivated grounds near the town, and it is not until one has passed round the northern side of the lake and reached the lucerne patches leading up to the rough lower and bushy slopes of the Montagne de Veyrier, that one really finds any lepidoptera. True, one sees an occasional *Epinephle ianira*, *Coenonympha pamphilus*, *Polyommatus icarus*, and the reed patches one passes hide swarms of *Hydrocampa stagnalis* and some *H. nymphacata* that come out at the least disturbance, although the former species appears to be still more abundant in the nettle-beds by the side of the road, which they choose for a hiding-place, but the Wicken-like ground near the lake seems to produce no Rhopalocera of importance. On the east side of the lake, however, *Papilio podalirius* soon becomes a roadside insect, as also do *Polygonia c-album*, *Pyramis atalanta*, *Epinephle ianira*, and *Polyommatus icarus*, whilst between Chavoire and Veyrier the flower-heads by the wayside abound with *Anthrocera carniolica*, *A. transalpina* and *A. filipendulæ*, and *Sesia stellatarum* flies at the flowers or buzzes up and down the white dazzling walls, resting occasionally under the topmost ledges for a moment before flying off again. A single badly-worn *Limnitis camilla* was also observed, whilst a large brightly-coloured form of *Pararge macra* was in equally unsatisfactory condition. Taking a few steps from the road upon the lucerne banks that edge the clover fields, to the left as one approaches Chavoire, in order to reach the rougher ground at the back, one immediately discovers a variety of

common species, *Vanessa io*, *Pyramis cardui*, *Gonepteryx rhamni*, *Epinephle ianira*, *Pieris rapae*, and *Melanargia galathea*, the commonest perhaps on the clover-heads, whilst on the lucerne flowers on the rough banks also *Melanargia galathea* is everywhere, *Polygonatus corydon* very abundant, and some examples very small, *Melitæa didyma*, both sexes, but quite over, with *Pamphila sylvanus* and *Thymelicus thaumas*, here, there and everywhere; much more abundant, however, than either, is *T. actæon*, very active in the hot sun, sitting for a moment on a lucerne head, and flitting off rapidly to give battle to another of its kind, but returning again and again to nearly the same place; the females, however, are found to be in much better condition than the males. Careful watch was kept, but fruitlessly, for paired examples or for ovipositing females, a real disappointment, as information is badly needed as to the method of oviposition of this species. *Spilothyrus larateræ* is occasionally observed, and difficult to follow on the steep slopes, whilst flying suddenly past is an insect one immediately recognises as *Lycæna arion*, getting worn at this, with our British experience, late date. This species flies rapidly and strongly enough in the hot morning sun, and does not remain long at each rest, so that it sometimes proves difficult to capture, although at other times it is less restless and quite easily taken. The insect is apparently scarce here, and not a single female could I detect ovipositing. Along the edge of the tall bushes covering the upper slopes, *Leptilia sinapis* flitted restlessly, settling, however, occasionally on the blossoms of what appeared to be a species of *Lathyrus*, and more frequently on the flowers of various Cruciferous plants. The conspicuous *Everes argyales*, with its pale underside, was observed sparingly over a bed of vetches, and one *Cupido sebrus* was also taken, both these last-named species being of large size. Looking down into a clover field from the slopes, one observed an Argynnid flying sparingly, and the capture of four examples resulted in two *Argynnis adippe*, one *A. aglaja*, one *A. niobe*, the three species thus occurring on the same ground. I was a little surprised (although I suppose one ought not to have been) to find *A. niobe* here at so low an elevation. An unexpected fluttering on a clover-head revealed a hitherto well-hidden female of *Papilio machaon* of large size, several others being taken later, the species being evidently only just out. A sudden flash of scarlet shows that *Callimorpha hera* is already on the wing, the few examples seen being in fine condition. *Enodia dryas*, males only, were also just appearing among the long grass and the bushes. Four species of *Anthrocera*—*nili pendulæ*, *transalpina*, *carniolica* and *achilleæ*—were abundant and in fine condition on all the flower-heads, and one is at first rather surprised to startle a large female specimen of *Hemithea strigata* (*thymiaria*) resting among the herbage on the exposed sunny banks; only twice have I noticed it before thus, and then quite at the end of July, 1898, when, at Bourg St. Maurice, I disturbed several on the rough exposed rocks where *Anthrocera purpuralis* is sometimes so abundant, and a single specimen in August, 1897, at Lanslebourg. *Pyrausta punicealis* and *P. purpuralis* are not uncommon on the slopes, but *Herbula cespitalis*, a very pale form, is in hundreds among the clover. *Strenia clathrata* is, however, almost equally abundant in the clover fields, flying freely all the morning and resting on the flowers; *Ematurga atomaria*

is, *par excellence*, the insect of the slopes, this summer brood being brightly coloured and of large size, the only English examples I know approaching them, being some captured in the hot July of 1893, on the chalk downs at Cuxton, and which were of a similar bright colour to these southern forms. *Hithya caruella* was going over, but *Cledeobia angustalis* was in swarms and in fine condition, whilst *Stenopteryx hybridalis* was also abundant but worn. *Euclidia glyphica* appears to fly with *S. clathrata* and *E. atomaria* all day at the flowers, but I was astonished to notice that *E. atomaria* with *P. corydon* was attracted by excrement at midday. On a white saxifrage that grew abundantly on the tops of the walls several *Thecla spini* were taken, some worn, others in moderate condition, whilst it was strange to find a ♀ *Zephyrus quercus* adopting the same habit, though several examples of the species were also seen on the bushes, settling on the topmost boughs as is more usual in the species. A row of eight bright apple-green eggs, and two laid separately, were found in a glass-topped box with a ♀ *T. spini*. They were evidently butterfly or Noctuid eggs, but knowing how easily one may be deceived as to eggs found in this manner, I dissected a worn ♀, and found that she contained apparently similar eggs. The eggs are orange-shaped, *i.e.*, a sphere somewhat flattened at the apex and base, attached firmly by the latter, and with quite three dozen well-marked longitudinal ribs passing from the base to the micropylar area, which is slightly flattened, and where the ribs become lost in a marked reticulation. In two days the upper part of the egg is becoming mottled with faint brown-red patches, chiefly in the upper area. The egg is so dissimilar to that of *T. w-album* that one doubts, in spite of the similarity of the imagines, whether the species are, after all, if these really be the eggs of *T. ilicis*, so very close.* A few *Aporia crataegi* were observed, all males, and in spite of the late date, not at all in bad condition; they haunted the flowers and not their food-plant. On the first day (July 29th) spent on these slopes, *Acidalia ochrata* was quite common, the males flying freely in the morning sun and the females easily disturbed; on this day no *A. rufaria* was seen. The next day *A. ochrata* was still common, and about half-a-dozen male *A. rufaria* were disturbed on the same ground. On the 31st not a single male *A. ochrata* was to be found, although the weather was in every way suitable, and I took what I supposed were four females; on the other hand, many male *A. rufaria* were seen; when I examined my captures at home, I discovered that the four supposed ♀ *A. ochrata* were of this species, so that I really did not get a single specimen of the former species. It is remarkable that two such closely allied species with almost identical habits should live on the same ground and be in the imaginal stage at the same time, although I had noticed this to be so previously

* These eggs were sent to Mr. Dollman who wrote on August 21st:—"The *ilicis* I cannot understand. Two of the eggs hatched the day after I received them, and the remainder have only now darkened, but the larvæ do not emerge. The two larvæ were placed in oak, but would not feed. They were not like any *Thecla* larvæ I know. They were elongated geometrid-like things with four chaspers—a long thin body and large head—very like young *Catocala fraxini* larvæ. They also had the restless roving habit of that larva when young. Are you quite sure the eggs are those of a *Thecla*?" From this one suspects that after all the eggs must have been those of some Geometrid-Noctua, *e.g.*, *Euclidia glyphica*.

at Aix-les-Bains, and I believe also at Bourg St. Maurice. A few male specimens of a beautiful blood-vein, the name has escaped me for the moment, and a few of *Eubolia bipunctata* were observed, and a couple of examples of *Acontia luctuosa* and one of *Eunychia octomaculata* were taken, whilst a specimen of *Agrophila trabealis* and a few males of *Heliothis dipsacea* at the flowers showed that these species were just coming out. Coming down from the slopes, a piece of stubble with the clover growth already well advanced, showed a few males of *Colias edusa* in first-class condition, and a single pale yellow female, worn, ovipositing; a single *Argynnis lathonia* was also apparently ovipositing in the same field, but I failed to find her eggs. Whilst standing on the slopes a *Satyrus alycon* was attracted by my light coat, and repeatedly settled thereon, but it insisted on settling on my back and so easily eluded the net; a few examples caught later were very unequal in condition, some good and others in very bad condition, although this one was quite perfect. *Colias hyale* was almost as active as its congener, *C. edusa*, but a couple paired, the ♂ carrying the ♀, were certain prey, whilst another ♀ went to Mr. Dollinan immediately on my return to Anney for him to try for ova. It is worth noticing that a fine freshly-emerged female *Tephrosia bistortata* (*crepuscularia*) was taken on the trunk of a plane tree in the Avenue du Paquier, but a close search revealed no more. I have before stated that the odonatist would have a good time. One vicious dragonfly was quite abundant on the road by the lake side, but so active that, although I knocked down one or two, they quickly got away, and I have brought no specimen home for recognition. I thought the insect was *Cordulegaster annulatus*, but I may have been mistaken. A beautiful blue-bodied species, *Enallagma cyathigerum*, was exceedingly abundant on the clover fields near the lake, mostly flying tandem in the morning sun, the ♂ attached by the last segment to the prothorax to the ♀, some, however, fully paired in this habitat. The ♀s of this species are dimorphic, one form, blue, having a black abdomen with narrow bands and sides, the other black with narrow green bands and sides. The immature form of this species was sure to attract attention, occurring all over the slopes and in the fields, its wings shimmering like molten silver in the sun as it took short weak flights from one stem to another. A beautifully brilliant form of the male of *Calopteryx splendens* was sunning itself on the vine leaves.

One may add that on July 25th. at Aix-les-Bains, insects were fearfully backward and rare, and one suspects that the cold weather we experienced in Britain, in spring and early summer, has been general over most of south-eastern Europe. *Melanargia galathea* in good condition, *Enodia hyperanthus* and *Epinephela tithonus* only just out, the second broods of *Leptidia sinapis*, *Colias hyale* and *Melitara cinria* represented by two or three specimens only, and a single example of what I have always supposed to be *M. athalia*, instead of the swarms of these species usual at the end of July, were all in the nature of an unsatisfactory surprise. The second brood of *Chrysophanus dorilis* was well out, and a single ♂ of *Polyommatus bellargus*. The Anthrocerids were all remarkably scarce compared with their usual amazing abundance here, whilst many generally common species were not seen at all.

The Tettigidae of North America*.

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

In a great work, published twenty years ago, Brunner von Wattenwyl remarked, apropos of the *Tettigidae*, that a very great variety of exotic forms was known, but that the family was in a chaotic state, and a monograph was badly needed. Writing ten years later, the same author, referring to the monograph of Bolivar, which had appeared in the meantime, said that it left nothing to be desired. The immense progress made by Bolivar may be realised when we compare the number of species known to Stål in 1873; the Swedish orthopterist only knew seventeen, from every part of the world, but Bolivar describes no less than two hundred and twenty-one. But the Spanish naturalist had but a poor collection of North American forms before him, and was only familiar with a small percentage of the species occurring in the Nearctic Region, and so, through inadequate material, he was unable to deal thoroughly with the *Tettigidae* of that part of the world. But an occasional contributor to this magazine has recently given us the results of nine years devoted to this interesting family, and his work deals with ninety species, distributed through twenty-one genera, which form the Tettigid fauna of North America.

The book is beautifully got up and extremely well illustrated, and, what is perhaps even more important, deals not only with the purely systematic arrangement, but gives a large amount of information concerning the bionomics of these interesting little grasshoppers.

The author, in giving an account of the various names applied to the group, does not follow Kirby and Kirkaldy in adopting *Acrydium* (Geoffroy, 1762), nor *Bulla* (Linné, 1764), nor yet *Tettix* (Latreille, † 1804), but the more familiar and generally adopted *Tettix*, as written by Charpentier in 1841. Dr. Hancock adopts the division of Bolivar into seven sections, of which four are represented in North America, namely, *Cladonotinae*, *Metrodorinae*, *Tettiginae*, and *Batrachidinae*. The curious *Cladonotinae*, with their remarkable leaf-life development of the pronotum are represented by seven species, of which all are confined to the West Indies excepting *Tylotettix sinuatus*, Morse, from Nicaragua. Of the *Metrodorinae*, three species (and three genera) described by Morse, are all from Nicaragua; it is the typical section, *Tettiginae*, however, which is best represented; there are sixty-four species ranged through eleven genera. The genus *Tettix*, itself, with its nineteen North American species is divided into three groups, the "*granulatus* group," "*ornatus* group," and "*arenosus* group." The commonest species appears to be *Tettix ornatus*, Harris, to which the original describer himself gave five names, deceived by the remarkable colour variation, a phenomenon which is familiar to all British orthopterists who have collected our common *Tettix bipunctatus*, L.; a note on the habits of this "grouse-locust" is appended to the description; among eight specimens captured on a single spot, on "sandy soil, where the light vegetable mould was sprinkled with fine gravel," six different

*The *Tettigidae of North America*, by Joseph Lane Hancock, with seven plates and many text figures by the author, Chicago; published by special grant of Mrs. Frank Logan, 1902.

* Misspelt by Hancock, Latreille.

aberrations were found. Another common species seems to be *Tettix triangularis*, Scudder, which differs but slightly from the preceding species, with which, according to Hancock, it interbreeds; the distribution of the two forms is the same, but, in certain localities in Illinois and Wisconsin, *T. triangularis* is commoner; and "the numerical relation between the two forms reaches about fifteen to one."

Paratettix, Bolivar, which is represented in Europe by the single species *P. meridionalis*, has no less than fifteen in North America. According to Hancock they are "unusually aquatic, the expanded tibiæ acting in a measure as paddles for swimming." Of the *Batrachidinae*, there are four genera, of which *Parilla*, Bol., *Plectromotus*, Morse, and *Scaria*, Bol., have only a single species each, but *Tettigidae*, Scudd., has twenty-two.

A noteworthy part of this book consists of the various notes on the habits and manner of life of the *Tettigidae*. They are remarkable for their variability, and are well known to have habits very different from those of other Orthoptera; many are known to have aquatic or semi-aquatic habits, and our common English species differ from our other grasshoppers in hibernating, so that adult forms can be found in the spring before other grasshoppers are out of the egg. Their protective colouring is remarkable and is well illustrated by a photograph of nine specimens mounted upon a single card, all of which were taken at the same time and on the same spot by the author. One of the most interesting points in connection with their habits is their food. Dr. Hancock tells us that they feed upon the vegetable mould or decomposing soil, sometimes mixed with algæ, or on the lichens, mosses, tender sprouting grasses, sedges, germinating seeds of plants and *débris* found in such situations. "Particularly sought after are morsels of the various coloured surface clays and black muck consisting of rich vegetable mould"; a microscopic examination of the contents of their stomach showed numbers of mould spores and algæ mixed with particles of quartz sand. (See a note by the same author in this magazine, vol. x., pp. 6-7, 1898. "The Food Habits of the Tettigidae.") This is an unusual dietary for Orthoptera, which are generally purely vegetable feeders, though a considerable number are carnivorous, but it is much doubtful if any other forms are so omnivorous as the *Tettigidae*, so as to actually eat mud and mould. A figure in the text shows that the female *Tettix* lays her eggs in much the same way as other Acridian Orthoptera as described by Riley. It appears that they migrate in the autumn, and local flights of considerable extent have been recorded; "in north-eastern Illinois, during sudden storms, multitudes are blown into Lake Michigan," from which they usually escape owing to their semi-aquatic habits; in the *American Naturalist*, 1894, p. 483, the same author gives a short account of an unusual flight of *Tettigidae lateralis*, Say. Another point in which the "grouse locusts," as they are often called in North America, are peculiar, is that instead of copulating in the late summer, as do most Orthoptera, at least in England, so leaving the ova in the ground through winter, the *Tettigidae* copulate in the spring, and the young larvæ are hatched out in the summer, becoming adult in the late summer or autumn: Dr. Hancock describes their copulatory habits, which, at least in *Tettigidae*, resemble those of a frog; the male rides about on the female's back, unless dislodged by a vigorous jump, and the two sexes often stay together for some days

at a time. One remarkable fact established by the author, is that polyandry exists among them and "forms an important factor in accounting for variations."

Several pages are devoted to descriptions of the ova, ecdyses, phylogeny as suggested by metamorphoses, their enemies, both internal and external, and to the external anatomy, which is described in some detail.

A kind of appendix, from page 167 to page 185, is occupied by a series of notes on "Vivarium Experiments"; we find a large number of notes with such titles as "Habits in confinement"; "Fifteen in a brood of *Tettix ornatus*"; "Males weaker than females"; "Third ecdysis of *T. ornatus*, growth depends on food supply"; "*T. ornatus*, fifteen days incubation"; "*T. ornatus*, hatching in June comes to maturity in August"; "Oviposition of *T. ornatus*"; "*T. ornatus* and *T. triangularis* in conjugation"; "Expulsion of faeces by means of hind tibia"; "Tettigids play in the sunshine, trying their wings"; "Mutilation not inherited in the offspring"; "Deformity of the tibiae in *Tettigidae* newly-born"; and so on, forming an interesting list of notes taken upon the habits of several species of *Tettigidae* kept under observation in captivity, with dates of their exclusion, ecdyses, copulation, the whole series of experiments forming an excellent example to British orthopterists who may well make up for the poverty of the fauna which they have to study, by more thoroughly examining from every point of view, the few species which come in their way.

Migration and Dispersal of Insects: Social Insects—Hymenoptera, Termites.

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

Hudson says (*Ent. Mo. Mag.*, xxvi., p. 23) that, in New Zealand, when he has observed the annual flights of *Atta antarctica* there, he has heard the peculiar "humming in the air," described by White of Selborne, very distinctly, and has little doubt that the sound which so puzzled the renowned naturalist was caused by a migration of ants in the higher regions of the atmosphere. This species, which is very abundant on the hills round Wellington, performs its annual flight with great regularity. On April 1st, 1888, enormous numbers of the ♂s were observed flying about over a very large extent of country. . . . The same phenomenon was exactly repeated on May 31st, 1889, when the ants were, if anything, even more abundant. Both days were calm and sunny, and no doubt this species takes advantage of the fine weather that usually prevails about this time to perform its annual migrations. Hudson considers that the "stocks" of the several nests must be completely mixed up by the process, and considers it remarkable that the males and females should escape simultaneously from the different nests over so wide an area. Another New Zealand observer, W. W. Smith, writing in September, 1890, says (*loc. cit.*, pp. 321-322) that, before the time for the swarming and migration of *Tetramorium nitidum*, a very minute species of ant, in that year, he wrote to several friends in different parts of Canterbury requesting them to keep a strict lookout for any flights of insects that might to appear in their districts, at the same

time asking them if such occurred to capture a few specimens and send them to him. From two correspondents living thirteen miles apart, some specimens of this ant were received, together with interesting letters describing two large swarms. These were:—

- (1) A great flight, observed on March 2nd, near the Rangitata Gorge.
- (2) Another large flight, observed on March 10th, at Mount Somers.

A small swarm was also observed on March 12th near Ashburton. No one, says this observer, who has not seen a flight of *T. nitidum*, could imagine the vast numbers that constitute it. This insect invariably migrates in calm and sultry weather, as it would be quite impossible for this minute and delicate species to do so during the slightest motion of the air. The last great flight observed moved very slowly on its course, whilst the "hum" or motion of the wings was only slightly audible. Great numbers rested on a wire fence for a few seconds, but again rose and joined the swarm, their minute hyaline wings, while resting, sparkling with iridescent hues in the sunlight.

The abundance of winged ants at certain seasons of the year, and their movement to considerable distances may possibly be due to the necessity for cross-fertilisation. Their ordinary habits tend to keep them well within the limits of their own community; but at the times they perform their annual migrations the ants from various nests must be pretty well mixed up. The life of a male ant is a very short one, and after fertilisation has been effected the female ant loses her wings. The tendency of the males and females to leave the same nest at different times also supports this view. But, apart from this annual dispersal of the newly-emerged males and females that regularly takes place, there is some little evidence that even the wingless forms migrate considerable distances. Darwin describes the movements of a Brazilian ant which migrates in large numbers. He writes: "One day, at Bahia, my attention was drawn by observing many spiders, cockroaches, and other insects, with some lizards, rushing in the greatest agitation across a bare piece of ground. A little way behind, every stalk and leaf was blackened by a small ant. The swarm having crossed the bare space, divided itself and descended an old wall. By this means many insects were fairly enclosed, and the efforts which the poor little animals made to extricate themselves from such a death were wonderful. When the ants came to the road they changed their course, and, in narrow files, reascended the wall. Having placed a small stone so as to intercept one of the lines, the whole body attacked it and then immediately retired. Shortly afterwards, another body came to the charge, and, again having failed to make any impression, this line of march was given up. By going an inch round the file might have avoided the stone, and this doubtless would have happened, if it had been originally there, but, having been attacked, the lion-hearted little warriors scorned the idea of yielding." Although Darwin considered these ants were migrating, there is nothing to show that they were not on a simple foraging expedition. Reference should be made here to Bates' account of the *Ecitons* (*Nat. on the Amazons*, pp. 350 *et seq.*).

The movements of Hymenoptera which we have described, may, so far as they constitute a change of habitat, be called migrating movements, but they are scarcely to be compared with the migrations over large areas, which we have considered in relation to locusts,

dragonflies, butterflies and moths. Winged ants, as we have seen, collect in vast numbers when they first emerge, and it seems to be a general habit among many species to disperse as quickly as possible, and to get as far away as may be from the spot where they themselves have been reared. The necessity of this is self-evident, if the reason we have previously suggested be the correct one, *viz.*, that crossing between the inhabitants of different nests may occur, for the males are exceedingly short-lived and the females lose their wings as soon as fertilisation has taken place. There seems, however, to be a possibility of confusion between the different phenomena here presented. The Driver ants (*Anomma*) seem to have no fixed homes, but to live in a constant state of migration, *en masse*, and simply moving in search of food. Colonies of *Formicidae* or *Myrmicidae* only occasionally shift their quarters *en masse* (sometimes more than once in a season, at others not for years), and then merely because the old quarters have become for some reason inconvenient, and does not result in the establishment of fresh communities like the "swarmings" of *Apis mellifica*, or the autumnal dispersal of fecundated ♀ ants after the nuptial swarming. In the latter case the original community remains, the old queens having long ago lost their wings, whilst each fresh queen that is successful starts a new community elsewhere. The comparatively few species of social wasps and bees (*Bombus*) do not exactly "swarm" like ants, *i.e.*, there is no collective exodus of all the males and females on one day, still it seems that, after fecundation, their females disperse to various quarters and start new colonies, each separately, next spring, the old colony perishing entirely at the approach of winter. The solitary bees and wasps do not properly swarm at all. They appear, it is true, in multitudes, at certain times and places, possibly not from any instinct to congregate, but simply from the simultaneous birth of many individuals from eggs laid together under favourable conditions, the individuals comprising such pseudo-swarms proceeding to copulate and nidificate at no distance from their own birth-places, forming as it were a sort of colony, which is, however, in no sense a true community, but merely a number of individuals living side by side, so long as conditions are favourable, but breaking up as soon as they cease to be so, choosing a new place, where, by chance, some of its members may find themselves together again, the movement being individual and not collective, a totally different phenomenon from the collective migration of a society, or from the movements resulting in the production of new societies by the dispersal of founder-queens. The fossorial hymenoptera, Chrysidids, &c., never really migrate collectively; they simply abound, apparently, but not really, swarming, wherever the environment is favourable. They appear to be found in aggregations not congregations. The migrations of *Teuthredinidae* possibly mean little more than exceptional abundance locally, the swarm being transported mechanically, but, here, as with the movements of aphides *en masse*, more evidence is necessary. The swarming of *Apis mellifica* in confinement appears to be a real instinctive phenomenon, due to the stock outgrowing its hive; but there seems no reason why, if a colony have the power to extend its quarters *ad infinitum*, these should swarm at all. Morice, to whom we are indebted for the above suggestions, says (*in litt.*): "On the whole, I believe that migration proper plays

a very small part, if any, in the dispersal of hymenoptera. Generally, I think, they spread by a very slow and gradual process of multiplication over suitable regions, each individual travelling in the course of its life a very little way from its own birthplace, and laying in the course of its restricted wanderings an egg here and an egg there where suitable opportunity offers. Sometimes local circumstances greatly quicken this process, *e.g.*, when a freshly exposed sandbank at once receives a great overflow of common *Andrenidae* and Fossors with their parasites from sandbanks hard by, or when a particular condition of weather tempts the *Tenthredinidae* imagines to ramble further than usual from their own food-plant to other specimens of it in the neighbourhood, so that the larvæ next season appear on twenty trees or bushes instead of one. But all this seems to me quite unconnected with a true 'migratory instinct,' and even true migratory instincts seem to include diverse kinds. I see little or no analogy between the Bedouin movements of an army of driver ants, the multiplication of *Formica* colonies by dispersal of fecundated queens, and the departure of an *Apis* swarm from quarters that can no longer contain it. Of course, in a sense, every shifting of its quarters by an insect is a 'migration.' But it is one thing if I move from this house to one in the next road for personal or family reasons, and another if I get up a colony of fellow Britons to settle in Rhodesia for 'imperial' reasons of policy. This seems to me more or less parallel to the difference between the migrations of insects with communal instincts and insects without them. The migrations of birds, as far as I understand them, have nothing in common with anything known to me in the Hymenoptera. Hence I am rather unwilling to use the word 'migration' at all in connection with Hymenoptera, lest it should suggest analogies that do not exist."

The termites or white ants as they are almost everywhere popularly called, have no real affinity with the true ants, indeed, there are scarcely any two divisions of insects more widely different than the true ants and the white ants. In spite of this great difference, however, both groups lead a social life, and there is much analogy between their habits. The swarming, if not the actual migration of termites, has been frequently recorded. Burrows states that he remembers well the curious swarming of the Natal termites, the clouds of flying insects and the ground littered with the detached wings. One corner of a field was one day quite white with detached wings. The females fly for a while then settle and deliberately bite or shake off their wings. In America a flight of *Termes nario* was reported by Bickford, from Texas, as occurring on July 16th, 1891 (*Insect Life*, iv., p. 146). They came from an easterly direction and flew from ten to twenty feet above the grass. This observer also mentions that, after a time, some of the specimens lost their wings. Both of these are reports of swarms on a comparatively small scale. Hagen has given (*Proc. Bost. Soc.*, xx., 1878, p. 118) particulars of a swarm of another species, *Termes flavipes*, in Massachusetts, in which the insects formed a dark cloud, and were accompanied by no less than fifteen species of birds, some of which so gorged themselves that they were unable to close their beaks. The termite economy is such that swarms similar to those just described are being continually given off. Vast numbers of superfluous individuals are produced in almost every

nest, and these, when they reach the winged state, leave the parent community in a manner similar to the cases already described.

Until quite recently it was generally considered that swarming probably took place, as in the case of true ants, in order (1) to increase the number of communities, and (2) to promote cross-fertilisation between the males and females of different communities, but recent observers (among others Grassi) believe that this is not so, and that the superfluous individuals which leave a colony are entirely destroyed by various enemies of the termites. Fritz Müller goes so far as to assert that, in the case of the majority of species known to him, the founding of a colony by means of a pair from a swarm would be just about as practicable as to establish a new colony of human beings by placing a couple of newly-born babes on an uninhabited island. Yet Sharp says (*Cambridge Natural History, Insects*, i., p. 364) that, "after the winged insects leave the colony, they associate themselves in pairs, each of which should, if all goes well, start a new colony;" and he further adds: "It is not improbable that Smeathmann may be correct, and that, in the case of some species, mature individuals may re-enter the nest after swarming and become royal couples. On the whole, however, it appears probable that communities of long standing are kept up by the substitution royalty system, and that new communities, when established, are usually founded by a pair from a swarm, which, at first, are not in that completely helpless condition to which they come when they afterwards reach the state of so-called royalty. Grassi's observations as to the sources of food remove, in fact, one of the difficulties that existed previously in regard to the founding of new colonies, for we now know that a couple may possibly bear with them a sufficient supply of proctodæal and stomodacal aliment to last them till workers are hatched to feed them, and till soldiers are developed and the community gradually assumes a complex condition. Professor Perez has recently obtained the early stages of a community gradually from a winged pair, after they had been placed in captivity unattended by workers. Müller's observation (previously quoted), is no doubt correct in relation to royal pairs after they have been such for some time; but that helplessness is itself only gradually acquired by the royal pair who are, at first, able to shift for themselves and produce a few workers without any assistance." This conclusion of Sharp's appears to us to be the most logical one that could possibly be formed in the present state of our knowledge, and, if it be correct, it results that the cause and result of the swarming and migration of the termites are, indeed, very closely analogous to the same phenomena as observed in the true ants. This is also the view of Bates, who notes (*Naturalist on the Amazons*, p. 110) of the Brazilian termites which he found at Caripí, that "the white ant is endowed with wings simply for the purpose of flying away from the colony, peopled by its wingless companions, to pair with individuals of the same or other colonies, and thus propagate and disseminate its kind. The winged individuals are males and females, whilst the great bulk of their wingless fraternity are of no sex, but are of two castes, soldiers and workers, which are restricted to the functions of building the nests, nursing, and defending the young brood. The two sexes mate whilst on the ground after the wings are shed; and then the married couples, if they escape the numerous enemies which

lie in wait for them, proceed to the task of founding new colonies. Ants and white ants have much that is analogous in their modes of life. They belong, however, to two widely-different orders of insects, strongly contrasted in their structure and manner of growth."

Notes on the life-history of *Aglia tau*.

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

OVUM (April 25th, 1900).—The ovum varies greatly in length and colour, from pale whitish-yellow to dark red-brown. Shape, a blunt-ended oval, almost circular in cross-section, *i.e.*, a cylinder with rounded ends. There is great disparity in size, and occasionally the eggs are bent and flattened on sides (oval section), giving them much the appearance of a French bean. The sizes of three measured work out as follows:—

LENGTH.	BREADTH.	THICKNESS.
·11ins.	·06ins.	·055ins.
·075ins.	·0675ins.	·05ins.
·115ins.	·06ins.	·06ins.

The last of these was straight, surface much wrinkled, and pale orange in colour. The surface is minutely pitted, and has traces of a fairly large, but very faint, cell reticulation. Scattered either singly or in little detached groups, much as the *Smerinthid* eggs are in captivity.

HABITS OF YOUNG LARVÆ.—The larvæ live solitarily, rest on the underside of a leaf in the "Sphinx" position, and move little, though occasionally they may be seen crawling along the twigs of leaf-stalks. Their habits agree closely with those of young larvæ of *Mimas tiliæ* or *Sphinx ligustri*.

DESCRIPTION OF YOUNG LARVA (May 15th, 1901).—1st skin (well-grown in 1st stadium) about twice length of newly-hatched larva. The habits are almost the same as those of a young *Sphingid* larva, *e.g.*, *M. tiliæ* or *S. ligustri*, resting on underside of leaf, sluggish, and moving little, adopting the "Sphinx" attitude when not actually feeding. In feeding it only exposes its head, working in the gap it eats, its body concealed, looked at from above, by the leaf. The larvæ already show traces of the habit of withdrawing head beneath the prothorax. *Head* rounded, but with a tendency to flattening at top and sides; slightly depressed or notched at crown; colour pale creamy white, with a broad band of pale red-brown over crown and down sides; the clypeal suture also bordered by a broad band of same colour; surface smooth, but not shiny, and under microscope (1" objective) is seen to be spotted with dark on pale ground; hairs scattered, pale and transparent, looking finely thorned or serrated. *Body* cylindrical, plump, and stout for length, with deeply-cut segmental divisions; the larva tapers forward from metathorax to head, and backwards from 1st abdominal to anus, the 7th and 8th abdominals being noticeably smaller than the other abdominal segments, 9 and 10 are also rather more dwarfed than usual; colour bright apple-green, rather paler and duller on the ventral area, with a raised and paler-coloured prominent lateral flange; prolegs almost colourless, but brown at foot, legs also pale and semitransparent

looking; traces of seven oblique stripes are present and have a head to anus slope; they start at dorsal tubercle *i* and end at level of spiracle (just above lateral flange) near the hinder edge of the next following segment; divisions of segments very deeply marked; subdivisions are rather obscure, but I think there are four on each abdominal segment. The noticeable parti-coloured forked horns are apparently developments of the fleshy bases of the tubercles. That on the anal segment is apparently a development of the anal plate itself, and not forked. A pair are situated on the prothorax, a very tall, large, and widely-forked pair on the metathorax, and a large single central unpaired one on the 8th abdominal. The small unforked one on the anal segment is also central. These horns are very formidable-looking, being widely forked, and covered with smaller lateral branches, having, as have the upper forks, hairs at their extremities, the branches on lower half being almost equal to the forks at top in size. The horns are rendered more prominent on account of their divergent colouring, the lower half of the thoracic and the 8th abdominal horns and the whole of the anal one being coral red. A band equal to about $\frac{1}{3}$ to $\frac{1}{4}$ is white and the upper portion and forks are coral red. When the larva is in the resting-position, they would most certainly protect it from the attacks of parasites that wanted to oviposit on it, as owing to the "Sphinx" attitude the thoracic horns protect the whole dorsal area, but this probably is quite unnecessary for a small newly-hatched larva, at any rate in its first stadium, but possibly they were an important defence to the adult larva in past ages, and have now been forced back into an earlier stadium by the acquisition of newer and better protective characters. The four thoracic and 8th abdominal horns are all developments of the fleshy base of *i*. This tubercle, on all other segments than those producing these enormous horns (they are quite half the length of the larva when it first emerges from the egg), is developed into a sufficiently remarkable, fleshy, branching horn, not, however, distinctively coloured; each branch gives rise to a single hair (so that we must consider *i* as bearing several hairs); there are about three large branches to each horn (tubercle *i*), and from three to six smaller ones varying from short branches to highly-developed hair-bases. The hairs themselves are covered with minute, closely-set thorns, and are, in some instances, bifid at tip; *ii* is a small, single-haired, fleshy-based tubercle, on all the thoracic, as well as abdominal, segments, as far as 8th. On the segments that bear horns, however, *ii* is really on base of horns, nearly the whole of the dorsal area of segment being utilised in the base of these projections. I think I should omit the prothorax as regards *ii*, as I doubt the hairs on posterior bases of horns bearing any close analogy to *ii* on other segments. Abdominal segments 9 and 10 both have a pair of the small tubercle *i* horns, showing clearly that the central anal horn differs from all, save possibly the prothoracic pair, in being developed independently of *i*. The horn on the 8th abdominal is a development of both anterior trapezoidals (*i*) combined, and is probably in some form or other a much earlier development than the thoracic horns, which are evolved one from each anterior trapezoidal (*i*). Another difference between that on the 8th abdominal and thoracic horns is that the forks of the thoracic are front and back on prothoracic, and nearly so on metathoracic horns, although here they fork somewhat at an angle to the median line of larva; on 8th

abdominal the forks are right and left, not front and back. Tubercle iii is a two-haired wart, and shows well the evolution of the branching horn, as the two hairs are each on tall, fleshy, cone-shaped tubercles, and the raised skin area which they occupy in common is already developed into a circular mound or low horn; iii is, of course, not nearly so large as i is normally on the abdominal segments; iv and v are both on the lateral flange; iv almost as directly beneath the small white spiracle, as iii is above it; iv is a two-haired tubercle, similar to, but not quite so large as iii; v is slightly prespiracular, but still very close to iv; v is single-haired, but larger than ii. There are a few additional hairs present, notably one between i and iii, and another at about same level or slightly lower behind it. There are two small hairs some distance apart on lateral flange in front of v and another behind iv, also a very small slender hair above lateral flange just over v. These extra tubercles are all single-haired and very small. As the 1st skin of *Aglia tau* is evidently, on the face of it, far removed from a primitive one, and is almost certainly a highly specialised adult (larval) development forced back to an earlier ontogenetic stage, these few extra tubercles, though not without significance, must not be used as if of the same value as additional setae in a generalised first stage.

(To be continued.)

COLEOPTERA.

ABUNDANCE OF *LYTTA VESICATORIA* NEAR DOVER.—When in the country near Dover last June, I noticed hundreds of examples of *L. vesicatoria* flying in the hot sun round and settling on the outer leaves of an ash tree (*Fraxinus excelsior*). The tips of the outer leaflets all round the tree (which was a large one) were in shreds, eaten by the beetles. The ground underneath the tree was covered with frass, and the air was impregnated by the odour emitted by the beetles, and noticeable some yards away. There were other ash trees in the vicinity, but it was only round this particular one that the beetles seemed to assemble.—H. D. STOCKWELL, 2, Albert Road, Dover.

PROTECTIVE COLORATION OF *CHRYSOMELA CEREALIS*.—The distinctive coloration of *Chrysomela cerealis* must be of considerable protective value to it, from birds, in its natural habitat. Mounted in the cabinet it appears unduly conspicuous, but insects kept in captivity in a seed-pan of wild thyme are exceedingly difficult to find. The insects feed in the very early morning for the most part, sometimes at night, and when the thyme is freshly sprayed their bright colouring exactly harmonises with the little glistening drops of water (*i.e.*, dew in their native habitat) on the bright pink stalks and rich green leaves of the food-plant. In fact, until you hunt the roots of the thyme or move the stones and thus disturb them, the beetles are generally safe from observation even in so restricted a space.—J. BURGESS SOPP, 104, Liverpool Road, Birkdale.

A FEW NOTES ON COLEOPTERA IN THE WEST COAST OF IRELAND.—In June last my friends, Messrs. Bouskell and Kaye, and myself, took one of the lodges at Rossbeigh, Dingle Bay, co. Kerry, for that month and as far as the weather would permit, we explored the surrounding country for insects (Mr. Kaye being after lepidoptera only). The full account

of our trip with a complete list of the species captured during our stay will appear in the *Irish Naturalist* later on, when all the doubtful species are worked out. In the meantime a short account of some of the best of the coleoptera taken may be useful here. We were very glad to take a series of the fine *Carabus clathratus*, it was found on marshy and boggy ground at the foot of Carrantual and other mountains, Carrantual being an additional locality to the Irish list.* It is a very handsome insect as it runs over very wet places in the sunshine. A number of jet black forms of *Carabus granulatus* were taken under stones, etc., on the mountains about. In the Irish list it is said to vary "from dull bronze to brilliant green," and Fowler (*Col. Brit. Isles*, vol. i., p. 9) says "almost black;" our specimens, however, are absolutely black without any metallic reflection whatever. One of the features which struck us was the number of species of which melanic forms were observed. *Pterostichus versicolor*, jet black, *Amara plebeia*, *Anchomenus viduus* (not the var. *moestus* in one instance, but quite black), *Phyllopertha horticola*, etc. *Blethisa multipunctata* mentioned as "rare" in the Irish list was taken in marshy places. *Antiodactylus binotatus* var. *spurraticornis*, occasionally on roads. *Pterostichus versicolor* very plentiful on roads, a very variable series, the black form being most frequent. *Trechus lapidosus*, under stones or in the clay at the foot of the cliff, about a dozen specimens were taken. In the Irish list it is recorded as "rare," and it is further stated that in most of the localities mentioned "only single specimens were met with." *Perileptus arcolatus*.—This species is a very interesting addition to the Irish beetle fauna. It was found in some numbers among the shingle on the banks of the Sheen river. It has been recorded heretofore in Great Britain from Lancashire, North Wales, and the Solway district of Scotland, but is always considered a rare insect. *Tachyporus formosus*.—Swept rather freely off herbage down a chine. In the Irish list it says the previous records of this species require confirmation. The variety *ciliaris*, Steph., of *Creophilus maxillosus* was not uncommon under dead birds and carrion. *Staphylinus pubescens*, *erythropterus*, and *caesareus* occurred not uncommonly on roads. *Coccinella 11-punctata* var. *confluens* (see *Ent. Record*, ante p. 99) occurred in numbers on the sandhills in a similar place to that in which the Rev. Canon Cruttwell took them in Galway, it was in our case accompanied by the type. The larvæ were feeding on *Aphis* on *Lotus corniculatus*. *Aphodius depressus*.—The aberration with the red elytra was taken in sheep's dung on Carrantual. *Elatер pomonae* (*miniatus*, Gorham) is, perhaps, our most remarkable addition to the Irish list, as it is apparently confined to the New Forest in Great Britain. Several specimens were taken. *Hylecoetus dermestoides*.—This interesting beetle is also an addition to the Irish list. It was taken out of birch and flying. Its other British haunts are Sherwood Forest, Cannock Chase, near Manchester, and Scotch Highlands, rare. *Lema septentrionis*, Weise.—A series was swept off *Lythrum* in one field near us. This is its first record for Kerry. That the Irish species is *septentrionis* and not *erichsoni*, as it used to be considered, is probably correct, but we cannot agree with Mr. Champion that the Irish species is the same as that found in England (see *Ent. Mo. Mag.*,

* "A List of the Beetles of Ireland," reviewed elsewhere in this magazine.

1897, xxxiii., pp. 135-136) not only is the colour of the thorax black in the Irish species and blue in the English, but the English is shorter and broader, and all the coleopterists to whom we have shown the two forms quite agree with us, that they are distinct species. In our opinion the English form is the true *erichsoni*, Suffr. The English species is very rare, only three specimens being known. The specimen which started the question was taken by us at Rye in 1897. *Phyllotecta carifrons*.—This rare species was swept in the same field as the preceding, only one specimen has been recorded before from Ireland (Armagh). *Clinochara undulata* was beaten off birch, only one specimen has been taken before in Ireland (Kenmare).—HORACE SR. J. K. DOXISTHORPE, F.Z.S., F.E.S., 58, Kensington Mansions, South Kensington.

COLEOPTERA IN SCOTLAND.—January and February this year were marked by excessive and continued cold, so outdoor work was impossible, and my first outing, after the flood workings in January, was a Saturday afternoon, on the bleak exposed moor near Leadburn, on the road to Peebles, about the middle of March. I took my water-net, but the result was very poor. *Aquarius bipustulatus*, L., was common, and single specimens of *Hydroporus melanarius*, Sturm., and *H. tristis*, Pk., turned up, but nothing else worth noticing. Out of haystack refuse, *Orypoda opaca*, Gr., and *Tachinus collaris*, Gr., were sifted, and from under bark of beech trees came *Bromius agilis*, F., and *Phyllotreta undulata*, Kuts. During the early part of April I was too busy with examination work to spare time for entomology, and the latter part of the month was spent in England. Edinburgh, like the rest of the kingdom, had a cold, wet, inclement May, and only once was I able to get out. I went to Aberlady on the 2nd, there was hardly a trace of the belated spring, so I found very few insects. On the sand-hills, under stones, *Harpalus puncticollis*, Pk., and *Philonthus vernalis*, Gr., the latter a scarce insect at all times, put in an appearance, and by fishing with the net in a shallow ditch overgrown with weeds, I secured *Rhantus exoletus*, Forst., before a heavy hail and rain storm forced me to make a hasty stampede for cover. A small stream enters the Forth at this point, and by searching on the undersides of stones taken out of it I found *Elmis aeneus*, Müll., very commonly, with a few specimens of *E. cupreus*, Müll., and floating in the stream I picked up a single *Phyllotreta nemorum*, L. With June, more genial weather conditions began to assert themselves, and, as a result, more frequent excursions were made, and many good things began to appear. On June 10th, near Polmont, *Telephorus obscurus*, L., was beaten fairly commonly out of hawthorn blossom, while from general sweeping, in a piece of rough ground much overgrown with hawthorn and bramble, the following were obtained:—*Phyllobius oblongus*, L., this insect occurred by hundreds in one very restricted spot (Canon Fowler only gives Moray and Solway districts for it); *P. viridicollis*, F., off nettles; *Halysia 18-guttata*, L., Dr. Sharp says this latter insect is rare in the Solway, Tweed and Forth districts, but I have generally captured it wherever I have been if there were any fir trees; near Perth it is certainly common; *Anoplus plantaris*, Nacz., off birch; *Orchestes fagi*, L., and *Ceuthorrhynchus contractus*, Marsh. On Saturday, June 14th, I made the first of several visits to one of the most romantic and beautiful spots near Edinburgh, the lovely glen of the North Esk, between Hawthornden and Roslin. Here

entomological labours were suspended for a while, and some of the beauties of a spot hallowed by generations of pilgrims were explored: the grand old tree, beneath whose shade tradition asserts Ben Jonson and Drummond sat and talked, the caves where Robert Bruce hid, and many another memento of by-gone days in the stormy and ever-fascinating history of Scotland. Time slipped quickly by on that sunny morning as I sat on a platform at the back of the old mansion looking up the glen, the trees on the steep banks clad in the most exquisite green, and the river, far below, brawling over its stony bed, its water glistening in the bright sunlight, as fair and beautiful a scene as one could wish to see. When I returned in the evening my bag was as satisfactory as the memories of that never-to-be-forgotten walk. Just outside the lodge gates of Hawthornden I swept off *Alliaria officinalis*, *Centhorrhynchus cyanipennis*, Germ., quite common, *C. quadridentatus*, Pz., and *C. sulcicollis*, Gyll., also *Phyllotreta nemorum*, L., and *P. undulata*, Kutz., the latter in this case was the commoner of the two species, though Dr. Sharp seems to have found just the reverse in the Solway district. Sweeping at the side of a small burn running into the river in the park, produced *Helodes marginata*, F., *Plectroscelis concinna*, Marsh., and *Anthobium torquatum*, Marsh., while by beating young trees I secured *Anthophagus testaceus*, Grav., in plenty. Just beyond the village of Roslin, on a piece of ground much overgrown with rank herbage, *Phyllobius viridicollis*, F., was found in abundance on nettles, and *Tropiphorus mercurialis*, F., in scanty numbers, the river bank at this point was lined with alders, and off them I beat *Phyllobius calcaratus*, F., in some numbers. Walking back to the station I beat off birch the var. *cinereus* of *Phyllobius maculicornis*, Germ.—T. HUDSON BEARE, F.E.S., 10, Regent Terrace, Edinburgh. August 27th, 1902.

NOTES ON THE HABITS OF *ÆGIALIA RUFA*.—This very local insect, previously known as only occurring at Wallasey, Cheshire, and Hightown, near Liverpool, has appeared this year in a new locality in the Lancashire district, namely, the Birkdale sandhills. In order that the conditions of its occurrence may be understood and appreciated, it is necessary to describe briefly the topography of these sandhills, especially of the spot where *Ægialia* was taken. The Birkdale sandhills may be described as consisting of two ranges of hills running parallel with the coast line, and separated by a low-lying plain covered with *Salix repens*, etc. In one place a few years ago the wind dislodged a large quantity of sand from the seaward range and spread it over a part of this plain, where it forms a bank of bare sand perhaps twenty by twenty yards in extent. All round this bank star-grass and creeping willow are struggling through the sand. I have very frequently searched this bank and the neighbouring sandy hollows for some years, as they happen to form a particularly good collecting ground, but no *Ægialia rufa* occurred before the present year. On Whit-Monday I found a solitary specimen. The next day Mr. Wilding showed me a pair that he had taken. On the following Thursday it was abundant, and Mr. Wilding and myself were able to make some interesting observations regarding the insect, observations amply verified subsequently. We noted that it did not occur uniformly over the whole of the bare sandy surface of the bank, but affected a very limited area, perhaps six feet by six feet. Thither, as the afternoon advanced,

Aegialia was continually flying, but whence the insects came we could not discover. During the whole of the six weeks' period of the insect's occurrence this spot was the one specially selected by it. Here it could be taken in hundreds, whilst very few were to be found elsewhere. Mr. Wilding informs me that he has observed a similar phenomenon at Wallasey. During the night the insects evidently burrowed into the sand, for, after the first few days, they were observed emerging and, moreover, could be exposed by scraping away the sand. There are some interesting problems connected with the occurrence of this creature that await definite solution. These are :

1. Its sporadic appearance in profusion. Here we have an insect suddenly occurring in abundance in a new locality that has for some years been specially searched for it.

2. The selection of a spot for congregation. How is this accomplished? It seems most likely that the first insect simply drops in a suitable looking spot, and that the others are attracted to it, or rather to some odoriferous emanation which soon pervades the area, for after the spot had been completely cleared of insects (a very easy task) new-comers were constantly arriving.

3. The reason for this assemblage. It seems not unreasonable to suppose that in the case of *Aegialia rufa* a very large number of the individuals of a really rare species annually congregate at a particular spot, probably to facilitate reproduction. This hypothesis would afford an explanation of problem no. 1, for the discovery by a collector of the little area frequented in any year might be only a happy accident.

—GEORGE W. CHASTER, 42, Talbot Street, Southport. August 13th, 1902.

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

ORTHOPTERA IN ASHDOWN FOREST.—A stroll across the Ashdown Forest on July 19th resulted in little of interest. The season was still too young for Orthoptera to be abundant in the mature stage. *Stenobothrus viridulus*, L., was numerous, and stridulating when the sun was out. *S. parallelus*, Zett., of course, was in numbers, but I did not find a single *S. bicolor*, Charp. *Gomphoceris maculatus*, Thunb., occurred in the adult stage in a few places on the higher part of the Forest. I hunted in vain in one marshy place in hopes of finding some more uncommon form; *Thamnotrizon cinereus*, L., was common enough in some places, but all were immature, mostly in the "nymph" stage, when the organs of flight are visible as little flaps on the shoulder. The most interesting specimen I found was a single *Platypleis brachyptera*, L.; this is the first time that this species has been noted from this neighbourhood.—M. BURR, B.A., F.Z.S., Dormans Park. July, 20th, 1902.

EXOTIC LOCUSTID IN ENGLAND.—Mr. Percival Westell has sent me for determination an exotic locustid, which appears to be *Agroecia vittipes*, Redtenbacher, recorded by that author from Theresopolis, in Brazil. Mr. Westell's specimen, which is a female in good condition, was captured alive on the wall of a house, in the middle of July last, at St. Albans. In reply to my enquiries, Mr. Westell informs me that there is an orchid nursery close at hand, where plants are frequently received from South America and other tropical countries; this specimen was probably imported in the egg stage, and succeeded in reaching maturity in the artificial heat of the nursery. It was in too good condition to have come over in the imago stage. We know, too, that at least some locustids that are furnished with large sword-shaped

ovipositors, lay their eggs in the stems of trees, in which case they can be very easily transported; Mr. E. E. Green exhibited at the Entomological Society of London (March 18th, 1896) the eggs, probably of a Pseudophyllid, extracted from a twig of *Cinchona* from Ceylon. "A slit half an inch deep and more than two inches long had been cut into the hard wood," and in this slit the eggs had been laid. If this Brazilian *Agroecia* also deposits its eggs in a slit in wood, it can be easily imagined that they can be transported from one part of the world to another.—*IBID.*

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

LARVA AND PUPATION OF *PLUSIA MONETA*.—Between June 4th and 10th last I took one young and fourteen nearly full-grown larvæ, and three cocoons of *Plusia moneta* on *Delphinium* growing in a garden situated at Herne Hill, within the four-mile radius of Charing Cross. Although I had but little time to spend in studying these insects, I made the following observations, which perhaps will interest some of the readers of *The Entomologist's Record*. I may premise by saying that I know nothing of the habits, &c., of the young larvæ, as unfortunately the only young one I found sickened and died shortly after its capture. The average length of the full-grown larva is about one and a half inches. The head is small and round, the body gradually increasing in bulk from the head to the 8th abdominal segment from which it tapers slightly. Its anal extremity is rounded. The segmental incisions are deeply marked. The larvæ are slightly hairy, the small very light green hairs being placed at regular intervals on each segment. The skin is smooth and glossy, and of an apple-green colour, the head and legs being glaucous green. The larvæ have three pairs of true legs, the same number of prolegs, and a pair of anal claspers. The dorsal line is of a darker green than the ground colour, while the subdorsal and spiracular lines are of a lighter green. These latter lines were almost white in the one young larva I had. The larvæ feed at night, resting during the day on the underside of the leaves of *Delphinium* along the mid-rib, with the head bent round towards the body. It seems to prefer the lower leaves of the plant to the higher and younger ones. While crawling the body has the action characteristic of a Geometer. It is not easily knocked off from the leaf, and, if touched, waves its head from side to side as if trying to hit one's finger away. The larvæ began spinning their cocoons between June 6th and 14th, taking about four days to complete this task. They first spun a very thin white oval cocoon on the underside of the leaves, or on the top or side of the breeding-cage (if kept in captivity), the larvæ for the most part preferring to be "topsy-turvy," two only out of my specimens spinning on the side of the breeding-cage; they afterwards strengthen the cocoon by either spinning further layers of silk, or else by biting the original cocoon (which they do is hard to determine) so that in the end a fairly firm cocoon is made. During the whole of these four days the larvæ are very restless, and if disturbed they eat their way out of the cocoon, and after a short time recommence making another cocoon. The cocoons spun on the leaves gradually began to turn to a rich golden-yellow colour, taking about three days from when they were finished to completely change colour, but those spun elsewhere than on the leaves

remained completely white. What is the cause of this? The chrysalis when first formed is wholly green, the back afterwards gradually changing to black, while the remainder of the pupa (including the wing-cases) becomes slightly paler. A short time before emergence the markings of the wings may be faintly traced through the pupal case. The wing cases without the lobe reach to the 2nd abdominal segment, while the lobe reaches to the 8th abdominal segment. On emergence, which happens about one month from pupation, the moth bores a small very neat circular hole at one end of the cocoon as an exit, and rests on or near the cocoon until its wings are fully expanded. One curious habit of the imago is worthy of notice, namely, the way it rests during the day. It rests "topsy-turvy" with its wings folded over its body and the tips of the forewings almost touching each other, the hindlegs are put back to the tip of the wings, on which pair nearly the whole of the weight of the body is rested, its front legs are nearly fully stretched out at right angles to the body, thus making the head a good distance from its resting-place while the tip of its forewings are touching the ceiling or wherever else it may be resting. When in this position the proboscis is half uncurled. If touched, the moth lets go with its front legs and hangs by its hind ones, and, in this position, it looks as if it were hanging by the tip of the forewings, because the hindlegs are hidden by the wings. In conclusion, I must thank my friend, Mr. F. W. Jones, for the great assistance he has given me in confirming the observations made.—RALEIGH S. SMALLMAN, Carlton House, Herne Hill, S.E. *July 9th, 1902.*

THE LARVA OF *THAIS POLYXENA* AND ITS PUPATION.—The larva, which is stout in shape and rather tapers to each extremity, is about $1\frac{1}{8}$ inch in length, of a greenish-ochre colour, with the segments deeply incised, and sharply confined by a broad transverse skinfold between each one. Its principal characteristic, which is a striking one, is the six rows of projecting spines found on the subdorsal and lateral regions. These are rather over $\frac{1}{4}$ inch in length, and are of a beautiful rose colour. These spinous projections are arranged in the following order, which will give six in number to each segment, except the prothoracic and the anal ones. On the mesothoracic segment commence two subdorsal lines of these projections, one spine on each side of this and all the segments following it. Below these, on each segment, except the anal one, but including the prothoracic, are two spines set one above the other and forming a double lateral line on each side of the larva. All of these spines are of a beautiful transparent rose colour, tipped with yellow, and sprinkled thickly with black setæ. There are two black dorsal lines which commence on the mesothoracic segment and extend to the anal end. These are sharply interrupted between each segment by the transverse skinfolds, thus breaking the dorsal lines into a series of pairs of short lines. On the prothoracic, on the 1st abdominal, and the remainder of the posterior segments, is found on each side a pair of black elongated markings—the upper ones just underneath the subdorsal spines, and the lower ones (which are not in line, but run upwards and backwards) just below the upper spines of the lateral rows. The spiracles are black and lie just below the lowest row of spines. The head, which is the smallest of the segments, is deep sienna in colour, with a dark brown lobe on each side of the crown. On the face is a dark triangular marking with a

concave base. The legs are black, and the claspers ochreous-green with black feet.

The larva begun to prepare for pupation on July 9th at mid-day. A few of the stalks of the food-plant were connected with ragged-looking threads of silk enclosing the larva. It then placed itself in the centre on a stout stalk, head uppermost, and spun a girding thread below its thoracic segments which passed under the lateral spines on the 1st abdominal segment, and in front of those on the dorsal surface, without making any anal attachment whatever. These proceedings were done in a leisurely manner, and were completed by ten o'clock on the morning of the 10th. The larva remained in this position until the 15th, when it was found to have pupated at 8 a.m., and was now hanging head downwards and suspended at the anal end to the cast skin, which was held in position by the girding thread. The pupa is stout in form at the head and thorax, with an elongated and rather tapering abdomen. Its colour a variegated amber, darker on the wing-cases, and with a wide dark dorsal marking on the thorax. This is accompanied by a wavy, lighter, subdorsal line on either side as far as the 3rd abdominal segment. The spiracles are very strongly marked with dark irregular spots, black in the centre. Projecting from the head are two short cases containing the palpi, with dark tips furnished with minute setæ. There is a subspiracular darkish line on each side, and on the ventral surface of the abdominal segments are broad, dark, brown blotches.—J. C. DOLLMAN, Hove House, Newton Grove, Bedford Park, W. *July 19th, 1902.*

EGG OF *HEMITEA STRIGATA* (THYMIARIA).—To the naked eye the egg of *H. strigata* looks like a pale green, shiny, much flattened, oval scale. Under a strong hand lens it is seen to have a regular oval outline; the length : breadth : height is about 4 : 3 : $1\frac{1}{2}$, rather higher at what one may suppose to be the micropylar end, although the micropyle is not discernible after the power used. The surface appears to be finely pitted, and it thus gets the appearance of having a texture similar to finely woven silk. The upper surface is slightly depressed over the greater part of the area, the sunken oval giving the shiny appearance to the egg when viewed with the naked eye. The eggs are attached firmly by the whole of the basal area. Laid during the night of July 31st, the ♀ caught the preceding day at Chavoire, near Annecy.—J. W. TUTT. *August 2nd, 1902.*

SCIENTIFIC NOTES AND OBSERVATIONS.

SILK MIXED WITH THE OVA OF *TEPHROSIA BISTORTATA*.—I am at a loss to explain the source of the silk which this species mixes with its ova when laying them. A newly-emerged ♀ captured on the morning of July 29th on the tree-trunk of a plane tree near Annecy, laid a large number of ova between the upper rim of the box and the lid, during the three nights following capture. The bright green eggs were so thickly covered with and mixed with the well-known short pieces of greyish flossy silk, as to give one the impression that they must have been laid by the ♀ of a woolly-tailed species. I have noticed this before, but have never seen such a free use of the silk as in this instance. I believe the source of the silk has been noted, but I cannot just now remember where.—J. W. TUTT. *August 2nd, 1902.*

VARIATION.

ABERRATIONS OF *POLYOMMATUS* VAR. *ARTAXERXES*.—The following interesting aberrations of *P. artaxerxes* are, in my experience, unique, although I have captured some hundreds of this interesting species:—

1. An aberration with the bright red marginal spots continuous down the outer margin of both fore- and hindwings, and also with the central spots in the centre of the forewings blue instead of white, a most striking and unusual variation. Specimens occur with the white spots of varying sizes, from entirely obsolete to very large, but I have never seen one with blue spots before.

2. This aberration is typical *artaxerxes* but it has a central white spot on the hindwings as well as on the forewings. This form Mr. Tutt tells me he has already named ab. *quadripunctata*.

Both forms are sufficiently unusual here to merit their being recorded.—J. C. HAGGART, 58, St. Andrew's St., Galashiels. *July 15th, 1902.*

CALLIMORPHA DOMINULA AB. *ROSSICA*.—On July 20th I captured, at rest, on *Eupatorium cannabinum*, a small, but perfect male specimen of *Callimorpha dominula* ab. *rossica*, whilst collecting along the under-cliff, near Walmer. The ground colour of the hindwings in this form is yellow instead of crimson. I do not consider it to be by any means a rare form, but as it appears scarce in collections possibly deserves recording. Staudinger, in his new *Catalogue*, states that, in Armenia and north-eastern Asia Minor, *rossica* is the permanent form, but elsewhere it is merely an aberration. We find a "yellow" form, ab. *lutescens*, in *C. hera*, so it is not surprising that *C. dominula* should possess a "yellow" form in ab. *rossica*. I may incidentally mention that in my early days of collecting I remember a carriage road from Walmer to St. Margaret's Bay, good hunting-ground for insects all the way. Now but a comparative fragment of the road remains, the sea coming close up to the cliffs at high tide for two-thirds of the distance, such is the inroad the sea has made at this part of the coast!—A. H. JONES, F.E.S., Shrublands, Eltham.

ABERRATION OF *PLEBEIUS* *EGON*. On July 5th I visited a heath near Cullompton, in Devonshire, known there as "Gaddon Down," at about 6.30 p.m. One corner of it is covered with *Arcia flavescens* (?), the flowering heads of which were swarming with *P. egon*, which had gone to rest there. I secured about 30 specimens without the use of the net, including a specimen which may be described as having the forewings from the base to about one-third along the costal margin and inner margin normal. From there the colour is a pale bluish-grey, somewhat the colour of a male *Polyommatus corydon* only paler. The hindwings are much the same as the forewings, but the seven crescentic marginal spots show on the upperside very distinctly as in the female. On the underside the spots are mostly very indistinct, especially on the forewings. I do not know if such a curious instance of albinism is common, *P. egon* seems to be a very invariable insect.—RONALD M. ANGUS, 11, Wentworth Place, Newcastle-on-Tyne. *July 19th, 1902.*

CURRENT NOTES.

In the *Annuaire du Musée Zoologique de l'Académie Impériale des Sciences de St. Petersbourg*, t. vii., 1902, pp. 55-75, Nicolai Adelung contributes a "Beitrag zur Kenntnis der Paläarktischen Stenopelma-

tiden." Of these curious spider-like grasshoppers, which live chiefly in caves, only five or six species have hitherto been known in the Palaearctic Region representing the two genera *Troglophilus* and *Dolichopoda*. Adelung erects the new genus *Tachygrines*, which falls between *Troglophilus* and *Diestrammena*, with the single species *T. asynamorus*, but it can hardly be regarded as a true European form, having been taken among exotic plants at St. Petersburg, but the original locality is unknown. The new genus *Gymnaeta* has two species, both new, *G. beresowskii* and *G. gansuicus*, both from the province of Gansu in China; *Acmodogryllus brunneri* is a new species and genus from Japan; *Magrettiella natica*, Brunner, previously recorded from Aschabad, is noted from the Afghanistan frontier, and two new species of the same genus are described, namely, *M. zarudnyi* from south-eastern Persia, and *M. persica* from the province of Persian Baluchistan. An interesting note on the habits of *Magrettiella* is appended. They are nocturnal insects; in the daytime they are to be found under stones, and the skulls of larger animals, and sometimes in the bark of *Dorema ammoniacum*. At night they are attracted by light and were sometimes found in the travellers' tents in the early morning. They live in stony localities which are clothed with more or less luxuriant bush and shrub vegetation. *M. abominata*, Brunner, was found by Magretti on acacia in Suakim.

NOTES ON COLLECTING, Etc.

HYLOICUS (SPHINX) PINASTRI RECORDED FROM WINCHESTER.—I have to record the capture of a perfect specimen of *Hyloicus (Sphinx) pinastri* on a lamp-post on June 30th, in the city of Winchester.—E. F. JOHNS, F.L.S., Winton House, Winchester. July 22nd, 1902.

VAGARIES OF THE SEASON IN THE TIME OF APPEARANCE OF LEPIDOPTERA.—I am much struck by the extraordinary mixture of June and August insects now occurring in my light traps in large numbers, e.g., *Nudaria mundana*, *Calligenia miniata*, *Psilura monacha*, *Lithosia lividcola*, *Agrotis tritici*, *Geometra papilionaria*, *Hemitea strigata*, *Hypenodes albistrigalis*, *Crocallis clingularia*, *Boarmia repandata*, *Emmelesia alchemillata*, *Lomaspilis marginata*, *Scoparia vesinea*, *Hydroecia nictitans*, *Cidaria picata*, and second-brood examples of *Selenia tetralunaria*, *Tephrosia histortata*, all quite fresh. So far *Cleora lichendaria* seems to be the insect of the year here, simply swarming in the traps now night after night.—E. F. C. STUDD, M.A., Oxtou. August 8th, 1902.

LIVENESS OF THE SEASON FOR LEPIDOPTERA.—The first part of the season in this district of Yorkshire was very backward; the first *Theretra porcellus* was taken at flowers on June 20th, and the first *Eumorphia clypeor* on June 21st. Last year the former appeared on June 4th, and was over by the 20th, and in previous years it has often appeared in May. *Phaertra menyanthidis* are now appearing daily, whilst last year the species was out on May 25th, and was over by June 6th and ova hatched on June 10th.—(REV.) C. D. ASH, B.A., Skipwith Vicarage, Selby. June 28th, 1902.

LUFFIA FERCHAULTELLA AND OTHER PSYCHIDS IN ESSEX.—I find that *Luffia ferchaulteella* is scattered all over this district. At Thun-

dersley I have found on oak-trunks about 150 cases of a *Luffia* which appears to belong to a more robust race than those with which I have previously met. So tenaciously do these larvæ cling to the trunks that, on several occasions when attempting to remove them with the forceps, I detached the case only, leaving the naked larva, apparently not much concerned at finding itself suddenly deprived of house and home. From the cases of *Nargyia mouliifera* obtained here, an imago emerged yesterday, whilst a solitary larva of *Bacotia sepium* (now in pupa) was found either on oak or hornbeam (oak I think), at Eastwood, on May 11th.—F. G. WHITTLE. *July 2nd, 1902.*

ABRAXAS ULMATA AT SLEDMERE.—I was at Sledmere on June 27th, and again on the 29th, and it may be worth noting that, although specially searching for *Abraaxas ulmata*, I found the species in fewer numbers than aberrations were a few seasons ago, and crippled examples were again very evident.—S. WALKER, York. *July 10th, 1902.*

THE LATE SEASON FOR LEPIDOPTERA IN WYRE FOREST.—During the last few days of June and the first few days of July I went to Wyre Forest. Work during the day was practically useless, but sugar at night produced a fair number of species, though nearly all in small numbers. Though only about forty miles from here, the insects of the same species are of a different type, and there is a large number of species in each locality which do not occur in the other. *Cymatophora duplaris* was very abundant, but all of the pale type, while here they are all of the dark type. *Aplecta tincta* was common, and also very much paler than those here. The season was very late, and *Brenthis selenæ* was only just coming out. On one day *Euthemonia russula* was flying, and I took two ♀s, both of which laid batches of eggs before I got back to the house. *Hadena contigua* was not uncommon, and was in good condition, whilst *H. grivistæ* occurred, but was all but over. A few specimens of *Xylophasia hepatica*, *Cymatophora* or, *C. octogesima* and *Neuronia saponariæ* also came to sugar, and four *Craniophora ligustri*. When I left, on July 5th, *Boarmia roboraria* was just beginning to appear. Here, at present, although moths appear fairly numerous at dusk, hardly anything comes to sugar and beating produces nothing. On June 25th I picked up a female *Notodonta trepida*, which laid a large batch of eggs, and they did well sleeved out until the tomtits discovered them. I cannot now keep larvæ of any size in muslin sleeves as the birds always find them and pick them out. Next season I shall try cheese-cloth for sleeves. During coronation week sugar, however, was good, *Bomolocha fontis*, occurred very freely, *Aplecta prasina* was numerous, a very few *A. tincta*, and three or four *Zonosoma pendularia*, whilst *Cymatophora duplaris* was abundant. On the whole, with few exceptions, it has been a very unsatisfactory season.—F. C. WOODFORDE, B.A., F.E.S., Market Drayton, Salop. *August 19th, 1902.*

LEPIDOPTERA IN PERTSHIRE.—I take the opportunity of reporting the taking of the larvæ of *Cirrhoedia verampelina* here, the first week in April, at dusk, crawling up from the burnside, at the roots of old stunted ash-trees, but only at those trees that had very prominent flower-buds. I do not think it has been taken here by anybody for several years till now. I have also taken several larvæ of *Drymonia chaonia* this week, about half fed, at oak, I find the best way to get

this larva is to stand beneath the tree and look up, and it can then be seen resting along the midrib of the leaf, and upon the same tree that probably you have been giving a sound thrashing; a more tenacious larva I know not. *Anticlea sinuata* can now be seen ovipositing where there is an abundance of *Galium verum*, generally upon dry southern slopes, and is often mistaken for *Melanippe montanata* at first sight. *Thera simulata* larvæ are also full-fed, I beat some from juniper last week.—E. ROGERS BUSH, 1, Strathmore Street, Perth, N.B. July 30th, 1902.

PARTIAL SECOND BROOD OF *CUPIDO MINIMA* IN BRITAIN.—On the 11th inst. I took a fresh male *Cupido minima*, at rest, on the South Downs. I believe specimens of this, the second brood, are rarely met with in Britain. Some of the other insects taken or observed in the same locality on that day were *Melanargia galathea* (rather common), *Lithosia complana* (one), and several *Eremobia ochroleuca* settled on the flower-heads of knapweed.—J. F. BIRD, "The Lodge," Cowfold, Sussex. August 15th, 1902.

PARTIAL SECOND BROOD OF *DICRANURA FURCULA* IN BRITAIN.—Last June I found a larva of *Dicranura furcula* on a willow growing in one of our hedges. About the second week of July it formed a cocoon, which seems to me to be constructed in an unusual position, and is made so as to resemble a willow gall. From it a male emerged yesterday evening, August 14th. I think this is worth noting, as I see in *The Lepidoptera of the British Islands*, that Mr. Barrett mentions that a solitary instance of a second emergence in the year, in this country, was observed by the Hon. F. Thelluson, in 1893.—IBID.

PRACTICAL HINTS*.

Field Work for September.

By J. C. DOLLMAN.

1.—The larvæ of *Macaria notata* will feed up well and quickly on birch, which is a food-plant generally more easily obtainable than either alder, willow, or blackthorn. It is a reddish-brown larva, with lemon-yellow, diamond-shaped, lateral blotches, not unlike that of *Hybernia defoliaria*.

2.—*Cossus ligniperda* larvæ are best hibernated with some chunks of bark and wood, placed in a galvanised pail, covered with perforated zinc. This is preferable to the flower-pot and glass-cover treatment, which is nearly sure to generate mildew. Cut a disc of the perforated zinc to fit inside the pail, an inch or two from the rim, and on this lay a ring of stout leaden pipe bent to fit neatly.

3.—Give plenty of foodplant, and room also, to larvæ of *Drepana hamula*, as otherwise they may disappear gradually by the process of cannibalism.

4.—The larvæ of *Drepana lacertula* should be searched for on quite young birch trees, which are more frequented by the larvæ than the larger ones, and they can be thoroughly examined by simply standing over them for the purpose.

* PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST, Part 1, published May, 1900, and already almost completely out of print, contains 1250 similar hints to these, distributed over every month in the year. Interleaved (for collector's own notes). Part 2 is now in the printer's hands, and subscribers wanted.—ED.

5.—*Dasychira pulibunda* larvæ can be brought up well on birch, and will readily spin up in crumpled newspaper, which should be fastened round the side of the cage containing them.

6.—In tapping bedstraw on heaths for the larvæ of *Larentia pectinitaria*, be watchful for the very young examples. They are exceedingly small, and coil themselves up tightly on being dislodged. As they are of a bright-red colour, almost scarlet, they look like anything rather than larvæ.

7.—The imagines of *Chesias spartiata* can be beaten from broom in the day-time, when they flit quickly to the next bush and can be marked down.

10.—Examine every example of belated *Leucania lithargyria* that you see at sugar. It is very easy to mistake *L. albipuncta* for the first-named insect by the light of the lamp. *L. albipuncta* is rather the smaller, has squarer-shaped forewings, which are redder, and the under ones lighter than those of *L. lithargyria*. The principal distinction is not, however, seen to advantage, when the insect is quivering on the sugar. This is the sharp and bright definition of the white spot on the forewings, which has no upward blur towards the costal edge as is found in *Leucania lithargyria*. It is safest to take every one on suspicion.

9.—It is sometimes tempting to take *Catocala nupta* or *Mania manra* when they are found at sugar, though the killing-bottle in use at the time is too small to capture them comfortably. On such an occasion it will be found that, if the mouth of the bottle is placed quickly over the insect only allowing the top edge of its neck rim to touch the tree, the moth will dive into the bottle without getting its wings damaged.

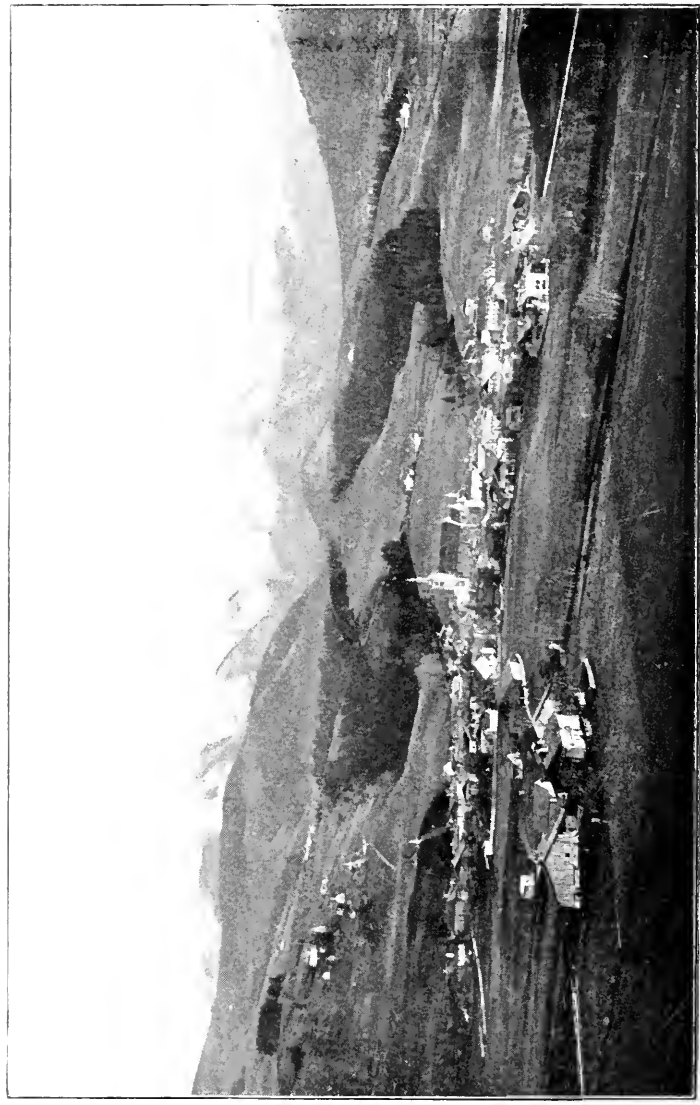
10.—There is a striking similarity between the larvæ of *Melanippe fluctuata* and *Coremia designata*, and as they are both to be taken on rape and cabbage, it is best not to mistake the latter for the former. The larva of *C. designata* may be known from the other by the tint of the dorsal surface which is not so olive-green in colour as in *M. fluctuata*, but browner; the head, prothoracic and first three abdominal segments being very dark on the upper part. Also, examined closely, there will be found four to six obscurely-marked, diamond-shaped blotches, with dark centres, on the summit of the dorsal region.

11.—The larva of *Manduca (Acherontia) atropos* should never be fed airtight as, unless it has plenty of air and space, it is very liable to sweat, and, being a very delicate creature, this condition is fatal to its being successfully reared.

REVIEWS AND NOTICES OF BOOKS.

A LIST OF THE BEETLES OF IRELAND, by Rev. W. F. Johnson, M.A., F.E.S., and J. N. Halbert. 1902.—We have received the above list which has just been published, and which is the first general list of the beetles of Ireland yet produced. It is a paper reprinted from the *Proceedings of the Royal Irish Academy*, before which Society it was read on June 21th, 1901. It is a most interesting list, and moreover it is a pleasure to study it, as it is well printed and arranged, with notes on all the species, their habits, localities, general distribution and references to their previous records, in fact, it is just what such a catalogue should be. In the Introduction our authors call attention to such

literature as exists on Irish coleoptera from the earliest records. They point out that the only species which is almost entirely confined to Ireland is the var. *subrotundata* of *Silpha atrata*, which replaces the type in Ireland, the only other place where this species has been found being the Isle of Man. The following species are given as only occurring in Ireland in the British Isles—*Dyschirius obscurus*, *Bembidium argenteolum*, *Stenus argentellus*, *Nantholinus cribripennis* and *Otiorrhynchus auropunctatus*. The second, third and fourth of these species are brought forward as British for the first time here, and we shall refer to them again later. The Irish beetle fauna is shewn to be made up of three groups which may be recognised by means of their European range. Group 1 consists of species which range over central Europe and the Mediterranean region, but are rare or wanting in Scandinavia and northern Europe. Group 2 is composed of species that are of northern origin, a good many of which inhabit mountain districts. Group 3 consists of species found almost exclusively in south-western Europe and the Mediterranean region. We notice a slight error in what is stated of the distribution of one of the species in this third group, viz., *Ithopalomesites tardyi*. It is said to be "locally abundant in wooded districts throughout Ireland, but in Great Britain it is confined to Devonshire and the west of Scotland." It occurs, however, also, in the south-east of England in the Hastings district, etc., having been taken by ourselves at Pett. It is pointed out that not more than forty species in this list have been introduced. The Bibliography is then given, and this appears to be very complete, and is followed by an outline map of Ireland, showing the provinces and county divisions. The list itself consists of some 1630 species and is as complete as can be expected, since it is only in comparatively recent years that Ireland has been systematically worked for beetles, and no doubt many additions will be made before anything like a complete catalogue can be compiled. We have the pleasure in another part of this magazine of adding a few more species to the Irish List. Of the species new to the British list, *Bembidium argenteolum* is a very interesting addition. It was first captured by Mr. Johnson on the shore of Lough Neagh, in 1899, and referred to *B. paludosum*, but recently it was discovered to be a different species. It may be known, however, by its larger and more robust build and more shining upper surface; thorax much broader than long, with the posterior angles sharp and prominent. Our authors tell us it greatly resembles an *Elaphrus* in life, both in its movements and general appearance. *Nantholinus cribripennis*, Fauvel, is a species found in the counties of Donegal and Derry. It is closely allied to *N. distans*, a little larger, with a pronounced bronze lustre, and the head more closely punctured at the sides, etc. *Stenus palposus*, Zett. (*argentellus*, Thoms.), was also found on the shore of Lough Neagh (this locality, by the way, appears to be most productive, one of the other species, *Dyschirius obscurus*, confined to Ireland, being only found there). Its nearest ally is *S. buphthalmus*, from which it may be distinguished by its larger size, stronger pubescence and shorter and stouter antennæ. It appears to be a rare species on the continent. At the end of the list is an index to the genera. Altogether we consider this a most useful, well-planned and well-executed production.—HORACE DONISTHORPE.



MEDIVE AND MOST JOBY.

Entom, Record, etc., 1902.

Lepidoptera of Haute-Savoie: Megeve (*with photograph.*).

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

Haute-Savoie has deservedly won a great reputation for its lovely and majestic scenery, and Chamonix has become a central playground for thousands of English tourists. As I had never been to Chamonix, and wished to spend a month in the department of Haute-Savoie, I determined to eschew the recognised route, and to go *via* Culoz, Annecy, Thônes, Flumet and St. Gervais, a route much patronised by the French people as passing through a lovely country little known to, and not at all frequented by, the foreigner. Now that the steam tramway runs from Annecy to Thônes, and diligences are in *correspondance* between Thônes and Le Fayet, whence runs the electric railway to Chamonix, a delightful piece of country has been opened, which, for many years, has only been possible to those who were wealthy enough to hire private carriages for a long journey, or so little saddled with luggage that they could journey on foot the whole of this distance. I recommend it now as a delightful and alternative route to those *via* Geneva or Martigny, and one that cannot fail to please the tourist who has already gone by either of the better known routes.

Like almost all the more highly cultivated departments, Haute-Savoie is not altogether the best district in France for lepidoptera. Not that a complete list of the lepidoptera of the department might not compare favourably with that of almost any other department in France, but insects are not in that amazing abundance that they are in some of the districts of Dauphiny, or the Basses-Alpes, or the Jura. Except in their chosen haunts the number of specimens of many of the various species observed is usually small, and one does not see the wayside teeming with that abundance of insect life that one observes in many parts of Switzerland, Piedmont and south-eastern France. Notices here and there along the road warn the vagrant that he may not cut the herbage by the roadside, a bad sign for the entomologist, for one knows at once that the said herbage is private property, and will be cut and harvested, and that all such usually happy resting-grounds are closed to the wayside butterflies of the country. Still one can find butterflies enough if one chooses one's ground and keeps, as far as possible, away from cultivated regions. Between Annecy and Thônes, on the brilliant morning of August 4th, the wayside was, in places, swarming with insects, of which the large fritillaries—*Dryas paphia*, *Argynnis adippe*—and *Callinorpha hera* were usually the most noticeable, although colonies of blues, mostly *Polygonmatius corydon*, were frequently observed. Between Thônes and Flumet, the village of La Clusaz would make an excellent hunting-ground, and plenty of convenience for a stay exists there. Here *Parnassius apollo* makes an appearance, and *Polygonmatius damon* occurs in amazing abundance. The beautiful Col d'Aravis with a ravishing first sight of three of the main peaks of Mont Blanc in this direction, did not seem so productive as might have been expected, *Erebia melampus* and *E. stygic* being the only two species that were netted to make assurance doubly sure that the species were correctly identified. Strangely, *Coccyzygus pamphilus* was common on the top of the Col. Just through the tunnel of La Giettaz was a splendid butterfly corner, where *Colias phicomone* and other species were recognised as being abundant as the diligence swept

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downwards to Flumet. From Flumet to Megève cultivation held sway, for here is one of the most fertile uplands of this part of France. At Megève, without knowing anything of the country, I had anticipated staying for a week, and I hoped to explore the slopes of the great Mont Joly, the nearest neighbour on this side to Mont Blanc. I did so in part, but the weather was very unsettled. Storms and hot sunshine alternated at first, and, later, cold wet days continued, and one could only guess by what one caught what one might have caught under better conditions. However, one more word as to the district. Insects or no insects, no one should miss the walk to Combloux, to Sallanches and to St. Gervais, for there are some of the most beautifully picturesque pieces to be found in the Alps along these roads. Sallanches is too low for a continued stay, Combloux is exceedingly well situated, but the native holiday-makers who flock to Megève, whence Mont Blanc is not visible except by a fair ascent, seem not to gather at Combloux. True, Megève boasts two excellently managed hotels, the new Hotel du Panorama and the Hotel Soleil d'Or, both quite full during the time that I was here, but with the proprietor of the former, ready to find comfortable outside accommodation until rooms at the hotel were available, and the hotel can be recommended most strongly. The inns at Combloux also look comfortable; still the facts remain—fashion favours Megève, nature favours Combloux, and fashion at present has it, but one supposes not for long. There are numberless walks in the neighbourhood, three hours or a little more suffices for the ascent of Mont Joly, from whence an incomparable view of the Mont Blanc range is to be obtained on this side, and the peak has been well called the "Grammont" of the western slope. Combloux and Megève, however, are not in a position to rival any of the nearer villages, Chamonix, Argentière, or even Les Contamines, in the estimation of the foreigner, who comes not only to see, but to take his morning constitutional upon the slopes of, Mont Blanc, and hence one can only hope to attract the "voyageur" rather than the "tripper" to these really beautiful valleys. Megève itself has an elevation of some 3700ft. above the sea, a little village of the typical French-Swiss type, with a remarkable lot of chapels known as the "Calvaire," collected on a knoll on the slopes of Mont Joly, and a row of little chapels, above one mile long, running along the road towards Combloux. To me the most interesting feature was the "mule" fair, August 8th-9th, when young mule and horse foals were brought into the market by the farmers who breed them, not in great numbers, but each one or two. The prices for young mule foals appeared to vary from 60 to 90 francs, we heard 70 asked for quite a baby foal. The lepidoptera caught were not numerous. Megève boasted among others the following species. *Papilio machaon*, a single freshly-emerged specimen; *Aporia crataegi*, a few only, evidently nearly over; *Pieris brassicae*, *P. rapae*, common as in all cultivated districts; *P. napi*, very large and fairly abundant; *Gonepteryx rhamni*, occasionally, all males, probably not yet fully out; *Colias edusa* males certainly not yet fully out and not a single *C. hyale*. No doubt *Parnassius apollo* and *Colias phicomone* are on the mountains, but my visits were in dull and unsatisfactory weather and I did not see either. *Leucophasia sinapis*, second brood, not at all uncommon, the ♀s often resting on a trefoil, although not noticed egg-laying there. Of the Chrysophanids, *Chrysophanus virgaurcae* was fairly common, but

C. hippothoe var. *curybia* was over, and represented only by some very ragged males. Neither *C. phlaxus* nor *C. dorilis* was seen. *Polygonatus corydon* was the only really common blue; here and there *P. damon* was not uncommon, nor was *P. icarus*, but a single worn *P. astrarche* and battered ♂ and ♀ *P. hylas*, suggested that these species were over. Towards St. Gervais, *Plebeius acyon* was often observed in the roadway at puddles. Rather high up on the mountains *Nomiades semiargus* was occasionally observed, usually worn, and, near the village itself, *Cupido minima* was now and again netted, whilst a fairly good specimen of *Lycaena arion* was unexpectedly taken. *Limnitis camilla* occurred towards St. Gervais, but quite 500ft.-750ft. lower than Megève. One wonders whether *Polygonia e-album* should not be considered a real mountain butterfly. In 1901 I took several above Au Pra, in the Pellice Valley, at an elevation that must have been nearly, if not quite, 8000ft.; here, at Megève, I took it on a flower in a pasture from 5000ft.-6000ft., as well as on the wild hops in the wood between Le Fayet and St. Gervais, low down at about 2100ft. *Eugonia polychloros* appears common hereabouts, many flying among the trees between St. Gervais and Megève, and one captured at dung in the road near Combloux. *Vaessa io* was not uncommon, *Euranessa antiopa*, one only observed, and that with a pale border; *Pyramis atalanta*, rather common; *P. cardui*, in abundance as larvæ on thistles (at Chavoire the larvæ were equally abundant on *Artemisia vulgaris*), and rarer as imagines, both worn and in fine condition. Only one species of *Melitaea* was seen, *M. dictynna*, but this made up for much. I have over and over again, contrary to the views of the recognised authorities, stated that I doubted the specific value of this insect, the reasons largely based on the fact that, at the many places I have taken it, I have always found it with undoubted *M. athalia* or *M. aurelia*, which again I do not seem to be able to distinguish properly now that I have a fair number of specimens. Here, at Megève, the *M. dictynna* were undoubted, all were of the most approved *dictynna* type, and there was no approach to the *athalia* or *aurelia* facies. On the other hand, at Le Fayet, *M. athalia*, or what I suppose to be this species, occurred. *Argynnis niobe* was found occasionally everywhere, but somewhat abundantly about the little knolls covered with pines and with a thick undergrowth of *Vaccinium myrtillus* found scattered here and there all over the district, evident remnants of the character of the country before it was placed under such close cultivation as now exists. *Argynnis adippe* and *A. aglaia* were in beautiful condition, the former rather scarce and only to be found by the wooded sides of the torrents running from Mont Joly, the latter abundant and very generally distributed. With *A. adippe* was *Brenthis amathusia*, in poor condition nearer the village, in good condition higher up towards the sources of the streams. None of the smaller fritillaries was observed, but *Dryas paphia* became common and was in good condition between Le Fréney and Le Fayet, quite outside the Megève district however. *Melanargia galatea* occurred sparingly everywhere from at least 1000ft. above Megève, right down to Le Fayet, and was still, wherever found, in fair condition. The weather prevented one discovering any *Erebias* on the higher slopes of the mountains. Near Megève, on the wooded slopes of the torrents, worn *Erebia ligca* of typical form occurred, with equally typical and worn examples of *E. curyale*. Higher up the streams the latter, in fine

condition only, was to be taken. This mixing of the two forms (or species) was quite a new experience to me. A solitary example of *E. goatse* showed that this species also occurred in the district. A single *Satyrus semele*, and several *Pararge macra* were noticed, whilst *Epinephele ianira* was the only really common wayside butterfly besides *Aglais urticae* (larva of which were in thousands on all the nettle-beds, some of which were stripped quite bare, whilst imagines also were not uncommon), and *Thymelicus lineola*. *Euodia hyperanthus* was interesting: it was common up to nearly 5000ft. in suitable damp places, and presented the form known to me at present only from the Carlisle district, and which one suspects to be a highland race. *Coccyonympha pamphilus* was very rarely observed, and I was disappointed in not finding *C. iphis* in my wanderings. High up, whilst the sun shone for a few minutes on an upland flowery meadow, on August 10th, I took half-a-dozen specimens of a beautifully large form of *Syrichthys alveus*, and I have no doubt that here the species was abundant, but again the weather balked one. *Pamphila comma*, too, was in fair abundance at the same spot, as many as a dozen flying quickly in front of one at the same time. The common species of the district, however, was *Thymelicus lineola*, which swarmed almost everywhere, worn, however, to shreds by the roadsides and in the fields around Megève, gradually getting into better condition as one ascended the mountains, but still quite abundant up to 5000ft. I remember the species common I think in the Val Veni, not so very far away really, at nearly, if not quite, 6000ft. Among the moths nothing of interest occurred. Crambids were possibly the family most abundantly represented, but I observed nothing interesting except *Crambus scelasellus* and *C. adipellus* on almost every boggy piece of ground, and *C. couchellus* not below 4500ft. *Crambus tristellus* and *C. culmellus* were literally, as is the last usually in the Alps, in millions. *Camptogramma bilineata* was common on the same ground with *Emmelesia blandiata*, the former of a quite common English garden type. The commonest Geometrid was *Eubolia mensuraria*, and this was common everywhere. An interesting little Geometrid, *Acidalia ochrata* (?) was found in a boggy field with the Crambids, *Emmelesia albulata* at 5000ft. elevation, *Cidaria pyraliata* occasionally in the fields, etc., but the Geometrids were most disappointing, and the Noctuids were nil. I saw *Charaxes graminis* at the flowers in the uplands and found a larva of *Hadena pisi* in my net after sweeping. I was, however, interested to notice the great abundance of *Mimaseoptilus fuscus*, and observed also a fair number of *M. bipunctidactyla*, but, considering the abundance of scabious in the district, the insect was not common, nor was *Acipitilia tetradactyla* specially so. As illustrating the difficulties of insects to maintain a footing in such highly cultivated districts as this, I may mention that, on the evening of August 6th, I saw *M. fuscus* and *Oxyptilus distans* flitting abundantly with *Phycis ornatella*, and *Hypercallia christiornella*, on a little level piece of ground just above the "Calvaire." Next evening I went provided with the necessary apparatus to capture a few, when I found the herbage cut and raked, and not a single moth on view. The cutting had of course not killed the moths, but had certainly dispersed them so as to lessen their chances of continued existence. Among the *Vaccinium* in the pine clumps I noticed *Tortrix viburniana* commonly,

and only just above the village, *Sciaphila argentana* occurred in these places. I have not noticed that *Tanagra chaerophyllata* was just appearing in great numbers. It seems impossible to bring this insect home alive in perfect condition, they scratch and wear almost directly. High up, too, one sunny afternoon, August 10th, I saw *Adscita sticticus*, in a pasture, and brought home for identification a couple, since at Courmayeur, at the same elevation, one only gets *A. geryon*, but these latter are on the rocky slopes and not in alpine fields. These examples, however, were quite normal male *A. sticticus*. *Pyrausta purpuralis*, and *Diasemia literalis*, were found up to about 4500ft., whilst *Herbula cespitalis* was in great numbers in the fields, *Botys verticalis*, too, among the stinging nettles. *Botys phrygialis* was of course present above a certain altitude, and *Crambus percellus* took the *warringtonellus* form at the higher levels. *Nomophila noctuella (hybridalis)* was locally abundant, as also was *Scricoris cespitana*, and *Orthotaenia striana*, too, was occasionally noticed. *Hypena proboscidalis* came into the room to light, but very few species seemed to be thus attracted.

Altogether the list is a short and unimportant one, but as, little by little, British entomologists are covering the European continent with their explorations, and are gradually collecting absolutely reliable data as to the distribution of the European butterflies, there can be no question of the value of publishing those lists that exhibit our failures as well as those that set forth our successes.

Notes on the life-history of *Aglia tau*.

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

(Continued from p. 239.)

LARVA IN 2ND STADIUM.—A well-grown larva in this stage is getting very adult-like save for the huge spines or horns. It has the overhanging prothorax very marked, and a bright cream-coloured lateral band runs right along the larva from base of prothoracic horns to base of anal horn. The division of segments is very marked especially on dorsal area, where each segment rises into an angular transverse mound, giving a lateral or outline view as of the teeth of a saw, each tooth being a segment (very similar to the appearance seen in a side view of the larva of *Thecla w-album*). The tubercles, including horns, as in first stadium, but proportionately much smaller and less developed, showing a tendency to atrophy, chiefly noticeable in the shortening of the lateral branches of the horns; their colours are also paler, the red being less deep and the white bands not quite so brilliant. The area at base of horns on metathorax is much swollen. A well marked, but not very large, lateral flange is coincident with the lateral band for the greater part of its length. Numerous small (secondary) shagreen hairs are present, their bases being yellow. Head is bright green, flattened, and of a low trapezoidal shape.

RESTING HABIT.—The resting position is, as previously, on underside of leaves, but the head is not thrown quite so far back when the "sphinx" attitude is adopted. The legs are drawn up close to body. The prothoracic horns are sloped forward, those on the metathorax backward at an acute angle. That on 8th abdominal is almost perpendicular, and the anal one almost horizontal. The angle of the thoracic horns is sometimes so acute that the horns point backwards and forwards forming an

almost horizontal line. On May 26th, 1901, I note: The larvæ are mostly moulting. One or two have already changed and are in 3rd skin.

LARVA IN 3RD STADIUM.—Noticeable changes are the further development of the bases of the horns and dorsal tubercles i. The horns themselves would appear to be atrophying, the branches being small and insignificant, and the forks at top have disappeared, but the tip is still composed of two minute prongs, each bearing a single hair. The anal horn is now very short and the small dorsal horns, representing tubercles i on the segments that do not bear the large horns, are also degenerating. Lateral flange much stronger and stands out more sharply (coloured yellow) than before. The head is clear green, not shining, but with a dull surface, taller, and more clearly trapezoidal than before. The last joint of antenna long. The prothorax overhangs head more than ever: at rest the crown of head is anterior to mouth, the slope being about 45° ; ii is the most obscure of the tubercles, iii, iv and v are still clearly visible, chiefly on account of their raised bases. There is a dark slash of red on 1st abdominal segment, just above the lateral flange and behind the spiracle. The legs are green with pink tips, the prolegs large and Sphingid-looking, of a pale greenish colour. The spiracles long and narrow, and of a pale pink colour. The oblique stripes clear, but not strong or bordered as yet. The shagreen hairs are scattered over skin surface, they are raised on tall cone-shaped yellow bases, and the hairs rising from them, if they may still be so called, are short stumpy cylinders, rather larger at top than base. Hairs on tubercle vi and the basal hairs show up plainly by reason of their large size, as also do those on the other primary tubercles.

LARVA IN 4TH STADIUM (June 10th, 1900).—The larvæ will, on occasion, crawl backwards for a short distance. They have lost all trace of horns. Head as before, but rather a tall trapezoid, with well-marked lobes and notch at crown; mouth-parts pink, antennæ long, also two fleshy appendages rather prominent (? palpi) in front of mandibles, palpi and ocelli brown, 6 ocelli present, one very ventral. Numerous scattered fine short white hairs on head. The body slopes up from head to metathoracic segment, and tapers rapidly and suddenly from 8th abdominal to anus; it is of about even thickness from metathorax to 8th abdominal. It is now a square-cut, angular-looking larva with the dorsal area of segments raised into square, sharply-angled humps; when at rest, however, the intersegmental areas are so compressed, and the humps fit so closely together, that the impression is given of very tall short segments. The metathoracic and 1st abdominal segments show a marked tendency for the humps to coalesce and form a single one, the cleft at intersegmental area being not at all apparent. The larva is bright apple-green, studded with numerous yellow shagreen tubercles. The lateral ridge is very sharp and distinct, coloured bright yellow. This yellow line along lateral flange is continued round edges of anal flap and turns up in front of prothoracic spiracles along the anterior ridge of prothorax. The ventral area below the lateral ridge changes after moult to a dull sage- or glaucous-green. Feet on prolegs are \perp -shaped, pale-coloured, the rows of dark brown hooks on them showing up distinctly. The true legs are greenish tipped with pink. The spiracles pale red. The red or pinkish warning spot, developed from the dark red slash on 1st abdominal segment and referred to in

previous stadium as being beneath and slightly posterior to spiracle and situated just above the lateral flange, is nearly or quite hidden, according to circumstances (position, movement, etc.), by a fold in the skin when at rest; if the larva be disturbed or irritated, the larva retracts its head and thoracic segments, lowers the flange, and discloses a large deep red spot; in the larger larvæ this red spot is bordered with yellow. The shagreen hairs are very short, and appear as small blunt cones on lateral and dorsal areas; on the ventral area, some few are hair-like. Oblique stripes not strong but clearly marked when larva is at rest.

GENERAL NOTES.—The 4th stadium is the last, there being only three moults as in *Amorpha populi*. The larvæ commenced to prepare for pupation on June 11th. The larvæ darken before going down, the darkening consists of a dirty brown hue, and the dark colour is developed in patches and not evenly distributed all over the larva. This larva also voids a dark brown or greenish fluid with its faeces just before going down as does that of *Dimorpha versicolora*. The warning marking is rather a primitive affair compared with that of *Enmorpha elenor* or *Theretra porcellus*, and is rather comparable with the warning mark of *Stauropus fuji*. It is, compared with the thoracic spots of the larva of *Lasiocampa quercus*, less complex in pattern, but of course larger, and probably in an active state of development and use, while those of *L. quercus* are evidently undergoing atrophy; the pocket in which it is hidden allows of a sudden and startling display in *A. tau*, so that there is less need for elaboration of colour design.

List of Species, Varieties, and Aberrations of Lepidoptera so far only recorded from the British Islands.

By J. W. TUTT.

(Concluded from p. 205).

GLYPHIPTERYGIDES.—GLYPHIPTERYX THRASONELLA VAR. CLADIELLA, STA.—From Deal to Shetland Isles. Certainly overlooked on the continent.

ARGYRESTHIDES.—ARGYRESTHIA ERARIELLA, STA.—Possibly an almost unicolorous dark bronzy-fuscous form of *A. conjugella*.

A. SEMIFUSCA, HAWORTH.—A quite distinct species; local, but widely distributed in England.

ZELLERIA FUSCA, STA.—Perthshire; sunk by Rebel as *Z. hepariella*, Sta.

GELECHIDES.—BRYOTROPHA POLITELLA, STA.—Widely distributed in England, Ireland, and Scotland. [Recorded doubtfully from southern France.]

LITA PLANTAGINELLA, STA.—Coast species; England, Ireland, and Scotland. Possibly overlooked on the continent.

L. SUEDELLA, RICHDSN.—Another coast species, confined to the coasts of England. Also possibly overlooked.

L. INSTABILELLA, STA.—Pretty widely distributed in England.

L. BLANDFELLELLA, TUTT.—Local; only recorded from the Deal sand-hills. Closely allied to *L. semidecaudrella*.

L. VISCARIELLA, STA.—Recorded from England and Scotland. Recorded also doubtfully from Hungary.

L. FRATERNELLA, DOUGL.—Local in England and Ireland. [Recorded with doubt from south-west Germany.]

LITA PORTLANDICELLA, RICHDSX.—Closely allied to *L. mundella* and *L. umbrosella*. Possibly not distinct.

ARISTOTELLA TETRAGONELLA, STA.—Salt marshes on the coast; widely distributed along the southern and eastern coasts of England.

XYSTOPHORA DIVISELLA, DOUGL.—Apparently restricted to the Fen districts.

ANACAMPIS VINELLA, BANKES.—SUSSEX. Closely allied to *A. anthyllidella*.

ARGYRITIS TARQUINIELLA, STA.—Probably a form of *A. pictella*.

DEPRESSARIA AURANTIELLA, TETT.—Very near *D. badiella*, but with orange-coloured palpi. Kent and Surrey. Probably overlooked.

BORKHAUSENIA WOODIELLA, CURT.—A well-marked species, not observed for many years. Formerly taken near Manchester.

ELACHISTIDÆS.—CATAPLECTICA FÆRENI, WALSM.—Only reported from Cambridge.

ELACHISTA KILMUNELLA, STA.—North of England and Scotland. Recorded from Germany and Russia with doubt, but possibly occurs in both countries.

E. DENSICORNELLA, HODGKN.—Scarcely anything known of this species.

E. CONSORTELLA, STA.—Recorded from England, Scotland and Ireland.

E. SCIRPI, STA.—Widely distributed. Probably overlooked on the continent.

E. ELEOCHARIELLA, STA.—Occurs throughout to the Shetlands. Recorded with doubt from the Hartz mountains.

COLEOPHORIDÆS.—COLEOPHORA POTENTILLÆ, ELISHA.—Local, occurring in Dorset, Sussex, and Essex.

C. TRICOLOR, WALSM.—Rare, only recorded from Norfolk; comes near *C. livella*.

C. SATURATELLA, STA.—Locally common as far north as Denbigh.

C. TINCTORIELLA, COVERDALE.—Very local. Allied to *C. saturatella*.

C. SYLVATICELLA, WOOD, C. GLAUCICOLELLA, WOOD, and C. AGRAMNELLA, WOOD.—Three rush-feeding species confused with *C. caespitiella*.

C. ADJUNCTELLA, HODGKN.—A salt-marsh species; confined to England.

C. OBTUSELLA, STA.—Another salt-marsh species: confined to England.

C. TRIPOLIELLA, HODGKN.—Local: another salt-marsh species, confined to England.

C. ARTEMISIELLA, SCOTT.—Local, but widely distributed in England, Scotland and Ireland.

C. SQUAMOSELLA, STA.—Suffey; awaits rediscovery.

C. SALINELLA, STA.—Local on the coast: confined to England.

GONIODOMA LIMONIELLA, STA.—Locally abundant on *Statice limonium* in the south of England.

GRACILARIIDÆS.—ORNIX LOGANELLA, STA.—Widely distributed in Britain; recorded from Hereford, York and Sutherland.

LITHOCOLLETIDÆS.—LITHOCOLLETIS LAUTELLA VAR. IRRADIELLA, STA.—Olivaceous-fuscous in colour. Scarborough.

L. ANDERIDÆ, FLETCHER.—Closely allied to *L. ulmifoliella*.

L. PYRIVORELLA, BANKES.—Local in England—Dorset, Hereford and Sussex; allied to *L. mespilella*.

- L. ULICICOLELLA, STA.—Very local ; recorded from Durham.
- LYONETHIDES.—CEMIOSTOMA OROBI, STA.—Very local ; recorded from Yorkshire.
- NEPTICULIDES.—TRIFURCULA IMMUNDELLA AB. SQUAMATELLA, STA.—Dark aberration, rarely taken with type.
- NEPTICULA FLETCHERI, TUTT.—Confused with *N. anomatella*, both species with rose-feeding larvæ.
- N. TORMINALIS, WOOD.—Very local, single-brooded species on *Pyrus torminalis*, recorded from Herefordshire.
- N. SERELLA, STA.—Recorded also with doubt from Bavaria.
- N. POTERII, STA.—By some lepidopterists supposed to be specifically identical with *N. jilipendulæ*.
- N. HODGKINSONI, STA.—Possibly confused with *N. centifoliella*.
- N. WOOLHOPIELLA, STA.—A local species recorded from Herefordshire, closely allied to *N. argentipedella*.
- N. CONFUSELLA, WOOD.—Probably confused with *N. lapponica*.
- N. QUINQUELLA, BEDELL.—Exceedingly abundant locally, in some seasons, from Surrey to Cambridge.
- N. SUBAPICELLA, STA.—A rare species from Kent, previously confused with *N. argyropeza*, by Stainton.
- TINEIDES.—MEESIA RICHARDSONI, WALSM.—At present only recorded from Dorset.
- PSYCHIDES.—NARYCIA MONILIFERA VAR. ATRELLA, STPHS.—A dark form not uncommon in the metropolitan district.
- SOLENOBIA INCONSPICUELLA VAR. TRIQUETRELLA, EDL. (*nec* HB.).—A suffused form from the Manchester district. S. VAR. WOCKII, BARR. (*nec* HEIN.).—Grey with no tinge of ochreous ; Birmingham district.
- BANKESIA DOUGLASHI, STA.—A very distinctly marked specimen, still unique taken in Birch wood, Surrey.
- B. STANTONI, WALSM.—The species taken near Southampton is considered by Walsingham to be distinct from the *B. conspurcatella* of the continent.
- TALEPORIA TUBULOSA AB. MINOR, TUTT.—Small, almost unicolorous. Croydon district.
- MASONIA MITFORDSELLA, CHAPMN.—Locality doubtful.
- M. HIBERNICELLA, CHAPMN.—Ireland.
- FUMEA CASTA AB. MINOR, CHAPMN.—Small examples, apparently pretty generally distributed. F. AB. BOWERELLA, CHAPMN.—At present only recorded from Kent.
- F. SCOTICA, CHAPMN.—Rannoch and Sutherland.
- PACHYTHELIA VILLOSELLA VAR. NIGRICANS, CURT.—Blackish form. New Forest.
- STERRHOTERIX HIRSUTELLA VAR. FUSCA, HAW.—Pale fuscous ; Hornsey Wood and Highgate formerly.
- ERIOCRANIIDES.—ERIOCRANIA FIMBRIATA, WALSM.—A very rare species, based on two examples ; Berks.
- E. SALOPIELLA, STA.—Local, occurring as far north as Westmorland.
- E. CALEDIONELLA, GRIFFITH.—Sutherland. Sunk by Rebel as *E. purpurella*.

There are, I know, many sins of omission and commission in this list. I have been doubly unfortunate, first in having been exceedingly busy with other work when the list had to be made out, and, secondly, in failing to obtain a micro-lepidopterist more up-to-date with new

additions and captures than I have been able to keep myself recently, to check the list, and thus ensure greater completeness and accuracy. It will, however, I doubt not, form a good basis on which some lepidopterist with more leisure, and a more detailed acquaintance with recent work done in the micro-lepidoptera abroad, can make a catalogue of purely British species, varieties and aberrations, when such a thing is again wanted. If some such lepidopterist will make a copy of the list, and, having added his critical emendations, send it on to Dr. A. Russel Wallace, he will, I am sure, be as delighted as I.

Migration and Dispersal of Insects: Final Considerations.

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

We have now passed in review a large number of the published facts relating to the migration and dispersal of insects, and one suspects that some attempt should be made to discover if the facts throw any light on the cause of the migration or dispersal habit which evidently exists in many insects.

The facts appear to prove conclusively that there is, in many insects, a strong tendency for the imagines to spread from the area in which they have lived as larvæ, and there seems to be no doubt that, in the case of orthoptera and coleoptera, the essential reason of dispersal is in order to seek new feeding-grounds; some, at least, of the movements of aphides, appear also to be largely intimately connected with food-supply. In the case of the odonata no such direct reference to food conditions is possible, and it is distinctly evident that these do not directly influence the movements of lepidoptera in the imaginal state. It is possibly not unfair to suggest from the evidence that the mass movements of odonata are due to the necessity of finding new breeding-grounds, those in which they themselves existed as nymphs being dried up and no longer affording the necessary conditions for egg-laying. To a limited extent, perhaps, this may also be true of lepidoptera, but one suspects that the extent to which this may apply is exceedingly small. We have already noted that Piepers considers the migrating impulse is due to certain unexplained sexual conditions, which act as a primary motive force on the organism and cause it to undertake long flights from its native locality, but we do not see much evidence in support of this view.

In the hymenoptera, as we have already suggested, the cause of the various dispersal movements appear to be varied and possibly connected in some cases with the necessity of finding a new home, in others with the necessities of cross-fertilisation, and in yet others with the necessity of discovering new feeding-grounds. We appear then to have, in connection with this subject, several quite different phenomena to consider.

However varied the causes may be, the general results are similar, *viz.*, the occupation of new breeding-grounds, the extension of the range of the species should these breeding-places prove suitable, and the extermination of the progeny of the immigrants in the course of a generation or two should they prove unsuitable. The failure of successive migrating bands to permanently populate a new district is exceedingly well illustrated in our country by *Colias edusa* and *Pyramis*

cardui, and in North America by *Anosia archippus* and other species of similar habits, which, when they spread north, bring their southern continuously-brooded habits with them and attempt to do, under more rigorous climatic conditions, what they do naturally in their more southern homes, with the result that their progeny is almost entirely exterminated during the autumn and winter following their immigration. On the other hand, should the locality reached prove favourable, this again may become a new centre of dispersal. Such species, continually seeking new grounds to which they may extend, may well be termed dominant species, because they are least likely to undergo absolute extinction owing to local causes, and also because, in the process of extending their area, they are continuously being brought under, and to be successful have to respond to, changed conditions which must result in slow modifications of habit and possibly in appearance, culminating in the development of new races, and possibly ultimately of new species. The permanent settlement of such species as *Pyrameis cardui* and *Colias edusa* in a more northerly latitude than that in which they winter easily now, must depend upon the ability of the species to adopt a fixed hibernating habit which will carry them through some months in such a climate, for example, as our own. *Colias edusa* attempts to do this in the larval, and *Pyrameis cardui* in the imaginal, state, and there is some little evidence that a few examples may for a short time succeed, but these are met by the next band of immigrants without the habit, and crossing rapidly reduces or swamps altogether the hibernating power, and the progeny has almost, as it were, to start again *de novo*. Along the southern shores of the Mediterranean, where the actual winter is very short, some slight hibernation is successfully negotiated by both these species; if these individuals immigrated or spread into a comparatively near country or district, the progeny of those of the immigrants which had the hibernating tendency most strongly developed would be able to tolerate a slightly severer climate, and one can understand that, by easy stages, a race might be established that could spread slowly into far distant countries, and show a distinct definite hibernating habit differing greatly from that of its early southern ancestors. There is little proof, however, that the remarkable swarms of these species that more or less frequently visit Britain come from neighbouring countries; on the other hand, they often occur in years when there is certainly no excess of abundance anywhere in southern Europe, but such evidence as is forthcoming, especially with regard to *P. cardui*, suggests northern Africa as the area of origin. Here the species is sometimes observed in enormous numbers in March, the larvæ stripping everything that they can possibly eat in April, and producing imagines in May, many of which are probably forced, by their local circumstances, to leave their native homes and seek pastures new elsewhere.

It has been suggested by Scudder (*Psyche*, v., pp. 190 *et seq.*) that *P. cardui* was originally a native of the New World, and that its present distribution—practically over the whole world (the Arctic regions and part of South America excepted)—has been obtained by the species spreading from America. He observes that the species belongs to a subdivision of the genus *Vanessa*, the members of which (with the sole exception of this cosmopolitan species) are found

exclusively in the New World, whilst the antithetical section (with the single exception again of one member found both in Europe and the United States) is exclusively confined to the Old World, and yet it is just in America that its distribution is most limited: "It has a wide distribution in North America, is, however, known only in a comparatively small portion of South America, and occurs in none of the West Indian Islands except Cuba, where it is rare. The cause of this limitation cannot be attributed to the want of food-plants, which are quite as abundant in the districts where the species does not occur as where it does; nor can the heat of the tropics be placed as a difficulty in the way, since there is no place, he says, where it flourishes more abundantly than in the tropics and subtropics of the Old World. Scudder's explanation of its success in the Old World appears sound, for it is clear that, in the New World, its distribution is limited by its competition with its nearest relatives, whilst "being introduced into a new world where it had to contend in the struggle for supremacy with none of the members of its own restricted group, which had stood in its way in its native home, it would suddenly find that it had reached a region ready for conquest and would spread therein with such success as to completely overrun that division of the world." The force of this reasoning is excellently illustrated by the facts connected with the spread of the European *Pieris rapae* in America. This species, first noticed in America (Quebec) in 1860, had spread to Cacouna, to the Eastern Townships, and to the state of Maine by 1866, in 1867 it was noted at Montreal, whilst in 1868 there was a fresh importation by way of New York (a German naturalist having obtained chrysalides from Europe allowed the imagines to escape). From the two centres the spread continued, till in 1876 the species had covered the whole of Western Ontario, and in 1881 had invaded the whole country from the Atlantic Ocean to Texas, Kansas, Nebraska and Lake Superior; in 1884, specimens were met with on the shores of Hudson's Bay and at the foot of the Rocky Mountains, whilst at the present time the butterfly has practically covered the whole of Temperate America. Coming from a district (Europe) in which it has several near relations which compete closely with it for food, and possessed, as it is, of a strong migrating tendency which leads it to push itself even against these relations, it found itself in a country where the group of butterflies to which it belongs was poorly represented, and where its food-plant was excessively abundant. The consequence is that it has spread at an amazing rate, and in a quarter of a century has covered Canada and more than half of the territory of the United States, extending itself all over the temperate area, and elbowing out its native relations which are unable to compete with this hardier and more capable type. In fact, the scarcity of one of them, *Pieris protodice*, formerly a common insect, in the districts which the European species has invaded, is most distinctly marked. Here we see how a stranger can become dominant in a short time and crowd out its less pushing neighbours. But it is only in temperate regions that this species can spread, for its food-plants (the cabbage tribe) are scarce or entirely absent beyond the temperate zone. On the other hand, *Pyrameis cardui* suffers no such restrictions, its food being practically everywhere. There has been, therefore, everything in favour of its becoming a cosmopolitan species, and if there be one really deserving this term in the world, this species is probably it.

The spread of *Anosia archippus* also gives us food for reflection. It is one of the few New World representatives of a large Old World family. Its success in its own country is a proof of its inherent ability to spread, but yet it is in the Old World that it has become renowned for its power to extend its range in spite of competition. It is evident from its allies in the New World and the fact that it has split up into a number of local varieties, or even distinct species, that its introduction, or the introduction of the ancestor of the New World species dates back very, very far. Suffice it to say here that the modifications which this particular insect has undergone, have proved of advantage not only as against its own nearest relations, but also as against the descendants of its ancient allies in its old home.

COLEOPTERA.

DIBOLIA CYNOGLOSSI, KOCH, A BRITISH INSECT.—I have much pleasure in establishing this very rare beetle as a British insect. I swept a short series near Pevensy on August 11th last. This capture is practically an addition to our coleopterous fauna, as, though it is recorded in Stephens, it is not to be found in Fowler (*Col. Brit. Isles*) or Cox's *Handbook*, and it has not figured in a British list since 1866. Stephens, in the *Mandibulata* (*Col.*, vol. iv., 1831, p. 325), writes of this insect: "I possess a single example captured in the neighbourhood of Bristol," and in his *Manual* (1839, p. 301) notes "On *Cynoglossum officinale*, Bristol: 6."* Rye (*Ent. Ann.*, 1868, p. 76) writes "*D. cynoglossi*, an insect which does occur in our *Catalogue*, though with much doubt." It appears to occur in Central Europe and Spain. It is very rare in France. *Dibolia* belongs to the *Halticidae*, and may be easily known by the large bifid spur at the apex of the posterior tibiae.—H. ST. J. K. DONISTHORPE.

COLEOPTERA IN SCOTLAND.—During June I was able to make a few more excursions to places in the neighbourhood of Edinburgh. On the 18th I went out in the late afternoon to Cranond Bridge, and swept along both sides of a lane running by the side of the river Almond for some half a mile. Though the herbage was in fine condition and many of the wild flowers were in full bloom the weather conditions were, as usual, adverse—dull grey skies and a cool wind—the following insects were, however, obtained—*Liophloeus nobilis*, F., fairly common, *Scaphophilus muricatus*, F., *Centhorrhynchus quadridens*, Pz., *C. cyanipennis*, Germ., and *Phaedon tumidulum*, Kirb. This latter insect occurred in the utmost profusion, and varied greatly in colour and size, constantly misleading me with the hope that I had secured something new. On the 19th I made another afternoon visit to Hawthornden, but on this occasion I did not go at all into the grounds, my time being devoted to vigorous sweeping under the hedges in the neighbouring lanes and in a plantation of firs. Off *Alliaria officinalis* came again *Centhorrhynchus cyanipennis*, Germ., and *C. quadridens*, Pz., both in plenty, while general sweeping produced a fair number of good things, including the following—*Phylllobius uniformis*, Marsh., *Platytarsus echinatus*, Bons., *Hypera polygoni*, L., *Sitones puncticollis*, Steph., *Rhinosimus viridipennis*, Steph. (I swept this insect again a little later in Berwickshire, Canon Fowler says it occurs rarely in Scotland in the Dee district only), *Gastroidea*

* 6 means in June.

polygoni, L., *Mantura rustica*, L., *Cryptohypmus riparius*, F., *Brachypterus pubescens*, Er., previously only recorded rarely from Solway district, with *Meligethes acenus*, F., and *M. viridescens*, F., of course, in the utmost profusion. Sweeping under the fir-trees secured *Coccinella hieroglyphica*, L., *Phytobius 4-tuberculatus*, F., *Exomias araneiformis*, Schrk., Canon Fowler says this latter is doubtfully Scotch, and that Dr. Sharp had never seen a specimen, but I have also seen this summer specimens taken at Peebles, by Mr. Black, so the old record of Murray is quite correct, and, lastly, an insect which I can only make to be *Dryocetes autographus*, Ratz., which as far as I know has only been taken previously at Scarborough, in 1869. At Musselburgh, on the afternoon of the 21st, I obtained *Anisotoma calcarata*, Er., *Mantura rustica*, L., and *Otiorrhynchus muscorum*, Bris, by sweeping in an old sand pit, and the same afternoon I swept *Chaetocnema hortensis*, Fourc., in some numbers in the Regent Terrace gardens behind my house. This finished my collecting for June, except for the brief trip to Rannoch, the results of which have been recorded (*Ent. Mo. Mag.*, vol. xxxviii., p. 179). Several of the above insects have only been taken previously in other districts in Scotland and are recorded as uncommon, the above records are therefore new localities for them.—T. HUDSON BEARE, F.E.S., 10, Regent Terrace, Edinburgh.

LEMOSTENUS COMPLANATUS, DEL., AT STROOD AND CHATHAM.—Mr. Stanley Kemp records the occurrence of *Laemostenus complanatus*, Dej., an addition to the British fauna, from Dublin in June last (*Ent. Mo. Mag.*, vol. xxxviii., p. 216). This insect is superficially very like *Pristonychus terricola*, Herbst, but is smaller, has considerably shorter legs, and is, moreover, winged, while *P. terricola* is apterous, there is also a difference in the shape of the thorax, which is quite marked, as soon as attention is drawn to it. On examining my series of *P. terricola* I at once detected three specimens of *L. complanatus* mixed with them, and a reference to my entomological diary showed that they were all taken in the yard of a granary at Strood in 1901, under bricks. Mr. Champion says (*loc. cit.*) that he has two specimens taken by Mr. J. J. Walker, at Chatham, in 1874. It is possibly, in other collections, mixed with *P. terricola*, and has no doubt been passed over in the field for that insect.—IBID.

QUEDIUS OBLITERATUS, ER.—A QUERY AS TO MR. J. H. KEYS' NOTE IN THE ENTOMOLOGIST'S MONTHLY MAGAZINE, JULY, 1902.—In the *Ent. Mo. Mag.* for July last, Mr. Keys, in an interesting article, confirms as British, *Quedius obliteratus*, Er. He points out that, although not included in Canon Fowler's work, nor in Cox's *Handbook*, it was enumerated by T. V. Wollaston in his "Note on the Coleoptera of the South of Ireland" (*Zoologist*, 1847, pp. 1570-6), and is also ascribed to Great Britain, on the authority of Wollaston, by Fauvel in his "*Faune Gallo-Ibénaw*," vol. iii., p. 521. Mr. Keys states that this species is "doing duty in our collections as *Q. suturalis*, Kies." Are we to understand by this that there are no true *Q. suturalis*, Kies., in British collections? I have a specimen of a *Quedius*, which I took at Gravesend on August 8th, 1891, under refuse, and which I consider to be the true *Q. suturalis*, Kies. Mr. E. A. Newbery, who has seen the insect, also agrees with this conclusion. Further on Mr. Keys, mentions that he has taken *Q. obliteratus* in some numbers in the Plymouth district, and also that one or two specimens are possessed by other coleopterists.

Canon Fowler writes of *Q. suturalis* (*Col. Brit. Isles*, vol. ii., p. 241):—"Local, London district, not uncommon," and mentions many localities in England, and Scotland rare; are we to understand that all these records refer to *Q. obliteratus*? We should be much obliged if Mr. Keys will settle this matter for us. We may point out, by the way, that neither *Q. obliteratus* nor *Q. suturalis* are recorded from Ireland in the "List of the Beetles of Ireland," by Johnson and Halbert, 1902.—HORACE DONISTHORPE, 58, Kensington Mansions, S.W. September 14th, 1902.

DORCATOMA CHRYSOMELINA, STURM., ETC., IN LEICESTERSHIRE.—Whilst on a visit to my friend Mr. Bouskell, at Market Bosworth, in July last, I took two specimens of *Dorcatoma chrysomelina* out of an old dead birch tree in the park there. Out of the same tree we captured several specimens of *Mycetophagus picus* and *Phlocotrya stephensi*. Both the *Dorcatoma* and the *Mycetophagus* are new to Leicestershire. A visit to Thornton Reservoir produced a nice series of *Blethisa multipunctata*; *Anchomenus picus* was plentiful, and *Bembidium obliquum* and *Philonthus quisquiliarius* ab. *dimidiatus* were secured. The *Bembidium*, which is very common there earlier in the year, was getting over. *Longitarsus laevis* occurred on *Chrysanthemum leucanthemum* in Mr. Bouskell's garden.—IBID.

PRIONUS CORIARIUS AT ESHER.—On August 22nd I took a fine specimen of *Prionus coriarius* in the High Street of Esher. This is the first example of this longicorn I have taken here. Is it a new locality for the species?—HARRY FLEET, 7, Park Road, Esher, Surrey.

MALACHIUS MARGINELLUS, OL., IN SCOTLAND.—A single specimen of this insect was taken in Peebles, running on the pavement, near a grassy bank, on July 26th last. Canon Fowler states that this insect is almost confined to the south-eastern coasts of England, but he notes the capture of a specimen by Dr. Sharp, in the Solway district, in Scotland (*Col. Brit. Islands*, vol. iv., p. 157). The above record for quite another part of Scotland is, therefore, interesting.—JAMES E. BLACK, Nethercroft, Peebles.

LARINUS CARLINÆ, OL., AND OTHER COLEOPTERA IN THE HASTINGS DISTRICT.—Having spent six weeks at Rye, from the 31st of July last, I found that in spite of the weather I did very well entomologically, and added a number of interesting beetles to my collection. My best capture was *Larinus carlinae*, a species which has not been taken in the Hastings district for 25 years, when Mr. Butler took two specimens at Rye. Mr. Bennett had told me about this capture, and that it had not turned up since, and asked me to see if I could rediscover it. After searching many spots and examining numerous thistles, I at length found a place where the beetle occurred, and, moreover, was in plenty. It was not found on the carline thistle. The beetles are very hard to detect on their food-plant, as the yellow patches of hairs with which the freshly emerged insect is ornamented assimilate with the spines of the thistles, which are often yellow, and one finds that even when looking very closely at a thistle, it is often a long time before the beetle is noticed, although one may be looking straight at it all the time. Of course it is easily swept. The beetles eat round holes in the centre of the thistle leaves. *Telmatophilus sparganii* occurred in one ditch on *Sparganium*, accompanied by *T. typhae* and *T. hrevicollis*. The last of these species I turned up in four different localities, one at Winchelsea, two near Rye, and one at Iden. In the last-named locality I swept a

specimen of *Antherophagus silaceus*, being an addition to the Hastings list. *Bilessus unistriatus* was found in Mr. Bennett's locality at Camber, where also occurred *Deinopsis erosa* and *Bembidium fumigatum*. A nice series of *Podagrica fuscipes* was swept off mallow at Rye, and the very rare ♀ of *Athous difformis* was taken by evening sweeping. The pretty little *Apion urticarium* was swept off nettles in one or two localities, and *Ceuthorrhynchus echii* from *Echium vulgare* in some numbers. This last insect is also well protected by its colouring, on its food-plant; the white prickles of the *Echium* and mottled appearance of the dead leaves, forming a background well calculated to conceal it by their similarity to its colouring. *Scirtes orbicularis* and *Coccidula scutellata* were obtained not uncommonly by sweeping reeds. A series of *Hylesinus oleiperda* was beaten out of ash trees. The beetle bores into the end shoots of the branches and may also be taken by breaking off and examining any shoots that appear to be dead. I added this species, by the way, to the Hastings list in 1894, when I took a single specimen near Fairlight. Two specimens of *Choragus sheppardi* were beaten from an old hawthorn hedge. *Lixus algirus* was rather late this year no beetles being at large; there were plenty of its curious pupæ, however, in the thistle stems. I was fortunate enough to take *Ceuthorrhynchidius chevrolati* in a new locality (near Rye), and swept a series off *Achillea millefolium*, as a visit to the St. Leonards' locality had drawn blank. On August 25th, Mr. E. A. Butler accompanied Mr. Bennett and myself to Battle, where a very pleasant day was spent. *Anchomenus livens* turned up rather freely in the same spot where we took it in 1895. Diligent search for the var. *barbaræ*, Steph., of *Cryptocephalus parvulus*, which was first discovered at Battle by Mr. Bennett and myself in 1895, failed to produce it, as though the type was found and several dark intermediate forms occurred, *barbaræ* itself did not put in an appearance. *Anoplus roboris* was beaten off birch, and *Phytobius waltoni* and *Dorcatoma flavicornis* were obtained by evening sweeping. I may mention before closing these notes that *Lema erichsoni* was worked hard for on several occasions by Mr. Bennett and myself in its original locality, unfortunately without success. However, one cannot expect always to get everything one tries for.—H. ST. J. K. DOXISTHORPE, 58, Kensington Gardens, Sept. 20th, 1902.

PRACTICAL HINTS*.

Field Work for October.

By E. ROGERS BUSH.

- 1.—Beat birch-trees during early October, at night, for full-fed larvæ of *Demas coryli*.
- 2.—Also beat larch for larvæ of *Eupithecia lariciata* and *Odontopera bidentata*.
- 3.—It is most profitable during October to sweep, at night, railway banks and edges of woods where mixed plants abound, for hibernating Noctuid larvæ, as here many uncommon species may be obtained; they may be kept through the winter by planting a good root of knotgrass

* PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST, Part I, published May, 1900, and already almost completely out of print, contains 1250 similar hints to these, distributed over every month in the year. Interleaved (for collector's own notes). Part 2 is now in the printer's hands, and subscribers wanted.—ED.

in a flower-pot and covering with muslin; most hybernating larvæ will feed upon this until spring, when their own food-plant may be found.

4.—Look with lamp at night at blooms of ragwort for *Hydroecia luccens* (*nicitans*), *Agrotis obelisca*, and other Noctuids, which are rather later in Perthshire than in the south of England.

5.—Sugar north side of woods for preference, for *Agriopis aprilina*, *Agrotis obelisca*, *Epunda nigra*, *Orrhodia vaccinii*, *O. erythrocephala*, *Scopelosoma satellitia*, *Noctua glaucosa*, and many other species.

6.—By hanging a lamp on a tree in woods and standing by with a net, *Himera pennaria*, *Ennomos erosaria*, *Oporabia dilutata*, and *O. filigrammaria* may be taken; so also may many Noctuids when sugar fails.

7.—Search old stunted birch-trees during this month for imagines of *Cidaria miata* and *Leptogramma scotana*, the latter can be seen from a good distance (where it occurs).

8.—Sweep *Calluna vulgaris* for the larvæ of *Anarta myrtilli*, *Scodionia belgiaria*, etc.

9.—*Macrothylacia rubi* larvæ may be obtained in abundance during this month by searching at dusk by woodsides, these may be kept successfully by putting a good sized turf of grass in a box and placing the larvæ thereon; cover with muslin and stand out-of-doors.

[N.B.—We should be very glad to receive from lepidopterists complete series or individual “hints” for any month. Variety can only be obtained by the combined efforts of many lepidopterists accustomed to work in different districts.—Ed.]

ORTHOPTERA.

A RARE GRASSHOPPER: *AGROECIA VITTIPES*.—About the middle of July last, a boy brought to me, alive, a large grasshopper which he had caught on a wall of his house at St. Albans, Herts. It at once struck me as being a rarity, and, through the kindness of Mr. Malcolm Burr, F.E.S., it has now been definitely identified. At first Mr. Burr was inclined to think it was the female of *Agroecia nigrifrons*, of which hitherto only the male had been described. On further investigation, however, the unusual visitor has been definitely identified as *Agroecia vittipes*. It has been recorded by Redtenbacher from Theresopolis in Brazil, and the type is in the Brunner collection in the Hof Museum in Vienna. Both sexes of this species have been described, but I believe I am correct in stating that this is its first recorded occurrence in Great Britain. There is little doubt, however, that it is an imported specimen, as there is an orchid nursery not far from where the grasshopper was captured, and it must have been brought into this country with some plants from South America. It measures over two inches from the end of the ovipositor to the head; in colour it is dark brown, has two very large and long hindlegs and two pairs of smaller ones in front, very long slender antennæ and a long ovipositor. Judging from the hopping feats which I witnessed this specimen perform, I should imagine that in its native habitat its powers in this direction must be very considerable.—W. PERCIVAL WESTELL, M.B.O.U., St. Albans, Herts. September 6th, 1902. [As Mr. Burr is abroad we insert this although it is evidently only an independent record of the specimen noted *antè*, p. 243.—Ed.]

VARIATION.

NOTE ON A FORM OF *PÆDISCA PROFUNDANA*.—For some seasons I have taken a very interesting insect, which I supposed to be only a local form of *Pædisca profundana*. It is taken in an orchard here, and until this year was invariably beaten from apple, or bred from larvæ beaten from apple. The form is very constant in colour and markings, and a similar form is taken by Dr. Ridg. (with two or three other forms) also in an orchard, but at sugar, whilst Dr. Wood is said to obtain it in only two old orchards at Tarrington, where none of the ordinary form of *P. profundana* has been yet met. Mr. Bankes reports having taken the same form in the New Forest twenty years ago, and the general opinion up to the present has been that it is a phytophagic (apple-feeding) form of *P. profundana*. Recent experience, however, throws considerable doubt on this. On June 6th last, Mr. Bower and myself collected a number of larvæ in laterally rolled (cigar-shaped) leaves of apple in the particular orchard in which this form had previously occurred, hoping to breed it. On June 7th, we collected larvæ in similarly rolled oak-leaves, supposing them to be those of the ordinary form of *P. profundana*, as I have commonly beaten the species there, but have never taken the particular form from the orchard there. The oaks are about half a mile from the orchard, and no apple-trees are near. The larvæ were kept quite distinct, in separate cylinders on pots, the one lot on apple the other on oak. On June 15th we described the larva on apple as follows :

About $\frac{5}{8}$ ins. in length, dark green in colour; on the 3rd and 4th segments two black spots forming a colon, and beneath them two smaller ones, thus .:.; on all the other segments except the anal are two large spots like a colon, and beneath them one small one. The head yellowish-green; on the 2nd segment a plate, of a tint between the head and body colours, slightly darkened at each side, and a black spot (sometimes wanting in both the apple and oak larvæ) on front of plate. Legs black. Prolegs unicolorous with body; on the last pair, in some instances, a black spot on each. A few pale hairs emitted from each segment except the head.

Having made this description we proceeded to examine the larva on oak (which we supposed to be those of ordinary *P. profundana*) with a view to noting any differences, but we were unable to detect any. When Mr. Bower left me, about June 18th, most of the larvæ on apple had pupated (those on oak were not examined), the pupæ being either on the surface of the earth or in a turned-over leaf. Most of these he took with him and has since bred several imagines, all of the peculiar form. From the remaining pupæ from apple I bred four of this form, *viz.*, on July 9th, 10th, 11th, and 12th, whilst from those on oak three of the same form emerged, on July 11th (two) and 12th. These were the only ones bred, as we only collected a few larvæ from oak to satisfy ourselves that they were *P. profundana*. On July 16th I commenced to take this form in the orchard, and have taken several since. Several visits to the oaks, however, gave no example of the insect this year, although this particular form was quite common in its usual orchard. I should be glad to know if, elsewhere, the larvæ of *P. profundana* are to be found in similarly rolled leaves, or if anywhere the larvæ of this species have different habits from the preceding.—E. F. STUDD, M.A., Oxtou, near Exeter. August 8th, 1902.

GYNANDROMORPHIC AND ABERRATIONAL *LASTIOCAMPA QUERCUS*.—*L. quercus*.—On July 22nd I had a specimen of *L. quercus* emerge, with male colouring on the wings and ♂ antennæ, but the body was

more like that of a ♀ in size, and showed what looked like egg matter between the segments, while the anal extremity was devoid of the tuft of hair usually present in the ♂. In addition, on the forewings, was a yellow splash from the base of the wing half way to the discoidal spot. It was from a larva taken at Christchurch, Hants, in June. I also bred another specimen from a Deal larva with these splashes, and a specimen from an Eastbourne larva with the band on the hindwing almost obsolete.—C. W. COLTRUP, 120, Barry Road, East Dulwich, S.E. *September 20th, 1902.*

ABERRATION OF *TRYPHENA FIMBRIA*.—Last April I took a number of *Tryphaena fimbria* larvæ at Streatham. At the end of June they emerged, and among them was an aberration which I think worthy of notice. The forewings are those of the common light mahogany aberration, but the hindwings have an ocellated spot near the anal angle, and well separated from the black border. The right hindwing has a small hole surrounded with black, and the left one has a transparent "window" surrounded in the same manner and containing a very minute hole. The black rings are about $\frac{1}{2}$ inch in external diameter. The underside exhibits the same spots as the upper, but not quite so well defined. I may add that the wings are very slightly crippled.—C. I. PATON, Ormley, Glen Eldon Road, Streatham, S.W. *September 14th, 1902.*

EPINEPHELE TITHONUS AB.—On August 3rd, at Burgess Hill, Sussex, a striking aberration of *Epinephele tithonus* was taken. The insect was a male, well marked, in full strength, in all the dark parts of the wings, but instead of the usual brilliant red-brown for the ground colour of the wings it was a light butter-coloured yellow.—J. C. DOLLMAN, Hove House, Newton Grove, Bedford Park. *September 25th, 1902.*

NOTES ON COLLECTING, Etc.

LATE SEASON FOR LEPIDOPTERA IN PERTSHIRE.—As late as September 6th I obtained ova of *Dasydia obfuscata*, capturing a female on that date. I should like to draw attention to the fact that I have endeavoured to transplant this species to other than its original haunts by obtaining ova and placing them in various localities where the same food-plants grow, and where the environment is apparently almost identical, but the attempt has failed upon every occasion. I have also taken larvæ about half fed and put down, but these also failed. Purple bell-heather (*Erica tetralix*) is undoubtedly its food-plant, although nearly all authorities give other plants. It will be observed from the date of capture, that it, like everything else, is about a month late. My list gives the usual time of appearance as being about August 12th. *Noctua sobrina* is equally late. I took it at sugar upon August 15th, whereas in other years the dates have been from the third week in June to the second week in July. *Cerura furens*, *Epuada nigra*, *Notodonta dromedarius*, &c., were emerging the first week in August, whilst larvæ of *Theretra porcellus*, *Chariclea umbra* and *Anticlea sinuata* were taken in their first stadia upon August 25th, the whole of them fully a month behind their usual time, and no doubt due to the sunless summer which we have

had.—E. ROGERS BUSH, 1, Strathmore Street, Perth, N.B. *September 8th, 1902.*

LEPIDOPTERA, ETC., IN THE NEW FOREST IN JUNE, 1902.—I made my first visit to the New Forest for the purpose of working for lepidoptera on June 18th last, remaining there until July 1st, with Mr. Geo. T. Porritt, who was working principally for dragonflies, although he assisted in making the list what it is. It will be seen that we were not very successful, the most noteworthy feature being the backward state of, and the scarceness of, even common species; during our stay insects were very scarce, common or otherwise, and very little came to sugar, larvæ were far from common, even of the usually common species, and such special Forest larvæ as *Enistis quadra* were also scarce, although some of the "locals," who know the ground well, took a fair number. A good many of the oak-trees, etc., situated along the Lyndhurst Road, and in Hurst Hill and other enclosures, had been blighted by frost about the middle of May, and through this cause they had lost their leaves, and had quite a wintry appearance. The loss of caterpillar life must have been enormous from this cause alone, without taking into account the extremely wet and cold weather which prevailed during May and June previous to our visit. When we arrived, on June 18th, the Forest was a perfect bog all over, in fact the "natives" said it was as wet as they had ever known it even in the winter season. It will be seen from these remarks that the outlook for my first visit was far from rosy, and results unfortunately bore out appearances. I had hoped to see some of the larger fritillaries, *Limenitis sibylla* and *Apatura iris* on their native ground, but, of course, the lateness of the season prevented our seeing even an odd specimen of any of them, and I may say that the larvæ of *L. sibylla* were still being taken during the time of my visit. We made Brockenhurst our headquarters, and our investigations were confined to the immediate neighbourhood. What sugaring we did was done principally in Hurst Hill enclosure, where we generally had the company of two or three other entomologists. Among the lepidoptera noticed during our visit were *Giompteryx rhamni*, hibernated specimens very plentiful; *Argynnis euphrosyne*, several, some quite fresh; *Eugonia polydoros*, larvæ on sallow. *Pararge ægeria*, on old sugar patches on Hurst Hill; *Zephyrus quercus*, larvæ; *Syrichthys malvae*, some of the specimens in good condition; *Hesperia comma*, *Sphinx ligustri*, *Theretra poecilus*, *Eumorphia elpenor*, the two latter insects were noticed hovering about sugar patches at dusk; *Helmaris fuciformis*, *H. tityus* (*bombyliformis*), about over; *Egeria formiciformis*, a single specimen, fresh out among osiers; *Sarrothrips undulatus*, larvæ; *Haliastur prasinana*, *Noia cucullatella*, larvæ on hawthorn; *N. strigula*, larvæ not uncommon on oak; *Lithosia mesomella*, just coming out at end of June; *L. sorocula*, *Enistis quadra*, larvæ; *Gnophria rubricollis*, noticed flying over trees in morning sun, also found at rest on bracken; *Neocophila russula*, *Arctia villica*, *Cochlidium limacodes*, *Psilura monacha*, larvæ fairly plentiful; *Dasychira pudibunda*, *Poecilocampa populi*, and *Malacosoma neutria*, larvæ; *Macrothylacia rubi*, flying over heath, also noticed ova on fir-tree trunk about five feet from ground; *Drepana falcataria*, *Drymonia chaonia*, larvæ; *D. trimacula*, one or two imagines; *Thyatira batis*, common at sugar; *Asphalia videns*, larvæ fairly plentiful on oak; *Moma orion*, few at sugar; *Diloba caeruleocephala*, larvæ; *Dipterygia scabriuscula*,

Miana strigilis, typical forms; *Grammesia trigrammica*, with two or three rather nice aberrations; *Rusina tenebrosa*, *Panolis piniperda*, larvæ plentiful on firs; *Tachiocampa minusa*, fair number beaten out, larvæ of other species of this family were also common; *Eupleria lucipara*, *Aplecta prasina*, much lighter specimens than occur with us in North Yorks; *A. nebulosa*, *Hadena thalassina*, *H. genistæ*, single specimen taken at rest on post; *Cucullia umbratica*, *Erastria fasciana*, fairly common at sugar, and also beaten out during day; *Hydrelia uca*, just coming out, Matley; *Phytometra viridaria*, *Enclidia glyphica*, common on railway embankment; *Catocala promissa*, *C. sponsa*, larvæ. *Venilia macularia*, quite fresh; *Metrocampa margaritaria*, *Ellopiæ prosapiaria*, just coming out at end of June; *Eumomus quercinaria*, *Himera pennaria*, *Phigalia pedaria*, *Amphidasys strataria*, *Cleora glabraria*, and *C. lichenaria*, larvæ; *Boarmia roboraria*, just coming out. *B. consortaria*, worn; *Tephrosia crepuscularia*, very light form; *T. luridata*, not uncommon; *Pseudoterpna pruinata*, larvæ; *Nemoria viridata*, worn; *Iodis lactearia*, common at dusk; *Zonosoma porata*, *Z. punctaria*, *Z. annulata*, and *Z. pendularia*, *Eupisteria obliterata*, *Acidalia trigeminata*, one of the commonest moths during our visit, and came freely to sugar; *A. renurtaria*, *Bapta temerata*, and *B. bimaculata*, both common; *Macaria alternata*, a few at Matley Bog among alders; *M. liturata*, *Panagra petriaria*, a nuisance as usual; *Scoliona helværia*, lighter than northern forms; *Ematurga atomaria*, quite fresh; *Eupalus piniaria*, common, the forms occurring here are much different from our northern specimens, the ♂s having the patches on the upper wings yellowish in place of white as with us, and the ♀s are of a bright orange colour, while ours are very much darker and more marked; *Aspilates strigillaria*, common among heather; *Hybernia leucophaearia*, *H. marginaria*, *H. defoliaria*, and *Anisopteryx aescularia*, larvæ common; *Empithecia rectangularata*, common; *Collis sparsata*, specimens quite fresh, taken near Matley Bog; *Hypsipetes trifasciata*, banded specimens of large size, this seems to be a feature of New Forest insects, many of them being much larger than those of the same species occurring in the north, at any rate in the localities with which I am familiar; *Coremia unidentaria*, at rest on palings; *Phibalapteryx tersata*, *Anaitis plagiata*, *Botys pandalis*, etc. Dragonflies were very plentiful, and much better represented during our visit than lepidoptera, it was quite a pleasure to see some of these grand insects sailing about in the parts of the Forest which they haunted, the gorgeous and graceful *Calopteryx virgo* being specially noticeable gliding up and down the streams, especially on short stretches of open water passing through the woods. Among the dragonflies noticed (for the names of which I am indebted to Mr. Porritt) were the following species:—*Ischnura pumilio*, abundant on swampy grounds; the bright orange-yellow variety *aurantiaca* of the ♀ being more plentiful than the type. *Agriion mercuriale*, occurred freely in swampy ground, and also along the stream sides passing through boggy ground. *Agriion puella*, *Ischnura elegans*, and *Pyrrhosoma tenellum*, occurred, the latter pretty freely. On a broad stream the pretty *Gomphus vulgatissimus* was fairly common during the latter part of our stay, and with it *Cordulegaster annulatus* was noticed. *Anax imperator* was seen, and *Libellula quadrimaculata* occurred in some numbers in at least one locality. *Platycnemis pennipes* was abundant and very variable. *Orthetrum*

caeruleus, *Platetrum depressum*, *Calopteryx virgo*, and *Pyrhosoma nymphula* were also noticed in considerable numbers. Stag beetles (*Lucanus cervus*) were very plentiful, flying about during the evenings, and one or two came to sugar. Other noticeable visitors to sugar, although not welcome, were hornets, which, like a good many New Forest insects were of exceedingly large size.—T. ASHTON LOFTHOUSE, The Croft, Linthorpe, Middlesborough. September 16th, 1902.

EARLY EMERGENCE OF COSMOTRICHE POTATORIA.—When I was in the Broads June 21st-25th last, I was surprised to see several *Cosmotriche potatoria* on the wing, both ♂s and ♀s. There were numbers of larvæ feeding at the same time. On the 23rd I took a ♀ which laid 32 ova, these hatched on July 17th-19th, and the larvæ are now growing fast. I have never taken imagines of *C. potatoria* till the last week in July before. I am interested to see if the larvæ will feed up or hibernate.—H. M. EDELSTEN, F.E.S., Forty Hill, Enfield.

ACIDALIA DEGENERATA, HB., AT SANDOWN.—I was very much surprised, when sugaring at my favourite locality, on September 5th, to see a specimen of *Acidalia degenerata* among the crowds of visitors. The specimen is a male, the right pair of wings in perfect condition, the left ones (especially the forewing) badly torn. So far as I am aware, this species has never been recorded from any other British locality than the Isle of Portland, and as it is too conspicuous a species to be easily overlooked, I am inclined to regard it as an accidental importation to Sandown; it was taken quite close to the sea. The lateness of the date is interesting, but is in keeping with many others in this extraordinarily backward season.—LOUIS B. PROUT, 246, Richmond Road, N.E. September 22nd, 1902.

EUTRICHA QUERCIFOLIA IN SURREY.—I found this insect both in the larval and imago state at Farnham, Surrey, this year.—C. W. COLTHRUP, 127, Barry Road, East Dulwich, S.E. September 20th, 1902.

LEPIDOPTERA AT ESHER IN 1902.—The season of 1902 has been very cold and wet, and the appearances of lepidoptera peculiar; all old diary dates and records have been upset, yet the year, as a whole, has not been a bad one. The following are among my more interesting captures:—May 31st, a pair of *Notodonta trepida*, the ♀ laid a few ova which began to hatch on June 12th, and the larvæ to pupate on July 19th; larvæ of *Thecla w-album* and *Agrotis agathina* also captured. June 15th, *Nola cristulalis*. June 22nd, *Callophrys rubi* on the wing. July 12th, *Lithosia complana*. July 20th, larvæ of *Hemaris tityus*. July 26th, *Sarrothripa verayana*, the third specimen I have captured here. August 11th, *Agrotis agathina* began to emerge. August 26th, *Sphinx convolvuli* captured in the garden, the fifth specimen I have taken in this locality; one each in October, 1899, September 22nd, 25th, October 5th, 1901, and the one just recorded. August 28th, a larva of *Jocheucra alni* on the path to Westend; there was not much life in it, so I preserved and mounted it.—HARRY FLEET, 7, Park Road, Esher, Surrey. September 21st, 1902.

LOPHOPTERYX CARMELITA IN SUTHERLAND.—It may be of interest to record that I took the larva of *L. carmelita* in Sutherland last month, and that *Noctua dahlia* appeared at sugar. All Scotch insects appeared to be extraordinarily late this year.—NEVILLE CHAMBERLAIN, F.E.S., Highbury, Moor Green, Birmingham. September 21st, 1902.

LEPIDOPTERA AT FOLKESTONE AND DOVER.—August, 1902, proved

one of the worst months I have experienced for years, from a collecting point of view, lepidoptera generally being very backward. The weather was very bad, not a week's sunshine altogether during the whole month. August 9th (Coronation day) was about the best day, but then we did have the sun the whole day (although more fortunate than London where it remained dull the greater part of the day). After this the sun was a rare visitor and the weather was very heavy and oppressive. *Polyommatus corydon* was later in appearance and not half so abundant as in 1901. Some good aberrations were taken, however, including several males with spotless undersides and many approaching spotless, twelve very dwarf males, two no larger than *Cupido minima*, and four males, very large, measuring $1\frac{5}{8}$ " the largest I have ever taken. Another male has the blue more approaching that of *P. bellargus* in tint. Many females were taken with aberrant undersides, one exceptionally dark, one very light, quite as light as those of a normal male, four females much shot with blue, and four dwarfs. *P. bellargus* (second brood) was not seen up to the end of August, and *P. astrarche*, *P. icarus*, and *Cupido minima* did not appear till well into the third week. A spot where *Pamphila comma* usually swarms had not produced a specimen up to the end of August, but three nice aberrations of *Epinephle ianira* were taken, one male with two very large white patches on right hand side, one male with lower wings much bleached, one female with lower wing on left side almost white. Females of *Argynnis aglaia* were all fresh, one taken flying had the left side of the lower wing not developed. *Chrysophanus phlacas* were showing at the end of August, and *Melanargia galathea* remained fresh during August, three females taken at the end of the month were drying their wings. One *Colias edusa* was seen on August 9th at Dover, and two *C. hyale* at Dover, on August 20th and 23rd, I also heard of two taken at Folkestone. *Aglais urticae* and *Pyrameis atalanta* were not seen at all, yet *Pyrameis cardui* was fairly common in all stages, and small larvæ were taken quite at the end of August. *Plusia gamma* put in an appearance during the second week, they came very suddenly, and during the week they were in hundreds everywhere, after the second week they gradually diminished to an occasional two or three. I noticed quite a similar magical appearance in 1900. Larvæ of *Theretra porcellus* were fairly common, but extremely late, very small till about the third week, none that were taken had donned their brown coats before then. A few larvæ of *Sesia stellatarum* were taken, and *Sphinx ligustri* larvæ were common. Night work was an utter failure.—C. P. PICKETT, F.E.S. September 20th, 1902.

LEPIDOPTERA IN THE READING AND FOLKESTONE DISTRICTS. — On August 4th last I beat out on a chalk-hill at Streatley, near Reading, a specimen of *Mesotype virgata* (*lineolata*), a species which I do not think has been taken in this district before. I may say I took the specimen to Folkestone and showed it to Dr. Guard Knaggs, who says that it is a very nice aberration, and that was of course the reason that I was not at first quite sure that it was *M. virgata*, as it is very different from the specimens I have from Deal. Mr. Hills, of Folkestone, also says it is *M. virgata*. I also took my first specimen of *Coremia quadrifasciata* here on July 16th last. I spent a fortnight at Folkestone this month (September 1st to 15th) and saw about half a dozen *Colias edusa*, and captured one ab. *helice*, and four ♀ *Colias hyale*. *Hipparchia semele*

♀s were fairly common, some in fine condition, the ♂s mostly worn, but I took one ♂ very fine, and the darkest I have ever seen, whilst one very pale ♀ had the ocellated spots on the underside of a brown coloration. *Polyommatus bellargus* were not in anything like the numbers they were last year, but the ♀s were mostly dusted with blue, more so than last year. *Pyrameis cardui*, however, was fairly common, and *Plusia gamma* everywhere.—W. E. BUTLER, Hayling House, Oxford Road, Reading. *September 19th, 1902.*

MANDUCA ATROPOS IN THE NORTH SEA.—A specimen of *Manduca (Acherontia) atropos* was captured by the mate of the ss. Neiman, on a voyage from Leith to Hamburg; it flew on board when the vessel was about 20 miles east of the May Island.—T. HUDSON BEARE, F.E.S., 10, Regent Terrace, Edinburgh. *September 22nd, 1902.*

NOTE ON HEPIALUS LUPULINUS.—On June 9th last, whilst searching at midday in a partially shaded spot in Hazeleigh Wood, for larvæ of *Argynnis adippe*, I was surprised to see a specimen of *H. lupulinus* buzzing about in the gleams of sunshine, keeping close to the ground. Subsequently I noticed three or four others behaving in exactly the same way. So far as I could make out they were not attracted by a female, but were flying naturally. I have never before seen this species on the move in the daytime, although, of course, it flies at very early dusk.—(REV.) G. H. RAYNOR, M.A., Hazeleigh Rectory, Maldon, Essex.

LASIOCAMPA QUERCUS AT ABAXIA.—The observations on *Lasiocampa quercus* in *British Lepidoptera*, vol. iii., remind me that at Abaxia, near Fiume, on the Adriatic, last year (1901), I saw the males in numbers, dashing about in the early afternoon, somewhere about the third week in August.—F. MERRIFIELD, F.E.S., 24, Vernon Terrace, Brighton. *September 14th, 1902.*

MELANARGIA GALATHEA AT PAINSWICK.—In the third week of August last I spent a few days at Painswick, Gloucestershire, and found *Melanargia galathea* the commonest butterfly there; it was all over the hills, south and east of the town, not in grassy meadows where I have usually found it.—IBID.

PARTIAL SECOND BROOD OF NOTODONTA DROMEDARIUS AND LARENTIA PECTINITARIA.—From ova laid by a female *Notodontia dromedarius* taken at Tilgate Forest on June 28th, one of the larvæ which pupated produced a fine female insect on August 4th. *Larentia pectinitaria* ova from Tilgate in June, produced two imagines in September, a male on the 18th, and a female on the 19th. They were both undersized though from good larvæ.—J. C. DOLLMAN, Hove House, Newton Grove, Bedford Park. *September 25th, 1902.*

AGRIUS CONVULVULI AT WICK.—It may be worth while mentioning that during a few weeks' collecting in and around Wick and neighbouring villages, I came across a female specimen of *Agrilus convulvuli* on September 3rd, 1902, lying on a path near Wick. It was badly damaged by being trodden upon, but, judging by the condition of the fringes on its wings, it had not flown much. Is not this rather far north for this insect in September? —DAVID ROSIE, 163, Hampstead Road, Benwell, Newcastle-on-Tyne. *September 24th, 1902.*

COLIAS EDUSA AT DORKING.—As this does not appear to be an "edusa" year, it is perhaps proper to report that I took a female specimen in good condition to-day at Dorking.—T. A. CHAPMAN, Betula, Reigate. *September 27th, 1902.*

REVIEWS AND NOTICES OF BOOKS.

THE NATURAL HISTORY OF THE BRITISH LEPIDOPTERA, A TEXT-BOOK FOR STUDENTS AND COLLECTORS, VOL. III., BY J. W. TUTT, F.E.S. [588 + xii pages, Price £1 net. Published by Swan Sonnenschein and Co., Paternoster Square, E.C.]—Two years after the publication of the second volume, the third volume of *British Lepidoptera* has been completed. It differs from its predecessors inasmuch as it is not divided into two parts, but deals throughout with the species continued from vol. ii. The first species dealt with is *Pachygastris trifolii*, the last *Hemaris tityus (bombylififormis)*. One has little doubt that of all the species dealt with, *Lasiocampa quercus* will come in for the most notice. The history of this species occupies no less than 70 pages, much of it is in small type, and the whole composed of summarised detail dealing with facts, and without a word that could possibly be spared. Little that has ever been published on this interesting species can have escaped the search-net, and the full details of the variation will not only prove of the highest interest to all students and collectors of lepidoptera, but the critical onslaughts made on the misuse of the varietal names on the continent will necessitate a thorough study by continental lepidopterists. Short notes on *Lasiocampa* var. *callunae*, often repeated *ad nauseam* with no fresh facts or details and stating simply what has been published so often before, by recruits who are for ever finding out something quite new because of their ignorance of previously published matter or their inability to find it, must of necessity be fewer in number or more scientific in character now that the details (pp. 73-85) so industriously collected by the author can be so readily studied, for these pages do not represent the author's opinion of the subject, but the opinions and facts of all lepidopterists who have handled the subspecies since 1849, when Palmer first described it. To many the account of *Dimorpha versicolora* will be especially welcome, consisting as it does of 35 pages (pp. 229-264) of solid matter relating to this interesting species, and embodied in which one finds descriptions of no less than ten striking gynandromorphs; a complete life-history based on the observations of Chapman, Bacot, Holland, Clarke, Gascoyne, Merrifield, Buckler, Bernard-Smith, Poulton, Jenvey, Bankes, Tugwell, &c., whilst more than a hundred other lepidopterists are quoted for details relating to localities, dates of appearance, habits, &c. As a matter of comparison, however, it may be noted that *Gastropacha ilicifolia* has been worked out in such detail as to require from pp. 186-199 to describe it and its habits in their various aspects, and practically every detail of our knowledge of the species in Britain is here embodied, as well as a complete life-history never before published. The less than a dozen lines of Newman on *Hemaris tityus*, with at least two glaring errors, become here some twelve solid pages of detailed facts, checked with the authorities and vouched for by their names. These two species are those that occupy the least space; the other species are worked out in the same careful manner, but with more facts and details. To the biologist the extensive details relating to the hybridity, gynandromorphism and life-histories of the species treated, will prove a mine of information. The account of *Smerinthus* hybr. *hybridus* (pp. 448-459) is of the greatest value as a summary of all the work published on this best-known hybrid form; but the details on pp. 391-395 will prove no doubt of still more interest. The description and account of *Mimas* hybr. *leoniae*, a cross between ♂ *tiliae* and ♀ *ocellata*; of *Calasymbolus*

hybr. *interfaunus*, a cross between a ♂ of the American *astylus* and a ♀ of the European *ocellata*; of *Smerinthus* hybr. *oberthüri*, of *S.* hybr. *fringsi*, *Amorpha* hybr. *metis*, and *A.* hybr. *inversa*, are full of interest, whilst on pp. 291-294 are the details of numerous Attacid crossings, and on pp. 296-304 a full summary of the crossings of the allied European Saturnians; there is no need to state that full accounts of the crossing experiments of *Lasiocampa quercus* and its various races are also given. The details relating to gynandromorphs are most interesting. Scarcely a species that is here treated but has given some examples, and when one notes no fewer than 32 gynandromorphs of *Lasiocampa quercus* described, 60 of *Saturnia paronia* and 85 of *Amorpha populi*, besides smaller numbers of the other species, the biologist will recognise that he has here an abundance of material on which to work. The British collector will turn with the greatest satisfaction to Chapman's comparison of the life-histories of *Amorpha populi*, *Mimas tiliæ* and *Smerinthus ocellata*, and the author's grouping of the Amorphids should at least flatter the vanity of the City of London Entomological Society, which one knows he loves so well. The names of Messrs. Sich, Burrows, Kaye, Dadd, Bell, Nicholson, and Clark are all laid under contribution for new genera, and no doubt other members names are only missing because they have been previously utilised.

To the systematist there are four chapters that will require time, thought and digestion. Firstly, the account of the family *Eutrichidae* (pp. 111-123). Secondly, the study of the position of *Dimorpha* (*Eudromis*) (pp. 229-236). Thirdly, the classification of the Attacides, a detailed account of all the work done in this direction (pp. 265-290); and lastly, the exhaustive chapter on the literature, synonymy and classification of the Sphingides (pp. 342-382). Much internal evidence shows that the author hopes to attract criticism on this part of his work, and his preface tends also to point in the same direction. As to this, the final conclusion of the author on the actual types of the genera he uses may be worth quoting. These read (p. 355):—

1. *SEPIX*, Linné (1755).—Type fixed as *ligustri*, by Linné, in 1755.
2. *SESLIA*, Fab. (1775).—Type fixed as *stellatarum*, by Cuvier, in 1797.
3. *MACROGLOSSUM*, Scop. (1777).—Type fixed as *stellatarum*, by Scopoli, in 1777 (Falls before *Sesia*, Fab.).
4. *SMERINTHUS*, Latr. (1802).—Type fixed as *ocellata*, by Latreille, in 1810.
5. *EUMORPHA*, Hb. (1806).—Type fixed as *elpenor*, by Hübner, in 1806.
6. *MANDUCA*, Hb. (1806).—Type fixed as *atropis*, by Hübner, in 1806.
7. *AMORPHA*, Hb. (1806).—Type fixed as *populi*, by Hübner, in 1806.
8. *DELEPHILA*, Hb. (1809).—Type fixed as *elpenor*, by Curtis, in 1824 (Falls before *Eumorpha*, Hb.).
9. *ELPENOR*, Oken (1815).—Type fixed as *elpenor*, by Tutt, in 1902 (Falls before *Eumorpha*, Hb.).
10. *CELERIO*, Oken (1815).—Type fixed as *gallii*, by Tutt, in 1902. (*Gallii* and *euphorbiæ* are the only species included in Oken's genus.)
11. *HEMARIUS*, Daln. (1816).—Type fixed as *fuçiformis*, by Dalman, in 1816.
12. *DAPHNIS*, Hb. (circ. 1822).—Type fixed as *nerii*, by Curtis, in 1837.
13. *HIPPOTION*, Hb. (circ. 1822).—Type fixed as *celerio* (= *ocys*), by Hübner, circ. 1822.
14. *PIRYNUS*, Hb. (circ. 1822).—Type fixed as *livornica*, by Stephens, in 1850.
15. *HYLES*, Hb. (circ. 1822).—Type fixed as *euphorbiæ*, by Tutt, in 1902.
16. *THERETRA*, Hb. (circ. 1822).—Type fixed as *porcellus*, by Stephens, in 1850.
17. *HYLOICUS*, Hb. (circ. 1822).—Type fixed as *pinastri*, by Stephens, in 1850.
18. *AGRIUS*, Hb. (circ. 1822).—Type fixed as *cingulata*, by Hübner, ante 1826.
19. *MIMAS*, Hb. (circ. 1822).—Type fixed as *tiliæ*, by Hübner, circ. 1822.
20. *CHEROCAMPA*, Dup. (1835).—Type fixed as *porcellus*, by Duponchel, in 1843 (Falls before *Theretra*, Hb.).

It is of no use after this for the British collector to cavil at the change of names; here he has the whole literature of the subject at disposal so that he can form his own opinions, and the author himself provides the material on which such may challenge him if they disagree with his conclusions. "The Catalogue of the Palaearctic Lachneides" (pp. 225-229), and the "Catalogue of the Palaearctic Dimorphides, Bombycides, Brahmaeides, and Attacides," will prove of the utmost use to workers both in the Palaearctic and Nearctic regions, although probably for matters of space the species of the latter district have been excluded. The author asks for a full measure of support from all lepidopterists. He especially appeals to American lepidopterists to support the work, claiming that the volumes have a wider basis than their title would suggest, and pointing out that the basis of work is general, and, therefore, of as much importance to American as to European lepidopterists.—H.E.P.

CURRENT NOTES.

At the British Association Belfast meeting several papers were read before section D (Zoology), dealing with entomological subjects, Professor Poulton was responsible for three communications, with exhibition of specimens, *viz.*, "Notes on the habits of the predaceous flies of the family Asilidae," "Illustrations of British insects in their natural attitudes," and "Three-colour slides of mimicry, protective resemblance, seasonal forms of butterflies, etc." This last paper was intended to lead the way to a discussion on the interpretation of such phenomena by the theory of natural selection. Mr. Nelson Annandale contributed a paper with lantern illustrations on "Flower-like insects from the Malay peninsula," and Mr. H. C. Robinson another on "Protective resemblance in the Malay peninsula." The Saturday night lecture to working-men was given by Professor Miall, who selected for his subject "Gnats and mosquitoes." The life-history of these insects was described in detail, and by means of some beautiful experiments the lecturer showed how the larvæ of the gnat were able, by making use of the film on the surface of water, to keep themselves suspended at the surface, despite the fact that the specific gravity of their bodies is greater than that of water; the last portion of the lecture was devoted to an account of the work of Major Ross, on the connection between malarial fever and mosquitoes, one of the most interesting and important pieces of biological research work which has been carried out for some years. In moving a vote of thanks to the lecturer, Professor McKendrick said that the lesson he drew from the lecture was that no object in the animal or vegetable kingdom was so little or so humble that it did not repay careful study, and the observations made by naturalists of the habits of some of the lower forms of life might by and by have very important practical effects regarding the human race; words of wisdom to be borne in mind by every entomologist.

Mr. Gillmer appears (*Zeits. für Entom.*, vii., p. 375) to have been just in time to make a synonym of his *Amorpha populi* ab. *substylata*, which falls before *A. populi* ab. *pallida* (*Brit. Lepidoptera*, iii., p. 469).

The late season will make notes of collecting from various parts of

the British Islands, with dates of actual captures, particularly interesting for comparison with those of 1888, the most backward season of which we have any record. We should be glad of any such notes from any part of the United Kingdom.

The third volume of *British Lepidoptera* has been issued during the last month, and all subscribers should have received a copy. If any subscriber has not yet had his copy he should apply direct to the Editor. Those who have received copies and not yet acknowledged the safe receipt thereof are kindly requested to do so.

We should be glad to know of any lepidopterist who can send any facts based on personal observation of the egg-laying, larval habits, dates of capture, and localities (with counties), of *Theretra porcellus*, *Eumorpha ctenor*, *Phryxus lironica*, *Hippotion celerio*, and *Daphnis nerii*. We make an especial appeal to those lepidopterists who have met the three last-named species abroad for information, and if they are in a position to supply material, eggs, larvæ (in spirit or otherwise) and pupa-shells, would be very acceptable.

The Hon. N. C. Rothschild describes (*Ent. Mo. Mag.*), with plate, a new British flea, *Ceratophyllus garci*, a species closely allied to *C. gallinae*, Schrk., taken from a nest of *Gallinula chloropus* in July last near Tring.

Mr. Wainwright adds (*Entom.*) a new Tachinid to the British list, viz., *Meriania argentifera*, Meig. The specimen was taken by Mr. W. Lucas in the New Forest on April 30th last.

Mr. Johnson records the capture on June 18th last, on the Welsh coast, a specimen of *Anthroceva purpuralis* without any trace of crimson, both upper and lower wings being entirely bronzy-black. The melanic form of this species was described in *British Lepidoptera*, vol. i., p. 437.

Mr. Walter E. Hardy, 52, Bedford Street, Moss Side, Manchester, wishes to hear from entomologists willing to help in the formation of a local entomological society at Manchester.

Mr. G. B. Browne reports (*Entom.*, p. 269) *Agrotis obelisca* as being by far the most abundant species on the Deal sandhills at sugar for the fortnight commencing August 10th. He also records *Lithosia molybdeola* at Dymchurch, near Hythe. We beg to suggest the first of these records, and possibly the second, to be self-evident errors. A mere list of captures from a well-known locality is useless unless accurate. If accurate, all lists are useful as supplying data for distribution and times of appearance.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

OVUM OF CRAMBUS ADIPELLUS.—The egg of *Crambus adipellus* (*syllvillus*) is of a very pale yellow tint, the surface shiny and slightly iridescent; much more quadrilateral than oval in outline, the ends being somewhat square, one end (? the micropylar) being, however, rather more rounded than its nadir. The eggs are laid loosely in a box, they are plump, with no hollow due to sinking, and there are seven very distinct longitudinal ribs observable when the egg is lying naturally on one of its broad sides, the transverse striations being hardly noticeable under the power at disposal. The egg is exceedingly small, the length : breadth : height as about 5 : 4 : 3. Eggs laid August 9th, by a ♀ taken on Mont Joly at about 4000ft. elevation. Described August 12th, 1902.—J. W. TUTT.

Notes from Bozen in the South Tirol, in 1901-1902.

By F. E. LOWE, M.A., F.E.S.

In 1901 I spent a few days, June 20th-25th, in Bozen, South Tirol, and found it, as I expected, one of the richest hunting-grounds for Diurni that I have yet visited. As you have not so many reports from Tirolese as from Swiss tourists, you may consider it worth while to publish these jottings. They were not sent to you before because I intended to go again this year, and hoped to make my list much more complete, but when I arrived in Bozen this year, July 14th, all the insects were over or worn. There had been a prolonged drought of six weeks. Everything in the Eggenenthal was burnt up, even the hardiest wayside weeds were dry bones. In Piedmont, where I had been wandering for six weeks, the season was so late that I took practically nothing. My hope, doomed to disappointment, had been that the more sheltered and warmer Tirol would be only in the full swing of its butterfly season, but, as has been said, Bozen seemed to have experienced none of the drawbacks of a late and cold spring, whereas on the Brenner, where we went on July 17th to stay ten days, summer had not commenced, and such insects as appeared were fully a month late. Bozen itself is a charming old-world place, with good shops under quaint arcades, pleasant people, and very many hotels. On our first visit we stayed at the "Kaiser Krone," which evidently is content to live on an ancient reputation, but not to live up to it. This year we put up at the "Victoria," a most excellent house, conveniently near the station. I worked only two of the valleys which have their lower entrances at Bozen, or near, *viz.*, the Sarnthal and the Eggenenthal. Of these the latter, which is the way up to the famous Karersee, is perhaps the more productive, but both are delightful. What I found must be set down to June of last year, when this year, 1902, is intended, special mention will be made of the date. On a blazing hot day, June 20th, I started for the Sarnthal, but just before the entrance I turned aside to the left, and crossed the bridge over the Talfer, tempted by an attractive-looking little gorge, where I spent the morning. There I took a solitary *Argynnis daphne*, some male *Chrysophanus* var. *gordius*, several *Linnetis camilla*, one *Dryas paphia* male, and was delighted to find abundant the little delicate Syntomid, *Nacria punctata*, which I had not met before. I regret now that I only brought home three specimens. I once took an odd specimen of *Nacria ancilla* at Sierre, otherwise I have had no acquaintance with *Nacria*. On the road near the little inn, just at the end of the bridge, *Eugonia polychloros* was abundant, in finest condition. Males of *Lasiocampa quercus* were to be seen dashing about in all directions. The next day I started again for the Sarnthal in earnest, driving to the foot of the ascent of the picturesque old Runkelstein. Here, on the flowers of bramble, *Argynnis daphne* was in profusion, just freshly emerged. I see no reason, as Kane, to compare its flight with that of a *Melitaea*. It appears to behave and to fly very much as *A. adippe*, only that it is not so strong an insect. *Brenthis ivo*, on the other hand, which was very common in damp meadows near the Gasthof Brenner-Post this year, reminds one of *M. cinxia* in its lazy flight from flower to flower. I have also taken a few *A. daphne* at Martigny, and, in each case, flying overhead and fast. While netting

A. daphne I disturbed a fine *Arctia purpurata*, which I failed to secure owing to the too pressing attentions of a couple of young Tirolese, who were greatly interested in my operations. Higher up the valley I saw and missed *Lincentis populi*, sunning himself on a heap of road sweepings. This took me again next day to the same place—but I saw no more *L. populi* in the Sarntal, but I caught two *Lycaena amandus*, and also several later in the Eggenthal. Any who have only seen this species as taken at Martigny, as had I, can have only a faint idea of the rich colour and breadth of the dark suffusion of the Bozen specimens. On my return to the hotel I found that my wife, who had been to the Eggenthal, had caught a single *Neptis lucilla*, where she had also seen several *L. populi*. Next morning I was off by the train to Kardaun, which puts you down at the mouth of the Eggenthal. Some two miles up I took my first *N. lucilla*, afterwards I bagged four or five more, they were all a little less than fresh, but I think its time of emergence must extend over a considerable period, as with *L. camilla*, though I believe it has not two broods, at least in these parts, as has the latter, for, on July 15th of this year, I found it still flying, and a few individuals were in fair condition, though nearly everything was over, and in this valley they had had uninterrupted heat for six weeks preceding my arrival. I also secured (1901) some half dozen *L. populi* in tip-top order. These are very beautiful specimens strongly tinged with blue, approaching the colour of *L. camilla*. It was only now that I woke to the fact that the specimens I had previously taken, and several more that I had seen and missed on different occasions at Aigle, are the var. *tremulae*. Is this the only form at Aigle, or is it merely a chance in my case? I should be glad to hear from anyone who has taken the type at Aigle. *Libythea celtis* was common in both valleys, but literally swarmed in the Eggenthal. It is an exciting little beggar until you have had enough of it, and it may be noticed that on July 14th, 1902, a few quite decent examples were taken. Of the "Hairstreaks" *Thecla spini* ab. *lynceus* was not rare, and also *T. ilicis*, with var. *cerri*, was not uncommon. Of the "Blues," *Lycaena amandus* might be picked up at infrequent intervals, all males, but so fresh that I suspect that it was not yet fully out, and the females had not yet begun to appear. One brood of *Polyommatus orion* was nearly over, and one specimen may have been the herald of the coming second brood. In 1902 I took one example on July 14th. *Lycaena orion* was fairly common higher up the valley, but not nearly so broadly suffused with black as the examples of the Italian side of the Simplon, which almost suggest a giant *Cyaniris argiolus*, both in tone of blue and in the expanse of the black border. As often, the "Blue" most *en evidence* was *Nomiades semiargus*, but others, except high mountain species, were well represented as the subjoined list shows. The only *Melitaea* I saw was *M. athalia*, the ordinary rather coarsely marked form of north Italy. For some reason or other *M. parthenie* seldom or never comes my way, or else I am slow to recognise it as anything more than one of the many forms of *M. athalia*. I am tempted to say that I do not believe in *M. parthenie* (only I fear the storm I should raise) except as var. *varia*, which might, perhaps, as well be called a mountain form of *M. athalia*. *Melanargia galathea* was more or less of the var. *provida*, generally more; *Satyrus semele* was fine, but not of the var. *aristaeus* form, while *S. hermione* and *S.*

actaea var. *cordula* were common, and, it seemed, very early; *Coenonympha arcania* was a typical form with well-developed band to under-side of hindwings, and the eye-spots strong, and presenting little variation; *Coenonympha pamphilus* gave no interesting divergence from the type, and var. *lyllus* was not seen. No Erebiids were observed but I did not at any time climb more than 2000ft.

Here is a list of all the butterflies (of which I have a note) as actually seen or taken on the five days on which I was on the trail. *Papilio podalirius*, *P. machaon*, *Parnassius apollo*, *Aporia crataegi*, *Pieris brassicae*, *P. rapae*, *P. napi*, *Euchloë cardamines*, *Leptidia sinapis*, *Colias hyale*, *C. edusa*, *Gonepteryx rhamni*, *Thecla spini* and ab. *lynceus*, *T. ilicis* and var. *cerri*, *Callophrys rubi*, *Chrysophanus aleiphron* var. *gordius*, *Plebeius aegon*, *P. argus*, *Polyommatus orion*, *P. icarus*, *P. amandus*, *P. bellargus*, *P. hylas*, *P. melager*, July 14th, 1902, not fresh; *Cyaniris argiolus*, *Cupido minimus*, *Nomiades semiargus*, *Lycarna arion*, *Libythea celtis*, *Apatura iris*, July 14th, 1902; *Limenitis populi*, common; *L. camilla*, not numerous; *L. sibylla*, scarce; *Neptis lucilla* is evidently fairly abundant; it has rather a feeble hesitating flight compared with *L. sibylla*. The Vanessids were plentiful, viz., *Polygonia e-album*, *Eugonia polychloros*, *Aglais urticae*, *Vanessa io*, *Euranessa antiopa* (hybernated), *Pyrameis atalanta*, *P. cardui*, very fine, but I saw no *Araschnia leana* nor *Polygonia egea*; *Melitaea athalia* in only moderate numbers. The Argynmids were better represented by *Brenthis amathusia*, *Argynnis daphne*, to my knowledge only in the Sarntal; *A. lathonia*, *A. adippe*, *Dryas paphia*, *Melanargia galathea*, *Satyrus hermione*, *S. cordula*, *Pararge maera*, *P. megera*, *Epinephele janira*, *Enodia hyperanthus*, *Coenonympha arcania*, *C. pamphilus*, *Spilothyrsus laraterae*, *Syrichtus carthami*, *S. fritillum*, *S. malvae*, *Nisoniades tages*, *Thymelicus thaumas*, *Pamphila sylvanus*. More I think should have been done even in the time at my disposal, but the heat was intense.

Aphodius fætens, F., and A. fimetarius, L. (with plate).

By J. EDWARDS, F.E.S.

Notwithstanding what has been written to the contrary in this magazine and elsewhere (c.f. Donisthorpe, *Ent. Rev.*, xiii., p. 272, Sep. 1901. Bouskell, "Variation and distribution of the genus *Aphodius*," *Trans. Leicester Literary and Philosophical Soc.*, v., Sep. p. 8) these two species are constantly and readily separable by the characters given below.

Venter of abdomen red; extreme apices of the elytra beyond the striae shining like the remainder of the surface; apex of the α -deagus in the lateral aspect, unarmed *foetens*.

Venter of abdomen black; extreme apices of the elytra beyond the striae distinctly dull as compared with the remainder of the surface; apex of the α -deagus in the lateral aspect produced on each side into a subtriangular tooth *fimetarius*.

Under ordinary circumstances the colour of the venter of the abdomen is decisive. Immature specimens of *A. fimetarius*, however, may at times give trouble; but here one can have recourse to the elytral characters, which are very convenient since they are independent of sex. The latter were first made known by M. des Gozis, and Canon Fowler, in introducing them to the notice of British entomologists (*Ent. Mo. Mag.*, xxii., p. 163; *Col. Brit. Isl.*, iv., p. 20).

appears rather to have missed the point of these characters. The distinction lies in the state of the extreme apices of the elytra, whether those parts are shining or dull, quite outside any question of punctuation; there is no need for the employment of a strong magnifying power. I have added the characters derived from the aedeagus, although these are a little more troublesome to observe, because they are not mere differences of degree, but, on the other hand, such as experience warrants one in accepting as evidence of the present distinctness of two species.

EXPLANATION OF PLATE VII.

EDEAGUS OF APHODIUS.

I. *A. jimetarius*.

II. *A. foctens*.

(a) Dorsal aspect.

(b) Lateral aspect.

British Lepidoptera in 1902.

By (REV.) C. R. N. BURROWS.

Entomologists, in London at least, are asking one another, I find, how they have got on during the season of 1902, and also whether it has not been about the worst year for collecting which even middle-aged enthusiasts remember; so I may, perhaps, be allowed to place on record my experience, which possesses, as its chief claim to notice, the fact that I always keep at it all the year round, which many ardent collectors are not able to do.

First as to "sugar," which is my chief amusement. I find from my diary that I commenced in my garden on May 24th with two *Gionoptera libatrix* and one *Taeniocampa gracilis*. I appear to have taken so little up to June 11th that I have no record from that date until June 16th, when Mr. Mera and I went for a week to Wicken. I am not writing about Mucking alone so I may be allowed to remark that, well as I know the Fen, I have never before realised what it can be during a wet time. We got quite wet through night after night, and took nothing of note until the last night, when we got *Macrogaster arundinis* and *Meliana flamma*. I would that I had influence with the editor, sufficient to persuade him to print in the largest type—*Never visit Wicken without waders*. This advice was given to me before I started, but I took no notice. Yes, we got wet! and neither in Soham nor Ely could we purchase anything better than hob-nailed boots, which kept us pretty dry, but hurt "awful." Sport was so poor on my return that I find no record of note until July 10th, when I had a really good night, but on the 14th I find the sad record "sugar useless." Here and there only have I a record of a good night, until the beginning of September, when insects began to arrive in more normal quantity. I find we are inclined to speak of insects generally as being more or less late this year. I have made a few extracts to show that they are not so much behind time as one is tempted to think. I take them "baphazard" from different parts of the year:—*Heliothobus popularis*, first taken in 1902 on September 1st, in 1901 on August 25th. *Agrotis tritici*, in 1902 on August 5th, in 1901 on July 16th. *Apamea didyma (oculea)*, in 1902 on July 17th, in 1901 on June 29th. *Hadena genistae*, in 1902 on June 4th, in 1901 on May 25th. *Acidalia trigeminata*, in 1902 on June 30th, in 1901 on May 30th. *Miana bicoloria*, in 1902 on July 5th, in 1901 on June 20th. *Neuronia reticulata*, in

1902 on June 25th, in 1901 on June 18th. *Mellinia gilvago*, in 1902 on September 15th, in 1901 on September 11th. *Anchoecis pistacina*, in 1902 on October 1st, in 1901 on September 11th. *Orthosia lota*, in 1902 on October 6th, in 1901 on September 23rd. *Tiliacea aurago*, in 1902 on October 10th, in 1901 on September 23rd. *Scopelosoma satellitia*, in 1902 on September 29th, in 1901 on September 16th.

These dates are sufficient to show that I have found the season a week or ten days later than last year.

Another remarkable feature of the season which I have noticed at Mucking is the marked rarity of common species. *Acypha putris*, *Nyctophasia varca*, *Tiliacea citrigo*, *Noctua angur*, *Hadena pisi*, *Eupleria lucipara*, with others I have not seen this summer. *Agrotis segetum*, *A. exclamatoris*, *Hadena olivacea*, *Bryophila perla*, *Mamestra persicariae*, *Noctua triangulum*, *Calyptia trapezina*, *Cuspidia megacephala*, *Hydrocchia nictitans*, *H. paludis*, *Helotropha leucostigma*, *Miana literosa*, and *Naxia typica*, have been exceedingly scarce; and of better insects I have not seen a single specimen of *Manduca atropos* (in any stage), *Noctua stigmatica*, *Apamea ophiogramma*, *Cirrhoedia serampelina*, and only one of *Triphaena interjecta*, two *Leucania obsoleta*, two *T. jimbria*. On the other hand, some species have been more than usually common—*Leucania straminea*, *Nudaria senec.*, *Rirula sericealis*, *Gonophora derasa*, *Phaetra rumicis* (second brood, certainly), *Neuronion reticulata*, *Agrotis obscura*, and *Calamia phragmitidis*. I have seen very little of *Porthesia chrysorrhoea*, but have noticed with extreme interest that the insect which in my early collecting days seemed to be always associated with this species, *viz.*, *Eremobia ochroleuca*, is also returning to its old haunts, after having been absent, or rare, for so many years.

I have not yet found time to extract from my diary records of late appearances, but one or two have struck me as curious. A male *Mala-cosoma neustria* came to light on September 3rd, a *Nyctophasia monoglypha* to sugar on October 13th, two *Cosmia diffinis* on September 29th, *Leucania pallens* on October 14th, *Triphaena comes (orbona)* on October 10th, *T. pronuba* on October 14th, and *Hadena olivacea* on September 23rd. I cannot find later dates than these in my diary, except a *T. orbona* on October 21st, 1898.

Amongst other things I saw a lovely *Callimorpha lera* in my garden on August 23rd. This record may cause confusion, or excite doubts; so it is as well to confess that I put out a number of young larvae last autumn, and that at least two survived the winter at large, one, a full-fed larva, I "blew" in June, the other, a female, I allowed to fly about undisturbed. If, therefore, in time to come, this species be noticed in these parts, I hope I shall have the honour of being known as the planter.

After working a district carefully four seasons one scarcely expects to turn up many fresh species, but still one does, and Mucking has come out fairly well this year, for I have added to the list the following insects:—*Cymatophora octogesima*, *Gortyna ochracea*, *Eremobia ochroleuca*, *Plusia moneta*, *Pericallia syringaria*, *Selenia lunaria*, *Eunomus alniaria*, *Amphidasys betularia*, *Phorodesma pustulata*, *Asthena luteata*, *Emmelesia unifasciata*, *Eubolia plumbaria*, *Scopula lutealis*, *Ebulca crocealis*, *Eidematophorus lithodactylus*, and *Acipitilia galactodactylus*.

Epanda luteata is now becoming increasingly scarce since its "climax," in 1900. I use the word climax intentionally, because I

feel certain that there is some sort of culmination in the occurrence of almost all, if not all, forms of life. Consider our lepidoptera! What collector does not know how curiously the abundance or scarcity of different species varies in different seasons. Certainly, if the hunting-ground be the same from year to year, as mine is, this peculiarity forces itself upon one's attention. I recall, amongst many others, a *Dicycla oo* year (1887), an *Agrotis obscura* year (1894), a *Maestra abjecta* year (1900), and I have heard of *Noctua depuncta*, *N. sobrina*, and even *Plusia bractea* years. I do not seek to explain the fact, though I accept it as fully as that there may be years of *Colias edusa*, *C. hyale*, *Eurannessa antiopa*, *Agrius convolvuli*, and *Plusia gamma*. There may be more than we understand in the complications brought about by the variations of the climatic conditions of succeeding seasons, or there may be something related to overcrowding, or over-competition, or over-production. I do not know what it is, but there is a rise and fall of species, as of nations, and the culmination of a species I call its "climax." The climax of *Epuoda luteolata* is passed. I arrived upon the scene before the species reached its height. I tell no man the full numbers of specimens I have taken, suffice it that I took in 1899 nearly twice the number of the previous year, and in 1900 double the number again. Thence the numbers decrease. Last year I halved the product, and, again, this year, assiduous collecting has failed to produce more than, roughly speaking, a half again; and, with the falling off of the actual number of specimens, comes also a falling off in the number of aberrations, for which of course I chiefly look. In 1899 14% were grey, in 1900 11%, and in 1901 3%. I cannot report the result of this year's collecting until the insects are off the boards, for, although I keep an accurate record of each night's captures, I often discover later on that the specimens recorded first as aberrations are only worn, or normal, on closer examination. I have certainly, however, taken one or two very nice forms, but not a second specimen of Stephens' ab. *consimilis*, the type of which is not in his collection at the British Museum, and I should much like to see it to compare with mine. I do not notice any marked backwardness in this species. It appeared here first this year on September 12th. In 1898, it came on September 21st (perhaps I found it late), in 1899 on the 15th, in 1900 on the 11th, and in 1901 on the 5th. It is a remarkable thing to me that I never get a specimen after October 9th, and that the first good steady rain cuts it off entirely. After a night's pouring rain I may get one specimen, but that is the end.

I have mentioned above that *Agrotis obscura*, again this year, has been more than usually common. This I also named as a "climax" species. Since my great take at Rainham, between July 5th and September, 1899, I have each year taken one or two specimens, and it is evident to me that it occurs in these marshes with considerable regularity. This year it did not occur until August 8th, and I have taken eight or nine decent specimens. With *A. obscura* I have noticed comes, also, *Agrotis nigricans*, and, this year, I have had a far larger number of this insect than for a good many years past, and at Mucking it has always been scarce.

Sugar in the late autumn has some difficulties, it must be clapped on well before dusk, for the moths fly early. Tonight, October 14th, I put it on at 5.30 p.m. Directly my 97 patches were finished, I lighted

my lamp, and though far from dark, went round furiously until 6.45 p.m., when the flight was virtually over. I have often tried this time of year going round later on, but I always find the moths sitting about, "chewing the end," and not upon the sugar.

I shall be interested to hear what my brother entomologists have to say about their experience of the year 1902.

Lymington and its insects.

By BERNARD PIFFARD.

The New Forest hardly requires advertising, its character is fully established, but I think it is high time that collectors should hear what Lymington has to say for itself, or rather for its insect life. From a picturesque point of view the Lymington district runs the New Forest very close, with its beautiful winding river, edged with tall reeds and aquatic plants, and crossed by so many rustic bridges, besides the massive and ancient stone bridge at Boldre, which adds greatly to its beauty, and affords the entomologist an opportunity of readily crossing from one side to the other as he deems it necessary; both sides are a paradise for their insect inhabitants, but, to make my paper practical, I propose taking my favourite spots in detail, and indicating their capabilities as well as I can, but I must admit I am more accustomed to the use of the pin than the pen.

In early spring, before the herbage is too rank, there is a convenient spot (especially for diptera) near the town between the two level crossings, just outside the railway station, it lies between the riverside and the telegraph posts. It is marshy, but far from impassable, as several deep cuttings run off the surface water; alders and willows luxuriate, and meadow-pinks and marsh-mallows glow in the little sheltered nooks between them, and the soothing hum of the bumble-and hive-bee delights the ear; but avoid easterly winds, then all is silent except the telegraph wires; these may charm the scientific ear, but in no way compensate the naturalist for his favourite melody, but even his time may then be employed usefully in collecting sawfly logs, drilled through and through by the larvæ of *Aroma moschata*.

Milford-on-Sea is a choice spot some four miles off, omnibuses run early from the station, and set you down a short distance from the cliffs, here there is a fine sweep of coast, with jutting cliffs at intervals, sheltering warm flowery bays, and all along their bases are hillocks covered with wild flowers—banks of wild thyme, mounds all aglow with *Anthyllis vulneraria*, seathrift, and dense masses of *Ononis arvensis*, also *Genista tinctoria* and an occasional *Ophrys*, among the tufts of long grass. There is here good beating among scattered bushes and tall *Umbelliferae*. But above everything choose a day when the wind is from the north. When the wind blows over the cliffs the insects rise more freely, but when it blows from the sea, it does blow, and no mistake; as to beating it is hopeless, and the constant splashing of the waves is depressing, and what can be more repugnant to the fly-catching mind than the sight of an unlucky *Crambus culmellus* under closely-reefed sails, and clinging for its very life to a grass stalk, with every now and then some quick and unrecognised insect that has broken away from its anchorage drifting by, and adding to his disappointment; mind—do not go when the wind is in the south. I have here taken on

various occasions the following lepidoptera:—*Scoparia combrac*, *Phycis dilutella*, *Homocerosoma binacella*, *Sericoris littorana*, of a peculiar type, and the true *Cupido (Lycaena)* var. *alsoides*, this may be distinguished from *C. minima* by its sharp and more rapid flight.

For those who prefer a longer walk the opposite side of the river has its advantages. Cross the bridge near the town, turn to the left, and follow the coast facing the Isle of Wight, it is muddy at first (decidedly so), but in course of time it grows shingly, and the edges of the shingle are clothed with dwarf roses, *Silene inflata*, and seathrift, and to the rear of these is marshland, and here *Acidalia emutaria* occurs. But continue your walk about five miles and you arrive at Pit Steep, a coastguard station, and the mass of *Silene inflata* is astonishing. I would recommend it strongly for *Dianthocicæ* to those who do not mind making a night of it. It is a romantic spot, and surrounded by woods that promise to repay the beating-stick, it is said that this place receives the attention of coleopterists every year from Southampton, and from all accounts, the coast that lies beyond the town on the Milford side is a favourite hunting-ground for beetles. It is zigzagged with a seawall with many sandy-edged pools, which should be searched as far as Woodside, and then on to the rifle butts. These seem to be some of the places that have a local reputation, but all are of great rusticity and beauty.

But for the visitor to Lyminster (as the Forest itself is close at hand) an eight o'clock train lands him at a low fare at either Brockenhurst or Beaulieu Road Station, and this station is in one of the tip-top localities of this celebrated forest, for it is only a little over a mile from the farfamed, but too little known, Matley Bog, the headquarters of *Hydrelia unca*. Here among their marshy joys are found *Arctophila mussitans*, *Sericomyia borealis*, and *Echinomyia grossa*. This latter is a most sepulchral insect, and one of the biggest blackest blowflies in existence, a real "buster," they tell me "Bustum" is the Latin for a grave, so I hope next time they name it they will think of this and call it accordingly.

Besides Matley Bog a profitable search may be made in Hurst Wood, somewhat over a mile from Brockenhurst Station. About here three specimens of *Prionus coriaceus* were taken this year. One day, on returning, I saw a squirrel high up in a tree munching a large white fungus, portions of which he let fall. There were several like it growing under the tree, so there could be no mistake. The wonderful instinct insects have for hiding themselves was well illustrated one late summer's day on returning from Ramnor; passing a clump of trees we commenced beating, suddenly a fine *Catorata promissa* broke cover and went away. It took over an open flat moor—there was some excellent running—but as it was passing over the old stump of a tree rotting in the ground it darted downward, the stump being precisely the colour of its upper wings; it disappeared into a small hole in the stump, but it was soon unearthed and captured. Among the good things met with this year in the forest have been *Eucetra pilleriana*, *Sarrothripa rrayana* ab. *ramosana*, *Tortrix picana*, among firs, and *Phycis abictella*.

By the way, I noticed a curious fact in regard to *Mutilla europæa*. Seeing one on a hot and loose sandy bank I placed a pillbox over it, then passed a card under the pillbox to secure it, but before I had done so the *Mutilla* had burrowed and escaped, rather a clever dodge, remind-

ing me of thimble-rig. I have met also with several good plants at various times here—*Pinguicula lusitanaica*, *Cicendia filiforme*, and, some years ago, *Leucobryum minus*, then new to Europe.

I would only add in conclusion that those who want good collecting, combined with a really pleasant country, cannot do better than try their luck in the neighbourhood of Lympington.

Three weeks' holiday among the butterflies of Switzerland.

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

I spent a brief three weeks' holiday, July 5th-30th, this year, in Switzerland, and the time was occupied in hard work, in the entomological sense, and of close and careful observation. I think I may fairly add that they were by no means unattended with success. Among the butterflies I brought away 68 species; I observed, also, in more or less abundance, some 14 others which I had no special desire to take, and there is little doubt that I saw, at different times and places, several other species whose identity I did not recognise. I regard my net total of 82 species, however, for July, as satisfactory and encouraging.

I journeyed *via* Dieppe and Paris, and after a cold night's ride from Paris I commenced observations in the early morning out of the window of the railway carriage. *Melanargia galathea* and *Ecnodia hyperanthus* were among the first species to show up, and then, as the train pulled up for a moment at a luggage siding, a magnificent specimen of *Limenitis populi*, after a few graceful turns over a heap of stones, settled right in front of the carriage window. My net was unready, the train went on, and *L. populi* retained its freedom. The train arrived at Bex about 1 p.m., and here a two hours' stay was necessary before the electric tram was ready to start up the steep incline to Villars, some 4000ft. above the sea level. The journey took another two hours, but the lethargic pace of the car was to some extent compensated by the gorgeous views which met one at every turn, whilst Argynnids, Vanessids, Pierids, and Erebiids began to appear in almost the same profusion as the flowers which lined the banks.

On reaching the hotel, my first capture was *Aporia crataegi*, a specimen of which I knocked down with my hat as I crossed the garden; this species proved to be one of the commonest in the district. Though I could not resist the temptation of boxing a nice specimen of *Scoria dealbata* which flew out of the grass on my way to church, entomology proper began on Monday. I met no other entomologists in the district, but as a matter of fact I do not think my captures would have been seriously diminished if half the lepidopterists of Great Britain had been staying there. Every field was full of flowers, and every flower seemed to have its butterfly. I knew nothing of the place before starting, but it was soon clear that it was an admirable hunting ground.

After the usual unsatisfactory repast of coffee and rolls, I started off with a large balloon net and a knapsack full of pillboxes, a cyanide bottle and zinc box for pinning, intending to give the place a general survey. In an hour and a half I was back at the hotel full up, having gone only about 100 yards from the ground, and after emptying my boxes I was off again, and once more returned with them quite full,

in good time for dejeuner, at 12.30 p.m., and this after rejecting many specimens that I would have made a day's excursion for in England. The weather continued hot and fine, though we had three excessively severe thunderstorms, which one might have supposed would have washed all the butterflies off the face of the earth. With the exception of a *passé* generation of *Nomiades semiargus* that disappeared after the first storm, most of the species remained in excellent condition, and fresh *N. semiargus* appeared again. Day after day passed thus; new species kept putting in an appearance and scarce a day passed without the pleasure of taking for the first time, a species of which one had read, but which was now a living reality, and possessing a more than doubled interest. My captures were made on the heights above Villars, Chamossaire, Perche, Col de la Croix, and the neighbourhood of Diablerets, but mainly near the road between Villars and Gryon, the latter a village of delightful chalets about three miles down the *chemin de fer*, in the direction of Bex. Among the species seen and captured were—*Papilio machaon*, in company with *Pyramis atalanta*, swirling over the dizzy precipice at the top of the Chamossaire mountain, at an elevation of over 7000ft., also near Gryon, and in the pass between the Diablerets and Argentines; in the same pass I took a solitary *Parnassius delius*; *Aporia crataegi*, everywhere, and in excellent condition; I bred one from a pupa found belted upon *Pyrus aria*. I contented myself with observing the common whites. A single specimen of *Anthocharis belia* var. *simplonia* was netted near Gryon, whilst *Euchloë cardamines* appeared on several occasions; *Leptidia sinapis* occurred sparingly, and would probably have been common if worked for; *Colias hyole* was in plenty but they were not all in good condition; I only detected *C. edusa* in the Rhone Valley. A nice series of *C. phicomone* was taken at the foot of the Argentines, and a few specimens of *Gonepteryx rhamni* were noted here and there. *Callophrys rubi* was seen several times in wasted condition, whilst three species of the Chrysophanids were taken near Villars, viz., *Chrysophanus phlacas*, a worn specimen of *C. helle*, and a short but good series of *C. hippothoe*, one, an underside aberration, possessing two large irregular black spots. The Lycænidæ in the same district comprised *Plebeius ægon*, *Polygonatus astrarche*, *P. icarus*, *P. corydon* (very common after July 12th), the lovely sky-blue *P. hylas*, several in perfect condition, the even more beautiful *P. damon*, fresh and in plenty, *Cupido minima*, *Nomiades semiargus* (the commonest of all the blues, and in variable condition), *Lycæna alcon*, one worn example, and a good and varied series of *L. arion*. One worn specimen of *Neurobius lucina* was netted and released. Among the Nymphalidæ I only secured one much torn specimen of *Limenitis populi*, but saw others on several occasions when out of reach. I was successful in finding eight pupæ of *L. camilla*, a butterfly more intense and beautiful than *L. sibylla* in its colouring. They were found hanging on the extremities of the twigs of the species of honeysuckle which grows abundantly among the woody undergrowth adjoining the hotel, and nothing could have so admirably resembled curled-up dead leaves. Four emerged satisfactorily, and one produced an ichneumon fly. *Araschnia levana* I think I detected from the railway carriage, but I cannot be quite sure; *Polygonia c-album* was fairly common, but somewhat *passé*; *Aglais urticæ*, as usual, was everywhere, and *Pyramis atalanta* and *P. cardui* were common, especi-

ally over the tops of mountain ridges. Next came the interesting, but no less confusing, Argynnids—*Melitaea aurinia*, one freshly emerged; *M. cinxia*, several worn; *M. athalia*, and, I think, *M. dictynna*, very common everywhere; *Brenthis euphrosyne*, common, but *passé*; *B. pales*, common at a higher altitude; *B. dia*, fairly common; *B. amathusia*, very common, one in the larval state crawling with great speed in the hot sun on the banks of Lac des Chavannes, and seeking a place to pupate. It fixed itself up for that purpose in a pillbox before I got back to the hotel, pupated there satisfactorily, and the imago emerged at Paris on the homeward journey. I also took two fresh examples of *B. ino* in the fields round Villars. *Argynnis lathonia* I noticed and missed on several occasions, only taking two near Perche. *A. aglaia* was common, and I caught one truly magnificent black aberration with the majority of the silver spots on the under-surface represented in deep bronze set in a dark green belt. It was taken casually as it flew across the road near the hotel, and for a moment I did not know what to make of it. It is in perfect condition, and as I carefully pinned it, I wished much that it were possible to show both sides. I find that one very much like it is figured in Curtis' *British Entomology*, caught at Ipswich, in 1827, but mine is, I think, an even more striking aberration. *A. niobe* was very common, though I have only captured a single example of the silver-spotted type; *A. adippe*, too, was common, and one specimen which I obtained has the under-side very richly banded with brown. Among the Satyrids *Melanargia galathea* was one of the commonest butterflies, and was accompanied by plenty of *Pararge maera*. I am not sure that I saw *P. megera*, but *Hipparchia semele* and *Epinephala ianira* were there, and *Enodia hyperanthus* in the greatest abundance. I am still in doubt as to the identification of some of my Erebiid captures. I certainly took a good series of *Erebia melampus*, *E. manto*, *E. tyndarus*, *E. aethiops*, *E. ligea*, and one specimen of *E. curyale*. The others I cannot identify for certain, nor a Lycaenid taken at Villars, which is nearly black on the upper surface. *Coenonympha iphis* and, I think, *C. satyrion* were taken in small numbers, while the ever-abundant *C. pamphilus* was left to enjoy its freedom. Among the Hesperids, *Pamphila sylvanus*, *Thymelicus thaumas*, and *Nisoniades tages* were present, and one specimen I think must be *Spilothyrus altheae*. Of the Syrighthids again I dare not say what species I have taken.

My two days' hunting at Zermatt afforded other species. *Parnassius apollo*, six or eight good specimens in the Visp Valley, below Zermatt. On the Riffel Alp I observed *Brenthis pales*, again in some abundance, and higher up, in fact at the top of the Gornergrat, I took a good specimen of *Pieris callidice*, and rejected several others that were too much worn. On returning by a short cut to the Fündeln glacier hotel, I took *Erebia tyndarus*, and one specimen of *Colias palarno* flying with *C. phicomone*, and three specimens of *Polyommatus orbitulus* in poor condition. Some very fresh specimens of *Nomiales semiargus* were again noticed flitting over puddles in the road; a lovely fresh specimen of *Melitaea phoebe* occurred on the way down to Zermatt, and two specimens of a neat little fritillary which I have designated *M. parthenic*, and a short series of *Pamphila comma*. As the sun set behind the Matterhorn I found the grass blades and scrubby juniper bushes, on the banks of the Visp, literally covered with *Plebeius argus*, of which, thinking it was

P. acyon, I only took two of the thousands I saw. I captured some coppers, males, on the hill slope between Findeln and Zermatt, and supposed at the time that they were all one species, but on closer inspection they proved to include some eight or nine *Chrysophanus virgaureae*, and the remainder *C. hippothoe* var. *curghia*, whilst among them I had again taken an underside aberration, the spots on the hindwings on one side only being elongated into narrow radial streaks. In conclusion I may add that both Villars and Zermatt are not at all bad places for the lepidopterist, and that my short experience of Switzerland makes me long for another visit.

Migration and Dispersal of Insects: Final Considerations.

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

It would be well if future observers would discriminate, as far as possible, between those movements which are made by insects from one part of their ordinary breeding-grounds to another, and those which make sudden and sweeping changes of location far outside the limits of their breeding-grounds. We are quite conscious of the difficulty of doing this, and see clearly that there is no very distinct line of demarcation between them, because, whereas some great flights covering hundreds or even thousands of miles would still keep those species which have a very wide distribution within the limits of their breeding-grounds, a movement of a few miles would take some local species outside theirs. It would be irrational also to suppose that any strict definition between local and migratory flights, based on the above considerations, can exist, because what may be a so-called migrating flight, if measured by distance, in one species, may become a strictly local one if applied to another. Comparatively short local flights in one species, then, may be just as truly migratory, and undertaken for exactly the same benefit to the species, as are the longer flights of other species.

The evidence that we have collected shows very distinctly one fact, *viz.*, that, however irregular the direction of individual migrations or dispersal movements may be, there is a tendency for them to assume a general northward direction whenever they originate in the subtropical regions north of the equator, and to assume a general southward direction when they originate south of the equator, that is, the tendency is to spread from what may be considered more favourable to less favourable regions so far as the stress of climatic environment is concerned. Scudder insists that some of the butterflies to which we have referred—*Anosia archippus* and *Pyranis cardui*—have return swarms (*Psyche*, viii., p. 192, *Butts*, *New England*, p. 1086), *i.e.*, that certain butterflies come north in spring, and that their progeny return in autumn, and later Moffat (*Report Ent. Soc. Ontario*, 1900, pp. 44 *et seq.*) has written supporting this view. Scudder refers us (*Psyche*, viii., p. 192) to his own and Riley's evidence on this point, but, as we had already reviewed this, our conclusions remain unchanged. The assumption that the swarming of *Anosia archippus* in autumn (which is evidently merely a roosting-habit of the species, the insects selecting a favourable spot and coming up day after day from all quarters to this place at the end of the afternoon, and dispersing in the morning, so long as the weather is favourable, as shown by

almost all records relating to the swarming of the insect) is directly connected with migration, has, in our opinion, no real evidence to substantiate it. Nor is the habit at all confined to this species. Eaton notes (*Ent. Mo. Mag.*, xiv., p. 276) that, in the Bombay Presidency, in the latter part of the "rains" (September-December), in the beginning of the cold weather (*i.e.*, the meteorological conditions being analogous to those under which *Anosia archippus* adopts this habit) *Papilio hector* commonly roosts in flocks. "About sunset they betake themselves to trees—usually the babul (a species of gum-acacia) clinging to the underside of the subpendulous branches towards their extremities, in crowds of many hundreds, and there they rest until the sun is well up." An almost parallel instance is to be found in the imagines of the common European *Satyrus hermonie*, which, in some districts, where trees are available, not only rest on tree-trunks frequently by day, but even when engaged busily feasting on flowers during the hot sunshine, return to the trunks and branches of the trees to roost. Moffat, as we have just noted (*Report Ent. Soc. Ontario*, 1900, pp. 44 *et seq.*), disagrees with our conclusion, *viz.*, that the data at disposal do not warrant our stating that there is a southern migration of *Anosia archippus* in the autumn in North America; he adds, however, no further facts to the discussion, although he states that the data that we have already published relative to this species, tend to prove his point. These show a general proof, he considers, that the migrating swarms slowly move southwards. As these dates refer to different years, involving different conditions, and have no connection with the same swarms, we are unable to follow this argument, and the obvious points which these dates do suggest are entirely missed, *viz.*, that winter commences later in the more southern latitudes than the northern, that, as a consequence the swarming will occur later in the more southern districts, and that cold appears to be the moving factor in causing the swarming previous to destruction in the districts outside the area that can form possible winter-quarters for the species. Much more exact data are wanted before a return journey can be accepted for this species, much as we would like to connect so close an analogy between the migrations of insects and birds. In a later paper (*loc. cit.*, 1901, pp. 78-82), Moffat concedes much of what we urge, and there is no real need in these papers to push the matter further. He notes that the species cannot survive in any of the stages of its existence in its northern breeding-grounds, hence, after each succeeding winter, these regions where it is produced in the greatest abundance have to be replenished in the spring by individuals coming from the south. He has obtained from Thaxter a note supplementing his observation (*Can. Ent.*, xii., p. 38), and already quoted, to the effect that, in Florida, the swarm observed was sketched on January 3rd, 1873, that the imagines did not scatter until February, and that then many were observed *in coitu*, thus showing that in the southern States they do exactly what *Pyraucis cardui* does in northern Africa, *viz.*, live actively in the imaginal state all the winter until the breeding-season arrives, and then lay their eggs as soon as the vegetation is suitable for the purpose. True Moffat still maintains the idea of a "return" of the northern-bred butterflies in autumn, but he offers no further evidence than the facts already recorded. It is a remarkable fact that *P. cardui* has been noted as having somewhat similar habits in North America as in

Europe. In June, 1884, it occurred suddenly and in incredible numbers in Manitoba, and, in early June, 1901, it as suddenly appeared in amazing numbers at Ottawa, Manitoba, and westward to the Pacific, the females laying their eggs immediately on their arrival, as do the immigrants of this species when they visit us. The immigrants in 1901 were supposed to have come from the south and west, Cockle having noticed the species at Kaslo, on Kootenay Lake, B.C., on May 2nd, in thousands, but most of the specimens only stayed a day or two, whilst at the same time in early May countless thousands were observed in California, all flying to the north-east and parallel to the Sierra Madre range (*Ann. Rept. Ent. Soc. Ont.*, 1901, pp. 54-57). One suspects now that attention has been drawn to the matter that our present uncertain knowledge concerning this subject will, in the course of a few years, become more definite and accurate as reliable data made by competent observers accumulate. The different conclusions arrived at by Scudder and ourselves, both having the same facts before us, is all a matter of what we will respectively accept as sufficient evidence, and Scudder seems to be satisfied to the point of conviction with much less evidence and fewer facts than we require. We suspect that no lepidopterist in Europe believes in any autumnal return movement of *Pyramis cardui* following a spring invasion of this species into north temperate Europe, yet Scudder writes (*Butts. New England*, p. 1086) that, in the great migration of *Pyramis cardui*, in 1879, in Europe, a return movement was made out by Fritsch, who, from observations made from early in July to near the end of October, and by noting the direction of flight of every specimen of the species observed, concluded that there was no prevailing direction until August 26th, when and until October 20th, with few exceptions, the prevailing movement was towards the west-south-west and south, or diametrically opposite to the prevailing movements of the swarms in June, and he says: "Here, then, the return movement of butterflies, the apparent absence of which so much perplexed Mr. Belt, was, by careful and minute observations, made clear. It is in no way improbable that it is a regular and permanent feature of all migrations among butterflies. In this instance the collective movement was in the spring, the individual movement in the autumn; in *Anosia archippus* the case is exactly reversed. Why may there not be, in many cases, individual movement at both seasons, which has been overlooked for want of just such careful observations?" We have no objection to Scudder being satisfied with this evidence, we only ask him to allow us to ask for more facts, before we ourselves can possibly be satisfied. It is just probable, of course, that natural selection may, in the course of ages, have induced a return migratory tendency, but it is, in the case of insects, and in our present state of knowledge, very difficult to believe that this has been so. The northward spring movement of *Anosia archippus* is an evident fact, the autumnal swarming,* although at present quite inexplicable as having any connection with migration, is

* As bearing on the swarming rather than the migration of the species, Scudder notes (*Butts. New England*, p. 1085): "The immense numbers of *Aporia crataegi*, which, at Easter 1829, made the thorn-trees on the promenade at Erfurt look as if hung with white blossoms has been related by Keferstein, and the sudden outburst of *Neoplasia menapia* in Washington Territory in 1882, was, according to Hagen, 'wonderful, and only to be compared with an irruption.'"

also a recognised fact : one understands, too, that, as the cold weather advances, those individuals (or swarms) that fly south will, in most cases, have the greatest chance of living a few days longer, but that any number of the species, either singly or in flocks, that have been bred in Canada or the northern States, ever reach subtropical America, there is, as we have before stated, not an atom of sound evidence to show. We suspect that the northern-bred specimens are killed off under exactly parallel climatic conditions to those that kill off our autumnal-bred *Pygmaeus cardui*, the progeny of a spring irruption into the north temperate parts of Europe.

(C) ORTHOPTERA.

TWO COCKROACHES NEW TO BRITAIN.—The following two species have not, as far as I am aware, been noticed in this country before, and though only casual visitors, I think it well advised to publish some description of them, more particularly as one *Stylopyga decorata*, Br., is a species with a wide distribution, and may, like *S. orientalis*, L., and its allies of the genus *Periplaneta*, become acclimatised in Britain.

STYLOPYGA DECORATA, Brunner.—[SYN.: *Periplaneta decorata*, Br., "Nouveau système des Blattaires," 1865, p. 224.]—"Rather smaller than *P. americana*, L. Brownish-black, with yellow markings. Head yellow, with three transverse dark bands. Palpi yellowish, with the distal joint darker. Antennæ dark brown, longer than the body. Pronotum brownish-black, with a yellow streak within its anterior and lateral borders, but following their contour. Posteriorly this streak becomes a series of yellow blotches. The brown central portion of the pronotum is ornamented on each side by an irregular yellow blotch enclosing a black dot. The mesonotum and metanotum and abdominal segments blackish-brown, with clearly margined yellow blotches and dashes and black dots. Elytra lobiform, rounded, dark, with two yellow blotches, the external one being much the larger. Legs long, yellow, with dark markings, and brown spines. Supra-anal plate membranous, yellowish, bilobed. Subgenital lamina rounded, excised at the insertion of the long thin styles. Length of body 25mm. DISTRIBUTION: "Mexico, Venezuela, Buenos Ayres, Zanzibar, Madagascar, Madras" (Brunner). This species might perhaps be confused with immature specimens of *P. australasiae*, but its ground colour is much darker, its markings more varied and more clearly defined, and its lobiform elytra are entirely separated from the mesonotum.

The single male specimen from which the above description is taken reached Worksop alive, March 20th, 1902, running out of a box which contained some live birds from South Africa. It was in company with several *P. americana* and was killed by Mr. J. Houghton, of Worksop, by whom it was given to me, and is now in my collection. Mr. Malcolm Burr kindly identified it for me.

PANCHLORA EXOLETA, Klug.—[SYN.: *P. exoleta*, Klug. Burmeister, 1839, "Handb.," ii., p. 507. Brunner v. Wattenwyl, "Nouv. syst. des Blattaires," p. 272.]—Size about two-thirds that of *P. americana*, L. Colour delicate transparent green. Head green. Eyes rich chestnut-brown, enlarged and nearly contiguous above. Antennæ testaceous. Pronotum green, with a distinct yellow line on each side separating the disc from the lateral margins. These yellow lines are continued anteriorly around the vertex just above the eyes, and posteriorly along the mediastinal nervure of each elytron. Elytra and wings perfectly developed hyaline, with green nervures. Abdomen much compressed, yellowish-white, verging into green laterally. Legs pale greenish, spines tipped with brown. Length of body 18mm., of elytron 21mm. DISTRIBUTION: "Brazil, Jamaica, Venezuela, Veraacruz, Surinam" (Brunner).

The single female here described reached South Leverton alive, June 4th, 1902. It is now in my collection, having been given to me by Rev. A. Thornley, who received it from a fruit-dealer of Coalville, in Leicester-

shire, who found it there amongst some imported bananas. I have to thank Dr. Carl Brunner v. Wattenwyl for its identification.—ELAND SHAW, M.R.C.S., &c., North Leverton, Notts. *September 25th, 1902.* [NOTE.—Since writing the above I notice that Mr. W. L. Distant has already recorded the occurrence of *P. eroleta* in Scotland, *vide, Ent. Mo. Mag.*, October, 1902, p. 247.—E.S. *October, 1902.*]

COLEOPTERA.

NOTES ON COLEOPTERA COLLECTED NEAR NEWTONMORE, INVERNESSSHIRE, FROM AUGUST 29TH TO SEPTEMBER 15TH, 1902.—The following notes on Scotch coleoptera may be of interest, the references to the commoner species being given on account of the locality. The weather during the above time was rather cold, and not favourable to the appearance of many insects. *Cicindela campestris*, L., on sandy bank at foot of Creag Dhu; *Carabus catenulatus*, Scop., under stones; *C. glabratus*, Pk., on road side; *C. arvensis*, F., under stone on moor, about 1000ft.; *Notiophilus aquaticus*, L., and *N. palustris*, Duft., from moss in wood; *Nebria brevicollis*, F., under stones; *N. gyllenhallii*, Sch., under stones, top of Creag Dhu, 2350ft.; *Miscodera arctica*, Pk., one example under a stone on moor, 1000ft.; *Bradycellus placidus*, Gyll., damp moss in wood; *B. cognatus*, Gyll., *B. collaris*, Pk., and *B. similis*, Dj., under stones on moor; *Harpalus aeneus*, F., on road; *H. latus*, L., under stones on moor; *Pterostichus niger*, Schall., *P. nigrita*, F., and *P. strenuus*, Pz., under stones; *P. vitreus*, Dj., under stones on Cruban Beag, 1900ft.; *Amara rufocincta*, Sahlb., on road (only previously recorded very rarely from the south of Scotland); *Calathus cisteloides*, Pz., *C. flavipes*, Fourc., and *C. melanocephalus*, L., under stones, very abundant (the var. *nubigena*, Hal., was fairly common); *Taphria nivalis*, Pz., two examples, under stones on high moor; *Anchomenus angusticollis*, F., under a stone; *Olisthopus rotundatus*, Pk., under stones in a wood; *Bembidium tibiale*, Duft., *B. atrocoeruleum*, Steph., *B. decorum*, Pz., *B. monticola*, Sturm., *B. bipunctatum*, L., and *B. bruceellense*, Wesm., under stones on banks of river Spey; *B. littorale*, Ol., in moss; *Trechus minutus*, F., under stones on moor; *Patrobis assimilis*, Chaud., under stones; *Cymindis caporariorum*, L., under stones on high moors, almost always occurring singly, but four specimens were taken under one stone at the cairn on the top of Cruban Beag, about 1950ft.; *Haliphys ruficollis*, De G., pool near river Spey; *Deronectes depressus*, F., *Hydroporus rivalis*, Gyll., *H. septentrionalis*, Gyll., and *H. darvii*, Curt., river Spey; *H. palustris*, L., and *H. planus*, F., pools near Spey; *Agabus bipustulatus*, L., and *Platambus maculatus*, L., in small ditch; *Rhantus histriatus*, Berg., and *Gyrinus minutus*, F., pool near river Spey; *Astilbus canaliculatus*, F., ant's nest (said by Canon Fowler to be scarce in Lowlands only); *Gymnusa variegata*, Kies., decaying fungus; *Mezocriconus analis*, Pk., and *M. inclinans*, Grav. (one example), under stones, foot of Creag Dhu; *Bolitobius trinotatus*, Er., and *B. pygmaeus*, F., in fungus; *Quedionuchus lacrigatus*, Gyll., under bark of fir and birch; *Staphylinus stercorarius*, Ol., under stones, by side of road through moor; *Ocyopus brunneipes*, F., under stones; *Othius myrmecophilus*, Kies., in moss; *Lathrobium fulvipes*, Gr., under stones, top of Creag Dhu; *Olophrum piceum*, Gyll., in fungus; *Necrophorus humator*, F., and *N. mortuorum*,

F., on dead bird; *Silpha rugosa*, L., dead bird; *S. atrata*, L., in decayed wood; *Parnus prolifericornis*, F., and *P. auriculatus*, Pz., under stones, banks of river Spey; *Aegialia sabuleti*, Pk., and *Serica brunnea*, L., sandy bank near moor, about 900ft.; *Ernobius mollis*, L., on doorstep of cottage; *Otiorynchus blaudus*, Gyll., under stones, but not frequent; *Strophosomus lateralis*, Pk., under stones on moor, and also two species of *Maltica*, one a black form, swept from heather. The rarer and more difficult insects to determine have been kindly verified by Professor Hudson Beare.—JAMES E. BLACK, Nethercroft, Peebles.

COLEOPTERA IN SCOTLAND.—After the end of June, except during my holidays in August, pressure of work prevented me from giving much attention to collecting, but the following stray notes may be of interest. On July 3rd I swept up, just before dusk, on a damp cold evening, in a copse on the eastern slope of Arthur's Seat, *Balaninus brassicæ*, Fab., *Eriehinus acridulus*, L., *Liosomus oratulus*, Clair, and *Apion numile*, Germ., and on July 17th I found under stones, near the summit of the hill, *Corymbites aeneus*, L., *Otiorynchus muscorum*, Bris, and *Quedius boops*, Gr. On the afternoon of August 5th I paid a visit to Loch Leven, and thoroughly explored the southern shores for some mile or two; I was much disappointed at the results, for I had formed expectations of taking several good insects which seem to have been found here fairly commonly years ago; sweeping the herbage and flowers at the edges of the neighbouring fields produced nothing, so I spent my time turning over and shaking the heaps of dead water weeds thrown up on the beach, and in this way obtained *Blethisa multipunctata*, L., fairly commonly, *Elaphrus cupreus*, Duft., *Bembidium doris*, Pz., and *Philonthus quisquiliarius*, Gyll., which was very abundant; this insect, therefore, which Canon Fowler stated did not appear to occur even in the Midlands (though it is abundant in Leicestershire), appears to extend very far north, I do not know whether this is its first record from Scotland. On August 7th, *Malldodes marginatus*, Lat., and *M. sanguinolentus*, Fall., were abundant on bracken in Dalmeny, and, all through the month, *Niptus hololeucus*, Fald, kept turning up in my house; during the winter I found the other species, *erectus*, F., in my house at Heriot Row. In the summer I searched many of the roads and waste places round Edinburgh to find plants of *Sisymbrium officinale*, mindful of an interesting note of the late Mr. Rye, but never found it; in September, however, I came across two patches of the plant, one near Musselburgh, and the other on Calton Hill, off these patches I swept the following insects:—*Psylliodes cupronitens*, Forst., *Centhorhynchus sulcicollis*, Gyll., *C. assimilis*, Pk., *C. crysimi*, F., *C. contractus*, Marsh, *C. quadridens*, Pz., *Centhorhynchidius floralis*, Pk. so I am hoping next year, by working the plants in June, to turn up the two rarer insects, *C. picitarsis*, Gyll., and *C. rapae*, Gyll. When I worked them the plants looked like bundles of dusty twigs, and yet insects were quite abundant on them; off mallows, close to them, came *Apion aeneum*, F., and *A. radiolus*, Kirb., in the utmost profusion.—T. HUDSON BEARE, F.E.S., 10, Regent Terrace, Edinburgh.

QUEDIUS CRUENTUS VAR. VIRENS, ROTTBG.—In Johnson and Halbert's *List of the Beetles of Ireland*, p. 644, *Quedius cruentus*, Ol., is recorded from Antrim and Armagh, and it is further stated that "the specimens from both these localities are referable to the variety *virens*, Rottbg." Mr. Halbert having kindly sent a specimen for me to see, I find it to be

identical with a var. of *cruentus* I took at Torquay on February 10th, 1896. Mr. Halbert referred me to Ganglbauer (*Die Käfer von Mittel Europa*, ii., p. 399), who describes the var. *circus*, Rottenberg, as follows:—"Bei var. *circus* sind die Flügeldecken schwarz, oft mit grünlichen schimmer, an der naht und oft auch an den seiten röthlich." This is a very distinct form, and reminds one, superficially, of *Quedius impressus*, Pz. I note Mr. Tomlin records it in the *Irish Naturalist* (1902, p. 62) from Ballycastle. This is one of the many cases where the "Irish List" proves, and will prove to be most valuable to coleopterists in this country.—HORACE DONISTHORPE, 58, Kensington Mansions. *October 1st, 1902.*

NOTES ON COLLECTING, Etc.

LEPIDOPTERA AT BURGESS HILL IN 1902.—THE LATE SEASON.—The months of August and September, of 1902, will surely carry a record for low temperature and broken weather. At least, this was certainly the case in Sussex, and, in the vicinity of the Downs, the continuous bad weather bid fair to spoil the entomological season altogether. Had it been a hot season, or even one blessed with the average amount of sunshine, the local butterflies around the neighbourhood of Burgess Hill would have made a great display. Even as matters were they made a game fight for it, and after a week's boisterous cold weather, would make another start and again be flying strongly, when the next visitation of storm would come and destroy them. The Vanessids were well to the fore, as were the larger fritillaries. The "whites" showed in abundance, and latterly the strong touch of positive colour, afforded by *Gionepteryx rhamni*, was visible with almost every burst of sunshine. The Coliads did not appear at all in the locality this year, nor among the "blues" was *Polyommatus bellargus* to be seen, and only one solitary example of *P. astrarche*. *Chrysophanus phlaras*, *Epinephele janira*, *E. tithonus*, *Euodia hyperanthus*, and *Coenonympha pamphilus* were all exceedingly common, and, in a retired quarter of the Downs, a surprise awaited one in the discovery of *Melanargia galatea*, which was evidently fairly numerous. This is one of those instances of the "laying down" of a species, however, for I remember meeting a brother of the net in the vicinity some three years ago, who informed me that, the year preceding, he had thrown down a few eggs, which a boxed ♀ of *M. galatea* had laid, and that he had seen a few specimens of the insect near where he had sowed the eggs, during the year he was speaking to me. I have also heard of the appearance of this species on the Downs at another part, so possibly it has drifted along the slopes of the hills, east and west, to stop and breed in the countless grassy hollows of their formation. The locality seems to agree with the insect for those I saw were finely marked and large in size. The pursuit of "sugaring" cannot be said to have been a success. What the conditions are that make a favourable evening at sugar we are always guessing at, without result, and it might perhaps be a better plan to make a note of what elements are dominant on unfavourable occasions. On these lines the past season must certainly demonstrate that a low temperature is absolutely fatal to success. During these two months there were scarcely half a dozen evenings when the temperature was not chilly, immediately after sunset. Only

ordinary insects appeared, and these but in restricted numbers, while some very common species were not visible at all. On the other hand, while imagines of the Heterocera were scarce, larvæ were plentiful enough, in certain localities, and the beating tray became the most interesting of the appliances to use. Of all larvæ here this season, that of *Cynatophora duplaris* seemed to be the most abundant, as of all imagines *Thymelicus linea* was also the most numerous. This insect was truly out in myriads. The roadside banks, grassy lanes, long growth on the downs, and in fact everywhere that there might be an excuse for its existence, there one would find *T. linea*, buzzing in the sun. The periods during which the various butterflies were seen were as follows:—*Pieris brassicæ*, August 5th to September 13th; *P. rapæ*, July 31st-September 17th; *P. napi*, July 31st-September 12th; *Gonepteryx rhamni*, August 5th-September 17th; *Brenthis selemæ*, August 2nd; *Argynnis aglaia*, August 1st-27th; *A. adippe*, August 2nd; *Dryas paphia*, August 2nd; *Eugonia polychloros*, July 31st-August 26th; *Aglais urticæ*, August 1st-September 17th; *Vanessa io*, August 16th-September 4th; *Pyramcis atalanta*, August 20th-September 13th; *P. cardui*, August 8th-29th; *Melanargia galatæa*, August 5th-16th; *Pararge megera*, August 15th-September 2nd; *Satyrus semele*, August 5th-September 17th; *Epinephelè janira*, July 31st-September 17th; *E. tithonus*, July 31st-September 17th; *Enodia hyperanthus*, August 1st-12th; *Coccytonypha pamphilus*, August 1st-September 17th; *Chrysophanus phlægas*, August 1st-September 13th; *Zephyrus quercus*, August 1st-20th; *Plebeius ægon*, August 2nd; *Polygonmatus astrarche*, August 16th; *P. icarus*, August 6th-September 17th; *P. corydon*, August 5th-September 13th; *Cyaniris argiolus*, August 11th-29th; *Thymelicus linea*, July 31st-September 4th; *Pamphila sylvanus*, July 31st-August 25th; *P. comma*, August 5th-27th. Of these insects it may be remarked that *P. brassicæ* was out strongly between the dates given, as were *Pieris rapæ* and *P. napi*. *Gonepteryx rhamni* was also very abundant. *Argynnis aglaia* was common on Ditchling Beacon, and at Tilgate Forest, on August 2nd, the four fritillaries, *Brenthis selemæ*, *Argynnis aglaia*, *A. adippe*, and *Dryas paphia*, were flying on the same day; though the first-named was on its last legs, or wings. *Eugonia polychloros* was numerous and frequently met with in many localities. *Vanessa io*, *Pyramcis atalanta*, and *P. cardui* were fairly numerous, though infrequent. *Satyrus semele* was rife on the Downs always, and *Plebeius ægon* going strongly at Tilgate on August 2nd. *Pamphila comma* was late in coming at Ditchling Beacon, but latterly was out in great force. The ♂ of this insect is a great deal commoner than the ♀, at least on flight. Whether the ♀ is concealed in the herbage or not it is impossible to say, but not more than ten per cent. of those taken on flight are ♀s. On July 31st an imago of *Trochilium bembeciformis* was beaten from willow, and the following brief record of the failure of sugaring may dismiss that portion of the pursuit, with the remark that every insect named occurred but sparingly. *Bryophila perla*, August 13th-22nd; *Leucania lithargyria*, August 23rd; *Hydrocicia nictitans*, August 23rd-27th; *Nyctophasia lithoxylea*, August 2nd; *N. monoglypha*, August 10th-September 16th; *Cerigo matura*, August 15th-16th; *Mamestra brassicæ*, August 7th-September 8th; *Apanca didyma*, August 1st-September 3rd; *Agrotis puta*, September 3rd; *Peridroma ypsilon*, September 6th-17th; *Noctua plecta*, August

23rd-September 1st; *N. c-nigrum*, September 3rd-9th; *N. rubi*, September 9th-12th; *N. baja*, August 2nd; *N. xanthographa*, August 16th-September 14th; *Tryphaena fimbria*, August 29th; *T. interjecta*, August 1st-23rd; *T. comes*, August 2nd-September 14th; *T. pronuba*, August 2nd-September 16th; *Amphipyra pyramidea*, August 30th; *A. tragopogonis*, August 29th-September 7th; *Naenia typica*, August 4th-September 6th; *Mania maura*, August 3rd-September 14th; *Anchocelis lunosa*, September 16th-17th; *Citria fulvago*, September 16th; *Mellinia gilvago*, September 16th; *Cosmia trapezina*, August 17th; *Calymnia affinis*, August 10th-16th; *Phlogophora meticulosa*, August 24th-September 17th; *Hadena olivacea*, July 31st; *Gonoptera libatrix*, August 12th-September 10th; *Catocala nupta*, August 16th-September 17th; *Hypena rostralis*, September 6th-17th; *Melanippe fluctuata*, August 5th-September 2nd. Among other common insects which failed to show at sugar may be named *Leucania pallens*, *Miana strigilis*, *Peridroma saucia*, *Agrotis segetum*, *Anchocelis pistacina*, and *Citria flavago*. Other insects seen or taken, at rest, or with the net, were *Scisia stellatarum* (once only), August 15th; *Egeria caliciformis*, August 1st; *Calligenia miniata*, August 2nd; *Lithosia griseola*, August 19th; *L. lurideola*, August 1st-25th; *Porthesia similis*, August 6th-September 11th; *Notolophus antiqua*, July 31st-September 4th; *Malacosoma neustria*, August 1st-4th; *Lasiocampa quercus*, July 31st; *Tryphaena ianithina*, August 7th-15th. Though this insect did not come to sugar it was to be disturbed by tapping hedges of dwarf beech, pretty freely. *Eupleria lucipara*, August 6th; *Plusia gamma*, August 7th-September 17th; *Epione apiciaria*, August 14th-30th; *Selenia bilunaria*, August 6th-11th; *Crocallis linguaria*, September 7th; *Pseudoterpsma pruinata*, August 8th; *Hemiteua strigata*, August 19th; *Geometra renaria*, August 1st-6th; *Zonosoma annulata*, August 19th; *Z. porata*, August 1st-19th; *Asthenia candidata*, August 7th-22nd; *Acidalia dimidiata*, August 11th-14th; *A. trigeminata*, August 1st-20th (very late. Ed.); *A. imitaria*, August 1st-6th; *A. aversata*, August 1st-11th; *A. virgularia*, August 11th; *A. emarginata*, August 4th-7th; *Timandra amataria*, August 15th (the only one); *Halia canaria*, August 10th; *Strenia clathrata*, August 12th-21st; *Emmelesia unifasciata*, August 19th; *Thera variata*, September 15th. Other common insects which were to be seen continually were *Cabera pusaria*, *C. exanthemaria*, *Abraxas grossulariata*, *Lomaspilis marginata*, *Hypsipetes sordidata*, *Melanthia ocellata*, *M. procellata*, *Melanippe fluctuata*, *Camptogramma bilineata*, *Cidaria testata*, *Eubolia limitata*, *E. bipunctata*, but not *Anaitis plagiata*, which, from being generally an universally present insect, was very scarce, and only seen once or twice. The dates of observation of these imagines have been given, at the risk of being tedious, as this year the appearance of species has been so uncertain that the subject is one which may possibly interest some readers. For the same reasons it may be allowable perhaps to append dates to the finding of larvæ, for, in this branch of the study, many inconsistencies were found. The following list will show the species of larvæ, with dates: *Aglais urticae*, July 31st-August 17th; *Pyramcis atalanta*, August 4th-21st; *Thymelicus thanax (linea)*, August 27th; *Polyommatus icarus*, August 8th; *Sphinx ligustri*, July 31st-September 3rd; *Theretra paeonius*, August 20th-29th, on the downs, at rest; *Smerinthus ocellatus*, July 31st-September 2nd; *Halia prasiana*, August 28th-September 15th; *Gnophria rubricollis*, September

15th; *E. jacobaræ*, September 5th-15th; *Dasychira pulibunda*, September 5th-17th; *Notolophus antiqua*, July 31st-September 4th; *Lachneis lanestræ*, two nests were found, one on July 31st and the other on August 12th; *Lasiocampa quercens*, July 31st, an enormous larva, larger than many larvæ of *Eutricha quercifolia*, but which proved to be ichneumonid; *Drepana lacertula*, July 31st-September 15th; *D. falcula*, September 2nd-15th; *D. hamula*, July 31st-September 5th; *Cilix spinula*, September 17th; *Picranura furcula*, August 19th-September 1st; *D. rinula*, July 31st-September 11th; *Pterostoma palpina*, July 31st-August 28th; *Lophopteryx camelina*, August 1st-September 15th; *Leiocampa dictacoides*, September 5th-15th; *Notodonta dromedarius*, July 31st-September 15th; *N. viczæ*, August 2nd; *Pygaera bucephala*, August 19th-September 13th; *Clostera curtula*, September 10th; *Cymatophora duplaris*, August 22nd-September 17th; *C. fluctuosa*, September 5th-15th; *Triana psi*, September 2nd-17th; *Acrioneta leporina*, August 26th-September 17th; *Hadena contigua*, September 5th; *Gonoptera libatrix*, August 1st-September 3rd; *Plusia gamma*, August 4th; *Chariclea umbra*, August 19th-25th; *Catocala nupta*, August 1st; *Pericallia syringaria*, September 3rd-17th; *Selenia lunaria*, September 17th; *Crocallis elingvaria*, September 5th-6th; *Amphidasys betularia*, August 28th-September 17th; *Tephrosia punctularia*, September 1st-17th; *Iodis lactearia*, August 19th-September 17th; *Zonosoma linearia*, September 5th-19th; *Cabera pusaria*, July 31st, and always; *C. exanthemata*, July 31st, and always; *Macaria notata*, September 5th-15th; *Lomaspilis marginata*, August 19th-September 13th; *Hypsipetes impluviata*, September 5th-15th; *Eucosmia undulata*, September 15th; *Cidaria corylata*, September 5th-15th; *Euclidia mi*, August 20th-27th; *Eupisteria hepatica*, September 15th. The greater part of these larvæ were obtained at Tilgate Forest, which was visited first on August 2nd; but the season was then too early, as the few larvæ found were all very young. The next visit was on September 5th, and others afterwards. Parts of the Forest had suffered severely in the spring under a most extraordinary visitation of the larva of *Cheimatobia brumata*, and large tracts of birch trees were almost denuded of foliage. These trees, later in the year, had made an effort to develop a second growth of leaves, but had again fallen a prey to clouds of aphides, and these creatures made larva-searching and beating a perfect ordeal. Whenever a tree or bush was struck the air was filled immediately with a dense flight of the pests, which at once settled on the offending bearer, and his face was almost covered. The wonderful plague of this blight, the unusual number of flies, and also wasps, was a great contrast to the accompanying poor amount of lepidopterous insects of the same period. Sussex seems to have been infested with flies and wasps in the country north of the Downs this year, which is a curious thing when one remembers how very little sun there was. *Cymatophora fluctuosa* was found only at Tilgate Forest, and it was in vain to seek it in the blighted trees. The larva appears to have but one requirement, *viz.*, good fresh green leaves. Any sized birch-tree or bush, in any aspect, may have larvæ feeding on it, in any part, high and low, but it must be a healthy tree. Probably those larvæ which find themselves on failing pabulum, a fact which the entomologist who breeds the species will quickly have brought before his notice.—J. C. DOLLMAN, Hove House, Newton Grove, Bedford Park, S.W. October 3rd, 1902.

AUGUST LEPIDOPTERA IN SUTHERLANDSHIRE.—I spent the last twelve days of August, this year, near Invership, in Sutherlandshire, and the following notes on the lepidoptera seen in this northern locality may be of interest. Among the butterflies three are worth noting, *viz.*, *Erebia aethiops*, *Coenonympha typhon*, and *Argynnis aglaja*. They were all in much finer condition than is usual at this time of the year, *C. typhon* especially being beautifully fresh. Larvæ were very scarce on the moors last year, but this year those of *Lasiocampa quereus* simply swarmed over them. Whether this abundance was local or general over Scotland I do not know, but I have never seen such numbers anywhere before. Those of *Saturnia paronia (carpini)*, on the other hand, were scarce, *Phaetra menyanthidis* was hardly to be found, and I did not come across a single *Spilosoma fuliginosa*. Near the river, which ran down our Strath, were woods of old birch trees, and I devoted some hours to searching these for larvæ. The Notodonts were all unusually late, many being only just out of the egg. The latter is laid on the underside of the leaf, and, by turning over the long twigs at the ends of the lower branches, the little larvæ are easily seen. In this way I found great quantities of *Lophopteryx caudina*, a good many *Notodonta dromedarius* and an occasional *Lasiocampa dictacoides*, but my most interesting capture was *Lophopteryx carmelita*, which was nearly full-fed. Other larvæ to be found on these birches were those of *Demas coryli*, *Acrionicta leporina*, *Selenia tetralunaria (illustraria)*, *S. bilunaria*, *Biston hirtaria*, and *Cidaria miata*, while some fine aspen trees near by produced larvæ of *Lasiocampa dictava* full-fed, and *Cuspidia megacephala* larvæ in their first and second instars. Before last year I always thought that the favourite foodplant of *Demas coryli* was hazel, but when staying at Tongue in the extreme north of Sutherlandshire, I found the larva very plentiful on the stunted birches that grow near the sea coast, exposed to the full force of the cold northerly winds. The larvæ of *Biston hirtaria*, *Selenia tetralunaria (illustraria)*, and *S. bilunaria* are not hard to see when you know how to look for them. During the day they sit motionless among the clusters of dead twigs, only moving at night to the fresh leaves. Sugar was more productive than usual, owing to the lateness of the season, which caused many species, usually over, to be still on the wing. *Gymatophora duplaris*, *Xylophasia rurea* (both the type and the ab. *combusta*), and *X. polygon*, including some superb black aberrations, were pretty abundant. Among the Noctuids, *Noctua augur* and *N. baia* were everywhere in splendid condition; *N. festiva* was common, but rather worn, *N. dahlia*, *N. brunnea*, and *N. neglecta* only showed themselves occasionally. *Dyschorista suspecta* was in fair numbers, and apparently only just out, as I did not see it on the first night. The Epundas—*Epunda lutulenta* and *nigra*—are doubtless to be found in the district, but they were not out when I left. I took the latter last year sitting on a stone right out in the middle of the moors. *Aplecta tineta* (one specimen) and *A. occulta* in some numbers, but in very bad condition, also came to sugar, and I have a brood of larvæ from eggs laid by a female *A. occulta*, which I kept alive for the purpose. The only "Geo" I took at sugar was *Boarmia repandata*, which is very light in colour in this locality, but *Larentia caesiata* and *L. didymata* were abundant enough by day. Last year, on a cliff near Tongue, I took *Larentia flavicinctata*. It is a very local insect, not moving far from its food-plant, which in this case was *Saxifraga aizoides*.—NEVILLE

CHAMBERLAIN, F.E.S., Highbury, Moor Green, Birmingham. *September 28th, 1902.*

LEUCANIA ALBIPUNCTA, ETC., IN SOUTH DEVON.—Last month I had again the pleasure of taking several *Leucania albipuncta* on the South Devon Coast, three of them on September 4th, two of which singularly were secured on sugar of the previous night, and which I casually looked over on my way home. On September 5th, with another *L. albipuncta*, I took a female *Laphygma erigua*, the only one seen on this year's visit: it was so worn, too, that I fancy it must have been a straggler from the summer brood, and that the autumn brood was not yet out this late season. The only fresh lepidopteron of interest to my former records was *Thecla betulae*, females of which were flying about blackthorn bushes. Of dragonflies the formerly rare *Aeschna mixta* was abundant in several places, Torcross proving a good locality for it. A fresh species to former records, too, turned up in the fine *Cordulegaster annulatus*. Two fresh trichoptera, too, were taken at sugar, the rare *Linnophilus bipunctatus* being very welcome, and *Stenophylax concentricus* commonly. The weather generally was bad from a lepidopterological standpoint, but from my experience this and last year, the September of 1900 was an exceptional one, and I expect the marvellous captures of that time are only likely to be repeated in occasional equally exceptional seasons.—GEO. T. PORRITT, F.L.S., F.E.S., Crosland Hall, near Huddersfield. *October 8th, 1902.*

LEPIDOPTERA IN MERIONETH.—The weather in North Merionethshire was fine in August and September, and butterflies were abundant, if late in emergence. *Pieris brassicae* appeared about August 8th, and was very numerous in September; *P. rapae*, August 15th; *P. napi*, out for some days before August 1st. Of the Vanessids, *Vanessa io* was abundant from August 19th; *Aglais urticae* from the end of July, especially on the uplands; *Pyramis atalanta*, August 14th-September 15th; *Polygonia c-album* sparingly, but widely distributed, in at least half-a-dozen localities, from August 21st. *Argynnis aglaia* and *A. adippe* swarmed on the wooded mountain sides. The former worn by August 1st, though I took a fine female of the ab. *suffusa* on August 23rd; *Dryas paphia* occurred in numbers in some of the woods, I saw a ♀ ab. *calesina* near Maentwrog, but could not get it. On August 23rd I caught an interesting ♀ ab. of *D. paphia*. This form is not to be found at South Kensington. The black spots, especially the "Augenreihe," on the lower wings are appreciably larger than the type, and the base and nearly two-thirds of the hindwings are powdered with greenish scales, rather like those of *Argynnis lathonia*. Can this and the dark aberration of *A. aglaia* already noted have been due to the wintry spring and early summer? Of the Satyrids the usual species were plentiful, *Satyrus semele* being especially abundant, but *Pararge* var. *egerides* was decidedly rare, appearing very late in August; *Polyommatus icarus* and *Chrysophanus phlaeas* swarmed, and *Zephyrus quercus* was very numerous in the oak woods till September 3rd; *Cyaniris argioides* was rare, and I only saw two ♀s of *Angiades sylvanus*, August 5th and 8th. On August 8th I found *Brenthis selene*, some going over, some quite fresh on the Roman Steps—alt. circ. 1800ft. above Coombychan Lake. I cannot think this was a second brood, since the butterfly only appears on the low ground in May and June, I suppose it must be attributed to the season. Of sugaring and beating

the less said the better. I am attempting to introduce *Papilio machaon* and *Araschnia levana* into North Merioneth, and should be glad if collectors who go there would take the hint. The *A. levana* are coming from north-west Germany and north France as far as possible, as the conditions there are generally more like those of our islands than in the centre of Europe. Near us, Umbellifers are very numerous, and there are some good marsh meadows full of *Daucus carota* by the shore.—P. P. GRAVES, Emifa, Harlech. *October 13th, 1902.*

AMPHIDASYS BETULARIA ON BROOM.—Having recently returned from a part of Spain, where one was gradually learning to believe that everything would eat broom, even if it would eat nothing else, it is somewhat amusing, if less surprising, to find a larva of *Amphidasys betularia* at "Betula," feeding on a species of broom, a free-growing species with small white flowers, common in gardens, but the name of which I do not know. I watched it for several days on the shrub, and then brought it indoors and satisfied myself that it was eating and quite at home on the broom, though it may originally have come from a contiguous hawthorn or crab. *A. betularia* will eat most things, so that broom may have been already recorded, but I do not remember it.—T. A. CHAPMAN, M.D., Betula, Reigate.

LEPIDOPTERA AT FOLKESTONE AND CHELMSFORD.—While staying at Folkestone, from August 28th to September 12th, my father and I captured some fourteen *Colias edusa* and one ab. *helice*, in bred condition. I brought one *C. edusa* ♀ home for eggs. It laid ten, and the larvæ all hatched out, but the ants took them when two or three days old. *Melanargia galatea* were going over, but we took a few very good ones on the Warren and the hills round Cæsar's Camp. We also took four *Colias hyale* and a few *Pyramis cardui*, *P. atalanta*, *Hipparchia semele*, *Polygonmatius astrarche*, *P. adonis*, one or two blue *P. icarus*, females, *Argynnis aglaia*, and two *Acidalia ornata*, while *Bryophila perla*, *Luperina testacea*, *Neuronia popularis*, *Peridroma ypsilon* (*suffusa*), and *Porthesia chrysorrhoea* ♂, came to light. Autumn insects are late here this year, as most species have been during the summer. *Eubolia coccinata* is still emerging in a cage out of doors; and *Polia flavicincta* has just made its appearance here. A good many of my young *Eutricha quercifolia* larvæ, which were sleeved out in the egg state, are still very small, and I am afraid will not have time to feed up for successful hibernation, before the leaves fall.—(Miss) E. MILLER, The Croft, Rainsford Road, Chelmsford. *October 16th, 1902.*

DATES OF APPEARANCE.—The dates of appearance of the same species must, in some instances, be very different in Perthshire and Yorkshire. In the "Practical Hints" for October, Mr. Bush gives October as the date for the occurrence of species that we normally obtain much earlier. The following dates will exemplify my meaning—*Oporabia filigrammaria* is an August insect here. My dates are—1895, August 28th, worn; 1896, August 11th; 1902, August 29th and 30th. This species is usually fairly common here, frequenting open heath land, and I can usually get the larvæ about the middle of May on *Calluna vulgaris*. Is it a *lapsus calami* for *O. dilutata* which is just coming out now? *Noctua glareosa*, 1895, August 28th; 1900, August 30th; 1901, August 21st; 1902, August 30th. *Anarta myrtilli*, larvæ are usually full-fed here about the end of July, and I never take any after the middle of August, as these are always ichneumonid.—L. S. BRADY, 68, Hunterhouse Road, Sheffield. *October 21st, 1902.*

ABUNDANCE OF *VENUSIA CAMBRICA*.—The season here has been a bad one. Some favourite woods of mine in the Doncaster district appeared almost tenantless. The only species I have noticed as being more abundant than usual has been *Venusia cambrica*. In a wood about 10 miles from here I usually see one or two typical forms yearly, but this year they were on every tree-trunk and a good half of them the dark melanic form, curious looking insects with white fringes. I have not seen this form there before, though I suppose it must have occurred, but nearer Sheffield. 90% of those I see are the dark ones. - *Ibid.*

TIME OF APPEARANCE OF *HESPERIA COMMA*.—I notice (*antea*, p. 272) that Mr. Lofthouse reports having taken *Hesperia comma* between June 18th and July 1st. Is not this an error, as I have never taken it before August 1st?—W. E. BUTLER, Hayling House, Oxford Road, Reading. *October 20th, 1902.*

COLIAS EDUSA AB. *HELICE* AND *CAMPTOGRAMMA FLUVIATA* IN HERTFORDSHIRE.—On the morning of September 7th, I captured a beautiful specimen of *C. edusa* ab. *helice*, at rest in a clover-field, off the Station Road. In the afternoon of the same day I netted a male specimen of *C. edusa*, in an open space adjoining the canal bank near Miswell, near Tring, which I found, however, after boxing, was chipped, so set at liberty. It was the more surprising to me to find *C. edusa* this year, as, in 1900, it was not nearly so common as *C. hyale*, whilst in 1901 it was not observed at all, and *C. hyale* was scarce. This year *C. hyale* is absent, *C. edusa* reappears, but very scarce, these being the only two seen or heard of in this neighbourhood, though I worked the clover and lucerne fields for a good way round. I take this opportunity of recording also a specimen of *Camptogramma fluriata*, a species that appears not to have been before recorded for the county. It was netted at the Reservoir on September 21st, 1888, by myself, but only recently identified with other insects by the Hon. N. C. Rothschild, to whom I tender many thanks for this and other services in identifying difficult specimens.—A. T. GOODSON, 18, Park Road, Tring.

NOTES ON LEPIDOPTERA FROM BURNLEY, 1902.—The principal characteristics of the past season have been an ordinary experience up to the end of April, followed by a cold May and June, with a good deal of high wind, moderate July and August, and a stormy September. In consequence many insects have been very scarce, and most of them late in appearing, and only a few normal or more abundant than usual as the following dates will show. Owing to the weather being so bad I did not try for much until May 17th, when I paid my first visit to the moors, but it was quite fruitless; I tried again on the 24th and 31st, but the combined result was only two *Hadena glauca*, one *Acronycta menyanthidis*, and one *Pachnobia rubricosa*. *Hypsipetes impluriata* appeared in singles from May 29th, and was still emerging on June 24th, while a good specimen was taken on July 1st. On June 7th two *Amphidasys betularia* ab. *doubledayaria* were taken *in cop.* on an ash trunk; one emerged on the 15th, and one was taken on a trunk, just out, on the 18th, also one *Larentia salicata* on a wall. *Odontopera bidentata* came to light on the 26th, and *Rumia crataegata* was abundant and fine on the 27th; *Eubolia palumbaria*, among forage on the 28th, was plentiful; *Cabera ecanthemaria*, *Melanthia ocellata*, and *Selenia lunaria*, on an elm trunk, were also taken, the latter being an addition to our local list,

which was further augmented by *Phalera bucephala* at light, and by *Xylophasia lithoxylica* at rest on July 24th. On July 1st was captured a fine example of *Spilosoma menthastris* ab. *ochracea*, on a wall. *Epithecia nanata* and *E. pulchellata* were observed on July 19th, also *Larentia caesiata* and *Melanippe montanata*, while *Tanagra atrata* were abundant. *Hepialus vellela* on the 24th, *Hadena dentina* on the 26th, and *Plusia chrysitis* emerging on the 31st, completed the month. August was very bad, one *Venusia cambrica* on the 1st, and *Cidaria pyraliata* on the 16th, only being noted. In September, on the moors, the following occurred: *Larentia didymata*, plentiful, 13th to 20th; *Polia chi*, 13th to 27th, scarce; *Cidaria populata* and *C. testata*, fairly good, 13th to 27th; *Characas graminis*, ♀s, fine, on the 20th, also two *Larentia caesiata*, one in good condition; *Celaena haworthii*, 20th to 27th, worn, and *Oporabia jiligrammaria* on the 20th to 27th complete a very poor list.—W. G. CLUTEX, 124, Coal-Clough Lane, Burnley. *October 23rd, 1902.*

ON THE DATES OF CAPTURE OF SOME LEPIDOPTEROUS LARVÆ IN 1902.—The following particulars as to dates of capture of the larvæ of a few species of lepidoptera taken on the southern end of Lazonby Fell may prove interesting: October 5th, *Amorpha populi*, L., full-fed, also pupæ; *Leiocampa dictaea*, *L. dictacoides*, *Notolonta ziczac*, and *N. dromedarius*, from half-grown to full-fed; *Acronycta menyanthidis*, full-fed; *Anarta myrtilli*, half-grown. October 11th, *Amorpha populi*, full-fed; *Leiocampa dictacoides*, *Notolonta ziczac*, and *N. dromedarius*, full-fed; *Drepana falcataria*, half-grown. October 15th, *Amorpha populi*, crawling on the pavement in Penrith.—H. BRITEX, Prospect House, Salkeld Dykes, Penrith. *October 20th, 1902.*

PLUSIA MONETA IN MIDDLESEX.—I am glad to say that the wet spring seems to have had no effect on my colony of *P. moneta*. The plants of acouite which yielded a few larvæ last year, provided me with a dozen in May, which were spun up at the end of June, and duly emerged the following month. I may add that I noticed no larvæ this year on *Delphinium*, while those taken were confined entirely to a row of rather stunted plants, away from a considerably more flourishing bed elsewhere.—H. ROWLAND-BROWN, M.A., F.E.S., Oxhey Grove, Harrow-Weald. *October, 1902.*

LEPIDOPTERA AT MARLOW IN 1902.—This has been a most disappointing season. Not a single specimen was seen of *Polyommatus bellargus*, *Melanargia galatca*, *Dryas paphia*, or *Bapta bimaculata*, the Ephyrids and Pyraustids were very scarce, and even such common things as *Enodia hyperanthus* and *Pararge egeria* were seldom met with. On the other hand, *Faunessa io* appeared in something like its former abundance, and *Pyramis cardui* was far from rare. Of species new to the district, *Thera variata* was taken at the end of June, and again early in September, *Phibalapteryx tersata* on June 28th, *Scotosia retulata* on July 6th, *Zephyrus betulae* on September 21st, *Polia flavicincta* on September 25th, and the larva of *Acronycta leporina* on the same day.—H. CLARKE, F.E.S., 109, Warwick Road, Earl's Court, S.W.

CURRENT NOTES.

WE have already drawn attention to the remarkable larva of *Lophocoonii* (*Brit. Lep.*, iii., p. 362), and even gone so far as to give a description of this larva suggests that the species is not new at all; but Dyar has been fortunate enough to obtain an

example and describes it (*Proc. Ent. Soc. Wash.*, xiv., pp. 410 *et seq.*) in detail. He finds it to be a true Sphingid, not more nearly related to the Ceratocampids than any other Sphingid, and with all the primary larval tubercles represented by spines except tubercle ii on abdomen, vii on the 7th and 8th abdominal segments, and viii on all apodal segments. A full account of the early instars of this curious larva is much to be desired.

In the *Proc. Ent. Soc. Wash.*, iv., pp. 414 *et seq.*, Dyar describes the life-history of the Epiplemid, *Callidapteryx dryopterata*, Grt. The structure of egg and larva suggest that it belongs to the Hepialo-Noctuid stirps in spite of its remarkable apparent Geometrid affinities. Dyar further gives a revisional phylogenetic tree of the upright-egged stirps, certainly the best and most logical that has yet been offered us. With the exception that we should exchange the position of the *Epiplemidæ* and *Thyatiridæ*, should possibly place the *Pericopidæ* on the Aretiid branch, and should move the *Nalidæ* above the Geometrid and Lachneid branches, we see no real objection to it. The arrangement is, with these one or two exceptions, practically that which we are using in our own work.

Dyar further gives an interesting account (*Proc. Ent. Soc. Wash.*, v., pp. 43 *et seq.*) of a lepidopteron, *Epipyrops barberiana*, n.sp., the larva of which appears to be parasitic on a leafhopper species near *Issus aureus*, Uhler. Westwood gives (*Trans. Ent. Soc. Lond.*, 1876, p. 519) an account of a lepidopteron, *Epipyrops anomala*, found living on *Fulgora candelaria* at Hong Kong, and later (*loc. cit.*, 1877, p. 433) cited instances of an analogous species observed by Ansen in a Fulgorid of the genus *Aphaena*, in the Dillrang Valley, and by Wood-Mason upon another Fulgorid, *Eurybrachus spinosa*. Champion recorded (*Proc. Ent. Soc. Lond.*, 1883, p. xx) the occurrence of *Epipyrops* larvæ on some of the smaller Fulgorids in Central America, but the larvæ were apparently not bred.

Yet another most interesting paper "On the fluctuations of the postspiracular tubercle in Noctuid larvæ" (*Proc. Ent. Soc. Wash.*, iv., p. 370) has been published by Dyar. One would like to have seen the results thrown into a tree for comparative purposes, with the generalised and specialised branches of each tribe well shown by marking the genera.

At the meeting of the Ent. Soc. of London, held on October 1st, Dr. Chapman read a paper on *Heterogynis paradoxa*. The paper reported that at Bejar, amongst other brooms, *Cytisus purgans* and *Genista florida* abounded, and on these *Heterogynis paradoxa* was found, and, excepting also *Cytisus scoparius*, the larvæ would eat no other plant. Owing to this fact and the apterousness of the female, and the sluggishness of the male, it resulted that three separate colonies of the species were found, absolutely segregated from each other, though two of them were only four or five miles apart, each colony presenting definite differences in larval colouring, time of appearance, size and colour of imago, and in the habit of concealment or otherwise in both the larval and pupal stages, as well as imagines. The differences between *H. penella* and *H. paradoxa* were also noted, of which the most unmistakable was the occurrence in the 1st stage larva of *H. paradoxa* of very remarkable secondary tubercles, of which no trace existed in that of *H. penella*.

At the meeting of the City of London Entomological and Natural

History Society on Tuesday, October 22nd, a very interesting lot of exhibits of *Hydriomena furcata* (*Hypsipetes sordidata*) were brought together, well illustrating the almost endless variability of this species. The smaller size of the bilberry-fed examples, with a prevalence of blackish and reddish forms from Yorkshire and Scotland, and of pale and yellowish greens from Kent and N. Devon, was very noticeable: whilst the most intense melanic specimens were Mr. V. E. Shaw's from Wigan, and Mr. H. J. Turner's from Macclesfield, the former having been bred from sawfly in a small wood. Discussion turned on the causes of the variation, it being pointed out that the insect must either be capable of adjustment to very varying conditions, or else must be protected in some other way than by its colouring, and thus able to continue in a state of exceptional instability. In this latter connection it was remarked that, in the south, *H. furcata* was hardly ever seen exposing itself on tree-trunks or palings like its congener, *H. autumnalis* (*trifasciata*), but seemed constantly to resort to the shelter of thick bushes.

At the meeting of the Ent. Soc. of London, on October 15th, 1902. Mr. A. J. Chitty showed an entirely black specimen of *Metoccus parabolæus* as tending to disprove the mimicry suggested by him at the meeting on the 1st October. Dr. Chapman said that in his experience one out of every six specimens of this species was black. Mr. Donisthorpe stated that out of about one hundred specimens he had never caught or bred a black *Metoccus*.

At the same meeting Mr. E. P. Pickett exhibited a long series of *Polyommatus corydon* taken near Folkestone and Dover in August last, including four males of the last named species, with the black band on the edge of the forewings much deeper than usual; also twelve dwarf male specimens of this species, four dwarf females, and many other aberrant forms. Mr. Goss said this dwarf form of *P. corydon* occurred constantly, according to Mr. Sidney Webb, in one valley about two miles east of Dover, but he was unaware of its regular occurrence elsewhere in this country. He remarked that a dwarf form of *Lycæna arion* occurred everywhere where the type was found, both in Gloucestershire and Cornwall. We recorded the dwarf form of *P. corydon* (*Ent.*, xx., p. 323) almost 20 years ago from the upper edges of Fan Bay, the hollow near the South Foreland lighthouse, and suggested reasons for its occurrence there. Professor Cockerell also discussed the matter at length (*Ent.*, xxii., p. 176).

At the same meeting Dr. Chapman exhibited of *Notodontæ* (*Hybocampa*) ? *dryinopa* from Queensland. It was remarkably similar in appearance, structure, and habits to *Hybocama milhauseri* (see, *Entomologist*, 1889, and p. 43 of 1902). He stated that the pupa, with a similar spine to that of *H. milhauseri*, does not cut out a regular oval lid from the cocoon like that species, but by a stabbing process pierces it with a number of holes, since with bits of bark, stone, etc., a cutting process would be impossible, whereas the cocoon of *H. milhauseri*, was of pure gum-like silk. He pointed out that the larva much resembled that of *H. milhauseri*, but the hinder segments were more like those of *Stauropus fagi*. He also exhibited living eggs, larvæ, and imagines of *Orina tristis*, var. *smaragdina*, from Pino, Lago Maggiore. The beetles were taken on May 30th, and had laid many eggs. Dr. Chapman said that the embryo, ready to hatch, might be seen within some of the eggs, and its hatching spines observed.

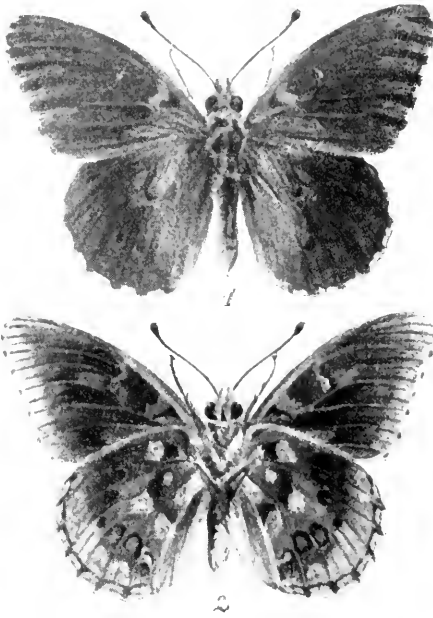
The new rules proposed by the Council of the Ent. Soc. of London are to be preferred to the old on the ground of distinctness and clearness in place of ambiguity. The addition of two members to the Council may be a boon to those who find the present number inadequate to gratify their ambition to serve the Society, but the present Council is amply large enough for business purposes. The *raison d'être* of the alteration is to improve the mode of election to the Council with a view to avoid in future any of the ill-feeling which certainly was raised over last year's election. It seems very objectionable that no way of attaining this has been devised without resort to a ballot every year; this is much to be deprecated. The Council are to be congratulated on the astuteness with which they appear to offer the "rebels" large democratic concessions, whilst making the election of anyone not on the Council's list practically impossible. Impossible, certainly, without an amount of general feeling on the point that would justify a vote of censure on the Council. A great amount of discontent, almost indignation, would be required, without which the necessary canvassing and organisation (without any assistance from the officers of the Society) would not be undertaken, and, if undertaken, would be fruitless. The effect of the amended rules is that, at the ballot, any member may replace any name suggested by the Council by any other he pleases, and nine-tenths of the members voting might do this, but the Council's list would be elected all the same. Suppose a majority, say, four-tenths of the voters, desired to expunge one name from the Council's list, they would fail unless they all agreed on the name to be substituted for it, and, equally, the desire of a majority to add a fresh name would be futile unless all agreed to strike out the same name to make room for it. It is absolutely necessary if the democratic character claimed for these new rules is to have a shadow of reality that some means be afforded by which all names that are to be balloted for, whether on the list of the Council or those proposed by individual members, shall be on the papers distributed for the ballot. The prohibition of plumping is merely a device for rendering more certain that the distributed votes and erasures of an unorganised opposition shall be futile.

Proposed alteration of Bye-laws for the election of the Council of the Entomological Society of London.

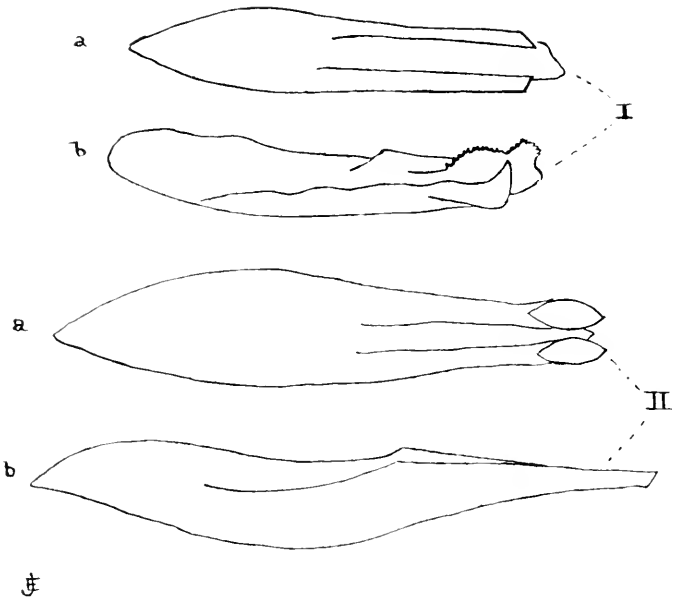
It is now nearly twelve months since the Council of the Entomological Society of London was warned that the society itself was no longer in leading-strings, and that personal likes and dislikes had to be put aside in the selection of those who should govern it, that those who were selected must be men who were entomologists first and other things afterwards, and above all things that they should be elected by the body of Fellows in reality and not merely theoretically. It was allowed to be desirable that a more democratic mode of election should take place, and that the Fellows should take an active part in the election, even by those Fellows who were unwilling to take part in a movement that might by the weak-kneed be construed into something approaching a vote of censure on the Council. After delaying the greater part of a year, and with the minimum time left at disposal to satisfy the Byelaws for their consideration and discussion, a series of alterations in them has been brought forward by the Council, which, to put it mildly, are the most transparently simple suggestions ever made for turning the Council into a closed body, and to prevent

the Fellows who are not placed within the charmed circle by the existing Council, to have any part in the management of the Society. It really seems ridiculous, and we tried to persuade ourselves that we were misinterpreting some clause or other, but no, there is no doubt about it, the emendations, instead of making it easier for the unofficial member to find expression for his views, which is their professed object, absolutely takes away the very slight chance of doing so which he has under the present Byelaws. We want the members of Council to believe that the average body of Fellows is equally capable of honest thought and of right and just action with themselves, and would select the men most suitable for the post. Time works changes in everything. Men slowly, and without knowing it, get out of touch with the society; such men would, naturally, in any democratic form of election fall through, and more active men take their place. The Council carries on the business of the society; this business is many-sided and must, if it is to be well done, be carried on by the at-present active Fellows of the society. If the Council is to be elected because of past services rendered, and not for present services being rendered, not only must the business be left to a few, but affairs stagnate. Things never stand still, they go on or fall back. We fully recognise the necessity of having on the Council members who thoroughly know the history and traditions of the society, and can preserve that continuity in its action to which such knowledge is essential. Apart, however, from the fact that the unofficial member will not forget this more often than the Council itself, it must be remembered that that element of strength is well protected by the circumstance that the important officers of the society—the secretaries, the treasurer, and the librarian—are practically permanent members of the Council. It is, therefore, essential that reasonable opportunity be given for the addition of young blood. The remarkable thing is that we supposed this view of the position to have been largely conceded, but the proposals of the Council go in precisely the opposite direction. A simple democratic result might have been arrived at in many ways. The nomination by the officers of say a score of names of eligible members from whom the twelve or fifteen members to form the Council should be elected by ballot, suggests itself. To these might have been added any suggested by the Fellows themselves at any of the three meetings preceding the election. A similar result might have been obtained by the bringing forward, at the November and December meetings, a proposed list and asking for additions thereto. What is wanted is a fair straightforward ballot for the return of men in touch with the Fellows, not the passage of a cut-and-dried list under the name of an election. What is the more remarkable in offering such a scheme to a body of intelligent and educated gentlemen, is that there are, on the Council, men who, in their public life outside the society, stand for progress. That the “shibboleths” of continuous office and the feeling of responsibility should weigh with some members of the Council is understandable, but that others should be satisfied to follow such a lead is incomprehensible. Rarely does a body of educated men give itself so completely away as does the Council of the Entomological Society of London in these proposed new Byelaws, or rather, proposed alterations of the old ones. No wonder that the Council elected a capable pleader for its case, but what the Fellows want, is not to be treated as units to be pleaded with, but as a capable body of thinkers to whose common sense an appeal is being made.





ABERRATION OF ARGYNNIS AGLAIA.



APHIDIUS FOETENS AND A. FIMETARIUS.

Aberration of *Argynnis aglaia* (with plate).

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

I have already (*antea*, p. 291) made reference to a magnificent black aberration of *Argynnis aglaia* taken by me at Villars, on July 26th, 1902. At the suggestion of Mr. Tutt I have had a plate prepared to exhibit the marked features of the aberration for the readers of the *Ent. Record*, and add the following detailed description of this striking aberration. The figures are from careful drawings which I have made from the specimen, which is a male in perfect condition. It has the median area of all four wings of an entire rich black on the upper surface. The base of the wings is of a warm bronze hue, surmounted in the forewings with a crescentic mark, small orbicular, and terminal streaks between the nervures of the typical *A. aglaia* brown. The posterior row of black spots on the hindwings is only just visible in three places, the ground colour being equally black. The body, legs and antennæ are normal. On the underside the median area of the forewings is again black, except the nervures, which are red-brown, and the termen of the wings ochreous, the black not being carried to the fringe as on the upper surface. Anterior silver spots of hindwings backed with olive-brown. Submedian series deep blue black with a few silver scales—most on lowest spot. These spots are set in a somewhat lighter olive-brown ground. Terminal silver spots small, slightly sinuate and anteriorly edged with red-brown. The ground colour of the hindwings is a very perfect blend of three colours, olive-green, olive-brown, and a trace of ochre. The fringe is whiter than in the type. The whole butterfly is of very striking appearance and somewhat resembles a specimen caught at Ipswich in 1827, and figured in Curtis' *British Entomology*.

Some spring and autumn observations chiefly in south-east France.

By H. ROWLAND BROWN, M.A., F.E.S.

For the first time in my life as a collector I think, it has fallen out this year that I have seen the first and last butterfly of the season abroad, and, curiously enough, at points within a few miles of each other. On March 26th I left London, arriving next morning at Avignon, and the first insect on the wing that greeted me was *Pieris brassicae*; some months later, as I turned northward from Vienne, on October 20th, the last butterfly I remember to have seen was a fresh female of the same species flitting weakly over the ancient walls of that extremely interesting city of the Romans. From the cabinet point of view, 1902 has been a marked failure for me, not because of any particular scarcity of insects in their usual haunts, but because circumstances took me to them at the earliest and latest months for day-hunting in the south-eastern corner of France. The best day of the whole year was undoubtedly the first that I unfurled my net—March 31st—when I found myself at the Pont du Gard, on ground well-known to other collectors, and, at a later date, even more prolific of species than on that brilliant spring morning. The cistus was not yet in flower, but the limestone hills were sweet with the scent of a small white narcissus about the size of a snowdrop, thick clusters of rosemary, and the ever suggestive fragrance of the budding thyme. Among the

DECEMBER 15TH, 1902.

ilex, prickly oak, and box, with which the cliffs of the Gard are wooded, there are numberless open glades, and in them and upon the warm rocks that face the river butterflies abound. The Swallow-tails—*Papilio podalirius* and *P. machaon*—swung lazily over the lower scrub; *Pieris brassicae*, *P. rapae*, and *P. napi*, with those typical butterflies of the Midi, *Anthocharis belia*, *Euchloë cardamines* and *E. euphenoides*, ♂s (ranked as a distinct species in the latest Standinger catalogue), with the flashing *Gonepteryx cleopatra*, and an occasional *Leptidia sinapis*, were everywhere. *Colias edusa*, small, but in prime condition, suggested an early emergence. *Callophrys rubi*, surely the commonest butterfly of the broom-clad Alpes-Maritimes and the hot Provençal hills, was already in full force, while of the Lycaenids, *Cyaniris argiolus* ♂s were settling on the ilex leaves, and the herbage teemed with *Polyommatus baton* (somewhat worn), *P. icarus*, *Thanaos tages* (very common) and *Chrysothamnus phlaeas*. The hibernated Vanessaids were also conspicuous, and, as a rule, looking little the worse for their winter slumbers. Of them, *Pyrameis cardui* was perhaps the commonest, with *P. atalanta*, *Euranessa antiopa*, *Aglais urticae*, and an occasional *Polygonia c-album*. Lastly, *Pararge egeria* and *P. megera* completed the list of butterflies about. With the exception of a few specimens of *Carcharodus alceae* on the grass plots outside the wonderful bastions of Aigues-Mortes on April 1st, I met with no further new species until I arrived at Digne, on April 5th. Here a disappointment was in store. The weather, which previously had been glorious since I left England, broke up, and of the whole week I spent in the capital of the Basses-Alpes, only one day was entirely fine. The orchard-trees and the flowering shrubs in the gardens, however, were worth a visit alone, and the plums especially proved attractive to *P. podalirius*. On April 6th, going off in search of *Erebia epistygne*, and taking La Collette from the Dourbs road, I saw several males, but, owing to the wind, failed to secure them. In the more sheltered gorges, *Nomiades melanops*, both males and females, were common enough, *Breuthis dia* was already showing signs of wear, and *Euchloë cardamines* (♂s) was just coming out with *Hesperia mulvae*, and again swarms of *Callophrys rubi*. The afternoon turned wet, but next morning, though the wind persisted, the sky kept clear, and on the slopes behind the old cathedral I took a single ♀ *E. epistygne*, a very fresh pair of *Thais medesicaste*, and a sprinkling of *Anthocharis belia*. On the walls of the convent, *Polygonia egea* basked in the sun, and *Gonepteryx cleopatra* was again extremely common. Meeting one of the Coulets on La Collette, he had advised me as to a certain spot under the Dourbs where I should undoubtedly find the desired *Erebia*. Accordingly, on the 8th, I spent the whole day on the mountains. Result, one ♀ and one single *Hesperia sae*, and with these the spring season ended for me, as it rained four days on end after, and by the 15th I was back again in London.

My second tour in France was not undertaken with entomology as a chief diversion, and occupied but three days, mostly spent on the bicycle between Étapes and Calais, by Crécy and Hesdin, to St. Omer. I merely mention it because the country, especially in the neighbourhood of the river Canche, turned out unexpectedly charming and well-wooded, the butterfly fauna strongly reminiscent of the New Forest, where, in this late season, I found *Limenitis sibylla*, females, quite fresh

in an interval of sunshine, vouchsafed during the two days' storm of July 26th-27th. The greater part of the Pas de Calais is highly cultivated, but the chalky soil makes useful banks beside the roadsides, and there are pleasant dingles with well-tended coppices of hazel, oak and ash. In them, *Dryas paphia* swarmed with *L. sibylla* and *Leptidia sinapis*, but, with the exception of a single *Chrysophanus dorilis*, I saw no other than the species we might net in a day's walk in any 'entomological' wood on our own side of the water. This *en passant*, and merely to suggest how, in a country husbanded to the last acre, species which have long since disappeared from similar areas in the United Kingdom, continue to hold their own, apparently unaffected.

My third departure promised a more interesting field, but once again the note-book is chiefly filled up with what I expected to find and did not. The start was anything but promising. Two days of rain and cold precluded my arrival at Turin, the first week in October. But the weather, at any rate, soon mended, and, coming from Cuneo by the Col de Tenda to Ventimiglia, I was able to get some sort of idea of the later butterflies of the Mediterranean coast. Both *Colias edusa* and *C. hyale* were large, in perfect condition, and common below Breglio; one battered *P. podalirius*, an almost indistinguishable *Pararge maera*, a few *Epinephele jurtina*, one *Coenonympha arcania*, with the common Pierids, completed my observations. Now October is the wet month *par excellence* of the Riviera, and I was not aware of the fact when I started. During a week spent at Beaulieu, October 8th-14th, I was, however, lucky to enjoy many fine exceptions to the rule, and even when it rained the clearing was sudden and effective—pouring torrents at sunrise, brilliant summer, cloudless blue, at noonday. Beyond the limits of the villa gardens, the grass and wild flowers of these lovely cliffs is all burnt up at this time of year. Great bushes of a "golden rod," with woolly grey-green leaves, helped materially to solve the universal grey, while the sheen of the olive and the ilex, the changing vine leaf, and the glimmering orange groves are a never-ending delight to the unaccustomed northern eye. A walk one bright morning (October 9th) up that narrow cut in the hills known as the Val Müerta to the Corniche road, high above—rather a memorable day, as I was emancipated from five weeks' foot bandages—yielded the following list of observations, for I can hardly say I made a bag at all:—*P. podalirius*, one very worn; *G. cleopatra*, one fine ♂; *Colias edusa*; *Chrysophanus phlacas*, in good condition; also a diminutive brood of *L. icarus* and one or two small *L. belargus* and *Coenonympha pamphilus*; *Pyrameis cardui*, very common, in all stages, from fresh primitiveness to utter dilapidation; *Satyrus circe*, one; *Polygonia e-atrum* and *P. eyea*, both fresh and active; *Pararge megera*, males and females, just emerged; *P. eyeria*, common on ilex and where the clematis hung over the rock path, but by no means confined to the shade, as I saw it constantly flying in the sun upon the shore under the low wall, that is apparently all the protection required against the tideless ocean. At the Corniche elevation I netted a single broken ♀ *Lampides boeticus*, and, among a heap of loose stones, at the highest and windiest point overlooking the bay of Beaulieu, I chanced upon quite a little colony of *Adopaea thaumas*, bleached almost white by wind and sun. The

Hesperiids are a hardy race, but, as it seems to be generally agreed that there is but one brood of this species, it may be assumed that the emergence is somewhat prolonged. My earliest date of capture abroad is June 23rd, 1899, at Susa, and this in the mountainous country of the Mont Cenis region, whilst it was not out at Digne that year before. The Riviera brood is not likely to be later beginning than this. Bromilow in his Catalogue gives June to September; my earliest observations in England show the first week in July. I do not remember ever to have found it on the wing after the first weeks of September. Here, at least, the flight is prolonged over a much longer period. On October 16th—a splendid day with a cloudless sky—through mountains gorgeous with the changing hues of autumn, and especially beautified by the dazzling red of the *Ilex cotinus*, mingled with the burnt gold of the sycamore, the diligence carried me from Puget-Teniers to St. André. Very few butterflies were upon the wing, with the exception of the ubiquitous *Colias*. At the top of the pass which looks towards St. André I noticed, however, a single *Brenthis euphrosyne*, evidently the last of the second brood, and one specimen each of *B. dia* and *G. cleopatra*. On the 17th I was once more at Digne, but just as the first week in April was too early, so the third week in October was obviously too late, and an overcast day did not assist matters, though I spent the whole of it in the morning on the right bank of the Bléone, in the afternoon on the slopes above the old cathedral. The former locality produced *Chrysophanus philarus*, quite fresh; one female *C. dorilis* (? third brood); several *Polyommatus corydon*, males, one, with most of the black borders obliterated; a brood of *P. icarus*, presenting no special features; and one small male *P. bellargus*. In the poplar copses by the riverside *Pararge egeria* was common, and a large worn *Catocala* flew up out of a small potato patch. On the other side of the river I saw nothing on the wing, and with this morning terminated for me the season of 1902, for the rest of my time was devoted to towns and cities, which soon brought me beyond the influence of the not always "sunny" south. I had certainly hoped to have made up a rather better note-book of emergences, to say nothing of captures. *Lampides telicanus*, which occurs on the Riviera right up to December, I did not see. *L. balticus*, which obviously hibernates in the imaginal stage—if, indeed, it be not continuous in these southern climes, for I found it four years since at Hyères in much the same condition on April 3rd—was confined to Beaulieu (*cf. Ent. Rev.*, vol. ix., pp. 250-1). As far as weather goes, the early season to the end of May appears to have been unusually wet at Digne, but not so on the Riviera, where a rainy season comes with the regularity of the tropics in October. In the case of some single specimens I may add that, though I did not catch them, I was most careful to secure absolute identification, and one or two such (? *A. belia*, and ? an *Erebia* on the St. André road) I have relegated to the "entirely doubtful" list. Entomologically speaking, my spring and autumn visits have yielded little, but I have "staked out" in a sanguine spirit several promising localities for further investigation which I hope to reach next year, before the autumn has finally set its seal upon the collector's hopes.

Migration and Dispersal of Insects: Final Considerations.

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

Nothing would have given us greater satisfaction than to have discovered in our enquiries into this subject an analogy between the migration of insects and the migration of birds, but we can find none. The latter is regular, systematic and purposeful, the former appears to be spasmodic, irregular, uncertain, and undertaken solely on account of the absolute necessities of the time, yet there is one point in which an analogy appears to exist. Migrating birds from the tropical and subtropical areas north of the equator go north, those from the tropical and subtropical countries south of the equator go south; so undoubtedly do the insects, and one is tempted to suspect that the primary motive was common to both. It has been suggested that, as the present northern subarctic regions in comparatively recent (Miocene) geological times had a subtropical climate, and possibly fauna and flora, the slowly changing climatic conditions drove certain members of the fauna (and flora) southward very gradually during the winter, but that they regained the lost ground in summer and returned to their old haunts to breed, and that thus an attempt was made to maintain the old ground. But each successive winter drove them just a little further than its predecessor, and the distance to return in summer became greater; and then, when, later, the climatic conditions became gradually ameliorated, it is supposed they attempted and still attempt slowly to regain the lost ground. There are many objections to this being considered as initiating a migrating tendency such as that observed in many insects. It may be accepted as forming a basis for the acquisition of a habit of following up annually the region that best afforded food at each season, but it is difficult to understand how such a dispersal tendency for food purposes could be changed into a migrating tendency on a large scale, especially in such short-lived animals as insects. On the other hand as an element in dispersion within given limits, one sees that climatic conditions may come in. As a matter of fact, a species occupies a certain area, some a greater, others a less, usually in a number of isolated habitats. Every species spreads, or attempts to spread, each year beyond its normal limits, but is cut back ruthlessly by climate, etc., to its normal area. Seasons, however, vary, and, according to the conditions, the species may be pruned more severely, in some seasons on its northern, in others on its southern, limits. If it happen that the pruning is done more markedly on the northern or southern side for several seasons together, there will be a swinging of the central point of the habitat north or south as the case may be, whilst on the whole the average remains stationary. The species may be looked upon as being secure at this central point and tries to spread in all directions, but is continually pressed at all sides to keep to its true territory. If now the secular change of climate above hinted at came in, so that there was an excess of pruning done on the north, and if there were none done on the south margin, as is assumed, the species would gradually shift southwards, but, as far as actual spreading or migration is concerned, the species really does nothing at all different from what it did before and can acquire no habit of migration thereby. The fact is we are scarcely yet in a position to speculate on the stimulus that

gives rise to migratory flights in insects, more particularly in lepidoptera. Some species appear to have a constant migratory instinct. Certain individuals, why we do not know, set off and fly apparently as far as they can, in a more or less definite direction, possibly because in some way they recognise that the ground is already occupied, and the excess individuals when the species abounds set off on a migratory quest for unoccupied ground. The presence of flying specimens of their own (or other) species may be looked upon as the stimulus, and so long as a swarm keeps together, the stimulus persists and the swarm keeps on so long as its individual members can. When a species occupies a habitat very favourable to it (*Pyramis cardui* in north Africa in perhaps an instance), this abundance must occur almost every year, and it is only by such migration that the species does not exterminate itself by eating up every available scrap of food before the larvæ are half grown. Despite their well-known migratory habits, there is reason to imagine that locusts do actually exterminate themselves over large areas. Suppose this self-extermination does actually happen, then the survivors are only a few that did happen to migrate; their progeny would have to work back to the favourable areas again, and then multiply exceedingly and repeat the process, and, after a time, the species would be descended from these occasional migrants in a number of their preceding generations, and it would become an instinct of the race. But with short-lived animals, such as insects, there could not possibly be any of that regular movement due to knowledge, that one readily understands in birds, and the migration of insects appears to us to have, beyond the initial cause of the tendency to dispersal, nothing in common with that of birds. Trimen, whose observations, being made in South Africa, are especially valuable, writes (*in litt.*): "There is, in the nature of things, no migration proper, *i.e.*, like that of birds, among such short-lived creatures as butterflies. The great assemblages of the latter, all moving onward in the same direction—which seem to be almost confined to *Pierinae* and *Danaïnae*—appear to be cases of emigration under pressure of abnormal multiplication in specially favourable seasons for the larvæ. It has been sometimes stated that only males composed these travelling myriads, but, although that sex was much more numerous in the few instances of the kind that came under my own and Colonel Bowker's observation in South Africa, we took a fair proportion of females among them, and my belief is that the food-plants over a large area, having been denuded of foliage by the unwonted number of larvæ, compelled the females to go far afield in search of some district containing fit plants for oviposition, and that they were naturally accompanied by the males. Of course, under normal conditions, every species is doing its best to extend over larger areas, and there is evidence in South Africa (and no doubt also elsewhere) of conspicuous species having extended their range to the southward in recent years, *e.g.*, at Durban, in Natal, a locality well-worked for butterflies by a good many resident collectors, it is certain that three species, *Crenis rosa*, *Golartia wakefieldii* and *Pieris spilleri*—which nobody could avoid seeing if they were about—made their first appearance there and on the Natal coast generally, some few years since, as stragglers from the north, but are now firmly established as resident species."

The causes of insect dispersion, then, so far as they relate to

butterflies and moths, are still very obscure. The migration of those insects whose imagines are voracious to the highest degree, as those of locusts, are evidently based on the absolute necessity of supplying their own immediate wants with food. Dragonflies are also voracious in the imago state, and their migrations may probably be due also to necessities of food, or still more probably to the drying-up of their breeding-grounds. The migration of ants also, has no doubt its origin in necessity, and their spread is evidently to prevent overcrowding and for the purpose of cross-fertilisation. Their migratory swarms appear to be largely confined to the male sex, the latter taking voluntarily to flight, whilst the workers, in many species at least, actually drive off the females from the nest in which they have been reared. As the females are driven off at the time that large swarms of males are on flight, and pairing takes place whilst on the wing, close interbreeding is thus prevented, and the physical excellence of the insects is maintained. But what are we to say about butterflies and moths whose only food is the sweet nectar distilled in some fairy cup in the bosom of a charming flower, who leave a flowery Eden in subtropical lands and take vast journeys by sea or land, not to advance their own welfare, but for the sake of their yet unborn progeny?

Is any explanation of this forthcoming? It is a generally accepted opinion among scientific men that the orthoptera, to which locusts belong, is one of the most ancient orders of insects. It is further believed that those insects which show the greatest and most marked differences, between their various stages (larva, pupa, imago), are the most recently developed, whilst those which have no very marked differences in their various stages are the oldest. If this be so, it follows that those which have undergone the greatest amount of differentiation from the ancestral type, such as hymenoptera, diptera, coleoptera, lepidoptera, will be likely to retain some slight traces of the habits of their ancestors, and if this be allowed, and if, further, the general opinion that the lepidoptera have been developed from offshoots of the neuroptera, and these again, farther back, from forms related to the orthoptera, be true, it becomes evident whence our lepidoptera may have first derived the migratory instinct which some of them still possess in so high a degree.

There is, of course, no reason why, with the instinctive faculty of migration present, it should not become active when the parent is seeking for food whereon to lay eggs as much as when the parent feels the necessity of obtaining its own food. It must be borne in mind, however, that males as well as females, at least of some species, migrate, and the instinctive faculty that would lead the females to migrate for egg-laying purposes, would hardly find a potent response in the males, unless the faculty were of a more generalised character than the premise suggests. The migrating instinct in insects seems to have a deeper-seated origin than this, and one is inclined to look upon it as a survival of a very old habit which has been transmitted through past ages, and preserved where, for any purpose whatever, its use has been of advantage to its possessor. It is very doubtful how far some of the instances recorded in the preceding chapters are really migratory movements at all. Especial reference is now made to the records relating to the genus *Callidryas* and allied genera in Central and

Southern America. These so-called migrating swarms usually fly from the northwest to southeast, and it has been suggested that this is due to the fact that at the time of migration the vegetation of the Pacific slopes is parched, whilst the forests of the Atlantic slopes are green. But the fact that the butterflies fly year after year from the same direction shows that, wherever they come from, they must lay their eggs, at least in part, before migration. Besides, the Pacific slopes are certainly not to the northwest of these areas, and the butterflies are not suspected of crossing the Rocky Mountains or the Andes. The migrating species in Nicaragua, referred to by various writers, must come from the forests of Honduras and Guatemala, and those in the Amazon valley from the countries to the north and northwest of that river. It appears, therefore, that these so-called migrations are at the most only local dispersal movements from regions that regularly produce these species in excess. Such at least is our impression after full consideration of the facts. Bates and others have noticed that many of these flights are composed entirely of males, an important fact, if true, that puts the movements of these species in quite a different category from those of such species as *Colias edusa*, *Pyrameis cardui* and *Anosia archippus*, in which both sexes are equally abundant.

It must be considered as quite outside the province of this paper to show how the presence of man has, in some instances, led to the extermination of animals and plants, and how, in certain cases, his presence has led to the spread or wider distribution of other species. This is especially the case with those insects which feed upon cultivated crops. Just as the spread of many plants (especially cultivated plants) has caused the spread of birds attached to them, so the spread of plants has, more or less, influenced the spread of insects. The introduction of non-indigenous timber trees into Britain from various districts, has added a large number of insects to our fauna, and the sustained extension of the area over which *Anosia archippus* has spread is dependent upon the growth of the *Asclepias*. It would appear, too, that the well-known Colorado beetle feeds in America on the native *Solanum rostratum* and that, wherever the beetle, owing to the cultivation of the potato (*Solanum tuberosum*), has spread more rapidly than its native foodplant, the crops have been injured; but as the native foodplant spreads the potato is left for it and but little harm is done. There can be little doubt that the introduction of the potato into its haunts has enabled it to spread very considerably. The Coliads revel among our cultivated clover crops, and endless other cases might be cited.

The question of the migration and dispersal of insects has heretofore received nothing but the most haphazard treatment, and it is only quite recently that the broader questions underlying dispersal movements have been at all carefully considered. Already there are signs that scientific methods will be applied in the near future to this subject and that careful observations and reliable statistics will furnish data for useful generalisations bearing on the subject. A paper by Webster (*Rept. Ent. Soc. Ont., 1901, pp. 63 et seq.*), entitled "The trend of insect diffusion in North America," illustrated by maps, sketches the paths by which some insects, once unknown in North America, but now common, have made their way to their present areas of habitation,

and the author also points out some generalisations suggested by the facts at disposal. The species dealt with are chiefly introduced ones—*Pieris rapae*, *Aphodius fossor*, *Crioceris asparagi*, *Phytomonus punctatus*, *Haematobia serrata*, *Cryptorhynchus lapathi*, &c., and hence are somewhat outside the purview of this paper, except that a want of knowledge of these and their mode of dispersal might vitiate generalisations based on observations made on native species. The general spread of those species that have entered the States from Canada has been south, and must be carefully distinguished from the dispersal of native species, e.g., *Doryphora decemlineata*, *Leptocris tririttatus*, *Diabrotica longicornis*, which, coming up from the south, extend north and east, making more or less permanent settlements under favourable conditions of environment, and appear to be especially influenced by the increase of food supplies derived from the spread of agriculture. Broadly, the dispersal movements of insects in the Nearctic area are similar to those observed in the Palearctic, viz., from subtropical to temperate regions, but, at the same time, it must not be overlooked that there is some evidence of the spread of certain members of the subarctic fauna southward. Schwarz has dealt (*Proc. Ent. Soc. Wash.*, i., p. 186) with the distribution of *Aphodius rufipes* and *Nomius pygmaeus*, but the facts at present are not numerous, and the whole question bristles with difficulties when one attempts any generalisations. One can only hope that the near future will give us more reliable facts on which to base our generalisations.

There are but few conclusions that can be formulated in the present state of our ignorance, and, as we have already said, the different phenomena included in our summary of the recorded movements observed in the species of the various orders, and the different factors influencing the different orders, of insects considered, make generalisations rather worse than useless. If we say that migrations take place irregularly, and only under stress of the development of an unusual abundance of species resulting in the failure of the foodplant, so that there is a surplus population to be got rid of, it may be quite true with regard to the occasional extensive movements of lepidoptera, but is absurd in its application to the regular autumnal spring movements of aphides from one foodplant to another, the annual spring swarming of *Apis mellifica*, or the autumnal nuptial swarming of ants. We may assert that, on the whole, the general trend of all dispersal movements in the northern hemisphere is northerly, and in the southern hemisphere is southerly, but we are well aware, and have just illustrated the point, that local dispersal movements may be in other directions, whilst it seems clear that there are no return swarms that are at all comparable with the going and returning journeys observed in bird migrations, i.e., no return autumnal journey in a direction opposite to that taken in spring. Nor are we at all clear what inherent impulse is the prime factor in bringing about, in some species, at far distant times, the desire to migrate and to leave the place in which they are bred. On all points relating to the migration of insects we want detailed facts based on accurate observations. When these have accumulated we may be in a much better position to discuss the *rationale* of migration. At present we have only attempted to bring together the observations already made and to add such remarks as the facts at present seem to warrant.

British Lepidoptera.*

By W. BATESON, M.A., F.R.S., F.L.S., F.Z.S., F.E.S.

The third volume of Mr. J. W. Tutt's *British Lepidoptera* is a really important book. It has been compiled on the same plan as the preceding volumes, though partly on account of the particular genera treated, but more from the catholic taste with which the author has brought together his materials, the present work is even more useful to the scientific entomologist than vols. i and ii. To the collector and systematist Mr. Tutt's books are without doubt of high value. The analysis of specific and varietal characters is evidently made with extreme care, but, to the general naturalist, and especially to the student of evolution, the book has a direct and uncommon importance.

Nothing of this kind has been attempted in any language hitherto. Mr. Tutt, though modestly entitling his work *A Natural History of British Lepidoptera*, has gone much further afield than such a title would lead a reader to expect. For example, in treating *Lasiocampa quercus* we are provided not merely with a discussion of the British races, but an abstract is given of all that has been observed in the field or discovered by experimental breeding regarding the foreign forms and the laws which govern their heredity and variation. Again, in connection with the natural history of *Saturnia pavonia*, Mr. Tutt introduces a full account of Standfuss' important experiments in crossing the Continental species. Many similar examples might be given illustrating the broad scope of the work.

It may well be imagined that in dealing thus liberally with species such as *quercus*, *potatoria*, *pavonia*, *tiliar*, *populi*, and *ocellata*, all forms famous in the literature of variation and hybridisation, a very fine body of evidence has been amassed. To take the subject of gynandromorphism alone, it is scarcely too much to say that the raw material for a treatise is scattered through Mr. Tutt's pages.

The abstracting and condensation of the evidence, so far as it can be judged by one who is not a professed entomologist, has been most carefully done, and the reader may feel confidence that, though the points are concisely put, exaggeration has been consistently avoided. Altogether, such a work is one to be thankful for, and there can be no doubt that such a publication will stimulate the younger generation of students to step from the narrow track of mere collecting and to wander off into the more fertile fields of experiment and observation of living forms.

When so much has been done for us criticism is hardly in place, yet a reviewer can scarcely avoid repeating a word of regret that the author has not leisure to digest his materials rather more completely. The trained student knows what to expect under the head of *quercus*, *populi*, and the like. He will easily find his way to the matter he is seeking, but even a professed naturalist, who had not a fairly clear idea beforehand of the class of fact each species was likely to provide, might find a good deal of difficulty in using the book. The kind of organised arrangement called for is, unhappily, about the most exacting task an author can set himself, and many a fastidious writer has never

* *A Natural History of the British Lepidoptera*, by J. W. Tutt, F.E.S., vol. iii. London: Swan Sonnenschein and Co., Paternoster Square, E.C., Price, £1 net.

published his collections at all because he had not the opportunity to arrange them ideally. Let us be grateful to Mr. Tutt that he at least has not sinned that barren sin.

A subject-index would go far to put all this right. Mr. Tutt tells us in his preface that if anyone will make such an index, he will print it in the next volume. Cannot some keen young worker take him at his word? Meanwhile, the student of evolution must not be daunted by the difficulty of putting his hand at once on the fact he is looking for, and the physiological *chiffonier*, as Claude Bernard called himself, may be assured that if he will only rummage about a little, he will pick up some rare treasures in Mr. Tutt's heap.

To include everything that can by any possibility relate to, or interest the student of the British fauna, is to err on the right side, though the connection with that fauna be rather remote. Now and again, however, we come on a few pages which are very doubtful in point. Space being so valuable, we feel that, for instance, the details regarding the structure and classification of the Attacides of the world need not have found a place here, not that the facts are unimportant, but no one is likely to look for them in a work on a fauna which contains one solitary species of the group.

The unprofessional reader wonders, too, who *uses* the solid pages of locality-records in the case of species widely distributed. When these records detail the varieties of the districts, their value is manifest, and they will form a solid basis for the observation of future changes in distribution. Did we not feel sure that, in this case, the author knows the requirements of his public, we might be disposed to question whether this was really the best use to which the labour and space could have been put.

None of these remarks, however, detract from the statement that the new *British Lepidoptera* is a fine scholarly piece of work, for which not only the entomological specialist, but naturalists of all orders will be thankful to Mr. Tutt for many a year.

Notes on *Abraxas grossulariata* and how to rear it.

By (Rev.) G. H. RAYNOR, M.A.

To most of us who have been collecting English Macro-Lepidoptera for a considerable number of years in the same locality, a time arrives when we feel we have so thoroughly worked the species frequenting our neighbourhood, that the only way to sustain our flagging interest is to take up some particular species and thoroughly investigate its range of variation in the British Isles. In such a case the three desiderata are that it should be common, variable, and easily reared from the egg; for, although the last item is not absolutely a *sine qua non*, yet it is highly desirable. In the early nineties of last century, I was fortunate to breed (from wild Darent Wood larvæ) a very fine male aberration of *Angerona prunaria*, which I succeeded in pairing with a female of the ab. *sordidata*. I was thus enabled to establish a very fine race of this species and to enrich my cabinet with a long and remarkable series of this magnificent insect. The race died out in 1897, after an existence of five or six years.

In 1893, when I was living at Panton, in central Lincolnshire, I determined to go in for *Spilosoma lubricipeda*, and succeeded in finding

a considerable number of the larvæ feeding on elder along the coast in the neighbourhood of Louth. From these I bred several very dark specimens, the progeny of which showed truly marvellous variations. This race I kept quite pure until last year, 1901, when it was evidently becoming worn out. I therefore crossed it with specimens from wild larvæ taken at Hazeleigh, Essex, and Weston, Herts. and this year I further crossed it with specimens from wild Hayling Island larvæ. For some time, however, I had been feeling that I had thoroughly explored this Aretiid, and, on casting about for something else in which to specialise, I hit upon *Strenia clathrata* and *Abraeus grossulariata*. Of the former of these I will not now say more than that I believe it has no superior in point of interest (so far as variation goes), but that it is only moderately easy to rear from the egg. On the other hand, it possesses an advantage in the fact that, in a wild state, it varies more frequently (and perhaps I may say more remarkably) than any of the other three species.

Well, to return to our M-agpies, I began operations in 1899 by enquiring among my friends for information as to the best way of breeding this species from the egg, and although I found, to my surprise, that none of them had any experience in the matter, this only made me more anxious to prosecute the enterprise. Deeming it best to start by obtaining larvæ from somewhat distant localities, I procured some from Mr. G. F. Leigh, of Chiswick, and others from a friend residing in a large manufacturing town in the County Palatine, where I knew the species to be variable. The former, between 200 and 300 in number, produced nothing at all interesting, but from the latter lot emerged a beautiful pale female, at the first sight of which my rapture knew no bounds. I had never seen a specimen at all like it before, and, in my inexperience, imagined it to be unique, but have since learnt (partly by hearsay, and partly by experience) that this particular form is not infrequently bred from larvæ taken in this same Lancashire town. That it occurs elsewhere is proved by the fact that I possess a similar specimen bred by Mr. Thomas Salvage from a larva he took at Arlington, in Sussex. For convenience, I at once named this specimen a "creamy," that being the ground-colour of the insect. Mr. Barrett figures nothing at all like it on the two coloured plates he devotes to this extraordinary species in his work on *The Lepidoptera of the British Islands*, but the second woodcut in Newman's *British Moths* is not by any means unlike it, the chief difference being that Newman's aberration does not show any yellow blotch at the base of the forewings, such as all my specimens possess. This being apparently a well-known form, seems to me to deserve a distinctive varietal name, and the one I hereby bestow on it is *ab. lacticolor*.

The curious point about this *ab. lacticolor* is that all the specimens I have seen, numbering between two and three dozen, are, without exception, females. The first *lacticolor* I ever beheld was born on July 7th, 1899, and mated with an ordinary male of Chiswick origin; but, among their progeny (over 100 specimens) born in 1900, there was not a single moth at all closely resembling the mother; which, of course, was a very great disappointment. However, I effected several pairings (in June, 1900) among different members of this progeny, pairing pale with pale and dark with dark where possible. In the spring of 1901 I had so entirely abandoned all expectation of breeding

any more *lacticolor* that I sent a few larvæ of two different pairings to three of my friends, two of whom, the Rev. C. O. Hatton and Mr. F. J. Hanbury, each bred one *lacticolor*, but Mr. A. W. Mera had no such luck. I myself bred rather over a score, and obtained eight pairings (of ♀ *lacticolor*) with eight males as diverse as I could select. Before proceeding further with my story, I may remark that these 1901 *lacticolor* (which resemble one another very closely) are extremely fine and handsome insects, being nearly twice the size of their grandmother, and having the two yellow transverse bands on the forewings excessively broad and of a deep coppery-orange shade instead of the pale yellow of their 1899 maternal progenitor. This excellent size and colour is no doubt due to their being fed on gooseberry, and plenty of it. I have never seen such handsome *grossulariata* anywhere else, and, as I think a great deal of them, I have so far only parted with a single specimen. Reverting to my main subject, I have to make the marvellous statement that among the progeny (of these eight 1901 pairings), which consisted of 40 specimens born between September 20th and December 25th, 1901, and many hundreds born in the summer of this coronation year, not a single *lacticolor* has appeared! However, nothing daunted, but true to my family motto of "Nec mora, nec requies," I went in for *grossulariata* more strongly than ever this summer, as may be proved by the fact that I brought about no fewer than 74 distinct pairings, in a considerable number of which specimens of creamy origin were concerned, whilst stock from Bude, Durham, Hazeleigh, Lancashire, and Nottingham had to do with other combinations. Of these 74 pairings, Nos. 8, 14, 23, 49, 50, and 67 proved infertile, although I saw all the insects coupled and all the females (except one which laid a single egg) oviposited freely. I have now, October 27th, something like 50 pupæ from pairings of Nos. 1, 2, 4, 5, 6, 7, 9, 10, and many full-grown or large larvæ belonging to that and other pairings up to about the 20th. As gooseberry and currant (both red and black) are no longer obtainable, I am now feeding my larvæ on *Euonymus japonica*, which they do not like nearly so well. However, they will get nothing else this year. The larger ones will have to pupate on it, and the smaller ones will nibble it a little till they gradually go to sleep early in November. I find that they awake pretty regularly again about the beginning of March, when I supply them with *Euonymus* until the gooseberry comes into leaf. They are extremely fond of the tender gooseberry leaves when first expanded, but the prickly stems of this pabulum make it somewhat unpleasant to handle, and I feed my larvæ almost entirely on red currant as soon as the leaves of this *Ribes* are fully expanded. Black currant also produces very fine imagines, but I am unfortunately not able to get a supply anything like sufficient for the many thousands of larvæ which I now aspire to rear.

This autumn I have bred five imagines at present, the first of which appeared on October 13th, the second on the 16th, the third on the 18th, and two yesterday (26th). The first four are from No. 1 pairing, the fifth specimen from pairing No. 9, all of "creamy" origin, but none in any way resembling *lacticolor*. They are chiefly black, striated with white, and generally have a fulvous blotch at the apex of the forewing. In summer the duration of the pupal stage is very regular, and may be put at three weeks, but, in autumn, I find it lasts a week

or ten days longer. For the last three autumns I have bred a fair number of specimens and have only had one chrysalis that failed to emerge, although my last imago in 1901 only appeared on December 25th, "presenting" itself appropriately on this date to an enthusiastic admirer of the species.

I am fortunate enough to possess a small room, facing east, which I can devote entirely to the rearing of larvæ. It is 11ft. long \times 7½ ft. wide \times 9ft. high, and running round three out of the four sides, are three tiers of wooden shelves, each 9in. wide, distant, respectively, from the floor, 3ft. 9in., 4ft. 10in, and 6ft. 2in. All along these shelves are ranged boxes, the bodies of which are made of stout cardboard, and the lids of a cardboard frame filled with fronts entirely of glass—such boxes, in fact, as drapers use for displaying neckties in their shop-windows. These boxes are made specially for me by Messrs. Hugh Stevenson and Sons, Victoria Mills, Pollard Street, Manchester, and are of three different sizes, so as to nest into each other when not in use, the size of the largest being 14in. long \times 7½ in. wide \times 3in. deep. In order to obtain ventilation I cut out small oblong pieces of the cardboard from the middle of the N.E. and W. sides, and by means of seccotine, fasten pieces of fine white muslin over the apertures. The boxes must be kept upright and arranged at a short distance from one another all along the shelves. After sprinkling some sand on the bottom of each box, I insert a small bottle full of water, containing a piece of food-plant large enough to pretty well fill up the interior of the box. Thus treated, *grossulariata* larvæ seem quite happy, and thrive amazingly. The advantage of this system over all others known to me is, that one can, in an incredibly short time, walk round a large number of boxes—I have over 100—and see at a glance which larvæ want feeding and what imagines have emerged.

For the purpose of pairing (which generally takes place about 9.30 p.m., or, failing that, about 3 a.m.) I use a muslin covered framework of wire, stuck in a flower-pot about three-quarters full of light soil, the whole being placed out-of-doors about 7 p.m., before the moths begin to fly. Next morning I kill off the male and remove the female to one of my smallest sized cardboard boxes, in which I have already placed a sprig of currant for the reception of her eggs. Should this sprig wither before the eggs hatch, I put another sprig (in a second small bottle) alongside the old one, and the young larvæ crawl off on to the new food without giving me the trouble of moving them. I thus avoid a serious waste of time at an extremely busy season. The young larvæ remain in this same box from the time of their birth until about the following April, when, after a month's feeding from the beginning of March, they are ready to be transferred into a middle-sized box. They then grow very fast, and, if they are a large healthy lot, I generally transfer the greater part of them, before pupating, into a box of the largest size, where they have plenty of room to spin up.

The perfect insects resulting from larvæ thus plentifully and regularly fed, generally emerge at least a month before their time, so that from these one has a far better chance of rearing a second brood. Although there can be no doubt that this species is more variable in some parts of England than in others, yet I feel confident that good aberrations may be reared in almost any locality, if a sufficiently large

number of larvæ be obtained, certainly not fewer than 1000. The natural food-plant, in rural districts at any rate, is blackthorn. By beating this in the daytime a moderate number of larvæ may be obtained, but by far the best plan is to go out any summer evening, say between the beginning of June and the end of July, about an hour before dusk, when the larvæ leave their hiding-places and can be found with the greatest ease as they ascend the blackthorn trees. There is no difficulty whatever in getting a hundred in an hour. Then, when the light begins to fail, a further supply may be collected by the aid of a lantern. The younger one gets the larvæ the better, as they are not so much affected by parasites, and if fed up on gooseberry or currant they undoubtedly produce larger imagines.

The larva drops very easily, and it is a good plan to take out with one the bottom of a chip-box pierced horizontally by a flower-stick some two or three feet long. Larvæ feeding in a clear place fall readily into this apparatus when placed beneath them, and in the spring it may be used in a similar way for *Tæniocampids* feasting on the willow blossoms.

It will probably be news to many of your readers that, in Durham and Northumberland, there is a constantly recurring jet-black form of the larva of *grossulariata*. This I had never seen till the present year, when I received twelve or fifteen among a comparatively small number of larvæ sent me from a locality not far north of Newcastle-on-Tyne. Buckler figured this black form of the larva on Plate cxxiv of vol. vii of *The Larvae of British Butterflies and Moths* (Ray Society, 1897), and in the text on p. 151 (ad finem) he says: "These black larvæ at Newcastle produce the most ordinary form of the imago. Mr. Robson has since informed me that the larvæ are not all sooty-black, but vary in every degree, from the ordinary colour to uniformly black, even more so than the specimen I have described. Mr. Robson has bred a great many of them, but never got a variety of the imago from them." In contradistinction to this black form of the larva, I, this year, found one at Hazeleigh in which the black markings are to a very large extent obsolete, so that the caterpillar presented a remarkably creamy appearance. It possessed, however, the usual red lateral stripe, the absence of which renders the black form so remarkable and (to the uninitiated) difficult to recognise. The imago varies considerably in size, the largest specimen I have expanding exactly 2in., whereas the expanse of the smallest is only $1\frac{3}{16}$ in.

(To be concluded.)

Lepidoptera of Haute-Savoie: The Brevent.

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

Chamonix does not give up its insect treasures without hard work and continuous search. Meeting M. Robert, a well-known French coleopterist, at Argentière, he informed me that the valley has produced nothing really good under 2000 mètres, but that, once that elevation was reached, many good insects were to be obtained. This was even more strikingly true of lepidoptera. I had practically made up my mind that there was no good species of *Rhopalocera* in the valley, when I selected a fine morning, August 18th, to go up the Brévent, and a start was made shortly after 7 a.m. This outing brushed away

all the cobwebs as to whether the valley really contained any insects, and I look back on it as one of the most enjoyable days of my life. Not that I brought home many insects, possibly a couple of hundred for the day's work were all I pinned, but the enjoyment was intense; the perfect weather, the glorious outlook, the final view of the whole length of the snowy summits arising from the huge Mont Blanc range and the gleaming glaciers that lie in its scarred and seamy sides, all added their quota, whilst the return of health and strength and unusual vigour added zest to the long upward journey. Almost before Chamonix was left, *Parnassius apollo*, of large form, was seen flying among the rockstrewn boulders covering the huge scarred seam that leads direct from Chamonix to the summit of the Brévent, and yet elsewhere in the valley *P. apollo* had appeared to be a rare or absent insect. *Dryas paphia*, too, was abundant and in good condition, and there were also some ab. *calesina*; *Argynnis adippe* was still more common, but was soon replaced, as one ascended, by an abundance of *Argynnis aglaia* and *A. niobe*. There was no trouble to select a few fine silvery-spotted undersides of the latter from among the females, nor could one but be struck with the large size of the *Colias edusa* that occasionally flitted by. Certain steep flower-strewn gullies climb straight up the steep sides of the Brévent through the pine-woods, no doubt occupied with roaring torrents in winter, but now quite pictures of floral beauty. There was here an accumulation of fritillaries and a few *Leptidia sinapis* were observed, the species, not having been seen elsewhere in the valley, must be rare here, or the second brood not fully out. Taking one of these gullies and crawling rather than climbing up it, we find an abundance of *Erebia melampus*, *Chrysophanus virgaureae*, *Anthrocera purpuralis*, *A. transalpina*, and *A. filipendulae*, large numbers of *Pamphila comma*, and many other species among which *Eubolia bipunctata* was conspicuous. *Chrysophanus* var. *erybia* was going over, and so also was *C. var. gordius*, but *Syrichthys alveus* was in first class condition, and abundant; *Setina aurita* was in good order, but was not at all common. Blues were scarce, *Polyommatus corydon*, *P. icarns*, and *Nomiades semiargus* being the only species in more than single specimens. It was interesting to find *Erebia ligea* at the bottom of the slopes replaced by *E. euryale* before much of the ascent had been completed, whilst a single *Melitaea phoebe* was observed, and *Melitaea athalia* was neither uncommon nor in really bad condition. I quite appreciated Mr. Lowe's views concerning *M. athalia* (*antè*). Like him I can, of course, pick out certain definite forms of the insect, and say that this is more or less typical *athalia*, that more or less typical *parthenie*, and the other, I was going to add, more or less *aurelia*, but I am not at all cocksure that I can even do the latter, whilst, of course, the mountain *varia* has, in the mass, a facies peculiarly its own. I have a really fine series of this insect—*athalia*—*parthenie*—*aurelia*—*varia*—probably between 300-100, captured by myself and Dr. Chapman, here, there, and everywhere in the Carinthian, Tyrolean, Swiss, Italian, and French alps, in central France and Savoie, in Piedmont, in Spain, and Scandinavia, with German types from the dealers, and I confess I am at present beaten. Perhaps light will come some day. Rühl wrote an article on these insects some five or six years ago in *Societas Entomologica*. I wonder if any British lepidopterist who reads German would translate and summarise it and

offer it to us to publish in the *Record*. *Pyraus carlui*, *P. atalanta*, *Ajlais urticae*, and *Euranessa antiopa* were interviewed, as also was *Leioptilus osteodactylus*, and then, after a fine walk up the long zigzags among the pines, one found oneself leaving the pine forest and coming out on the big seam that is such a conspicuous feature at Chamonix, and possibly a third or fourth of the way up the Brévent. Immediately the fauna changed—*Erebia goante*, *E. tytarus*, and swarms of *E. melampus* were around one everywhere. *Anthrocerus purpuralis*, quite brilliantly tinted, boomed along in the sunshine, and worn *Coenonympha satyrion* began to appear, but still *Colias elusa* occasionally passed us and continued to do so almost up to the inn known as "Plan Pra," where, later, one was only too thankful to lunch, in spite of the high price and poor fare. A single *C. phicomone*, a worn ♀, also came to the net, the only one I saw in the valley. I was glad to get it, as I had all along wondered why the species did not occur here, and was inclined to think that, at last, in spite of suitable conditions, I had found a valley that did not grow *C. phicomone*; *Lycæna arion*, a single worn example, many were seen at the bottom of the ascent, all badly worn, and worn *C. var. gordius*, also occurred here, as well as lower down, whilst *Acidalia mutata* was now frequently observed. More or less worn *Erebia stygæ* and *E. ceto*, soon tempted me up among the grass and heather and rocks, in the hopes of finding some better examples, and I soon made up my mind that I had to get to the summit by going straight ahead and chancing the possibilities. So I went. These two last-named *Erebia*s soon began to get into better condition, *Coenonympha satyrion* swarmed, and had a marvellous knack of being most abundant in the most inaccessible and difficult places, and, when not clinging to the heather by one hand and netting with the other, I was lying flat with my toes dug into the slopes for a rest and a change. Then *Euthemonia russula* got up, and many *Nemeophila plantaginis*, and soon, as *E. ceto* was left behind, *E. mnestra* appeared. I climbed and crawled and sat and lay until I had got up about 800ft. of the slope, and my box would seemingly hold no more. Already five or six *E. mnestra* were pinned sideways on one pin, one above the other, the *Parnassius apollo* had been transferred to the lining of my hat, and sundry other changes negotiated, and it became at last necessary to get off the slope, besides all of which I was literally starving. As Mr. Moss has before told us, rolls and butter and coffee (even with jam and honey added) do not do much towards filling the aching void that an English lepidopterist seems always to possess. The tall tough heather made progress slow, certain insects must be taken after all, but, at last, I observed that the heather and grass were getting shorter, and presently a bending down of the herbage indicated a track. I followed the track and it led to a splendid spring of water, boxed in (but unlocked), and with pipes to carry the delicious fluid to the town below. Having refreshed myself I sat down. A well-defined path zigzagged from the spring up the mountain, walking was easy, and soon the net was busy again. A good deal of squeezing followed, and the numbers in the tightly packed box steadily increased. *Syrichthus alveus* and *S. sœo* still appeared with *P. comma*, and I was now up almost 7000ft. I had passed thousands of *Sciaphila argentana*, *Botys aerealis*, *B. alpinalis*, *Crambus conchellus*, *Scoparia sudetica*, and now the leaden-coloured *Hercyna phrygialis* was in countless swarms, whilst a species closely allied to,

if not identical with, *Mimaesoptilus bipunctidaetyla* was not uncommon. *Larentia olivata* had only a little before been disturbed from the rocks, and here and there *Acidalia flavcolaria* had been passed flitting in thousands, and *Cidaria populata* almost as abundantly, whilst *Stenopteryx hybridalis* accompanied one right up the mountain, and the little black *Pygmaena fusca* was frequent. A single *Pieris callidice* was taken, but *Erebia mnestra* was now the common insect. Boxes, however, were full and the appetite was urgent, and I pushed on, and, when the "Plan Pra" inn came in sight, I hurried up and allowed it full play. To say that I got no further that day is needless. After lunch I lay and enjoyed myself to my heart's content, nor was I even sorry that the clouds that commenced to gather on the mighty peaks opposite floated over and obscured the sun. I watched others toil on "to do" the mountain, and from the way they kept their noses straight to the front I wondered what they saw. At the bottom of the slopes the following day, although it was quite unsuitable for entomology, I met with sundry other species, of which *Lithyia carnella*, *Spilothyrus althacae*, and many *Anthrocera lonicerac*, of a large form, may be mentioned. *Melitaea athalia*, *Chrysophanus* var. *gordius*, *C. phlaeas*, *Erebia goante*, *Syrichthos alceus*, *Pamphila comma*, and several other species also were more or less abundant, and there can be no doubt, that, to make a big bag, one should work the Brévent up the great seam and not by following the zigzags.

On the Nomenclature of the Orthoptera.

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

In the *Zoologische Anzeiger*, no. 676, 1902, Dr. Hermann Krauss* discusses the question of the acceptance or rejection of some of the older generic names of orthoptera. The writings of so distinguished and profound an entomologist must have great weight, and his decisions may be taken as authoritative.

As is customary nowadays, the earwigs are separated from the orthoptera as a distinct order, but under the name *Euplectoptera*. Westw., while de Geer's name *Dermaptera*, is quite correctly applied to the remaining *Orthoptera*. It has been pointed out by many writers and on many occasions that the name *Orthoptera* of Olivier has never had any claim to acceptance until, from sheer familiarity, it was generally assumed to be the right one: a few courageous authors have rejected it in favour of *Dermaptera*, which has undoubted priority, besides being more appropriate.

The *Euplectoptera* have one family, *Forficulidae*, with *F. auricularia*, L., as the type of the genus *Forficula*. The *Dermaptera* are divided by Krauss into the three familiar sections, *Cursoria*, *Gressoria*, and *Saltatoria*. The former have the subfamily *Panchlorinae*, while the genus *Blatta* has for its type, not *orientalis*, L., but *surinamensis*, Linn., for Brunner's *Leucophaca* coincides with *Blatta*. Krauss defends *Kakerlac*, which is the genus of *orientalis*, while *Periplaneta* is kept for *americana*: the genus *Leucophaca* of Brunner has for its type species *surinamensis*, Linn., while *nirca*, Linn., is in *Panchlora*. But

* "Die Namen der ältesten Dermapteren (Orthopteren) Gattungen und ihre Verwendung für Familien- und Unterfamilien-Benennungen auf grund der jetztigen Nomenclaturregeln."

surinamensis, by a sort of elimination, is by this time the type of *Blatta*, which genus, therefore, corresponds with Brunner's *Leucophaca*. The genus *Phyllodromia*, which de Saussure suppresses as being synonymous with *Blatta*, is thus restored with its type *P. germanica*. So that, owing to Latreille, in 1825 and 1829, taking *B. orientalis* as the type of his new genus *Kakerlac*, this barbarous name must now supplant *Blatta* for the familiar *orientalis*. *Stylopyga* is, of course, a synonym of *Kakerlac*. Kirby, in 1891, refers to *Kakerlac* (proposed for *B. orientalis* and allies) and *Stelcopyga* (includes *Blatta orientalis*, &c.), as synonyms of *Blatta*; the difference between the arguments of Kirby and Krauss is this, Kirby regards *orientalis* as the type of Linné's genus *Blatta*, in which case it is permanent, but Krauss maintains that Latreille first fixed the type in making *orientalis* the type of his new genus *Kakerlac*.

The *Mantidae* are not affected, *Mantis religiosa* remaining the type species of the typical genus; *Phasma phthisicum* (Linn., 1858), which is more familiar under the name *Phasma nectydaloides*, Linn. (1863), is the type of *Phasma*.

But confusion reigns supreme in the *Saltatoria*. Brunner's names, which were based rather upon use and convenience than upon the strict law of priority, have been freely used owing to the immense and far-reaching influence of his *Prodromus* that appeared twenty years ago; but many writers, including Bolivar, Kirby and Karsch, have shown their independence. Krauss divides the *Saltatoria* into three families; the first is *Locustidae* (= *Acridiodea* of Brunner), which is again subdivided. The familiar *Acridium aegyptiacum*, Linn., gives way before *Locusta tatarica*, Linn., so that the *Acridiidae* become the subfamily *Locustinae*. Many entomologists will welcome this change. The *Truxalidae* of Brunner form the subfamily *Acridiinae*, with the genus *Acrida*, as has been adopted by many recent authors, including myself in a recent monograph. Krauss courageously rejects *Tettix* and *Tetrix*, which have no claim by priority, confirming the opinion of Kirkaldy (*Entom.*, 1901, p. 243). Fabricius' *Acrydium* must be restored, but here we meet with another difficulty. As we have already a subfamily *Acridiinae*, it would be pedantic to force the Law of Priority to its furthest extreme and so have *Acrydiinae* as well; *Tettigidae*, and *Tetrigidae* must be rejected; Krauss suggests the name *Paratettiginae*, from Bolivar's genus *Paratettix*. Brunner's *Locustodea* become *Tettigoniidae*, though Kirby and Karsch prefer *Phasgonuridae*. Krauss restored *Tettigonia*, its type species being *T. acuminata*, a Brazilian form, but it is not quite clear whether he retains *Phasganura*, Westw., for *T. viridissima*, or ranges it in *Conocephalus*; if he does, the latter must entirely alter its significance.

The crickets become *Achetidae*, a change that will be welcome to many. The genus *Gryllus* remains, not for our old friend the Cricket of the Hearth, but for an exotic Central and South American form, *Gryllus muticus*, Geer. The House and Field Cricket are thus permitted to take back their old-fashioned names of *Acheta*. *Gryllo-talpa* remains untouched, although Kirby prefers Oken's *Curtilla*.

Many entomologists will probably be disgusted to find names that are in general use thus submitted to a searching examination; those that cannot prove their right to existence must go, and the only difficulty is that most authors have slightly different ideas as to the

legitimacy of a name under certain conditions. Still, after this "Writ of Quo Warranto," Krauss restores many old friends, which were used by the last generation of British entomologists, and we think that his innovations will be met with more general favour on that account.

Collecting Lepidoptera in 1902.

By (REV.) FRANK E. LOWE, M.A., F.E.S.

Those who ought to know tell me that negative evidence is nearly as much wanted as positive. This is my sole excuse for recounting my disheartening experiences in June and July of this year. The wish had been—starting at a much earlier date than Mr. Tutt's visits—to add something to his valuable "Contributions to the Fauna of Piedmont." Thanks to his kindness I was provided with all the back numbers of the *Ent. Record* bearing on the localities to be visited. Also, at some little trouble and expense, I had little booklets printed, with lists of all possible butterflies, and the page opposite ruled in columns like a school register, that I might have no need to trust to memory, but simply "mark the attendance" of each species in every locality, with a series of signs to denote "fresh," "worn," etc. London was left on June 4th, and reached again on August 1st. Our trip was to Freiburg in Baden, Turin, Susa, Valle di Pesio, Aosta, Courmayeur, back to Turin, Verona, Bozen, Brenner, and home. Well, we did all this and more, but the whole tour has not given me a single new species for the cabinet, and very few which may serve to renew or extend existing series. Everywhere but at Bozen, where we were too late, insects were so abnormally backward that there was nothing to be done. The weather was generally wet, and always cold for the time of year, but, though the summer species were retarded, there was no consolation of belated spring broods. At Freiburg, June 6th was a dull day, thunder threatening, and nothing stirring in the woods behind the "exercising ground" but a few *Abraxas sylvata*. The next was a pouring wet day, and I was laid up with neuralgia. Sunday, entomologically a dies non. On Monday, the 9th, as it looked more promising, I was up and caught the 6.0 a.m. train to Neu-Breisach. It began to rain before I reached my destination, and never ceased for more than a few minutes at a time. The motive of the *détour* to Freiburg and Breisach, was the desire of a good series of *Chrysophanus dispar* var. *rutilus*. Last summer I had taken four in passable condition on June 14th, *viz.*, one male and three females. Two of the latter were boxed for eggs, and ruined as specimens without obtaining ova. This year I hunted up and down the sides of the moat which surrounds the fortifications, in the same spot as last year, but took not a thing, not even *Agrophila trabealis*, or *Baukia argentula*, which abounded in 1901. Turning to go back to the station I was "halted" by a sentinel of the 142nd Regiment of the Line, who calmly, but very decisively, barred the way. From his remarks I gathered only one word, "verboten," at which I offered my apologies in English, and again attempted to proceed to the station. At that he manifested more excitement, and signalled to other soldiers who appeared ready to hand. These made me understand that I must follow them. So we marched back with arms at the slope to the guard-room. Here a sergeant, pen and note book in hand, endeavoured to question me, but

as he only spoke his own language, and I did not, we got no "forrader." After much delay, I was sent under guard to the citadel, and was again equally hopelessly interrogated by higher officials, who spoke neither French nor English. They evidently suspected me, most unjustly, of knowing German, for—by the way they insisted upon seeing the contents of all my pockets—when I showed a "pocket pistol" of whisky and water, saying "flask," as I had named every other article in turn, one very typical German, in a green uniform, sprang forward, seized the lapel of my coat, and bringing his face down to mine, snarled, "Hein! You no hab Deutsch? 'Flasche' ist Deutsch. A-rrh! vat you said." I gently suggested that the name of the vessel was practically the same to both of us, but that the spirit was good Dewar, and like myself a British subject. Not to prolong an amusing scene which, however, is not entomology, they found at last a private who had been in England, and could speak the language of civilisation. He came, and in a few moments I was discharged, "without a stain on my character." It caused some amusement when I ventured through the interpreter to express regret for the trouble I had inadvertently given, but official dignity was greatly ruffled when, through the same mouthpiece, I asked if I might come again to-morrow. Next day I tried Gottenheim, another haunt of *C. var. rutilus*, but with no better luck. The 11th was dull with slight showers. I took, however, two *Aporia crataegi* at rest on flowers of scabious. One of these, a female, is of remarkable beauty, apparently just emerged, the underside of the secondaries being of a strong maize colour. The coloration is visible on the upperside, but it is on the underside that the full effect of this unusual tint is seen. The costa and tips of the primaries are slightly tinged with the same, but the contrast of their semi-transparent whiteness, with the smooth uniform opaque yellow of the lower wings, reminded me forcibly of the startling effect of the under side of *Delias eucharis*. The same ground where, on June 16th, 1901, I had taken *Thecla pruni*, worn but common, did not yield one this year, or anything, indeed, but *Brenthis selene*, and a few *Ypsipetes trifasciata* on tree-trunks. On the 12th, being a little brighter, *Pararge aethine* appeared in numbers in the wood, commonly settling on damp patches in the road, or on the lowest sprays of beech or hazel in the open glades. The question is whether the cold and wet had shortened the length of the spring flight of *C. var. rutilus* and postponed the advent of *T. pruni*, or whether neither had yet emerged, or both were prematurely over? Last season, at the same date, *Limenitis sibylla*, *Brenthis ivo*, and others, were to be had abundantly in these woods by the railway. Other things noted at Freiburg on this visit were *Leptidia sinapis* ab. *diniensis*, *Gonopteryx rhamni* (worn), *Polygonamatus icarus* (one male), *Polygonia c-album* (worn), as also *Pyrameis cardui*, *Vanessa io*, *Pararge egeria* var. *egerides*, *Coenonympha pamphilus* and *Carterocephalus palaemon* (both common). Out of conceit with Freiburg we left for Susa, at which little town of classic fame we arrived on the evening of the 16th. Here we had three fine hot days during our stay, which extended to midday of the 21st. Though so much further south, Nature seemed to be little more forward here than at Freiburg. On the 18th, about 500ft. above Sta. Maria della Lusa, I found the meadows filled with the pheasant-eyed narcissus, in its first glory, with *Ornithogalum nutans* and others,

which formed quite an early spring show. While we were at Susa the only common butterflies were *A. crataegi*, *L. sinapis*, and *Pararge macra*, with some remarkable fine *Pararge megera*. One of the latter, a female, measures just under $2\frac{1}{4}$ in., and is as large as a good *P. macra* female. Half a mile above Sta. Maria, June 18th, a few *Nomiades cyllarus* were sharing the puddles with *Nomiades semiargus*, and among them was one var. *blachieri*, of which more anon. Close to the river and the town *Anthocharis belia* (one) and a damaged *Limnitis sibylla* were taken. Below the Mont Cenis railway, *C. pamphilus* and *C. arcania* were plentiful, the latter very fine. Higher up a few *Cupido minimus* var. *alsoides*, and well marked *Plebeius argon* could be taken. *Polyommatus hylas* showed up once or twice, and *P. orion* yielded one really fine specimen, but otherwise was over for the time. One *Pieris napi* var. *bryoniae*, and *Callophrys rubi* (common and fine on the narcissus ground) completes this list in the higher elevations. Just above the vineyards which surround the town I got one *Thecla ilicis* var. *aesculi*, and one *Libythea celtis* (worn), June 18th. The Argynnids had not yet appeared, with the exception of some *Argynnis lathonia* and one good *A. adippe* var. *cleolora*. A single fresh, but very diminutive, *Papilio machaon* was all I saw of the genus *Papilio*, and three *Melanargia galatea* var. *procida* were doubtless the advance guard of a host to come after our departure on the 24th. *Spilothyrus althaeae* and *Syrichthus carthami* contributed one each. *Nisoniades tages* occurred often, with var. *unicolor* or *approximata*. Without doubt there would have been good sport at Susa later, but the hotel was not run on sound principles of sanitary science, to put it mildly, and uninviting, therefore, for a protracted stay. The absentee chiefly deplored was *Polygonia cyca*, which Mr. Rowland-Brown found so abundant about a week later last year. With empty store-boxes we took train to Turin, and on the next day train again to Beinette, from whence, after some difficulties with our driver, we reached Certosa di Pesio at 4.30 p.m. on the 22nd. The old Certosa, or monastery, suppressed by Napoleon, has been converted into a most comfortable hotel and bathing establishment. We were the first visitors of the season, and never more happy in country quarters, but the valley is close and relaxing. Even here we were too early for the summer of 1902. The first insect to attract attention was *Nomiades cyllarus*, on the road just beyond the arched gateway of the Certosa. It was fresh, and apparently continued to emerge during our visit, and a longish series was made up with the Susa captures. At

* It was doubtless a mere accident that Mr. Rowland-Brown (*antea*, vol. xi., p. 292) did not observe any of the food-plant *Celtis australis*, for it grows not uncommonly on the rocks on the road immediately above the Triumphal Arch, and on the right hand, on the way up to the little village, at which the path turns off at the left for Sta. Maria della Luso. Just around Sta. Maria and above there appears to be no favourable place for it, if (as its habit at Crevola, Val Strona, Val Anzasca and the Eggenthal, etc., seems to indicate) it requires deep crevices of rocks in which to root. I would add to Mr. Rowland-Brown's interesting list of dates for the flight of *L. celtis* from my own knowledge:—Crevola, June 3rd, 1899, fresh; May 26th, 1900, worn to ribands; Val Anzasca, June 12th-15th, 1900, fresh; Sarntal and Eggenthal, near Bozen, June 20th-22nd, excessively abundant and fine, July 15th, 1902, few rather worn. In these parts there seems to be a first brood over at the end of May, a second in June, synchronising nearly with the appearance of *Thecla pruni*, and probably, at least in warm summers, a third in southern Piedmont and the southern Tirol [vide, *Ent. Rec.*, x., p. 119, Mr. Tutt at Susa.]

least the quantity was sufficient to afford an opportunity to note the great variation in number and size of the antemarginal row of spots on the underside of the forewings. Six spots is regarded as the normal number, but the following analysis of the Susa and Pesio specimens may interest others besides myself. To take them in an ascending scale they run thus:—

MALES.—One var. *blachieri*, with only two spots, and these reduced to dots (I do not mean that this makes var. *blachieri*, but that this example has this deficiency); five with four spots; five with five spots; six with six spots; three with six on right, and five on left, wing; four with seven, and of these specimens one has a small but distinct basal spot on each upper wing. Kane says of this species "no basal spots."

FEMALES.—One with four spots; one with five spots; three with six spots; two with seven spots.

It is at least curious that of three, having an unequal number of spots right and left, they, nevertheless, agree in having the larger number on the right, and the lesser on the left side. In every instance where the spots decrease in number, they also appear to diminish in size, and show a tendency to become obsolete. Thus, in the case of the insect with only two spots, they are mere dots, Nos. 1, 2, 3 and 6, according to the normal setting, being absent. In those specimens credited with seven, it would perhaps be equally, or more, correct to say that the sixth, or last nearest the inner margin, is double, like a colon, which might be counted as one, but in these cases it is rather a double dash, and not round. Certainly this is a long range of variation in just over 30 specimens, and these not picked, but all that came to the net. The Susa lot are, as a whole, finer and larger than the set from Pesio, but they differ much in size *inter se*, as is the way with "blues." The other Lyceids observed were *Polygonatus arion*, worn stragglers; *Plebejus argus* and var. *acgidion*, *Polygonatus astrarche* type, *P. icarus*, *P. bellargus*, *P. hylas*, a few; and *Nomiades semiargus*, very numerous. The most prominent butterfly at this time was *Parnassius mnemosyne*; it was everywhere round the hotel, in the meadows, and also in the woods by the side of the river. *P. apollo* was not out, except one sad example, which I found hopelessly intoxicated in the heart of a large scarlet lily, and another of better morals. But abundant were the common "whites," and also *Euchloe cardamines* and *Leptidia sinapis*. *Colias edusa* was seen once or twice. *Callophrys rubi* was the only "hairstreak," and very fine. Some shabby *Chrysophanus rigauracus* indicated that the first brood was over. *C. phlacas* was fairly common, but no var. *eleus*. *C. dorilis* was represented by var. *alpina*, large, and I may say here that, as Mr. Tutt has found, this variety is in my experience generally larger than the type, though Kane says "a smaller mountain variety." *Nemobius lucina* was scarce and small. *Aglais urticae* everywhere. *Pyraucis cardui* in last year's coat, but two magnificent examples were taken which were so beautifully flushed with pink that it is a temptation to label them var. *huntera*. *Melitaea athalia* had not yet shown in any quantity. After a fatiguing climb up the sides of Mt. Besimanda (twice I essayed it, but having been wrongly directed never reached the top) I took a short series of *Melampias epiphron* var. *cassiope*, the first I met on the continent. All the following were more or less plentiful:—*Pararge maera*, *Coenonympha arcania*, *Spilothyrus althaeae*, *Syrichthys carthagini*, especially also *S.*

malvac and *Nisoniades tages*, with a single *Carterocephalus palaemon*. Among the nut-trees, *Eucosmia undulata* was in fine condition, with *Melanthia albicollata*, and the beautiful *Odezia tibiale*, and *Eumychia octomaculata* rose from the path pretty frequently. All these in the woods by the river. At the base of Mt. Besimauda, while pushing a way through stunted growth of nut, beech, etc., *Bomolocha fontis* was frequently disturbed, and a few *Asthenia luteata*.

The evening of June 30th found us at Courmayeur. Here it was soon evident, as elsewhere, we were too early. It is not necessary to name insects which are simply a repetition of what we had met before. On July 3rd, a little way beyond the baths of La Saxe, *Pararge hiera* was common, and still, in many instances, in fair condition, and also next day on the Val Veni road past the little Santuario N. D. de Guérison, though less numerous, many specimens were in really good order. This is one of those quickly-worn things which it is very difficult to obtain in best condition. On Mt. de la Saxe—I did not find it on the Crammont—*Pieris callidice* was flying abundantly, and though rather small, mostly quite fresh. At the back of Mt. Chetif, climbed from the Val Veni track, I took four *Anthocharis belia*, which are not var. *simplonia*, and still less var. *ansonia*. They might be described as *semi-simplonia*, and, I suppose, are the form alluded to by Kane—"It is to be noted that the silvery traits on several butterflies are replaced by plain white in higher latitudes." On the 5th one beautiful *Dryas pandora* was netted, fluttering as if seeking to enter the "Scuole Maschili" at Courmayeur. On the 7th I attacked the Crammont, and near the snow took one *Melitaea parthenie* var. *varia*, and what I first thought was another, but it proved to be a very small *Melitaea cinxia* male, at an unusual elevation. By Dollone were a few *Coenonympha aleiphron* var. *gordius*; one is a strange little specimen (female) not larger than a fine *C. dorilis*, and very lightly marked, so that, except that it has not the dark underwings, it might easily pass for a female of the latter. Of the Lycaenids, *Polygonmatius escheri* was chiefly noticeable, with some *Lycaina arion* var. *obscura* of a poor form, in the Val Ferrex. Of the Erebiids—*Erebia ceto* (very abundant), *E. erias* (one), *E. lappona*, *E. curyale*, and on Mt. Crammont one which, had I taken it in Tirol, I should have confidently named *E. nerine* var. *reichlii* ♀, but which proves to be *E. erias*. It is a recently emerged specimen, but unfortunately a lizard or a bird has had a slice out of its left lower wing. In a wood, a little before leaving the trees, on the Crammont, several large females of *Emydia cribrum* were flying in the sun, one brought home is over 1½ in. in wing expanse. All the other butterflies mentioned for Susa, except *Nomiades cyllarus* and *Libythea celtis*, were present, to which may be added *Colias phicomone* (one), *Melitaea phoebe*, *M. dictyana*, *Argynnis aglaja* and *A. niobe* var. *eris*, while *Pieris brassicae* *Pyrameis atalanta* and *P. cardui* all seemed happy at the summit of Mt. de la Saxe flying in the company of *Pieris callidice*. We stayed at the Hotel du Mont Blanc, beyond Courmayeur, but for entomology I should decidedly recommend Pré St. Didier as affording better hunting-ground.

COLEOPTERA.

NOTES ON COLEOPTERA TAKEN DURING THE YEAR 1902 IN THE SOUTH-PORT DISTRICT.—In spite of climatic conditions, apparently adverse—a cold wet spring and persistent sunlessness—the season's collecting has been, on the whole, very productive of noteworthy species. It is hoped that the following list may be of some interest as a contribution to local faunistic work, and to this end certain species have been included which, although not accounted rare, are, nevertheless, little known in the south Lancashire and Cheshire district. Such species as have not been previously recorded are indicated by a prefixed asterisk. I was unable to commence collecting before the end of April, when, despite the weather, beetles were well in evidence. It will, however, facilitate the collation of my notes if I arrange the species in their taxonomic sequence instead of noticing them in the order of their appearance. *Harpalus neglectus*, D., during the months of May and June was rather less rare than usual. *Pterostichus minor*, Gyll., usually rare in the south Lancashire district, was abundant. **Bembidium clarki*, Daws., was discovered amongst wet moss, Birkdale sandhills. Of **Ochthebius marinus*, Pk., a single specimen was swept one evening in June from damp herbage on the Southport foreshore. Three examples of *Myrmelonia limbata*, Pk., were taken in April crawling on the sandhills; an ant was in the act of carrying off one of these. **Homalota exilis*, Er., occurred in profusion in flood refuse from the Birkdale sandhills, May 3rd. **Habrocerus capillaricornis*, Gr., is one of the southern-ranging species which from time to time unexpectedly turn up in the district; the specimen was shaken from powdery fungus and leaves in a wood behind Scarisbrick Hall. *Phytosus nigricentris*, Chev., was, as usual, common on the shore during the autumn. *Queilus eruentus*, Ol., and its var. *viridis*, Rottb., *Q. fulgidus*, F., and *Q. obliteratedus*, Er. (= *suturalis*, Cox; Fowler in part), have all been unusually plentiful in heaps of cut grass and straw during the summer. Two specimens of **Mycetoporus angularis*, Rey., were taken in April on the Birkdale sandhills. Of *Staphylinus stercorarius*, Ol., always a rare species in the district, Mr. Sopp took a specimen in August, another being captured by myself in September. *Ocyopus brunneipes*, F., for some obscure reason, was in evidence for two or three days only at the end of August. *Philonthus micans*, Grav., was, as usual, abundant on the Birkdale sandhills along with *Actobius signaticornis*, Rey. During July several specimens of *Actobius procerulus*, Grav., were taken, and in the following month **Leptacius parumpunctatus*, Gyll., turned up. **Lathrobium longulum*, Grav., occurred during July and August, the first specimen being shaken out of a deserted bird's nest; *L. quadratum*, Payk., was captured at the roots of reeds. *Medon obsoletus*, Nord., was abundant, as it has been for the last two years, in a habitat now destroyed, so that for the future it will probably be taken rarely, as, though generally distributed throughout the district, it is very rare. **Bledius longulus*, Er., and **B. opacus*, Block., are two decidedly rare species with us of which very few specimens occur annually. *Trogophloeus rivularis*, Mots., *T. corticianus*, Grav., and **T. pusillus*, Grav., were taken in flood refuse from the Birkdale sandhills, May 3rd. This material yielded a most interesting species—**Thinobius brevipennis*, Kies. During a stay of a few days Mr. Tomlin discovered *Trogo-*

phloeus tenellus, Er., in abundance. **Homalium deplanatum*, Gyll., was found sparingly in cut grass. *Pseudopsis sulcata*, Newm., appears to be a regular summer denizen of our garden refuse heaps, though its capture is a tedious process, as it lives deep down in the material that has almost rotted to earth mould. **Euplectus karsteni*, Reich., and **E. signatus*, Reich., were taken in garden refuse. **E. piccus*, Mots., was found under the bark of birch logs. **Nephanes titan*, Newm., was swarming in the fine siftings from the refuse heap. **Clambus pubescens*, Redt., was taken in vegetable refuse; **C. minutus*, Sturm., was swept from wet grass, July 2nd. Two examples of *Agathidium marginatum*, Sturm., were taken on the sandhills. Of *Anisotoma ciliaris*, Schmidt, I took one specimen in the spring and two in the autumn. At the end of August I was so fortunate as to discover a locality where for about a month *Anisotoma furva*, Er., was by no means rare. *Hydrobius punctatissimus*, Steph., has been decidedly rarer this autumn than last. *Saprinus quadristriatus*, Hoff., was taken very sparingly during May and June. One specimen of **Gnathonus nannctensis*, Mars., was found under dung on June 2nd. **Monotoma rufa*, Redt., occurred abundantly in a heap of rotting straw, along with *M. quadricollis*, Aubé. **Brachypterus gravidus*, Ill., is very common on *Linaria vulgaris*. During May and June a few *Orthocerus muticus*, L., were found crawling on the sandhills. Three specimens of *Heptanotus villosus*, Gyll., were taken at the end of June. *Psammobius sulcicollis*, Ill., was, as usual, common in spring, with a much smaller brood in autumn. *Ammocius brevis*, Er., is a characteristic local species, appearing early in spring and occurring sparingly until about the end of June. The sudden appearance of *Aegialia rufa*, F., has already been noted in the *Ent. Record*. A specimen of **Telephorus darwinianus*, Sharp, was found in May in a burrow of *Bledius spectabilis*, Mr. Sopp took another on the sandhills; a systematic search will probably prove this species to be far from rare. *Ptilinus pectinicornis*, L., is a noteworthy find, only one specimen having been previously noted in the district. *Aromia moschata*, L., usually so common here in July, was not noticed until the following month; to make up for its tardy appearance it continued in evidence nearly to the end of September. For a district so well supplied with ponds and large drains as is the neighbourhood of Southport, the genus *Donacia* is unaccountably scarce, and the occurrence of *D. versicolora*, Brahm, is on that account worthy of mention. *Mantura chrysanthemii*, Koch, which I failed to rediscover last year, occurred in great abundance during May and June of this season in its old, very restricted locality. It seems to live exclusively on *Rumex acetosella*. When I introduced a friend to the place in June, a few steps were taken whilst sweeping the *Rumex*. The net was then emptied on a sheet. A hundred specimens were picked out and bottled, after which operations were suspended. Of *Cassida flavola*, Thunb., a few examples were taken in June. A single specimen of *Anthicus bimaculatus*, Ill., constituted "the find" of May 13th. Among the great group of weevils very few notable species have been taken, though the importance of some of these counterbalances their fewness. The remarkable elongate variety of *Hypera suspiciosa*, Herbst, on which the inclusion of "*H. elongata*" in our lists is perhaps based, was taken on two occasions in July. Several *Orthocertes setiger*, Beck, were taken on the sandhills during August.

A dark example of *Tychius squamulatus*, Gyll., was found on the Birkdale sandhills on June 2nd. **Gymnetron collinus*, Gyll., and **G. linariæ*, Panz., two apparently long-lost species, certainly constitute the most important local records for the season. Both species are quite confined to plants of *Linaria vulgaris*, and are decidedly local, the former being quite rare. At the roots of the plants were small, evidently newly-formed galls. Some of these gall-bearing plants Mr. Sopp, with his characteristic liking for life-history work, has transplanted to his garden and is studying. A single example of *Orobittis cyaneus*, L., taken on August 18th, concludes the list.—GEORGE W. CHASTER, Southport.

A DAY AMONGST THE COLEOPTERA ON THE SOUTHERN END OF LAZONBY FELL.—A day's collecting in this interesting locality was not without interest. I made a start at some rotten fungi, at an elevation of 400ft., I obtained *Ips quadriquttatus*, F., *Pocadius ferrugineus*, F., *Aleochara succicola*, Thoms., *Oxygoda alternans*, Grav., *Homalota xanthoptera*, Steph. and *fungicola*, Thoms., *Autalia impressa*, Ol., *Bolitobius lunulatus*, L. *trinotatus*, Er. and *pygmaeus*, F., *Omalium ruficorne*, Payk., *Proteinus oralis*, Steph., all very common; *Megarhynchus depressus*, Lac., *Philonthus aeneus*, Rossi., *Tachinus humeralis*, Grav., *rufipes*, L., *margineellus*, F. and *collaris*, Grav., *Cholera chrysomeoides*, Panz., and *Ptomaphagus sericeus*, F., a few of each. Going on to the higher ground up to 768ft., stone-turning produced the following species.—*Miscodera arctica*, Payk., one; *Cymindis vaporariorum*, L. (seven); *Bembidium nigricorne*, Gyll., *Trechus minutus*, F., and *secalis*, Payk., *Calathus cisteloides*, Panz., *flavipes*, Fourc., *melanocephalus*, L. and var. *nubigena*, Hal., *Harpalus ruficornis*, F., *aeneus*, F., *latus*, L. and var. *erythrocephalus*, F., *Olisthopus rotundatus*, Payk., *Bradycellus harpalinus*, Dej., *similis*, Dej., *Quedius fuliginosus*, Grav., *tristis*, Grav., *molechinus*, Grav., *Philonthus politus*, F., *Lathrobium boreale*, Hoch., *brunniipes*, F., all common. The water-net produced the following species.—*Dytiscus punctulatus*, F., *marginalis*, L., *Acilius sulcatus*, L., *Agabus sturmi*, Gyll., *chalconatus*, Panz., *bipustulatus*, L., *Hydroporus palustris*, L., *incognitus*, Sharp., *erythrocephalus*, L., *gyllenhalii*, Schiöd., all very common; *Hydroporus morio*, Dej., a few; *Agabus nebulosus*, Forst., *Deronectes 12-pustulatus*, F., *Haliphus fulvus*, F., *Lacophilus obscurus*, Panz., *Rhantus exoletus*, Forst., *Hydrobius picicrus*, Thoms. and *Philydrus minutus*, F. a few of each species. *Henicocerus exsulptus*, Germ., was found clinging to stones just above the water level, in fair numbers.—H. BRITTON, Prospect House, Salkeld Dykes, Penrith.—October 10th, 1902.

COLEOPTERA IN THE ISLE OF WIGHT.—I spent a holiday in the Isle of Wight in May, 1899. The weather was uncongenial, and entomological work was consequently generally unsatisfactory. Everything seemed late and scarce, and the following captures were the result of three weeks' hard collecting:—*Notiophilus substriatus*, at Sandown, where also occurred *Leistus ferrugineus* and *L. rufescens*; *Dyschirius salinus*, at Bembridge, and *D. aeneus*, at Luccombe Chine; *Badister sodalis* and *B. bipustulatus* occurred at Sandown, and *Chlaenius restitus* in refuse on the sea-shore at the same place; *Acupalpus flaricollis* (Alverstone), *A. meridionalis* (Sandown); at Culver Cliff, *Harpalus rotundicollis* and *H. rubripes* were taken in plenty by cutting and shaking grass tufts; *H. azureus* was taken in numbers under stones in

a ploughed field near Ventnor, together with *H. ruficola*; at Ventnor, two specimens of *H. tenebrosus* were captured, and also one specimen of *H. cupreus*, ♀, at Bembridge; *Dicheotrichus obsoletus* was very plentiful on the marshes at Bembridge, all the specimens being immature; three specimens of *Anisodactylus pocceioides* were taken at the same place; *Pterostichus minor* occurred sparingly in a bog at Alverstone; *Amara apricaria*, *A. consularis*, *A. lunicollis*, and *A. communis* were all taken at Sandown, whilst *A. orata* was bottled at Ventnor; *A. couceiuluscula* rarely at Bembridge; one specimen only of *Calathus piceus* was found under a stone at Alverstone, and *Anchomeus oblongus* was plentiful at the same place; at Bembridge, on a patch of moist ground, *Tachys scutellaris* occurred in thousands, and these little beetles were so active that it was no easy matter to capture them, one specimen only of *Tachys bistriatus* was taken in company with them; *Bembidium striatum* occurred on walls, and *B. mannerheimi*, *B. 4-guttatum* and *B. saratilis*, with its light aberration, at Sandown; *B. minimum*, *E. ophippium*, *Pogonus chalcus* (in great numbers) and *P. luridipennis* were turned out of coarse grass, which grows plentifully near the coast at Bembridge; *Dromius linearis*, *D. melanocephalus*, *D. rectensis* and *Blechnus naurus* were taken out of grass-tufts at Culver, and *Brachinus crepitans* was taken in numbers under stones in the same field as *Harpalus azmeus* at Ventnor; a visit to some ponds near Sandown produced *Haliphus flavicollis*, *H. ruficollis*, *Noterus sparsus*, *Hydrovatus clypealis*, *Anacaena globulus* and *Limnebius papposus*; at Bembridge *Philhydrus maritimus* was taken in numbers out of brackish water near the shore, together with *Helophorus intermedius*, *Ochthebius margipallens*, *O. marinus*, *O. bicolor*, *O. acutus* and *O. punctatus*. Of the Brachelytra a large number of species occurred, amongst which may be mentioned *Alcochara grisea*, *A. algarum*, *A. obscurella*, under seaweed at Bembridge, etc.; *Hyobates nigricollis* from boggy places at Alverstone, and a nice series of *Myrmedonia limbata* was secured at Culver; *Alianta plumbea*, *Homalota halobrechtha*, *Xenusia urida*, *X. sulcata* and *Diglossa mersa* all occurred singly at Bembridge, whilst *Phytosus spinifer*, *P. balticus* and *Heterothops binotata* were much more plentiful at the same place; *Oligota atomaria*? and *O. punctulata* under bark at Newchurch; *Mycetoporus splendens*, *Leistotropius nurius*, both singly at Sandown; *Philonthus lucens*, *Stilicus rufipes*, *Stenus ater*, *S. ossium*, *S. acrosus*, *S. binotatus* and *S. similis* were all taken in bogs at Alverstone, and at Bembridge the following Staphs were found: *Philonthus fumarius*, *Cafius fucicola*, *C. sericens*, *Othius lacriusculus*, *Scopaeus sulcicollis*, *Melon ruficola* and *Bledius spectabilis*; at Culver *Melon propinquus*, *Sunius angustatus* and *Platystethus nitens* occasionally turned up, whilst *Paederus littoralis* was found very commonly; at Luccombe Chine, *Bledius bicornis* and *B. atricapillus* were taken in numbers. This brings the list of captures to the end of the Brachelytra, and I hope to complete my list in a future number of the *Record*.
—H. WILLOUGHBY ELLIS, F.E.S.

TROPIDERES (ENEDRENTES) HILARIS, FAHR., IN A LONDON WAREHOUSE.
—Although almost certainly an importation, it is perhaps worth while to record the capture of the above at a wholesale druggist's in the City Road. Only a single specimen was taken alive, and in good condition. Bedel states (*Faune Bassin de la Seine*, vi., 16) that it is found at the roots of broom (*Sarothamnus*) in June and July, and it appears

to be widely spread in France, although very rare. Reitter gives (*Cat.*, 1891) no other European locality. It is a significant fact that some broom tops had been recently purchased, but from whence I have not been able to ascertain.—E. A. NEWBERY, 12, Churchill Road, N.W. October 31st, 1902.

COLEOPTERA IN BARRON WOOD, CUMBERLAND.—The past summer has been one of the coldest and most sunless I remember, and coleoptera have been correspondingly scarce. It was not until June was in its third week that here in the north we had a touch of real summer warmth, and then it was of the most transient nature. On the 24th of this month after two previous but futile attempts, I managed to reach Barron Wood in the Eden Valley, perhaps the last remaining fragment of the ancient forest of Inglewood, which, in former times, extended from Penrith to Carlisle. This Barron Wood was a favourite hunting-ground with the entomologists of Carlisle of 50 and more years ago. T. C. Heysham, a valued correspondent of Stephens, found some of his rarest insects there, and the locality gave J. B. Hodgkinson many fine micro-lepidoptera. It was there also that the Geometrid, *Eubolia macniata*, now relegated to the list of British "casuals," was taken. I met my friend, Mr. Britten, by appointment at Lazonby and soon after we were hard at work in the wood beating the mountain-ash trees for *Rhychites cupreus*, L. We had met with this weevil a year ago on the same ground, but only sparingly, as we were probably too late for it then, or rather the season of 1901 was a more forward one than the present. This year, however, we had just hit the right time, and it did not take long to give us as many as we wanted. In the hot sunshine it is an excitable insect and soon flies off the beating-sheet. We met with many other species by beating other trees as well as mountain-ash, perhaps the finest being a lovely specimen of *Saperda scalaris*, L., the only longicorn we saw except *Rhagium bifasciatum*, F., and *Grammoptera ruficornis*, F. We took some rather interesting skipjacks, of which *Corymbites impressus*, F., was the best but was not numerous enough to satisfy us. *C. quercus*, Gyll., was common enough with one or two var. *ochropterus*, Steph., *C. cupreus* var. *aeruginosus*, F., was taken on the wing, and a single *Elater balteatus*, L., came from oak. *Sericosomus brunneus*, L., both males and females turned up in fair numbers, mostly on hawthorn. A skipjack we specially wanted was *Athous vittatus*, F., but we only managed to pick one or two each from the hosts of *A. haemorrhoidalis*, F., which were always dropping on to the sheet. *Dolopius marginatus*, L., was very abundant and variable. *Telephoridae* were numerous, the best being *Podabrus alpinus*, Payk., *Telephorus haemorrhoidalis*, F., and *Malthodes atomus*, Thoms. Some old larches produced *Dryophilus pusillus*, Gyll., both sexes in plenty. *Polydrusus micans*, F., and *P. undatus*, F., were both common on birch, the former being in fine condition. A single *Maydalis armigera*, Fourc., also came from oak, a single *Attelabus curculionoides*, L. Some hawthorns gave us a series of *Lochmusa crataegi*, Forst. Rain unfortunately came on in the afternoon and put a stop to beating and made sweeping unpleasant, so we went down to the river to see if there was anything to be had. On the sandy margins, *Bembidium paludosum*, Panz., was abundant, with others of the genus. *B. bipunctatum*, L., which we found here last year, did not turn up on this occasion. Under dead branches lying on the sand

we found a nice lot of *Aegialia sabuleti*, Payk., a welcome capture, and *Melasoma acutum*, L., was to be picked off in plenty from the under-sides of the leaves of the dripping alders.—FRANK H. DAY, 17, Thirlmere Street, Carlisle. *October 21st, 1902.*

CHRYSOMELA BANKSI, F., IN NORTH KENT.—It may be of interest to London coleopterists to know that this handsome *Chrysomela* is still to be met with in the neighbourhood of the metropolis, notwithstanding the encroachments of that fiend in entomological eyes, the suburban builder! The sight of a fine series recently taken by my friend, Mr. F. W. Terry, and his kind directions as to finding the habitat, in conjunction with the "aching void" above the specific label in my collection, were quite sufficient inducements to me to journey to the locality next day, when I had the pleasure of boxing upwards of a dozen specimens, several more being seen but not taken. The species here lives upon *Ballota nigra* (Mr. Terry informs me that he takes it in Cornwall on bracken), growing on the grassy bank of a lane, but although several were perched on the tallest flower-heads of their food-plant, they were not so conspicuous as from their size and colour might be supposed. I may remark, however, that these Kentish specimens seem to me to run smaller than others I have seen from Ireland and the west of England. Several localities in North Kent are given for *C. banksi* by Fowler, but most of these are now probably destroyed. The only other species of any interest met with on the same day were a specimen of *C. lamina* and the little *Longitarsus ballotae*, Marsh., which was common on the *Ballota*.—F. B. JENNINGS, F.E.S., 152, Silver Street, Upper Edmonton, N. *October, 1902.*

DISCHARGE BY ANCHOMENUS JUNCEUS.—A few days ago I pillboxed five specimens of *Anchomenus junceus* when collecting in Whitley Wood in the New Forest. On returning home I noticed such a curious occurrence in respect to one of them, that it seems worth recording. On turning one of them out of the pillbox, and touching it with a piece of cardboard dipped in chloroform to quiet it, it immediately sent out, from both sides of its abdomen, jets of dense white vapour, on touching it a second time it repeated this. The vapour was very dense, and did not condense for some time. On returning it to the box and opening the box shortly after, I found the box full of white vapour, so it must have let off the steam a third time. I know that the bombardier beetle does something of this sort on a small scale, also I know a South American beetle that does this, and that the vapour leaves a mark like caustic on the fingers, but this is the first decided instance of the sort I have met with in England.—B. PIFFARD, Ivy Cottage, Brockenhurst, Hants. *November 25th, 1902.*

SCIENTIFIC NOTES AND OBSERVATIONS.

THE ABDOMINAL MALE TUFT OF NYLOPHASIA MONOGLYPHA (POLYODON).—I find on the male of *Nylophasia monoglypha* (*polyodon*) a deep groove opening to the exterior on the 3rd and 4th segments of the abdomen. The groove is prolonged anteriorly in a cul-de-sac, which is contained within the 2nd segment and reaches nearly to the front of the abdomen. It has a chitinous lining, continuous at the margin of the groove with the general investment of the body. From the bottom of the cul-de-sac there arises a tuft of long silky hairs which extend back to the

posterior end of the groove, and the tuft is there bent round, being somewhat larger than the groove. The sides of the groove are also rather thickly covered with short hairs. The organ is, of course, paired, and is not present in the female. I find what is apparently a very simple form of the organ on the 3rd segment of the abdomen of *Porthesia similis (auriflua)*, ♂, but there is no trace of it in *Triocna (Acronycta) tridens*, ♂. [A similar structure is described in *Xylophasia rurea* (*Brit. Noct.*, iii., p. xiv).] I shall be greatly obliged if anyone can supply me with references to papers which describe this structure and discuss its function.—J. F. LISTER, St. John's College, Cambridge. October 22nd, 1902.

PARTIAL DOUBLE-BROODEDNESS OF LEPIDOPTERA.—DIANTHÆCIA CUCUBALI.—Four newly-hatched larvæ found in seed-capsules of *Silene inflata* at Cuxton, June 13th, 1899, fed up rapidly; moths emerged August, 1899 (two), June, 1900 (two). CYMATOPHORA OCTOGESIMA.—Ova from Boxworth, Cambs, on June 10th, 1901, hatched June 23rd, sleeved out on aspen with flower-pot attached to end of sleeve; pot brought indoors October 7th, two *C. octogesima* had already emerged and were dead and dry, remainder emerged in due course this year. MACARIA NOTATA.—In 1901, larvæ from Market Drayton sleeved out on birch with pot attached to sleeve; pot brought indoors October 7th, one imago had emerged and was also dead and dry; none emerged this year.—(REV.) C. D. ASH, M.A., Skipwith Vicarage, Selby. November 11th, 1902.

RETARDED EMERGENCE OF LEPIDOPTERA.—The pupæ have all been kept under similar conditions, *viz.*, in a fireless unfurnished room with window facing due east, and constantly open during day. Two winters in pupa:—10 *Drymonia chaonia*—none emerged first year; 14 *Notodonta trepida*—8 emerged first year, 4 second year; 20 *Lophopteryx cuculla*—1 emerged first year, 5 second year; *Notodonta dromedarius*; 8 *Cymatophora duplavis*—6 first year, 2 second year; *Acronycta leporina*; *Cucullia asteris*; *Anticlea rubidata*—4 out of batch of 15; *Venilia maculata*—the whole of a batch of 14; *Abra. sas sylvata*—2 out of 6; *Emmelesia unifasciata*; *Eupithecia venosata*—Shetland; *E. isogrammaria*—8 out of 30; *Chesias rufata*—about half the batch. Three winters in pupa:—*Eupithecia venosata*—Isle of Man; *Agrophila trabealis*—Breck district. Four winters in pupa:—*Agrophila trabealis*—Breck district. Five winters in pupa:—*A. trabealis*—Breck district. I have also had *Papilio machaon* two winters, and *Lachneis lanestris* three winters in pupa many years ago, but have no records.—IBID.

VARIATION.

PLEBEIUS ÆGON AB. UNIPUNCTA, N.AB.—For the rare form of *Plebeius ægon* with a basal spot to the underside of the forewings (perhaps unique, since I cannot find any notice of its having been recorded before, nor is any mention made of it by Messrs. Tutt, Barrett, Newman, or Lang, in their books on British and European butterflies), I propose the above varietal name of ab. *unipuncta*. The specimen happens to be a ♀ of the ab. (et var.) *corsica* form, and was taken by myself at Witherslack, in July, 1901. In addition to the already mentioned variation, the black spots on all the four wings are large and well-developed, including the metallic ones on the hindwings. The

form with the one basal spot is found in *Polyommatus corydon*, *P. bellargus*, and *P. icarus* (ab. *iphis*), but I had never come across, or heard of its occurring in either *Polyommatus astrarche* or *Plebeius aegon* until I captured the above specimen.—H. MOUSLEY, F.E.S., Burnfoot, Buxton.

ABERRATION OF ARGYNNIS AGLAIA.—On July 21st, 1897, I took a very fine ♀ aberration of *Argynnis aglaia*, in which the anterior wings are black, shot with dark green, a row of fulvous spots on disc, sub-marginal spots very faint, posterior wings normal. What is the scientific name of this form? None of my books define it!—F. B. NEWNHAM, M.A., Church Stretton. *October 27th, 1902.*

ABERRATION OF BRENTHIS EUPHROSYNE.—Early in June, 1901, I caught here a strange aberration of what, from the colour, I take to be *Brenthis euphrosyne*, in which the posterior wings are almost black above, as in var. *finjal*, but the base of these same wings beneath are light yellow, hind margins orange-red; marginal silver spots reach almost the centre of wings. It is very much like the aberration of *B. selene* given in Newman. I should very much like to know its name!—IBID.

LUPERINA TESTACEA AB. UNCA AT BUCKERELL.—The season hitherto has been very unproductive in my immediate neighbourhood, as it seems to have been elsewhere. I sugared for *Calymnia pyralina* five or six times in July in the orchard in which I usually take it, and not a single moth of any description was attracted. The light trap, too, was lighted, and was barren in the morning, although a few common insects have come occasionally to light in the bed-rooms. One of these was a dark *Luperina testacea* ab. *unca*. I have taken the insect abundantly in Devon and Cornwall, but never, hitherto, this form, they have always been the light putty-coloured or ochreous-brown forms. Does this aberration commonly occur in the south? I know it is taken freely in the north.—W. S. RIDING, M.D., Buckerell. *September 23rd, 1902.*

VARIATION OF NEMEOPHILA PLANTAGINIS.—On June 11th, while visiting in the neighbourhood of Helvellyn, I came across a number of nearly fullfed larvæ of *N. plantaginis*, and took between 40 and 50. I fed them up on dock, *Galium*, and other low plants. They spun up from June 15th-30th, and commenced emerging on June 3rd. From the 3rd to 8th 20 came out, all being females; one male on the 7th, and four more on the 9th came next, thence to the 17th the sexes appeared in equal numbers. Taken altogether there would be fully two-thirds females. The males varied very little, one dwarf specimen being the only aberration noticed. The females, on the other hand, varied considerably; they were mostly rather dark on the upper wings, and the markings also varied in arrangement, while the lower wings ranged from light yellow through orange to a rather deep red: three specimens were of the last form. Most of the bodies were of a bright red, a few inclined to orange, while three specimens had light yellow markings on their bodies.—W. G. CLUTTEN, 124, Coal Clough Lane, Burnley. *November 21st, 1902.*

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

OBSERVATIONS ON THE EARLIER LIFE-HISTORY OF TROCHILIMUM CRABRONIFORMIS.—A female of *Trochilium crabroniformis* was observed ovi-

positing on August 4th, 1902, at Petts Wood, near Bickley, Kent, on sallow (*Salix caprea*). *Ovum*: About 1mm. in length by 5mm. broad, and the same high, of a dull mahogany-brown colour, quite smooth, slightly depressed in the middle, inside of a brilliant metallic sheen, deposited in batches of two or three on midrib of leaves, and also in batches of from three to fifteen on the bark of small twigs; the egg, state lasted fifteen days. *Larva*: Emerged from ovum August 19th, leaving a minute circular aperture at one end, the portion of the ovum cut away for the purpose of egress being retained as a "door." Larvæ in first instar are dirty-white in colour, the head black, and the prothorax with a chitinous plate of the same colour; the young larvæ eat a small quantity of the leaf, leaving the fibres, and then, after feeding externally for about twelve to thirteen days, they descend the midrib till they arrive at the junction of the leaf with the stem, and, at this corner, they mine their way into the stem: they advance down the stem, entering the main branch at the axil of the leaf, causing it to drop off, and leave a quantity of frass at the entrance point: they moult at the time that entrance is being effected, and are then nearly white, with the head and prothorax approaching brown in colour. The larvæ in their first instar have a quantity of hair on them, but are practically naked in the second instar, *i.e.*, after the first change. One individual was observed to be feeding between the outer bark and the wood of the twig. *Parasite*: It was observed that the eggs deposited on the twigs produced a minute hymenopterous parasitic fly with transparent wings and black body; length from wing tip to wing tip 1.5mm.—MERYYN G. PALMER, 24, Prindsbury Road, Strood, Kent. September 30th, 1902. We should like to know definitely what Mr. Palmer means by "a quantity of hair on them." What is the character and arrangement of the hair? The 1st instar would appear to be in this species more specialised than the 2nd instar. It is a matter worthy of further consideration.—ED.

RED VARIETY OF THE LARVA OF SPHINX LIGUSTRI. In Buckler's *Larvæ Brit. Batts. and Moths*, ii., pl. xvii., fig. 2, is the picture of a most unusual aberration of the larva of *Sphinx ligustri*. From the letterpress (*loc. cit.*, p. 110) one learns that the larva was found in the grounds of Colechester workhouse on privet by Laver, on September 6th, 1882. I had never seen this form alive, and it was, therefore, with pleasure that I received, on October 22nd, two larvæ closely resembling this form from Mr. Head, of Scarborough, who writes:—"Most of my larvæ of *S. ligustri* were more or less of this colour this autumn, and I believe the very cold weather is the cause of it. I have often had a few dark specimens when the larvæ have been late in feeding up." One of the larvæ was already moribund, the other of a tint rather deeper dorsally than that of Buckler's figure, the upper part of the oblique lines pink instead of slaty, the spiracles yellow instead of green, and the sides in front of the lower portion of the oblique lines and the area below the subspiracular flange black, the caudal horn very shiny black, the anal flap also black, the prothoracic plate and head blackish without the green markings shown in Buckler's figure; there is no green mark behind the caudal horn, and the prolegs and venter are of a deep purple-black, except that the pale mark on the outside of the prolegs is fairly distinguishable.—J. W. TUTT. October 25th, 1902.

NOTES ON COLLECTING, Etc.

LEPIDOPTERA AT YORK.—The most remarkable feature of the present season seems to have been the extraordinarily late time of appearance of a great number of summer species, June and July insects having been on the wing in numbers as late as August and September. *Epinephle ianira* was flying along the hedgerows at the beginning of this week, so, too, was *Porthesia similis (auriflua)*. I found a larva of the latter species a fortnight ago building its cocoon on the bark of a tree. *Acrionicta leporina* was on the sugar on August 28th, whilst a ♀ *Cymatophora duplaris* was even later, September 5th. Sugar proved attractive for a few nights only in July. On the 5th, at Askham Bog, *Xylophasia hepatica*, *N. sublustris*, *Thyatira batis*, *Halena dissimilis (suasa)*, *H. dentina*, *Plusia festucae*, and *Leucania impudens (pudorina)* were in fair numbers, whilst *Noctua festiva* and *Grammesia trigrammica* appeared in greater numbers. Sugared thistle-heads seemed especially attractive to *Noctua rubi*, which swarmed. The 19th was another good collecting night, sugar accounting for many of the species above, but was particularly notable for large numbers of *Noctua augur* and *N. festiva*, which almost monopolised the sugar patches, one yellow aberration of *N. rubi*, ♂, was boxed, but it was badly chipped and of no cabinet value. Is *Eupisteria heparata* a double-brooded species in the south of England? At Bishop Wood, near York, I find it usually at the end of May and early June, but, during a visit to West Malvern, I took a female in excellent condition on August 1st, which would be surprisingly late, even for a Yorkshire specimen, to be on the wing. Perhaps it is double-brooded in Worcestershire.—S. WALKER, York. September 15th, 1902.

LEPIDOPTERA IN ESSEX.—Here, as elsewhere, owing to the long continued spell of cold wet weather the season has been a poor one, nothing, or next to nothing, at sugar. *Endotricha flammealis* has, I think, been the commonest moth of the year. *Porthesia chrysoorrhoea* is now so firmly established here that it beat *P. similis (auriflua)* in point of numbers. I have just heard that several larvae of the rare knothorn, *Nephopteryx rhencella*, have been taken within the last day or so near here. I bred the species two years ago from poplar, obtained at Eastwood, but I think I must have brought the larvae in with the foodplant, as I can remember nothing about them.—F. G. WHITTLE, 3, Marine Avenue, Southend. September 24th, 1902.

LEPIDOPTERA IN THE SKIPWITH AND BRIGHTON DISTRICTS.—The season has kept up its character here all through, with the exception of three weeks from the middle of July, when I was away from home, and about which I cannot speak from experience. There was a sharp frost on July 24th, which killed the young bracken and a good deal of the *Erica* on the common, and also, I fancy, killed the wasps and flies, for I have not seen a single worker wasp this year, and flies have been quite scarce; generally they are almost unbearable. Sugar, I have not tried very often, but, when it has been put on, the result has been practically *nil*. Light has been much less productive than usual, the number of species being fewer, and no species except *Luperina testacea* at all plentiful. Everything has been irregular as to date. *Acidalia straminata*, which is generally out from the last week in June till about July 10th, had not put in an appearance at all by July 14th, though I

worked for it on every possible evening. On July 14th I went to Brighton, and, with the exception of three days — 25th-28th — was in that neighbourhood till August 6th, and did some collecting at Lewes, and near Chichester. At Lewes, *Acidalia rusticata* was in good condition on July 16th, and *Eubolia bipunctata* was just coming out, but the only really common species was *Sphaeloptera ictericana*, which swarmed on the downs both there and at Brighton. *Polyommatus corydon* was scarce both at Lewes and on the downs near Chichester, on August 2nd, at which date *E. bipunctata* was out in great numbers, and in fine condition, whilst, in the woods, *Dryas paphia* and *Limenitis sibylla* were both in evidence, and both fine. Neither *Polyommatus ballarqus*, second brood, nor *P. icarus*, had appeared by August 6th, but the latter is now, September 27th, to be seen here quite fresh, and worn *Epinephala ianira* and *Coenonymphe pamphilus* are still to be seen. After my return, on August 7th, I found *Amphisa gerungana* out on the common here. I have not seen this species since July, 1895, when it swarmed. This year it has been very local indeed, occurring only on one small bit of ground and not plentifully even there. I took a fine *Phaëtra menyanthidis* on August 15th. Another disappointment has been *Agrotis agathina*. The larvæ were not plentiful in the spring, but I ascribed this in great measure to the cold nights, the imagines, however, have been very scarce. The first specimen appeared on August 26th, and I worked for it on every possible night till September 5th, when the weather put a stop to collecting, and I did not get another chance. Altogether the result of eight nights' work was seven specimens, most of them smaller than usual, and possibly two more (seen but not taken). *Lycophotia striola* was still out, and many specimens were quite fresh, *Eupithecia minutata* also being on the wing in plenty, but worn. *Parthesia similis* was in good condition at the end of August. Larvæ of some species have been fairly plentiful the last few days — *Anarta myrtilli* and *Eupithecia nanata* on the heaths, about half-grown; *E. minutata* still very small, and, on birch, *Notodonta dromedarius* and *Drepana jabataria* in fair numbers. *Plusia gamma* is the only moth at all in evidence just now in any quantity. On September 17th, while larvæ-collecting on the common, I noticed a moth hovering over rough grass at the edge of a marshy place about 3 p.m., which proved to be a ♀ *Luperina cespitis*. Is this the usual habit of the species?—(REV.) C. D. ASH, M.A., Skipwith Vicarage, Selby. September 27th, 1902.

EXTENDED PUPAL STAGE OF *AGROPHILA TRABEALIS*.—Perhaps the most interesting experience that has come my way this year has been the emergence on September 3rd of a fine ♂ *A. trabealis*, from a batch of pupæ sent me by Mr. Norgate in 1897. Of these pupæ (twenty in number) the first emerged in August, 1900, the second in August, 1901, and the third this year as just mentioned. I am keeping the rest of the pupæ to see whether any more will produce moths next year.—IBID.

EMERGENCE PERIOD OF *EUPISTERIA HEPARATA*.—Referring to Mr. Walker's query on *Eupisteria heparata* (*antæ*, p. 314), I should say that *E. heparata* is not double-brooded, in the south of England, but that its emergence is extended over a very long period. My diaries show captures from May 24th to August 16th without a break of a fortnight. I think the following also goes a long way to prove there is but one

brood. On September 25th, 1890, larvæ were beaten, from the pupæ of which the first moth was bred on August 4th, 1891, on which day six imagines and several larvæ were captured in the same wood as the 1890 larvæ were collected. — B. A. BOWER, F.E.S., Chislehurst. *October 20th, 1902.*

LEPIDOPTERA IN HANTS.—I am afraid I must add my complaints of the badness of the season, though for the past three weeks things have been decidedly better, and sugar is worth putting on, though all June, July, August, and the beginning of September I do not think I set 50 moths taken by this means, although I have worked every favourable night both here and in the Forest. *Epnuda nigra*, *Caradrina ambigua*, *Orthosia macilenta* and *Peridroma ypsilon*, are coming now more or less freely, and I have had the luck to take four *Leucania albipuncta* (two wasted), and one *Orrhodia erythrocephala*, a beautiful specimen, on September 14th. I kept both of the worn *L. albipuncta* alive for eggs, and have been rewarded with a few. Can anyone kindly give me hints as to rearing? I bred a good many of the dark aberrations of *Nonagria geminipuncta*, though about 25 per cent. of the pupæ were ichneumonated. Light has been of no use at all here, though a friend of mine took *Senta maritima (ulrac)* at his moth-trap. Larva-beating has been most disheartening; the numbers as about one is to one hundred, compared with last year.—(MAJOR) R. B. ROBERTSON, Boscombe. *October 17th, 1902.*

LABIDURA RIPARIA IN HANTS.—As lepidoptera have been so scarce I have been working for *Labidura riparia*, and have taken a few. It is a fine fellow when alive, but unfortunately shrinks during the process of drying.—IBID.

LEPIDOPTERA AT MARKET DRAYTON AND IN THE NEW FOREST.—Everyone grumbles at the now nearly-past season. I still hold to my opinion that, on the whole, about here at any rate, the failure has not lain altogether in scarcity of insects. During August, sugar was of very little use, and after the 20th an utter failure, yet, when riding home, I saw numbers of moths come into view in the rays of the acetylene lamp. Towards the end of the month and the beginning of September, when the moon was absent, large numbers of insects of common sorts came to the big lamp, especially *Neuronia popularis* and *Luperina testacea*, and among the former a ♀. *L. cespitis* also showed up in numbers, but the weather was often so very unpleasant that I did not care to go out. About the middle of September a ♀ *Drepana hamula* came to the lamp, a species hitherto unknown here. It was in very good condition but I kept it for ova, and it only deposited five. Larvæ were very late. Quite towards the end of September those of *Lophopteryx camelina*, *Notodontia dromedarius*, and *Leiocampa dictaeoides* were only about half grown, and those of *Cymatophora duplaris* hardly so forward. The latter is not to be wondered at as the moths were fresh which came to sugar in the middle of August. On October 1st I went to the New Forest with a view of getting *Nyctina socia*. During the first ten days cold north and north-east winds made collecting very difficult. During the next ten days the temperature rose, and common things were fairly numerous, especially *Aylina ornithopus*. *Orthosia lota* was scarce, apparently hardly out, *O. macilenta* much more numerous and in lovely condition. Of *N. socia* I got, altogether, fourteen, one on the 10th, five on the 13th, four on the 14th, one on

the 15th, and three on the 17th. On the 18th, much to my regret, I had to return home before, as I think, the emergence of *X. socia* was half completed. Six *Epunda nigra* also came during the period, but no *E. lutulenta*. *Citria fulvago* were fairly numerous and in good condition. On the 4th I took a fresh *Tiliacea aurago* on a lamp near Southampton. These dates are fortunately very unusual, and may it be long before such a wretched summer occurs again. Still, take it all through, I have known insects very much scarcer in other seasons, e.g., 1892 and 1894. I forgot to mention that beating in the New Forest produced a very fair number of larvæ of *Cinophria rubricollis* and *Boarmia roboraria*, a few *Tephrosia ctersaria*, *T. consortaria*, three or four *Arentia flexula*, and many *Haliis prasinana* larvæ.—F. C. WOODFORDE, B.A., F.E.S., Market Drayton. October 26th, 1902.

LEPIDOPTERA IN 1902.—This season I have had little opportunity for collecting, but have bred, or taken, the following species, which possibly may not yet have been recorded from the respective localities mentioned:—*Lithocolletis abniella* (*abnifoliella*), bred March 19th, from mines gathered from alder the previous October, at Barnes. *Borkhausenia* (*Oecophora*) *angustella* on oak trunks at Richmond, Surrey. This species was really numerous on June 26th. Twelve specimens were counted on a single tree. Among these was also a specimen of *Nepticula subbimaculella*, looking like a grotesquely small *B. angustella*. The common *Gelechia luculella*, which often occurs on the oaks, was not, however, in evidence. Whitsuntide was spent in the neighbourhood of Ventnor, Isle of Wight, but the weather was too cold and rough for collecting. Larvæ of *Coleophora grypphipennella* were found on rose, of *C. nigricella* on apple, *C. riminella* on sallow, *C. ochrea* on *Helianthemum vulgare*, and larvæ of *C. albitarsella* were given me by Miss Holman, who had taken them on *Glechoma hederacea*, close to the sea. In a sheltered corner among *Scolopendrium vulgare* I found a colony of *Teichobia verhuellera*. The larvæ were nearly full grown. The first imagines appeared June 18th. The first few days of August were spent in the company of my brother, H. Leonard Sieh, at East Hoathly. The weather was only fair. By beating we took *Argyresthia goedartella*, *A. brockeella*, and *A. retinella*, all sparingly; one *Nemotois minimellus* and one *Euranthus zocgana*. In one lane, *Notocelia uddmanniana* and *Oecophora olivella* were a nuisance, but *Endotricha flammealis* was everywhere, it was really quite difficult to keep it out of the net. In a damp spot we took a few *Glyphipteryx thrausonella*, brushing them off *Juncus* and *Potentilla comarum*, and one *Bombycia* (*Epunda*) *riminalis* fell into the net off sallow. *Egeria respiformis* (*cytipiformis*) was found at rest on a hazel leaf, and larvæ of *Hemaris fuciformis* were not rare on honeysuckle. Rhopalocera could not be called abundant. No Lycaenid was visible. *Crambus pinctellus* was noted as well as five commoner Crambid species. At light, on August 4th. *Pionca* (*Eubalea*) *crocealis*, *Herculia* (*Pyralis*) *glauconalis* and *Aphomia sociella* were taken. From mines collected on sallow, *Lithocolletis riminella* was subsequently bred. At Chiswick, lepidoptera have certainly been rather scarce this season, but two species, of which I had previously only scanty records, have curiously occurred almost commonly. On June 6th the beautiful *Tinea cloacella* was on the wing and *Ornis guttea* was seen. By the way is there a second brood of this species? I have a specimen dated 6.9.99. On July 1st, *Nepticula trimaculella* was taken at rest, and, on the

10th, *Gelechia rhombella* occurred on an apple stem. This rather local species has haunted the district for many years, for the late Samuel Stevens took it at Hammersmith at least 48 years ago. In the forenoon of July 12th I found three specimens of *Borkhausenia* (*Oecophora*) *unitella* resting in their odd manner on the leaves of a pear tree. They stand on the upper surface of the leaf with the head almost touching the leaf, and the body and wings raised on the long posterior legs. This is a great contrast to the position assumed by *B. pseudospretella*. In fact, the two species scarcely appear to belong to the same genus, so very diverse is their resting-habit. On July 28th, *Coleophora laripennella* was taken flying in the afternoon, and several prettily marked larvæ of *Aristotelia hermanniella* off *Chenopodium album*, and pupæ of *Cerriostoma laburnella* off their usual food plant. On the 29th, a fresh specimen of the delicate *Egeria myopaeformis* was noticed on flowers in the garden. *Mompha ochraceella* came to light about this time. On August 9th, *Argyresthia goedartella* was taken. Though there are plenty of birches in the neighbourhood, I have never taken this species here before. *Lithocolletis tristrigella* and *Coleophora homerobiella* also occurred on the same day, as well as a larva of *C. paripennella* and *Scythris* (*Butalis*) *chenopodiella*. I have reason to believe that this latter occasionally feeds on *Chenopodium vulvaria*, I suppose its olfactory nerves are different from those of man. On August 11th, the first *Bryophila perla* appeared in its old haunt, and on the 15th, *Mompha fulvescens* began to appear in the breeding-cage, hiding away in its usual manner. On August 23rd, a specimen of *Lyonetia clerkella* was bred from a cocoon spun on an apple-leaf beside the mine. Considering the way in which bricks and mortar are encroaching on this neighbourhood, records of even very common species made now, may be useful in the future.—ALFRED SICI, F.E.S., Corney House, Chiswick. *October 29th, 1902.*

EUVANESSA ANTIOPA AT WEST WITTERING, NEAR CHICHESTER.—On September 30th a specimen of *Euranessa antiopa* was seen near the sea by Mr. Charles Fowler, of this city. He had only a whip in his hand at the time, to attempt securing it with which he feared would have uselessly destroyed the insect, and he allowed it to escape. With a net its capture could have been easily effected.—JOSEPH ANDERSON, Abre Villa, Chichester. *October 29th, 1902.*

COLIAS EDUSA IN THE NEIGHBOURHOOD OF CHICHESTER.—One or two specimens of *Colias edusa* were seen flying in this neighbourhood during the first and second weeks of October. — *IBID.*

MIMAS TILIE AND *PHRYXUS LIVORNICA* IN LINCOLN.—It may be interesting to record that *Mimas tiliae* has occurred, both in the larval and imaginal stages, on the elms in the street here. I also wish to report that a friend of mine captured here two *Phryxus livornica*, at rest on a wash-house window-frame, resting quite close together, on September 6th, 1890. They were killed at once, and so, unfortunately, no attempt was made to get ova. — JOHN F. MUSHAM, Lincoln. *October 25th, 1902.*

LATE APPEARANCE OF LEPIDOPTERA.—This has been a remarkable season for the appearance of Lepidoptera. Only yesterday a lady brought me a male specimen of *Epione apiciaria* in fair condition: I should think this beats all records for late imagines, for I took this species in our woods during the second and third weeks in July. Last

week I saw half- to three-quarters-fed larvæ of species like *Lophopteryx camelina* and *Drepana falcula* wandering about the birch-twigs in search of leaves which have already fallen here.—L. W. NEWMAN, Bexley, Kent. November 5th, 1902.

LATE APPEARANCE OF LEPIDOPTERA.—It may be well, as illustrating the lateness of the season here, to note that *Calymnia trapezina*, *Orthosia macilenta*, and *Dichonia aprilina* are only just coming out in this district. I took a *Leptogramma scotana* on November 1st, they seem to be very scarce this year.—E. ROGERS BUSH, 1, Strathmore Street, Perth. November 6th, 1902.

AGROTIS AGATHINA AND XYSTOPHORA SERVELLA AT KING'S LYNN.—Sugar and light have been singularly unattractive this year, and I look upon this season as one of the most unproductive we have experienced for many years. I worked three nights for *Agrotis agathina*, and captured two specimens, losing two others in the heather (the first example observed August 27th). My best capture in *Micros* this year were three or four *Xystophora servella*; the cold nights prevented me getting more.—E. A. ATMORE, F.E.S., King's Lynn. September 30th, 1902.

REARING PACHYGASTRIA TRIFOLII. — HINTS WANTED. — Does *Pachygastria trifolii* always breed crippled? A few years ago I got larvæ at Lyndhurst, and about 75% were more or less crippled. This year I took over 30 larvæ and bred two good ones; though a good many of the larvæ died in this case. What is the experience of others? Will those who are more successful give hints as to their mode of procedure? —S. BRADY, 68, Hunterhouse Road, Sheffield. October 30th, 1902.

COLLECTING IN THE COTTESWOLDS IN 1902.—During the past season I have not been able to do half I desired in field-work on the Cotteswolds, but the few occasions on which I reached our usual "happy hunting grounds" I found abundance of insect life of one order or another, while, as regards lepidoptera, a student from Oxford who worked diligently here for some 20 days in July informed me that he had taken or observed over 200 species, including *Aegeria ichneumoniformis*, one of which I myself found in the snare of one of the largest of our hill spiders, *Agelena labyrinthica*. Among the remains in this snare were the conspicuous wings of *Anthrocera jilipendulæ*. I spent some time in sweeping and searching the herbage in that spot, but no living specimen of this uncommon clearwing rewarded my efforts, but I was very pleased with my find in the spider's den, it being the first I ever saw on our hills. Near the same locality on July 28th, while searching on all fours, I met with my first example of *Crambus pinellus*, L., while, near by, a fresh example of *Lithosia complana* rested ready for boxing. *Anthrocera jilipendulæ* this season appeared on our hills in greater numbers than I ever remember during more than 30 years' observations. Its parasites accordingly increased, and the gregarious cocoons of the little *Spanteles* could be seen in all directions attached to the tall grass stems, while a few weeks later the larvæ of the larger Ichneumon, *Mesostenus obnoxius*, Gr., could be found spinning their exceedingly tough cocoons, each singly in the cocoon of its host, where it passes the winter and spring, during which it may be collected by searching for full, hard cocoons of the Burnet moth. Some winters these are quite scarce, but at the present time it is not difficult to find several examples in a short stroll across the hills.

Here, too, is the home of *Macrothylacia rubi*, seemingly getting scarcer, as in recent years I have, during the late autumn, seen but few of its large and handsome larvæ compared with the quantities of former seasons. During this year I have placed in my collections a Gloucestershire example of the very uncommon (or rather rarely seen in its perfect state) Ox warble fly. I may note that my Aberdeenshire friend, Mr. W. Sim, of Gourdas Pyvie, recently sent me a cutting from the *Banffshire Journal* containing more of his valuable observations on this increasing pest.—CHAS. J. WATKINS, F.E.S., King's Mill House, Painswick. *November 19th, 1902.*

ANTICLEA SINUATA NEAR DAWLISH.—I took a ♂ *Anticlea sinuata* on July 28th last near Dawlish whilst beating for *Melanippe unangulata*, etc. The day was dull, with misty rain at times, and insects seemed very unwilling to answer to the beating-stick, still I secured a fair number of *Melanippe unangulata*, *Aridalia bisetata*, *A. scutulata*, *A. emarginata*, and others. We had had a great deal of wet weather previous to this date, and I had not been collecting in that particular district for a fortnight, and so I probably thus missed the brood of *A. sinuata*, since it is very unlikely that my capture was the only specimen there. *Galium* is abundant in the hedgerows of that particular lane.—ERNEST A. ROGERS, Kalrel House, Buckridge Road, Teignmouth, Devon. *November 21th, 1902.*

SWARMING OF PYRAMEIS ATALANTA.—In reading your article on "Migration, etc.," I find you mention the swarming habits of *Satyrus hermione*. Is it generally known that our common *Pyrameis atalanta* occasionally acts in precisely the same manner? I have twice noticed a swarm of these insects roosting on the branches of an oak-tree. I have never seen this habit of *P. atalanta* mentioned in any book on entomology, and should very much like to know the possible reason for the habit.—G. T. LYLE, Brookley Road, Brockenhurst. *November 23rd, 1902.* We suspect the habit is not uncommon in some species. It occurs to us that, on several occasions, at Bourg d'Oisans, in August, 1896, we watched *Papilio podalirius* fly up into some ash-trees, as the afternoon sun went off the lucerne fields in which they fed by day, to roost, and frequently observed them leave the trees again about 8 a.m. We quoted *Satyrus hermione* as being so well-known to lepidopterists. Records of other instances of the habit in other species would be interesting. ED.

COLLECTING IN CO. KERRY IN JUNE, 1902.—The dirge of the lepidopterist in 1902 goes up on all sides. Rare species have been very rare, usually common ones have been actually scarcer, and some species have not even appeared at all, where they are regularly to be found. Many theories and notions have been put forward to account for the general diminution. Some say it has been such a wet year, others so cold, others such a broken year, and so on. One sometimes hears the reason assigned to lack of sunshine. Is not this last the real factor that has so conspicuously failed us this year? and is it not want of sunshine that has, far more than anything else, given us such a wretched season for the lepidoptera? The meteorological returns show that, in reality, the year has not been an abnormally wet one—not even an average one up to date—in fact the only real difference from an ordinary year has been the want of light and heat, for which "Old Sol" is responsible. One knows by experiment that pupæ kept in the

dark can be retarded, and late emergences of butterflies, at least, can be thus in part accounted for. On June 5th last, Mr. Donisthorpe and myself started for the extreme southwest of Kerry. At New Milford we were joined by Mr. Bouskell, and all three of us were agreed that, although the weather previously had been miserable, things would improve. After twenty-five hours' journeying we arrived at our destination, and although not actually raining there were ample signs that atmospheric depressions and their consequences were at hand. The scene of our operations, Rossbeigh, was wild and uncultivated. We looked out over a very extensive range of sandhills, that almost stretch across the entire width of Dingle Bay. Away behind us were steep mountain sides, and in one small corner was a mixed bit of woodland, with plenty of bilberry and holly. In every meadow the yellow flag was always present, in some places occupying by far the greater part of the field. For several days nothing was seen moving at all save an *Ematurga atomaria*. In fact, we generally returned home early to thaw ourselves over a great fire! On the 9th, we journeyed over Seafin down to Caragh Lake. While the sun shone, and one was protected from the biting wind, it was very pleasant to view the clear outline of the hills on the opposite side of the bay, and *E. atomaria* showed up in numbers, but nothing else was flying. Once over the top of the hill and we were again shivering. Low down, near the shore of the lake, a fine yellow *Chrysophanus phlaeas* was taken at rest, and on the way back, in the wood mentioned, *Cidaria corylata*, *C. russata*, and *Bapta temerata*, were disturbed and netted. Whenever the sun did appear *Callophrys rubi* was about, and generally in excellent condition, and occasionally *Pararge megera* attracted attention. Mr. Donisthorpe, in assiduously sweeping for coleoptera, took two larvæ of *Plusia chrysitis* off nettle growing in a declivity on the mountain side near the sea. On the 14th and 17th Mr. Bouskell found specimens of *Tephrosia crepuscularia* (*biundularia*). The specimen taken on the later date strongly suggests *T. bistortata*, but, as our authorities declare that *T. bistortata* does not occur in Ireland, one acquiesces in calling this particular specimen *crepuscularia*. The two coleopterists in turning over stones frequently came across *Xylena monoglypha*. On the 16th Glencar was visited. On the summit of Windy Gap, about 1000ft. (the pass across the mountains) a ♀ *Scodonia belgiaria* was netted. On the bogs around Glencar the first real good day's collecting was enjoyed. *Hydrelia uncula*, *Aspilates strigillaria*, *Erastria fasciana* were all plentiful, and the day was genial. *Callophrys rubi* swarmed on the lousewort, one or two very ordinary *Campptogramma bilineata*, and last, but not least, a fine specimen of *Coenonympha typhon*. Having taken *S. belgiaria* less than an hour before, it was somewhat of a surprise to take *C. typhon*. The situation was very different, but hardly sufficient, one would consider, to account for two species, separated by quite three weeks, to be brought together. The fine weather of the 16th soon gave place to the old order, and it was difficult to get anything, much less specialities. On the 21st, on the railway bank, *Pyralis octomaculata* was secured, and, later in the day, an excursion was made to Kenmare. While we were travelling (some six hours to cover a direct line distance of less than thirty miles) the sun shone brilliantly, but, as soon as we were free to collect, rain and strong wind put a new complexion on the

possibilities. The following day, however, made amends. A few miles out on the Glengariff road I selected a likely spot, and soon was at work with *Melitaea aurinia* var. *praeclara*, *Coenonympha typhon*, *Aspilates strigillaria*, *Phytometra aenea*, and *Erastria fasciana*. The *C. typhon* were a particularly fine lot, just emerging. They are of very large size and with a very small amount of spotting on the underside. In the evening, *Eupithecia venosata*, of a dark form, approaching that from Shetland, and what was with very little doubt a specimen of *Dianthoecia caesia*, were captured. The latter, however, got into a "paraffin" box, and identification was hardly possible with certainty. The shape of wing, however, almost certainly fixed the species as *D. caesia*. The following day our headquarters were reached, and, as in the immediate neighbourhood, insects still seemed very scarce, a walk was made to Glencar. The same species as before were found plus one worn *M. aurinia* var. *praeclara*, and several ♂ and ♀ *Nemeophila russula* in fine condition. On the 28th, a flying visit was made to Killarney and Torc waterfall. The prizes were not to be found in the short time at one's disposal. Many insects were, however, on the move, *Spilote ulmata*, *Pelurga comitata*, *Boarmia repandata*, and *Cidaria truncata*, being amongst those secured, and regrets were felt that one could not linger in this charming spot. Sunday, the 29th, helped very materially to swell the still meagre total that we had to show. On the sandhills (which previously had produced nothing) *Barathra albicolon*, *Agrotis vestigiata*, *Heliophila littoralis*, and *Melanippe galiata* began to show up, but only the last at all commonly. On the way back to the house, *Nudaria maulana* was found to be swarming, and an acetylene lamp was lighted to attract any other visitors. *Eupithecia vulgata*, *E. castigata*, and a very fine curious-looking *E. pulchellata*, with a very narrow central fascia, appeared, and were joined by *Spilosoma menthastris*, with buff forewings, and *S. lubricipeda*, with the deepest buff-coloured wings, the only specimen I have at all corresponding in colour being one from Bude, Cornwall, also a very western locality. The total result is certainly disappointing, but not so hopelessly bad as to stop another visit being made in the near future.—W. J. KAYE, F.E.S., Caracas, Ditton Hill, Surbiton. November 18th, 1902.

CURRENT NOTES.

Dr. Chapman, in his paper on "Inflation in Insects," read before the South London Entomological and Natural History Society, on November 13th, pointed out that a very large number of insects secreted air apparently into the alimentary canal, in order to increase their bulk and produce tension or pressure, usually in an effete skin to be ruptured. This appeared to be the case in some species of *Oriina*, to rupture the egg-shell and in the same beetles to rupture the old skin at larval moults. It was especially the case in *Tipulidae* and lepidoptera to rupture the pupal skin, and, in many lepidoptera, to enable pressure to be made for bursting open the cocoon. It is probably the effective agency in forcing fluid into the "frontal vesicle" in *Muscidae*. In lepidoptera and tipulids it is effective in increasing the blood pressure required for expansion of wings, &c., very possibly for the

same purpose in other orders, and the author surmises it will be found used by all insects when moulting a somewhat hard skin. It is used by the imagines of ♀ Psychids to maintain their bulk and form after laying their eggs, to enable them to make further necessary muscular movements which they could not do, if flaccid. Also by ♂ Psychids to enable the muscles to be effective in introducing the abdomen into the sac and case of the ♀. This inflation has no relation to the large air-spaces and air-sacs and expanded tracheæ with which many insects are provided. The air secreted had not been examined, but was probably not precisely atmospheric air, but such a mixture of gases as was dissolved in the circulating fluids.

The Lancashire and Cheshire Entomological Society is attempting to improve its entomological library, and the secretaries ask for donations of excerpts from the Transactions of Scientific Societies, unbound pamphlets, reprints of papers and magazine articles, &c. Authors and entomologists who have any spare papers of this kind are asked to communicate with Mr. E. J. Burgess Sopp, 104, Liverpool Road, Birkdale, near Southport.

Mr. F. N. Pierce is busy studying the male genitalia of the Cymatophorids and Noctuids. For the purpose of making microscopic slides and illustrations for a proposed paper thereon, Mr. Pierce asks for males of the following species, condition being quite immaterial: *Thyatira batis*, *Cymatophora fluctuosa*, *C. ocellaris*, *Bryophila algae*, *Symia musculosa*, *Leucania vitellina*, *L. albipuncta*, *L. extranea*, *L. loreyi*, *L. l-album*, *L. straminea*, *Senta ulvae*, *Coenobia rufa*, *Tapinostola concolor*, *Gortyna ochracea*, *Nyctocampa conspiciellaris*, *Laphygma exigua*, *Crymodes exulis*, *Hydrilla palustris*, *Agrotis agathina*, *A. varida*, *A. pyrophila*, *Triphaena subsequa*, *T. interjecta*, *T. jimbria*, *Noctua ditrapezium*, *N. depuncta*, *Pachnobia alpina*, *Cosmia pyralina*, *Dianthoccia irregularis*, *D. albimacula*, *Polia nigrocincta*, *Hadena satura*, *H. peregrina*, *Gloantha perspicillaris*, *Nylina conformis*, *Cucullia gnaphalii*, *C. lychnitis*, *Heliothis peltigera*, *H. armigera*, *Plusia chryson*, and *P. bructea*. Any material should be sent to "The Elms," Dingle, Liverpool.

Herr H. Doleschall, in the *Socetas Entomologica* for November 15th last (vol. xvii., p. 121), claims *Anthrocera (Zygona) ochenheimeri* for a valid species, on the ground that he has bred it from larvæ which differed from those of *A. jilipendulæ* in their smaller size, smaller spots, and paler, more greenish-yellow, colour. In the same article he makes the astounding statement that, in August, 1901, he took a ♀ *A. purpuralis (minos)*, in cop., with a ♂ *Syntomis phegea*, kept the pair alive, and obtained ova from which larvæ, and, in due course, one ♂ imago resulted, which differed in no way from the ♂ of *S. phegea*. One suspects here an error in the observation of the sexes, the *phegea* being ♀, and, further, that it had already paired with a ♂ of its own species, or the writer may be trusting to memory. The fertilisation of an Anthrocerid by an Arctiid seems very improbable.

In two particulars, at least, the reports of the Entomological Society of London are occasionally a decade or two behind date. Leaving out the obsolete synonymy sometimes used, the mode of noting the exhibition of aberrations and varieties is exceedingly misleading. In a report of the meeting of October 15th, now before us, we read: "Mr. E. P. Pickett exhibited a variety of the female

of *Argynnis aglaia*, varieties of *Satyrus janira*, &c." We suspect the record should be: "Mr. C. P. Pickett exhibited an aberration of the female of *Argynnis aglaia*, aberrations of *Epinephele jurtina* (*janira*), &c." Varieties are local races, aberrations are casual varieties occurring with the typical form. One can understand the collector who does not know, and does not want to know, anything about entomology, except how to make a collection, using haphazard and inaccurate modes of expression, but there is no reason for our premier society to publish such. We would also ask what scientific value such a record as the above has if the nature of the variation of the aberrant *A. aglaia* and *E. jurtina* (*janira*) be not noted.

The casual record of lepidoptera that do not belong to the British fauna, as being seen or captured in the British Isles by collectors whose names are not familiar to British lepidopterists and without any details except the fact of their being seen or captured, has been far too frequent in our more or less authoritative magazines. Most of these records are due to want of knowledge, others are due to mistakes and other causes. *Parnassius apollo* at Dover, *P. delius* in Wales, *Chrysophaeus hippothoe*, in Sussex, *Syrichthus alveus* in East Anglia, *Hyles* (*Celerio*) *euphorbiae* at Harwich, and other cases will immediately occur to our readers. We now read: "Mr. Sloper exhibited a specimen of *Lycaena hylas*, caught at Dover on the 7th September last." (Report of meeting of Ent. Soc. of London, October 15th, 1902.) Was there no discussion of this exhibit or were there no lepidopterists present? We had not heard previously of the capture before exhibition, the record does not say who caught the specimen nor does it give any details of the conditions under which the specimen was captured, all of which are important from the scientific standpoint and in the interests of an accurate knowledge of the distribution of species. One would like to have known, for scientific purposes, the home of the ♀ parent of a Dover *hylas*, where she lived and where she died, and where the rest of her family lived and died, *i.e.*, whether an immigrant or not. We believe the specimen was accurately named.

Herr Gillmer, contemporaneously with the appearance of vol. iii of Tutt's *British Lepidoptera*, has worked out (*Insecten-Börse*, xix., pp. 223 *et seq.*, July 17th, 1902) the literary history of *Amorpha populi* ab. *tremulae*, Bkh. (1793), and has come to the only tenable conclusion, namely, that Bartel was wrong in renaming the form in question on account of its collision with the newer *tremulae*, Fisch. v. Wald. He adds that Bartel has fallen into a further error in uniting the albinistic ab. *borkhauseni* (*tremulae*, Bkh.) with a much darker form described by Herr Caradja, simply because both lack the rust-coloured spot at the base of the hindwings, for this latter is hardly an aberration except for Romania, where *A. populi* is nearly always *light grey* in colour. Herr Gillmer has had a photograph of Koch's specimen of ab. *tremulae* prepared, and hopes to publish it shortly.

In the *Ent. Mo. Mag.* for September last, in a note on "*Rhizotrogus ochraceus* confirmed as British," Dr. Sharp writes that he heard from Cornwall that a *Rhizotrogus* was flying in the daytime, and knowing from "continental" experience that this is the habit of *R. ochraceus*, he thought it might be this species, and such turned out to be the case. We do not see that this beetle requires confirmation as British, though.

of course, it is an interesting capture, as Douglas (*Ent. Mo. Mag.*, vol. xxi., 1885, p. 256) records it as having been taken in abundance by Mr. Weaver in North Wales flying in the daylight. He particularly repeats that, unlike *R. solstitialis*, it flies by daylight.

A species of the beautiful longicorn, *Saperda scalaris*, L., is recorded, in the *Ent. Mo. Mag.* for November, as having been captured by Mr. N. E. Frampton in Bretby Park, Derbyshire. Canon Fowler remarks that he once took a specimen in Robins Wood, and the late Mr. Blatch recorded the species from Sherwood Forest in 1889, and that these are the only Midland records of the species. Mr. J. Kidson Taylor, however, recorded it (*Ent. Mo. Mag.*, vol. vi., 1869, p. 60) from the latter locality off oak, and states that he bred it from pupæ taken at the same time under oak bark.

At the meeting of the Entomological Society of London held on November 5th, Dr. Chapman exhibited specimens of *Erebia stygne* and *Plebeius argus* (*aeon*) from Bejar in West Central Spain, for which the varietal name of *bejarensis* in each case was proposed. The *E. stygne* are very richly coloured, with the red bands well developed and the ocellated spots numerous and large, and form an exceptionally fine race, especially as the specimens are nearly half as large again as the ordinary Swiss form (up to 55mm.). The *P. argus* are, similarly, much larger than any other race, reaching an expanse of 36mm., strongly and brightly marked, and suggesting doubts as to how far they are not an approach to *P. zephyrus* or *lycidas*, and whether these are truly distinct from *P. argus* (*aeon* of the British lists). Curiously an equally large, but not quite so brightly marked, *Erebia* was amongst Mrs. Nicholl's exhibits, taken at Picos de Europa. The opinion seemed to be that this was also a form of *E. stygne*.

The most remarkable feature of Mrs. Nicholl's Algerian exhibit, on the same evening, was a fine series of *Teracolus daira* var. *nouna*, and of five species of Anthocharids. It was remarked that the *Anthocharis belia* and *A. belemia* seemed to represent very small forms. As a matter of fact all the six species were of almost exactly the same size, and, even including the *Teracolus*, of an exceedingly close general appearance. No remarks were hazarded as to the probable cause and meaning of this curious identity, although Mrs. Nicholl, in conversation afterwards, stated that she especially selected small examples of *A. belia* in making her captures, in hopes of getting *A. tagis*.

We have received the first fasciculus from Dr. Otto Schmiedeknecht of his *Opuscula Ichneumonologica*, which title sounds as though it were written in Latin, as it certainly should have been; as a matter of fact, it is, unfortunately, in German. The contents of this, which is the first of the quarterly parts to be obtained of the author at three marks apiece, at Blankenburg, in Thüringen, consists of a synopsis of subfamilies of the Ichneumonidae, of tribes of the Ichneumoninae, of the genera of the *Joppini*, *Ichneumonini*, *Histrodromini*, *Heresiarchini*, *Gyrodontini* (trib. nov.), and of the *Alomyini*, which last is quite correctly here placed and not excluded therefrom, as by M. l'Abbé Berthoumien in 1896. These tribes should, according to the German Zoological Society, bear the suffix "-ides," a termination used by lepidopterists for superfamilies, "idi" being uniformly applied by them as a tribal ending. The last 50 pages are occupied by the beginning of a tabular conspectus of the 500 palæartic species of the genus *Ichneumon*, L., representing of course that of

Wesmael, though *Eupalamus*, *Chasmias* (for which the preoccupied name *Chasmodes*, is claimed), *Eristicus*, and various species of *Amblyteles*, are here included. We shall look forward with interest to the promised elucidation of the *Phaenogeniides*, and trust that Dr. Schmiedeknecht will not, like Berttommien, overlook Professor Thomson's invaluable work on this much neglected tribe, the males of which are, at present, so difficult of discrimination. We feel that the students of these economically beneficial parasites—the Ichneumonidae, *sensu stricto*—will at length have some periodical to look forward to, which, in view of their scanty numbers, is all they can expect, and this could hardly be said of Pastor Konow's "Zeitsch. für syst. Hymen. und Dip.," the major part of which was occupied by Diptera and the Aculeata, not to mention the editor's work on saw-flies. A venture like Dr. Schmiedeknecht's needs nothing but subscribers to ensure success, and we trust that these will, though far to seek and far between, suffice to the propagation of his work. — C. M.

ERRATUM.—GONIODOMA LIMONIELLA.—In a note of mine published *Ent. Rec.*, xiii., p. 303, I referred to the breeding of *Gonioloma auroguttella* from plants of *Statice*. This species seems to have been described as *G. limoniella*. My attention has recently been called to this oversight by Mr. Bankes, so I now take the opportunity of correcting the error. F. G. WHITTLE, 3, Marine Avenue, Southend, October 30th, 1902.

ERRATA.—Page 268, line H, for "birch" read "beech." Page 271, line 16, or "*Epanda nigra*" read "*Clostera pigra*."

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PREFACE.

Another volume has been completed and we have again to thank our subscribers and contributors for their excellent support during the past year. There has been no special feature like the "century" articles of the last volume, but the volume contains a large amount of most important and useful entomological detail, which has, we believe, kept it quite up to the level of its best traditions.

The work of the assistant editors has been especially onerous this year. The coleoptera section under Professor T. Hudson Beare and Mr. H. St. J. K. Donisthorpe has been rather heavier than usual, and Mr. M. Burr maintains well the interest of our orthopterists in the work that is going on in their special branch of our subject. The help of Dr. T. A. Chapman and Mr. L. B. Prout with the lepidoptera, has again been of the utmost value to ourselves and our readers.

Help in the production of the plates published with this volume is gratefully acknowledged, we have to thank Dr. T. A. Chapman, the Rev. A. M. Moss, the Hon. N. C. Rothschild, and Mr. Dollman. To the latter our readers are indebted for the beautiful handpainted larva of *Dicranura bicuspis*, every copy of which was coloured by the artist himself.

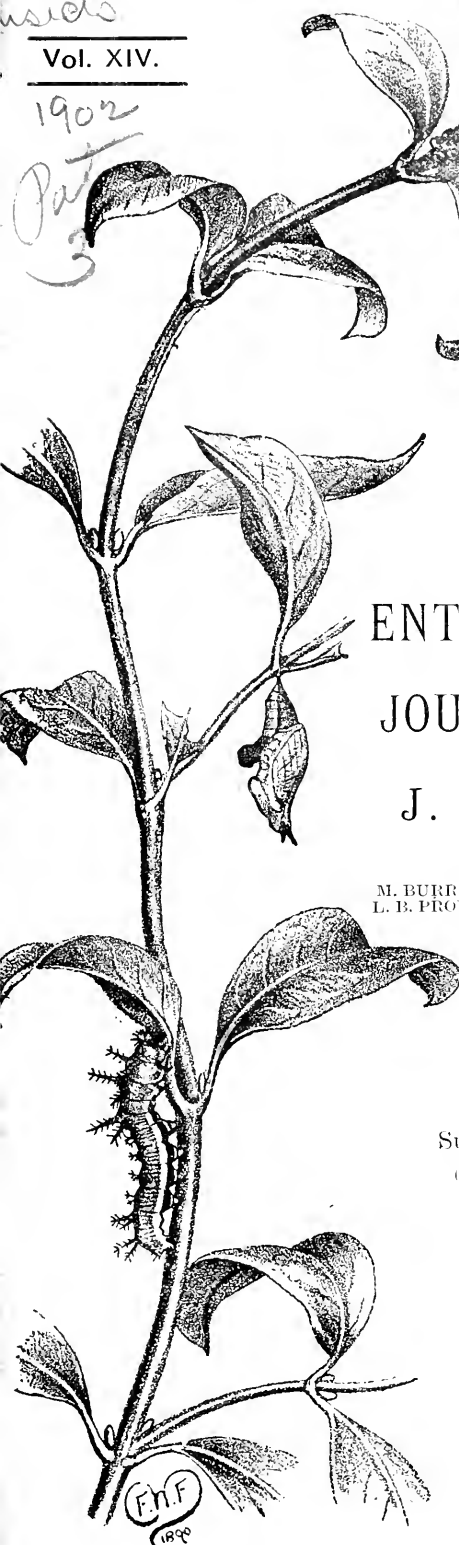
Owing to an unfortunate affection of the eyes, from which Mr. G. B. Routledge is suffering, extra help in the preparation of the Special Index has had to be obtained. Mr. H. J. Turner is helping Mr. Routledge with the lepidoptera, Professor T. Hudson Beare is doing the coleoptera, and Mr. M. Burr the orthoptera. Whilst regretting exceedingly the necessity for obtaining further help, we are exceedingly grateful to those who have so kindly offered their services. We trust that Mr. Routledge, to whose kindness we have been indebted so long, will soon recover from what we hope is but a temporary disability. It is hoped that the "Special Index" will be ready with the January number. We regret to add that, whilst this has been passing through the press, Miss E. Wells, who has for many years been responsible for the "general index" of this magazine, and had only a few days before completed that published with this number, died suddenly of apoplexy on December 5th.

We again ask for a supply of short notes and observations, which should in reality be not at all difficult to obtain. It would appear, however, that such are really more rarely penned than one might fairly expect. I may here point out that the compilation of really good text-books must depend largely on an abundance of such notes made by isolated workers. These notes become of the highest scientific importance when collected together for the purposes of generalisation. Similarly, notes on collecting—with dates, observations and localities—are exceedingly valuable.

In conclusion we beg to tender our heartiest thanks to our subscribers and contributors, and to everyone who has in any way contributed to make the volume a success.

1902

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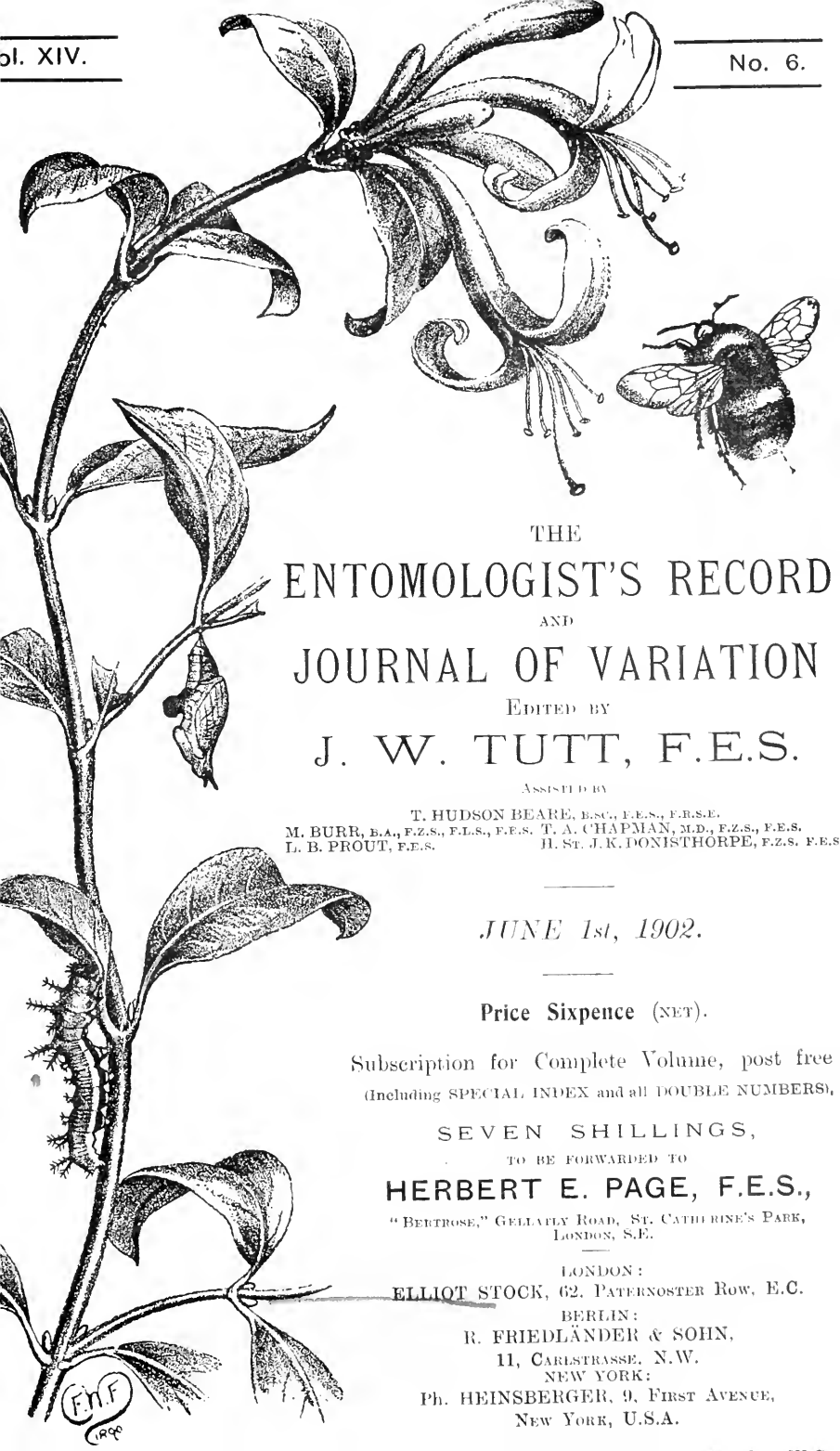
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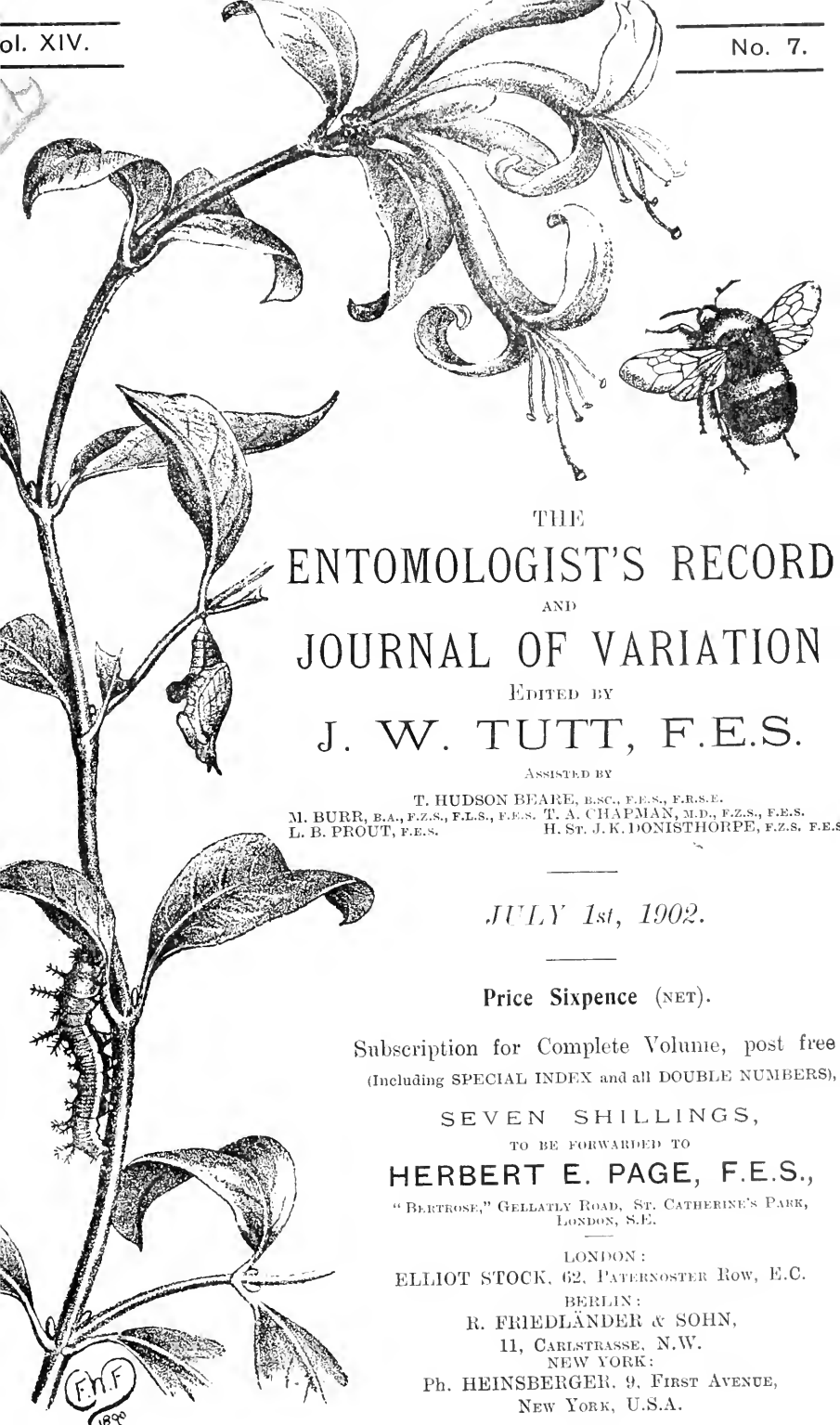
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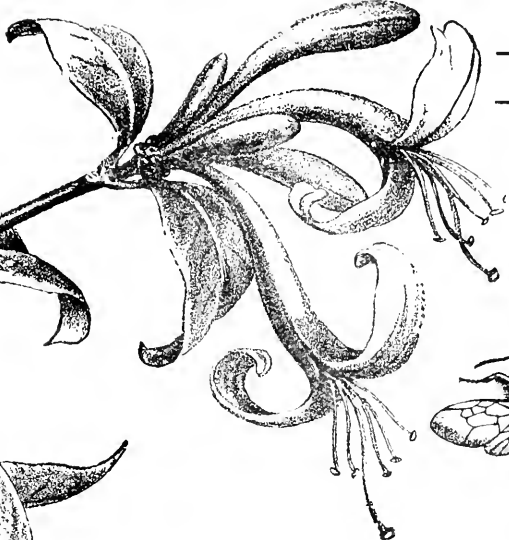
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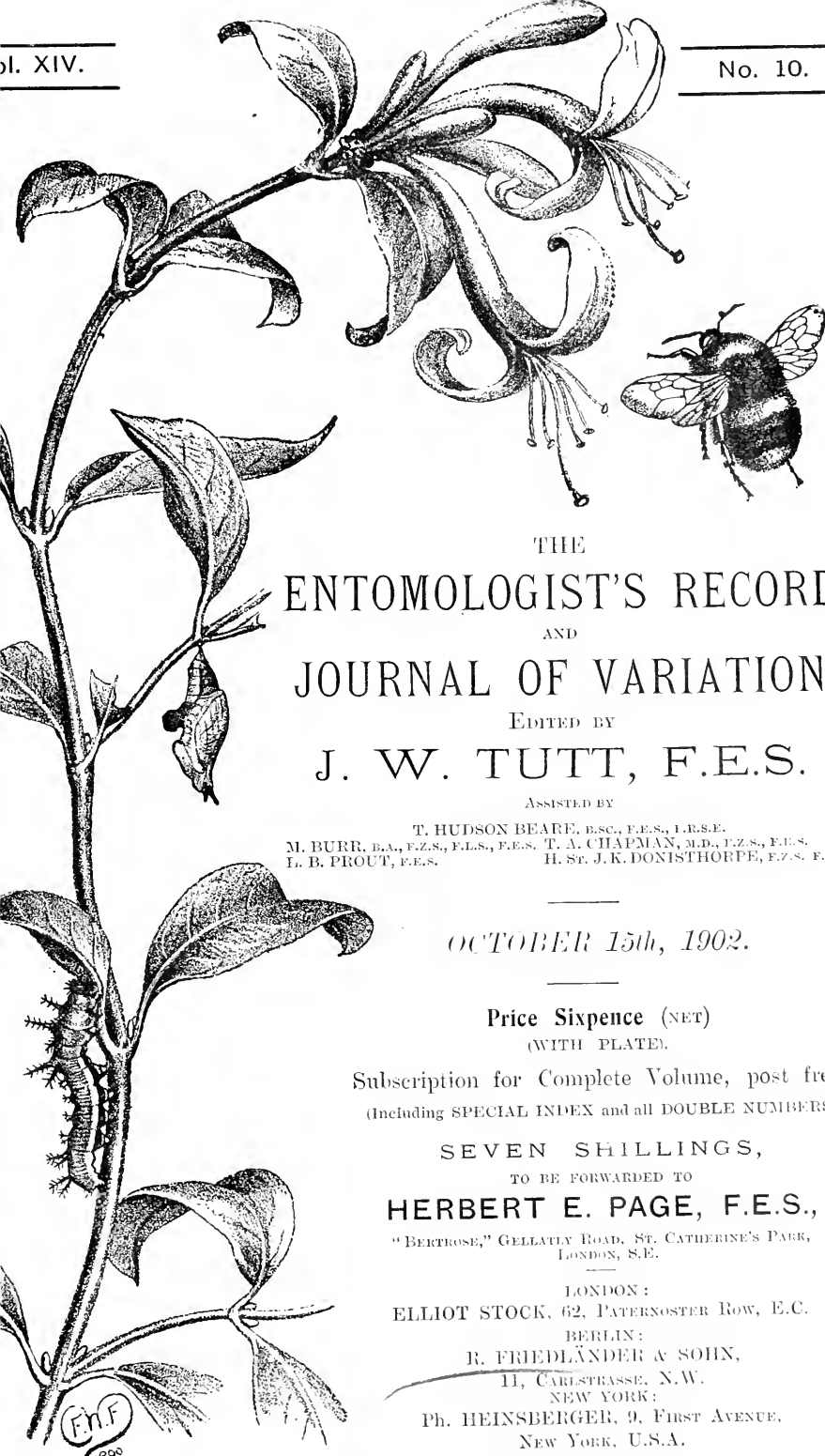
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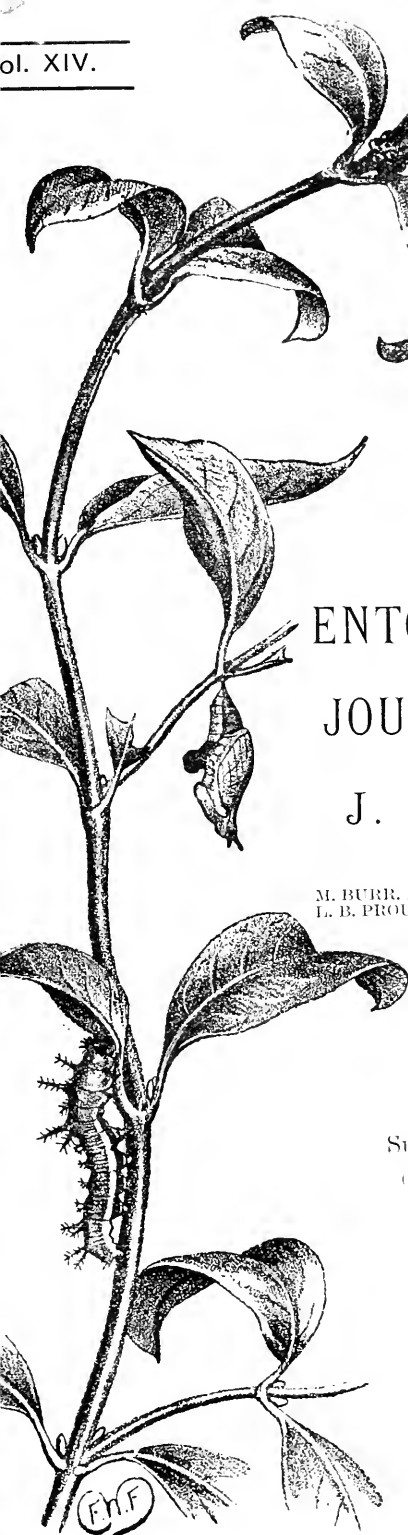
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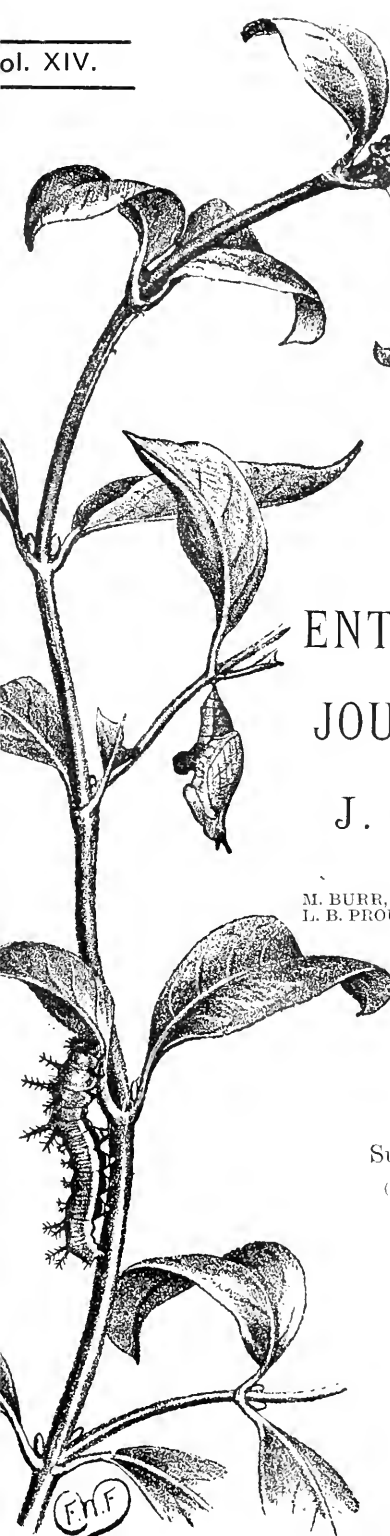
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