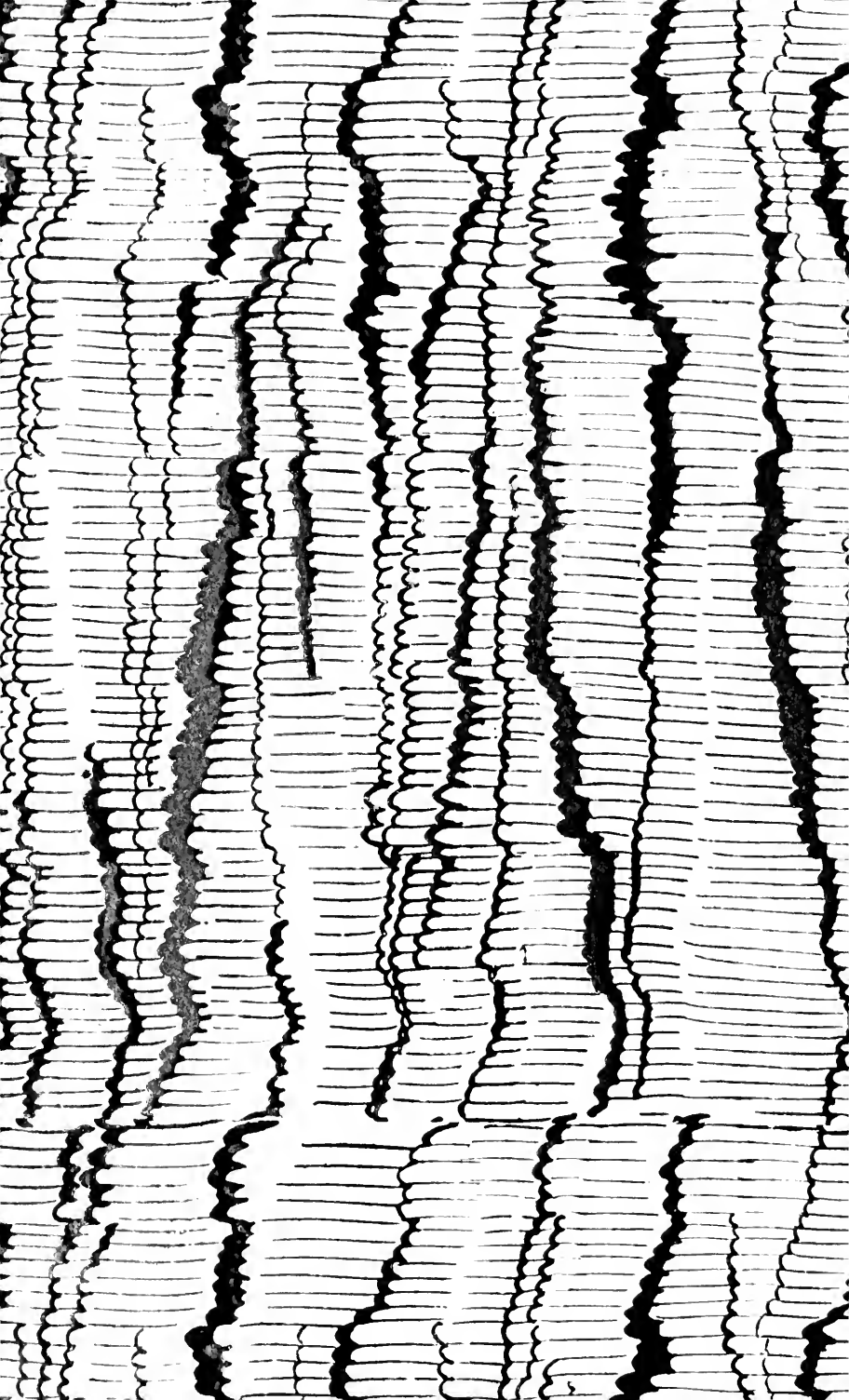

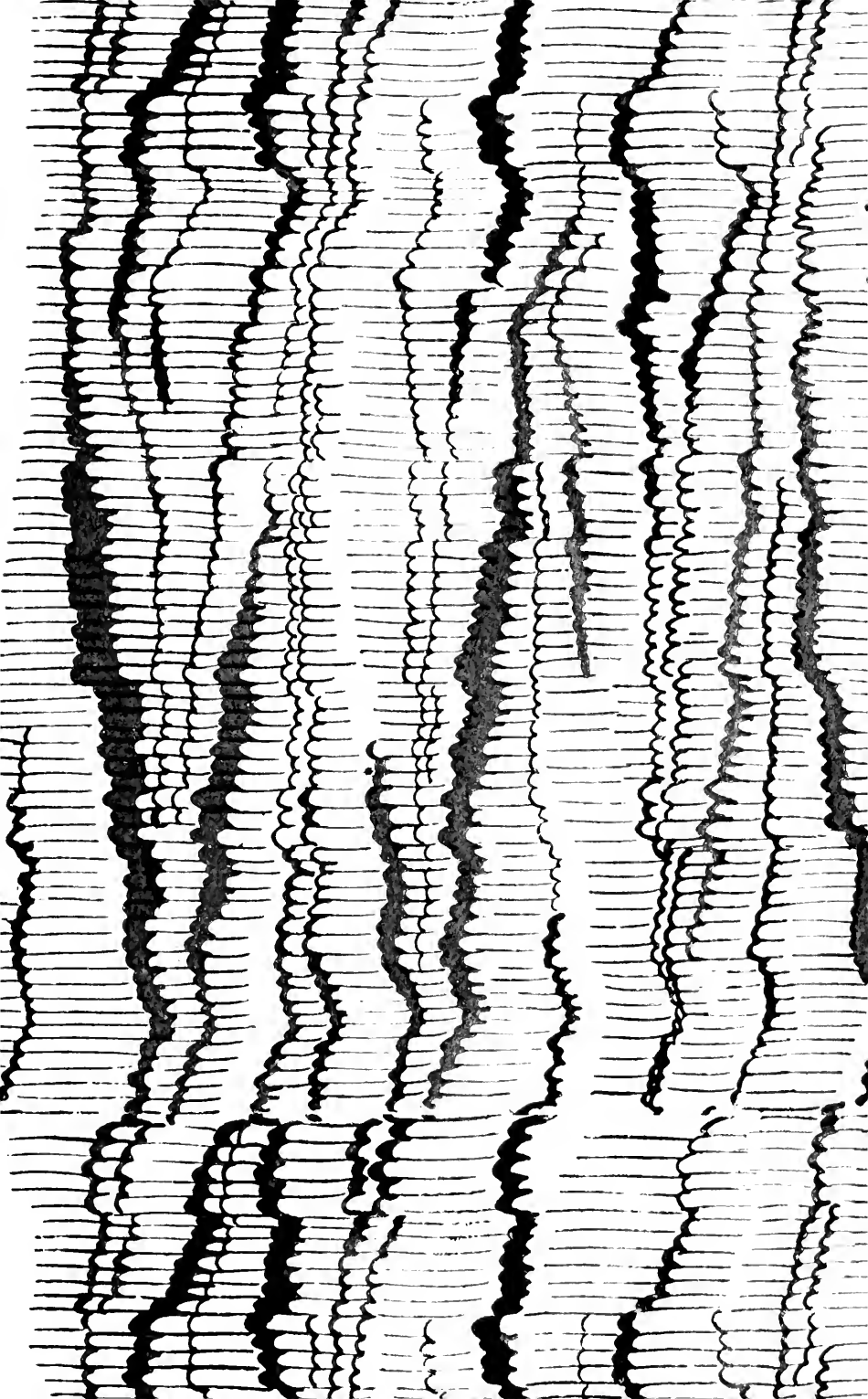

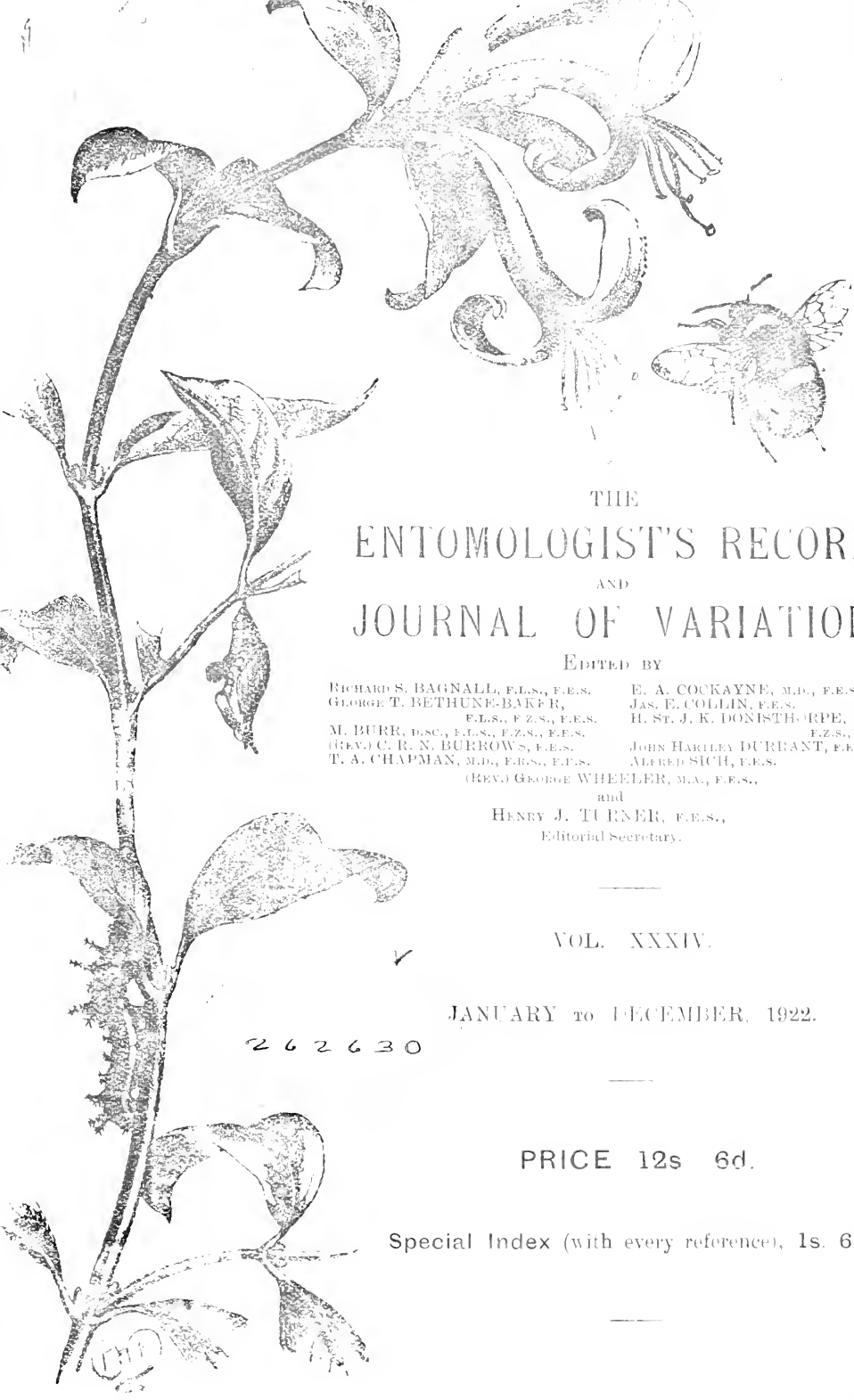

THE

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AND

JOURNAL OF VARIATION

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The Entomologist's Record & Journal of Variation.

VOL. XXXIV.

SPECIAL INDEX.

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

Coleoptera arranged in order of Genera. The other orders arranged by Species. Genera, Species, etc., new to Britain are marked with an asterisk, those new to Science with two asterisks.

ACARINA.

ARANEINA.

COLEOPTERA.

DIPTERA.

HYMENOPTERA.

LEPIDOPTERA.

NEUROPTERA.

ORTHOPTERA.

PARANEUROPTERA (ODONATA).

RHYNCHOTA.

NOT CLASSIFIED.

CORRIGENDA, Etc.

1917. plt. 8., fig. 2. *andromedae* should be sp. ?

1919. p. 131, 133, 170, 206. "*malvae*" in all cases should be "*malvoides.*"

p. 134, 170, 176, 173. "*coridon*" in all cases should be "*hispana* = *aragonensis.*"

p. 171, 172. "*pruni*" in all cases should be "*ilicis.*"

p. 186, line 45. for "*pruni*" read "*spini.*"

1922. p. 43, 44, 45, 46, 47, 48. "*nicaea*" in all cases should be "*jucunda.*"

p. 47, lines 36, 37. delete "*flavidor*" and substitute "*argus* (*argyrognomon*)."

p. 23, line 4 from bottom. for "und förmigen" read "C-förmigen."

p. 43, line 3 from bottom. for "*irimatorius*" read "*primatorius.*"

p. 83, line 4 from bottom. add "by Dr. A. Jeffries Turner.

p. 189, line 24 from bottom. for "*Phania lacta*" read "*Phaonia laeta.*"

Subscriptions for Vol. XXXIV. are now due.

Vol. XXXIV. **No. 1.**

The Entomologist's Record AND Journal of Variation

EDITED BY.

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The Entomologist's Record
AND
JOURNAL OF VARIATION.

Vol. XXXIV. No. 1. January 15th, 1922.

Myrmecophilous Notes for 1921.

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

The very long hot summer and the drought of 1921, made it a very poor year for Ants in England; nearly all the species burying themselves much deeper than usual in the ground. The entire failure of many species of Aphids during part of the summer also had a marked effect upon the *Formicidae*. My colleague Mr. Crawley tells me that he was informed of several cases of ants entering dwellings this year, where they had never done so before. I also heard of similar occurrences, and we are both agreed to attribute this to the lack of plant-lice. Some ants, as we shall see later, had their marriage-flights quite a month earlier than is usual with them. *Formica sanguinea*, which always goes down for the winter sooner than our other species of *Formica*, disappeared still earlier than usual this year.

Formicidæ.

Ponera punctatissima, Roger.—My friend, Mr. Philip Harwood, sent several winged females and workers of this rare little ant to me to name. He tells me he captured two ☿ ☿ in fungi, and a winged ♀ which he beat off a fungus on October 29th, in the Limpsfield Woods, near Westerham. On November 5th he took twelve more specimens, including winged ♀ ♀ as well as ☿ ☿, in the same locality, in a sawdust heap on which some large fungi were growing. I have only one previous record from West Kent, when a winged ♀ was swept by the late Edward Saunders, in a wood at Bromley, far from any houses [*Brit. Ants*, p. 72]. In Harwood's locality also, no houses are anywhere near, nor is there a refuse heap, or anything to suggest the ants had been introduced.

Myrmecina graminicola, Latr.—In my last year's notes I recorded that no winged females had been reared for the first time for four years in my observation nest of this little species, which I have now had in my possession for over eleven years. I suggested that the fighting, which took place between the ants in 1919, might have caused this, and that as no fighting to speak of had occurred in 1920, winged females might be produced again in 1921. Such has been the case, and large numbers of winged ♀ ♀ were reared; the first individuals putting in an appearance on June 17th. One or two of these females are still

retaining their wings to-day (November 15th). Many males were reared as usual, and the colony continues in a flourishing condition.

Stenamma westwoodi, West.—As pointed out in *British Ants* (p. 142), very few actual colonies of this rare species have ever been found. Its habits are obscure, and it is usual only to find isolated workers, often in or near other ants' nests; though sometimes a certain number may occur together in moss, etc. Mr. Phillips has, however, recently found a number of colonies in their actual nests in County Wexford. For his very interesting account of these discoveries see the *Irish Naturalist* for November [**30** 125-7 (1921)]. I am indebted to Mr. Phillips, and to Mr. Stelfox of the Dublin Museum, for a nice little live colony of this ant, which they kindly posted to me. On September 20th I fixed up this colony, which consisted of a deälated ♀, some 50 ☿ ☿, and a number of medium and large larvæ, in a four-chambered "Janet" nest. The ♀ laid eggs on September 21st, and again between November 2nd and 7th. I find the ☿ ☿ "feign death" when touched; they also have a curious habit, when the cloth over the nest is raised and the colony disturbed by being exposed to the light, of rushing at a larva, seizing it, and apparently giving it a good shaking up! I have found when touched that a larva will exude a drop of thick white fluid; it is probable that this is a means of defence, and possible that the worker shakes up a larva to induce it to discharge this fluid. These ants devour flies and other insects readily, with bits of which they feed the larvæ, as also with crumbs of cake and biscuits; but they do not appear to care much for honey. Mr. Main has kindly photographed two of the larvæ for me. He had them in his possession for about a fortnight, at the end of which time, when I returned them to their nest, the ☿ ☿ for a long time would have nothing to do with them. Eventually they were placed with the rest of the brood. The following is a short description of the egg and larva:—

Egg.—White, opaque, shining, longer than broad, somewhat parallel-sided, rounded at each end; rather large for the size of the insect.

Larva.—Greyish white, head pale yellow, mandibles reddish; covered *all over* with short anchor-tipped golden hairs. Plainly segmented to within a third of the posterior end; the head and 3 thoracic somites bent over posteriorly towards the ventral surface. Head flat, rounded, with short very pointed mandibles; abdomen pyriform.

The larva is semi-transparent under the microscope, part of the alimentary canal, breathing apparatus, and nervous system being visible through the skin from the dorsal and ventral aspects; but not nearly so plainly through the sides. At the ventral posterior end of the body, a white opaque mass can be seen through the skin, which is evidently of a liquid consistency, as when the larva is touched with a paint brush, a thick white drop of fluid is exuded from the anus, which either evaporates very quickly, or is partly received back into the body, leaving a thick white coating of the consistency of "Chinese White" on the anal surface of the larva.

Acanthomyops (*Donisthorpea*) *niger*, L.—Marriage flights of this ant took place on July 7th and 8th this year at Putney; about a month earlier than the more usual time. On August 20th another flight occurred in my garden at Putney in the afternoon, and shortly after it

had commenced a number of Sea Gulls had arrived, and were observed to catch the flying ants high up in the air. Yet another flight was observed (and also of *A.* (*C.*) *flavus*) on September 5th, when very many swallows collected and levied toll on the ants.

Formica exsecta, Nyl., ⌒* *F. fusca*, L.—Several mixed nests of these two species were found by Harwood on July 15th, when he was staying at Rannoch, in Scotland. He tells me there were three or four in number, within a yard or so of each other, situated under stones about seven inches by four inches in size. Little or no nest was visible from above, and, in fact, nothing to indicate that ants were to be found beneath the stones. The mixed colonies were not very strong, although a fair number of ants were found; the *exsecta* ☿ ☿ predominating over the *fusca* ☿ ☿ in each case. Very few mixed colonies of these ants have been found before, either in Britain or on the Continent [see *British Ants*, p. 279].

Formica sanguinea, Latr.—Colonies of the "Slave-Maker" were discovered by Harwood at Brasted, Westerham, and Ightham near Sevenoaks; the first records for Kent of this species.

Formica fusca, L.—On the afternoon of May 22nd when at Bewdley I captured a female of this ant on the wing. This appears to be the earliest date on which a winged *fusca* ♀ has been found away from the nest.

Introduced Ants.—On January 11th I visited Kew Gardens in search of ants, but found them to be far less abundant than in former years. The gardeners have (in my opinion very unnecessarily) been continually killing off ant colonies in the hot-houses in recent years, by means of poison. The ants do little, if any, harm, only attending such Aphids and Coccids that may occur on the plants, and it is very ridiculous to say that the ants introduce these pests into the hot-houses. On the other hand they do much good by killing off other noxious insects. *Prenolepis donisthorpei*, Forel., still occurs in the Fern House, and *Triglyphothrix striatidens*, Emery, was also present. The only other ant noticed was the common *Technomyrmex albipes*, F. Smith, in the Palm House, etc.

Coleoptera.

Quedius mesomelinus, Marsh.—On September 27th last year a number of this beetle was found in the Woking *A.* (*D.*) *fuliginosus* nest, and again this year on October 7th more specimens, including a fine ♂, occurred in the same nest. I have taken it with the same ant at Chiddingfold in numbers, and sparingly at Oxshott. This insect shows strong leanings towards a myrmecophilous life, and as I pointed out in my paper on the "Origin of the Ancestral Form of Myrmecophilous Coleoptera" [*Trans. Ent. Soc. Lond.* **1909** 407], we can

* ⌒ This sign was invented by Wasmann in *Die Zusammengesetzter Nester und gemischten Kolonien der Ameisen*, Munster (1891), to express the union of two species to form a single colony. The name of the auxillary species is always placed after the sign.

easily imagine a descendant of *Quedius mesomelinus* as a regular ants'-nest species.

Microglossa gentilis, Märk.—Previous to last year I had only taken this species at Oxshott, but it put in an appearance in the Woking *fuliginosus* nest on March 19th, 1920; on May 30th it was common together with its larvæ. It was subsequently observed on June 20th, 1920, and June 6th and October 7th, 1921.

Scydmaenus exilis, Er.—Harwood found this little beetle in a nest of *Formica rufa* in the Limpstield Woods near Westerham, in considerable numbers extending over a period of many weeks. On September 17th I had the pleasure of taking it with him in this nest. This precludes the possibility of its being only a chance find; moreover J. J. F. X. King sent me several specimens taken on July 24th, 1915, in a *rufa* nest at Bridge-of-Gairn, and Wasmann tells me he has it in his collection, taken by the late Viehmeyer with the same ant in Saxony. The beetle is often, and probably generally, found under bark—I have taken it under such circumstances in Sherwood Forest—but the above records show that at times it can, and does, lead a myrmecophilous life.

Chalcididae.

Spalangia erythromera, Först.—Having at last discovered the true host of this Chalcid, it seems advisable to give a short account of both how this was arrived at, and also its history as a British insect.

On April 6th, 1906, I captured a specimen of this insect (which had not previously been found in Britain) in a nest of *A.* (*L.*) *fuliginosus* at Wellington College. On the same date I took home a number of the ants and their larvæ, carton from the nest, and other débris, which I fixed up in a large glass bowl to serve as an observation nest. In this bowl large numbers of the *Spalangia* were reared (the insect continuing to emerge all through the year); as well as other parasitica; Diptera including many *Phyllomyza lasiae*; etc. I jumped to the conclusion, perhaps naturally, that as the Chalcid is shining black like the ant with which it always occurs, and as the ants treat them without hostility, even tapping antennæ with them at times, they were parasitic on the ant larvæ; and there the matter rested. I subsequently captured the species, always with the same ant, at Darenth Wood, 26-vii-09; Oxshott, 9-ix-13; Weybridge, 28-viii-14; and Woking, 27-ix-20, 22-ix, and 7-x-21.

On September 27th, 1920, I took home, from a *fuliginosus* nest at Woking, a small quantity of carton, damp earth beneath it, refuse, etc., which had in it a number of fat Dipterous larvæ, and various species of Dipterous pupæ; but neither ants, nor ant larvæ. This I fixed up in a small plaster nest. On December 10th a *Spalangia* put in an appearance. I suggested that—"This however proves nothing, as the *Spalangia* may leave its host before pupating, and have been present as a pupæ in the débris" (*Ent. Rec.* **33** 23 (1921)). It nevertheless made me suspicious, and I isolated some of the Dipterous pupæ in a small glass-topped box. On February 18th, 1921, a *Spalangia* emerged from a pupa of *Phyllomyza lasiae*; thus settling the question of the host. Two more specimens were reared from

Phyllomyza pupæ; one on April 10th, and the other on September 20th.

BRACONIDÆ.

Blacus mamillanus, Ruthe.—Mr. Hallett sent me a ♂ of this Bracon, which he had taken at Porthcawl, Glamorgan, on May 16th, 1921, in company with ☿ ☿ of *A.* (*D.*) *niger*. The shape, colour, and general appearance of the body and legs are very like the ant. The ♂ of this insect was unknown to science.

PROCTOTRYPIDÆ.

Heloius anomalipes, Pz.—Mr. Hallett took a ♂ of this Proctotrypid in company with *Leptothorax acervorum* at Candleston, near Porthcawl, in July, 1916. The insect in question is superficially so like a ♂ of the ant, that it was not until he was setting it together with ♂ ♂ of the *Leptothorax*, he discovered it was not an ant. This and the previous species were kindly identified by Mr. Morley.

Ceraphon sp.?—I captured a specimen of a species of *Ceraphon* in a nest of *F. rufa* at Westerham on September 5th, 1921, which I believe to be new to Britain; at any rate I have not taken it before.

HETEROPTERA.

Piezostethus formicetorum, Boh.—This curious little myrmecophilous bug was discovered by Harwood in a nest of *Formica rufa* in the Limpsfield Woods, Kent, in some numbers, both nymphs and adults being present. He showed me this nest on September 17th, when I secured a few nymphs. This capture is of considerable interest, as the bug has never been found in England before. It was first recorded for Britain in 1872 from Aberdeenshire where it was taken in *rufa* nests at Glen Lui (Hislop) and Braemar (B. White). After this it was not found again until 1907 when I turned it up in *rufa* nests at Rannoch, Perthshire. In May, 1909, I took it at Nethy Bridge; and again at Rannoch in June, 1911, when it occurred in some numbers in one *rufa* nest, both nymphs and adults being present. In July, 1915, J. J. F. X. King found it with its usual host at Bridge of Gairn, Aberdeen.

APHIDIDÆ.

Tetraneura ulmi, Geoff.—This species occurred in some numbers in a nest of *A.* (*C.*) *flavus* in my garden at Putney on March 25th. My previous captures of this Aphid are as follows: in nests of—*Myrmica ruginodis* Loch Arber 31-iv-08; *A.* (*C.*) *alienus* Whitsand Bay 16-iv-09; *A.* (*C.*) *flavus*, *Myrmica scabrinodis* and *Formica fusca* Bradgate Park 3-v-09; *A.* (*C.*) *flavus* Darenth Wood 6-vi-09; *Tetramorium caespitum* St. Issey 25-iv-11; *A.* (*C.*) *flavus* Isle of Eigg 18-ix-11; and *A.* (*C.*) *flavus* Lundy Island 9-vi-13. Mr. Laing tells me he has kept a special lookout for it, but has only found it on elm at Newlands Corner in Surrey. I imagine however that he has not looked for it in Ants' nests. It is very curious that a species which is associated with the elm should occur in ants' nests on Lundy Island, and the Isle of Eigg, where elm trees are not to be found! There is much yet to be learnt about the life history of most of the myrmecophilous *Aphididae*.

(To be concluded.)

A fortnight at Mont Ventoux (Vaucluse).

By G. T. BETHUNE-BAKER, F.L.S., F.Z.S.

From Digne to Mont Ventoux is not really a long way, but it is an awkward journey, and we found that much the best way was to go back to Marseilles and there get on to the main line to Avignon, changing there for Carpentras where we caught the motor-bus for Bedoin, which was to be our resting-place. To do this in a day we left Digne by the 5.30 a.m. train in the morning and even so had very little time to spare at Marseilles to enable us to catch the train north. Of course, the train we were in was late and it seemed to delight in staying as long as ever it could at every little wayside station we passed through, but at last we arrived at the great French port with about three minutes to catch the Avignon express. Fortunately I knew the station, so we seized our baggage and sped across to the other platform and had barely got into the train, when the departure horn was sounded. We had done the job and so we were content and could then enjoy the delightful views of the coast, if somewhat distant, that are obtainable from the railway for those who know what to look for. The motor-omnibus at Carpentras was waiting our arrival, but so full was it that I ascended on to the roof as did quite a few other men and sat among the baggage; it happened to be market day and all the people from Bedoin and several big intervening villages, had been to Carpentras to buy their week's provisions, etc., among them being one or two enormous yellow pumpkins about two feet long and well over a foot in diameter, all of which found a resting place with us on the top; the only things that troubled us occasionally were the branches of the trees that lined all the roads and that caused a torrent of excitement to issue forth from one or two of my travelling companion's throats when their hats were swept off by the passing branches. Meanwhile my wife was crushed inside and would far rather have been on the top, but alas it was not possible for a woman to make the decidedly primitive ascent. We at last reached our headquarters, somewhere about 6 p.m. in the evening, and if the Hotel du Mont Ventoux at Bedoin was somewhat primitive, the Hostess at least was kindness itself and nothing was left undone to add to the comfort of our visit. The heat was very great, but it was a dry heat, and was therefore quite bearable, for descending from the Maritime Alps at an altitude of about 3400 feet to somewhere about 800 feet, it will be readily understood that the difference in the rarity of the atmosphere must necessarily produce a certain amount of relaxation that was not at first conducive to violent exercise.

I understand that we were probably the first English people who had explored the country around and the Mont Ventoux itself, certainly they had never to their knowledge entertained "les Anglais" before in our little hotel. I had sorely wanted to stay at the hotel on the summit of Ventoux but Monsieur H. Brown of Paris strongly advised me not to do so, as the top was subject to violent storms and was very frequently enveloped in mist. So I had to be content with two separate nights on the summit and in one case there was a hurricane blowing that nearly took my wife off her feet, and in the other case when I stayed there alone, a soaking mist covered the highest area. But what are Bedoin and Mont Ventoux like? The latter from just

outside the little village of Bedoin appears to be a vast waste of rock and stone almost devoid of vegetation, but this first impression is not quite correct for there is really everywhere, except on the steepest gradients and the very summit, a considerable amount of stunted brushwood and also plenty of more or less dried up low growing plants that are just able to maintain an existence on the wind-swept serried surface. But along the route towards the east (the summit runs roughly east and west so that the slopes are approximately north and south ; Bedoin being on the southern side) that leads to the summit there are large areas of various trees, on the borders of which the vegetation, being protected, is more luxuriant, with lavender and other aromatic herbs in abundance. The best hunting grounds were naturally in this district, though Monsieur H. Brown tells me that much the most interesting side is to the north in the neighbourhood of Brantes. But Bedoin on the edge of the lowland country is totally different, here we were but 800 feet high, whereas the altitude of Ventoux is over 6000 feet, and around our hotel we found ourselves in the land of olives and vineyards, a land where tomatoes and asparagus were cultivated in acres and acres, and a land apparently of incredible plenty and luxuriant growth. The cultivated lavender, of which there were vast fields, grew in great and beautiful bushes four to five feet high with a girth in proportion, whilst the olive trees were probably by the million and were almost *the* feature of the landscape, with their neat and trim appearance, and their bluish green foliage, and with their height always within the range of a ladder of quite moderate length. The people like the country looked prosperous, the farms all beautifully kept and the fields in exposed parts protected from the winds by bamboo hedges and rows of maize. Poverty or want seemed to be most certainly banished from this part of France. It was indeed most interesting to see agricultural and horticultural France at home, quite off the usual tourist route, and here as ever, ready to give her allies a most cordial welcome, for nothing could be more gratifying than the welcome given to us not only by our hosts Monsieur and Madame Bernard but also by many of the French tourists on their way up to the observatoire, on the summit of Ventoux itself.

The butterfly fauna of Bedoin is not quite similar to that of Ventoux and therefore it will be better to keep them separate. No doubt we were fully late in both cases, but especially in the former, though this was advantageous so far as some of the Satyrids were concerned, but there is no doubt that had we gone there for the end of June and the beginning of July my list of species would have been greatly increased, nevertheless it may be interesting inasmuch as it is a record from a district that is probably quite new to most English readers. Taking the lowland country (if I may call it so at 800 feet) around Bedoin, between the vineyards or between the olive plantations, and such like, there are often broad cart roads for the passage of carts collecting the produce, and these are sometimes edged by high banks with paths on the top and plenty of rough growth and flowering plants, whilst here and there are small copses of trees with the usual undergrowth around—these byways and undisturbed spots were the places where insects were to be best obtained, whilst the small woods around the farms at the very foot of the mountain were also worth visiting for various odd species.

On a little wooded knoll outside the village both *Papilio podalirius*, past its best, and *P. machaon* were not uncommon, the latter in prime condition, and it may be of interest to note that of two females, both perfectly fresh, one is cream colour and one is of the pale form, both being taken during the first week in August; here also I took *Satyrus hermione* and *S. circe*. In the cart roads and by-paths *Pieris daplidice* was fairly common, the type form not var. *raphani*—*P. rapae* was less common whilst *P. brassicae* was still less so. *Colias croceus* (*edusa*) was to be seen here and there but was not plentiful, the few I captured being very fresh, evidently quite recent emergencies. I did not see, however, a single *C. hyale* at this level. Along these paths *P. podalirius* would occasionally course, but always with a very strong straightforward flight, *Satyrus arethusa* and *S. statilinus* were common, whilst occasionally *S. briseis* would dart out from the rough ground of the olive plantations and more often perhaps avoid my net than fall a victim to it. *Epinephele jurtina* race *hispulla* was plentiful but *Pararge maera* was rare, whilst I only saw one or two *P. megera*. *Coenonympha pamphilus* race *lyllus* were not infrequent and *Epinephele tithonus* also common. *E. ida* was to be found flitting uncertainly at the foot of the grass banks, but was difficult to take owing to its dodgy flight. It is curious to remember that when I took this species flying in the hedgerows at Ille-sur-Tet, I did not notice this quick uncertain flight; possibly the more open country here may account for this when compared with the more luxuriant growth under the high hedges of the Pyrenean district. The only *Argynnis* I took was *Brenthis daphne* but the genus *Melitaea* was better represented. *M. didyma* was common, some few being richly coloured with deep black spots, but the majority of specimens of both sexes showed signs of the hot dry climate in the paler ground colour and the reduction of pattern, the latter naturally more noticeable in the males than the females. *M. phoebe* was going over but *M. cinxia* was in excellent condition, whilst I was glad again to meet with *M. deione*. It is curious that in these paths the *Lycaenidae* were very poorly represented, indeed they were conspicuous by their absence. A few *Rumicia phlaeas* var. *eleus*, poorly coloured specimens, were captured, and one or two *Plebeius* (*Aricia*) *medon* (*astrarche*). In one or two uncultivated spots I took a few, very few, *Polyommatus coridon*, one *P. thetis*, and one just emerged female *P. hylas*, and I cannot think why this latter came down to so hot and dry a district. The *Hesperiidae* were also few and far between. A few *Urbicola comma* and *Augiades sylvanus*, a single *Erynnis* (*Carcharodus*) *alceae* and one *Hesperia fritillum* (*cirsii*) were all I obtained.

In a pasturage a little at the back of our hotel through which a stream flowed most of the year, but was quite dried up in August, with a few big trees on each side, I found very worn *Satyrus circe* and *S. hermione*, whilst on the other side of this field, on the edge of a well farmed area, I took a nice little series of *Polyommatus semiargus*, smaller than the mountain specimens but perhaps a little richer in colour; here also I took one or two female *P. icarus* and one female *Cupido argiades*. There is but one more insect to record, coming down from "la Madeleine" (the walled in cemetery) situated on a little eminence a short distance out of the village at the back, we encountered a very hot corner of a garden just before getting into the shade of the

top square. There were really almost two "squares" in the village—it was a corner in the blazing sun with a low stone wall surmounted with flowering shrubs of various sorts, here I found *Polygonia egea*, it was evidently a favourite spot with this species so that I was able to take a nice little series of it all in good condition. The heat of this lowland country was so great, after a month or more at la Sainte Baume and St. Martin Vésubie, that I have no doubt one's energy was somewhat modified and this might have affected the number of specimens captured, but I do not think it affected the number of species captured, for feeling the paucity of species I was anxious to increase my list, and I do not think I missed any of the day-flying Macro-lepidoptera that were then on the wing.

Turning now to le Mont Ventoux itself, my wife was very desirous to see the sunrise from its summit, so with this object in view we made enquiries from the only garage in the neighbourhood and ascertained that they would not take their car up to the summit under 200 francs, if, however, four people could be found to go, it would then be possible to do the trip for 50 francs apiece. I must admit we thought the charge "modest" to say the least of it, for the ascent in the car was made in well under two hours. We left it, therefore, for the time being, but intimated that if they could find two passengers we would make the other two, and so time went on, when suddenly just as we were finishing dinner one evening, Madame la Proprietresse came in in great excitement and said "another lady and gentleman wanted to go up Ventoux that night, would Madame and Monsieur join the party?" It was a case of yes or no on the spot, but it did not take long to make up our minds and the reply came back very quickly, "Yes, we would join. At what hour, however, would the start be made?" At 2.30 a.m! so there was not much sleep that night, but just after 2 a.m. we left our quarters and made our way on a brilliant night to the garage in the main street, and after some delay we were all well wrapped up and comfortably settled in. The start was made under almost a full moon and with the stars as bright spangling the heavens in myriads. It was a weird but intensely interesting ascent, the shadows, so deep and black, thrown across our view by the shoulders of the mountain and by the trees added to the novel strangeness of the scene, but up and up we went, and finally, just about 4 a.m., we pulled up in front of the door of the somewhat sheltered hotel, that had been built just below the summit. By this time it was bitterly cold and the wind was blowing like a hurricane, so that the shelter of the hotel was very welcome. But to our surprise we found the house almost full of students of both sexes from Avignon, a lively party indeed it was and hot coffee and cakes were very refreshing, but in spite of the noise everything was quite orderly and we made friends with one or two students, who kindly indicated all the mountains and districts to be seen, for this is one of the great view points of France. The wind was so furious that it was with the greatest difficulty the final steep ascent (up steps cut in the rock and with the assistance of a handrail) was made, when the announcement was given that the sun would be up in five minutes. Having arrived on the summit just above the "Observatoire," the best thing to be done was to sit down and wait, and then in a short time the minutest fraction of a deep red circle appeared above a hill, and moment by

moment the red vision increased till all the fiery orb appeared in view —but alas! that was all, for almost as rapidly a vast bank of black cloud rose up in front and hid from our sight all the wondrous colours that would otherwise have greeted us.

The whole summit is a waste of stone, but I did pick a few little asters nestled cosily in sheltered corners, and the pink, *Silene acaulis*, I believe. How we wished we could have remained for a time, the wind was so bitter and so strong that the shelter of the hotel was the wiser course for my wife. Our chauffeur, however, was good enough to lead the way for me across the side of the bare mountain (une jolie promenade) to see "une jolie source" issuing forth from the mountain side—certainly I should never have found the way alone for there was no track and the so called path had a bare precipice on the one side and the equally steep mountain rising up on the other, but it was nothing to those who knew the way and so we arrived at the "jolie source," which consisted of a wee stream of water issuing through a short leaden pipe out of the heart of the mountain and so trickling down to the valley far below.

But alas all things come to an end and we had to wend our way back, and much quicker than we came did the automobile carry us down to the sunny realms below, where we were not sorry to have an hour's rest before partaking of our mid-day dejeuner.

The difficulties of working this isolated mountain were not altogether small, I was roughly at least six kilometres from the nearest good locality, the village of Ste. Colombe about four kilometers away up a gradual ascent with a further two kilometers to Saint Estève, another tiny village, en route to the summit, had to be passed before arriving at any collecting ground that was at all satisfactory and from Ste. Colombe to St. Estève the gradient was heavy. I was able to borrow a bicycle once or twice from my kind host up to the former place, but beyond there this method of progression was quite impossible and after St. Estève the gradient slowly increased right up almost to the summit. It will be seen therefore that collecting was somewhat arduous and to add to the difficulty water was almost unprocurable, there being only two little founts on the south side of the mountain, one of which I did not find and the other was only a short way from the summit. I was fortunate in having the loan of a large scale map of the mountain all marked out with the best collecting localities. Mr. H. Brown had been good enough to lend me this so that I was thus able to go straight to some good spots. The first of these spots was a little distance above St. Estève at an elevation of about 2500 feet, after which collecting was profitable almost up to the "fontaine de la Grave" over 4500 feet high. All along the route and in the by-paths on the sides of the mountain, as we ascend, there are plenty of flowers and low vegetation, whilst an abundance of trees line the road for a considerable distance above the same hamlet.

Papilio podalirius was still on the wing and in very good condition, a single *Pieris rapae* and one *Leptosia sinapis* were caught. *Colias hyale* was evidently just emerging, the three or four specimens I captured being in beautiful condition with their pink fringes intact, I did not, however, see one *C. croceus* (*edusa*). *Gonepteryx cleopatra* was flying, but all the specimens showed signs of age. Thirsty and getting weary with a long day's work, for I had left Bedoin

by 8 o'clock in the morning and had been walking and collecting all day, I rested after 5 o'clock p.m. beside the "fontaine de la Grave," and drank and drank, and how refreshing the icy cold water was—had my wife been with me no doubt I should have been told how very bad icy cold water was, but it was very refreshing and most welcome for I had not had a drink since breakfast, grapes being all the moisture I had imbibed, when suddenly a butterfly dropped with folded wings almost beside me, being likewise "dry." A moment's refreshment sufficed and the wings opened and closed with enjoyment—*Pyrameis cardui*. I could not resist the attractions of this painted lady and we became travelling companions for the next week or two. It proved to be a female in perfect condition and I should think in her first flight. *Limenitis camilla* was on the wing for some little distance above St. Estève, but did not continue very high up. Of the *Melitaea* the same occurred here as below, *viz.*, *M. phoebe*, *M. deione*, *M. cinxia*, and *M. didyma*, one specimen of the last named species having the right forewing not quite fully developed and with posterior border broadly bleached. I took one *Brenthis dia* quite fresh, one poor *Argynnis niobe* and one equally poor var. *eris*. *Melanargia galathea* was going over but all my specimens are var. *procida*. It seems an interesting phenomenon that here we should find *procida*, whereas at La Sainte Baume at a less elevation and nearer the Mediterranean the form was typical *galathea*. The only *Erebia* flying was *E. neoridas* and it began about 2800 or 2900 feet and was so abundant that I secured a fine series. Here again it is a darker and handsomer form than the Mende Causse form, but on the whole a trifle smaller, neither being nearly so rich in colour or so fine as those from Digne or the Maritime Alps. It was a great pleasure to find oneself among the Satyrids again. *S. arethusa* was common everywhere and are mostly of the form *dentata* with the tawny fascia broad. *S. actaea* and its variety *cordula* were passed their best, but I brought home two or three nice examples. *S. briseis* was widely distributed but not exactly common; it was extremely wary in the brilliant sun and very difficult to catch, but I secured a little series some of which have a spread of two and a half inches from tip to tip. I have a longish series of this species and these specimens are only exceeded by some exceptionally large females from Brussa (Asia Minor), they are perhaps the form *major*, Oberthür. *S. hermione* was still in good condition and is a very large fine race. I took a single *S. circe* among some fir trees, where I also took several more *S. hermione*, but it and one or two more I saw were very old and worn. As I ascended *Hipparchia semele* appeared, and is a nice well marked form, in the male the spots are very distinct and nicely bordered with yellowish. *Epinephele jurtina* was, of course, present, while *E. lycaon* was practically over, but not quite ended, and *E. tithonus* was, of course, in good condition. *Coenonympha* was represented by two species, *C. pamphilus* var. *lyllus* and *C. dorus*. The Lycænids were again very poorly represented, but it was now mid-August and late for the group. I took four specimens of the genus *Heodes*, one *H. alciphron* more or less in rags—one *H.* (*Rumicia*) *phlaeas* var. *eleus* and two *H. dorilis*. Not a single specimen of the genus *Plebeius* occurred, but *Polyommatus* was better "en evidence," *P. icarus* was fairly common but a small form; the females as abundant as the males, and one only of ab. *icarinus* occurred. *P.*

coridon was common, a largish race, and here again I took more females than males. Only three specimens of *P. thetis* were captured and all were of an abnormal blue colour with mal-developed scales. I took a single *P. escheri* (worn) also of an abnormal colour, and likewise a single pretty, minute female of *P. hylas*. *Scolitantides* put in an appearance with a pair of *S. baton*, and I also saw one *S. orion* but failed to catch it, I feel sure it was *orion*, but of course I admit the doubt attaching to an uncaptured Lycænid. Again a single female *Lycaenopsis argiolus* made its home in one of my boxes and this closes the list of "Blues."

The *Hesperiidae* were far from common. I took a nice little series of *Urbicola comma*, two *Hesperia fritillum* (*cirsii*) and one *H. sao*.

This list is a very meagre record for Mont Ventoux, but my distance was too great from the scene of action, and I should judge that the only really satisfactory method of adequately working the locality (unless you had a motor-car) would be to camp out on the mountain near one of the very few water holes. It would then be possible to do justice to the district, which I should much like to visit again, were it feasible to adopt this method.

On August 17th we had to turn our faces towards the home country and thus ended a very delightful holiday, during which we experienced many and continued kindnesses from across the Channel, the "Entente Cordiale" being so far as we experienced of certainly the most cordial nature.

I must not close however without expressing my best thanks to my colleague Mr. Wheeler for kindly going through my *Melitaea* and naming them up for me, and also to Mr. Rowland-Brown for the same kindly help with the genus *Hesperia*.

During the whole two months absence we had glorious and uninterrupted sunshine. I believe that two short showers summed up the only rain we had.

Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera.

By ROGER VERITY, M.D.

(*Continued from vol. xxxiii., page 495.*)

Melitaea didyma, Esp., race *romana*, Calberla, and second generation ROMULA, mihi.—In my summary of the races and seasonal dimorphism of this species, in the *Ent. Rec.*, xxxi., p. 179, I used the name of *romana* for the second generation of my race *protea* from Tuscany. Staudinger gave *romana* as a synonym of *persea*, Koll. Seitz remarked that this was quite a mistake and he used the name for the individuals of the second brood of southern Europe, which resemble *persea*, together with that of *dalmatina*, Stdgr. In my Italian paper on the Mainarde Mts. (see p. 171) I have already stated at page 59 that, having procured Calberla's original description, I discovered both Staudinger and Seitz have made a blunder. He clearly says his typical series was collected at Monte Rotondo, m. 165, in May and June and he describes in a most perfect manner the first generation of the Roman race, which is different from the Tuscan *protea* in being of a lighter fulvous and less extensively marked with black. I remarked that *dalmatina* is no doubt the second generation of race *meridionalis*, Stdgr.,

and I called *caldaria* the very small and pale fulvous second generation, from Florence, of *protea*. I have just received a series collected last August at Genzano, near Rome; this is evidently the second brood. I find it is surprisingly different from the Florentine *caldaria* in that it is in no way as different from the first broods of *romana* or *protea*. It is only a little smaller than *romana*; it has none of the ochreous tinge, characteristic of summer individuals, being only of a yellowish fulvous in male and of a whitish or rosy fulvous in female; the black markings are only a little reduced in extent as compared with *romana*; the basal black suffusion, however, is always very limited or even abolished, and this is the only well marked feature, showing I have before me a second brood. On the underside the black markings and the fulvous bands are remarkably prominent and deep in tone, instead of being, on the contrary, faint, as in *caldaria*. Two very old females are unmistakeably survivals of the first brood and suggest *protea*, rather than *romana*, having flown at Genzano. A little August series from Paliano, a more arid locality of the same region, comes very near *caldaria*: presumably such surroundings would produce *romana* in the first generation, because the latter is a first step towards *caldaria*, as compared to *protea*.

Melitaea trivia, Schiff. and Denis, race *catapelioides*, Stauder [*Zeit. wissen. Insektenbiol*, xiv., p. 57 (1918)], and race CAUCASI, mihi.—This is one of the species which in Italy has only been found in a few localities, at great distances from each other. It is recorded from Botzen in South Tyrol by Spüler. Count Hartig, of Botzen, and Astfäller, of Meran, told me they had never found it, but the former had heard from Wagner and Stauder that they had collected it at the altitude of m. 1000 on Mt. Laugen, situated at the beginning of the Ultental, near Lana. It is found in the Roman Campania: recorded in old days by Calberla and Standfuss at Monterotondo, and lately by Rostagno, who found it at Oricola, m. 1000, on the boundary of the Abruzzi. I have just seen two specimens collected in August, by a beginner in entomology, at Paliano, on the railway between Rome and Finggi. The third locality is Calabria: discovered by Stauder in June above Paola, m. 400 to 600, and called *catapelioides*; found again last year by Querci, on May 23rd, near S. Fili, m. 900. The peculiarities of *catapelioides* in Stauder's description seem to be the light ochreous colour as in the Asiatic *catapelia*, Stdgr., and a series of black dots standing out prominently between the marginal band and the premarginal lunules, which constitute, according to Stauder, an entirely new feature in this species. Size like that of *fascelis*; black pattern very extensive; dark basal suffusion even more so than in any *fascelis*. The three specimens found by Querci do not fit this description exactly, showing there must be a good deal of individual variation. One is nearly identical to Seitz's figure of *fascelis*, but the fulvous is a little more ochreous in tone: the black dots described by Stauder are certainly there, but they are blent with the very broad marginal band. The other specimens are more ochreous in tone, but, being worn, are no guarantee as to what the colour was when fresh: pattern much less extensive than in preceding, and, more or less, as in what one calls the nymotypical *trivia*; no trace of the black dots. The two Paliano specimens of second generation are similar to the

two latter, but smaller and with pattern much less extensive, *i.e.*, similar to those *nana*, Stdgr., from South Russia, which point more to *catapelia*, Stdgr. Two more specimens from Genzano, near Rome, collected in August, 1921, are intermediate, being a little larger, redder, and with pattern more intensive than in the latter; they quite resemble Seitz's figure of male *nana*. August and September are the months one would have expected the second generation to emerge in and the Campania data answer this prevision. Two generations from April to July, as Spüler seems to suggest, is an absurdity. A bipartite emergence of the first brood is instead very likely, similar to the one Querci has observed near Florence yearly in *didyma*, Esp., since 1915; I described this phenomenon in the *Ent. Rec.*, xxxi., p. 105. For the small and ochreous second generation of Central Europe I think one should revive the name of *iphigenia*, Esper, from "Austria," which has been neglected. I possess a very pretty race of *trivia* collected by the Sommier-Levier expedition in the Central Caucasus at the Latpari Pass, m. 2000 to 3000, on August 4th, 1890, together with the first *Parnassius nordmanni*, Mén., of the nymotypical race found in Europe and now in my collection. This race, to my knowledge, has not yet been recorded. It corresponds to race *alpina*, Stdgr., of *M. didyma*. In both sexes the black markings are not particularly extensive, but the female has the ground colour of a yellowish white in the outer portion of the wings, and of a greenish grey in the basal part; only the anterior half of hindwing, as far back as the third median nervure, is of the usual bright fulvous; it thus has a very variegated appearance, distinctly alpine.

Brenthis daphne, Schiff. and Denis, race TENUITERMACULOSA, mihi, and race *nikator*, Frhst. [*Internat. Ent. Zeit. Guben*, iii., p. 113 (Aug. 14th, 1909)].—Frühstorfer very rightly pointed out the considerable differences of aspect exhibited by the nymotypical race and the one from South Tyrol (Klausen) and from the Valais (Martigny). The characters he gives are "the lighter yellowish-brown ground colour, the much smaller submarginal spots of hindwing and the notably finer black markings generally, the underside colour, which is altogether lighter, with eye-spots more prominent and the yellow median band lighter in tone and more sharply outlined." He notes that his Valais females are still more conspicuous than his finest from Klausen. Turati and I in our "*Faunula Valderiensis*" [*Bull. Soc. Ent. Ital.*, xlii., p. 212 (1911)] referred the race of the Baths of Valdieri in the Maritime Alps to Frühstorfer's. Subsequently I found that all the specimens collected by Querci in Central Italy, from Tuscany to the Mainarde Mts. in Southern Latium, were quite similar to my series from that locality and I used the same name for them. Last year, however, I purchased an extensive series collected by the late Arno Wagner at Klausen, and Querci procured me some specimens from S. Fili on the Coast Range of Calabria. I then discovered that the races of these two localities, although so different and far apart, were very similar to each other, but that the race which extends from the Maritime Alps to the whole of Central Italy, was as different again from those *nikator* as the latter are from nymotypical *daphne*, and constituted a much further grade of variation in the same direction. Suffice it to say that only one male from Klausen, out of 25, resembles

the Valdieri race. The females differ still more from each other and resemblance never occurs: at Klausen their black markings are more extensive than in the male; in the other race they are, if anything, less extensive. This, of course, is due to the usual rule in all the *Argynnidi* races of the Alps, as compared with those of Central Italy. In this case, as in the others, a striking feature is the total or nearly total absence in the latter region of the dark basal suffusion on all the wings in both sexes. Other features of my new race, besides the notable further accentuation of the characters given by Frühstorfer, are its larger size than *nikator* and the particularly pale, dull ochreous yellow of the female, which increases the sexual dimorphism. What is surprising is that *daphne* at the Baths of Valdieri should be the same as in Central Italy, whereas *niobe*, L., and *aglaja*, L., produce in that locality their Alpine characteristics to a high degree and differ most markedly from the races of Central Italy by the extent of their dark markings. Frühstorfer was right in saying the Valais race is still more striking than the one of Klausen. Judging from specimens collected by Wullschlegel at Martigny, it is intermediate between the two races described, but it comes nearer to my new, culminating one than to the Klausen *nikator*. I propose restricting this name to the latter and calling the other *tennitermaculosa*, taking as "typical" my series from the neighbourhood of Florence. The Martigny race could be designated as *tennitermaculosa* trans. ad *nikator*. It will be noticed that in this species again the Calabrian race goes back to the darkest Alpine race and contrasts with its near neighbour of Central Italy.

Argynnis niobe, L., race *rubida*, Vrty., trans. ad *appenninica*, Vrty. —In the *Bull. Soc. Ent. Ital.*, xlv., p. 214, pl. I., fig. 8 (1914), I described the beautiful race discovered by Querci at the Piani di Carmelia, m. 1200, on the Aspromonte, which is a near ally of *kuhlmanni*, Seitz, from the Black Sea, and I described (*l.c.*, p. 213, pl. I., fig. 6 and 7) the race from Central Italy, which contrasts sharply with it. The race of the Coast Range (Le Crociate, m. 900 to 1000, above S. Fili) has, as usual, the Calabrian characteristics to a lesser extent than the Aspromonte one, but in the case of this species, instead of approaching the race of the Alps, it is transitional to the one of Central Italy, probably because *rubida* itself is oriental in character and not similar to the Alpine race, as is the rule in the other species. At Le Crociate the fulvous is slightly more reddish than in *appenninica*, but far from the beautiful carmine tinge of *rubida*; the black markings are intermediate in extent; the underside of hindwings has traces of the rust-coloured spots, but paler and less extensive than in *rubida* and often mixed with the green, which replaces it in *appenninica*; finally, one male specimen has been found with all the silver spots present, whereas no *rubida* of this sort has been detected amongst the large numbers collected on the Aspromonte.

Argynnis aglaia, L., race LOCUPLETATA, mihi, = *locuples*, Vrty. [*Ent. Rec.*, xxxi., p. 195].—I propose this new name to replace that of *locuples*, which I was sorry to discover had already been applied by Butler to an *Argynnis* of the species usually called *adippe*, L.

(To be continued.)

NOTES ON COLLECTING, Etc.

AUGIADES SYLVANUS.—On June 25th last, I took while on the beach at the foot of low cliffs on the Hampshire coast a remarkable male specimen of this species. The position of the markings is more or less similar to the normal, but the colouring is quite distinct.

The normal bright yellow ground colouring of both fore- and hindwings is replaced by white, which is also the colour of the six spots near the apex of the forewings, and also of the costal margin; the normal broad brown marginal area of the outer and inner margins of both fore- and hindwings is replaced by a greyish brown, the wing rays being also of the same colour.

The sexual mark is large, and is rather broader than usual towards the base, and is quite black.

The longer hairs of the basal area of all four wings are of a greyish indigo blue colour on a dark greyish brown ground colour, giving this portion of the wings a distinct bluish tint, and this greyish blue effect also extends in a thin line along the inner margins of the forewings as far as the outer area.

The body and thorax, instead of being the usual dark brown colour, have a greyish blue effect similar to that of the basal area, the colour being apparently the combined effect of dark brown, greyish blue, and white hairs. There is no sign whatever of fulvous or yellow scales, or hairs anywhere on either wings or body.

If identification is possible from the foregoing description, the writer would be glad to be informed of the probable name of this variety.—R. BARNARD CRUICKSHANK. *December 12th*, 1921.

A NOTE ON SOMERSET DRAGONFLIES.—On July 11th last I visited Maiden Down, which lies beside the Taunton-Exeter road, and is about 2 miles over the Devon border and some 5 miles beyond Wellington, Somerset. The object of the visit was to take a series of *Plebeius aegon* (*argus*), which was there plentiful, the Down being covered with heather and *Ulex nanus*, the dwarf furze. The Down is divided by a boggy stream which owing to the drought was nearly dry. At the lower end of this stream I took 2 male *Cordulegaster annulatus*, and *Orthetrum caerulescens* was common along the bog, 4 ♂s and 3 ♀s being easily netted. In the afternoon my nephew, J. R. Paterson, caught a ♂ *Agrion* which turned out a prize, the local *A. mercuriale*. I am not a dragonfly collector myself but was capturing the above for Mr. H. H. Slater, Joint Recorder and Secretary of the Somerset Arch. and Nat. Hist. Society. Upon enquiry I find *A. mercuriale* to be a new record for Devon, not having been previously taken west of Dorset.

On July 25th I made a special visit with Mr. Slater to try and capture *A. mercuriale* on the Somerset side of the border. We went for this purpose to "The Merry Harriers Inn on the Blagdon Hills some 6 miles below Taunton, where there was similar ground. The day turned out dull with a wind and little was on the wing. We again took *C. annulatus*, and found *O. caerulescens* in a worn state. About 12.30 (summer time) the sun shone for about half a minute and I succeeded in taking a ♂ *A. mercuriale*. I afterwards found that the spot was some 40 yds. over the Devon border. If the drought has not exterminated the dragonflies I hope however to

capture *A. mercuriale* in Somerset next season. A record of five dragonflies new to the Somerset list will appear in the *Transactions of the Somerset Archaeological and Nat. Hist. Soc.*—(Capt.) R. Troup, The Grove, Wembdon, Bridgwater. *July* 21*st*, 1921.

Second brood of O. sambucaria.—*Ourapteryx sambucaria* put in an autumn brood early in October, 3 ♂ s coming into the house here at Wembdon; *Hepialus lupulina* was also taken in the garden, but I unfortunately did not record the date and cannot now remember whether it was the end of September or early in October.—Id.

The White Border of Euvanessa antiopa.—I should like to mention that hybernated specimens of this species were not uncommon at sallow-blooms, near Wiesbaden, in the spring of 1888, all of such that I netted and released having white borders. A short series obtained later in the same year, there, of the freshly emerged examples, all have deep cream-coloured borders, and have retained this tint in the cabinet, up to the present time.—R. M. Prideaux, Brasted Chart, Kent.—*January 4th*, 1922.

The White Border in Euvanessa antiopa.—Mr. J. H. Durrant informs me that Camp 44, from which Lord Walsingham's specimen with defective scales came, was in California, Siskiyou, Winchester, 31, vii.—1, viii., 1871. This is near Mount Shasta. The majority of these abnormal *antiopa* seem to be from boreal, or mountainous localities.—E. A. Cockayne.

CURRENT NOTES AND SHORT NOTICES.

It is with great grief we have to announce that our illustrious colleague, Dr. T. A. Chapman, F.R.S., has passed away. An account of his life and work will appear later.

In the *Vasculum* for July and December, 1920, Mr. Donisthorpe has some "Notes on the Recent Extensions of the Range of certain British Beetles," giving the history of such extensions from the earliest records to the present day.

The "Verrall Supper" Association of Entomologists has announced that the Annual gathering will take place on January 17th, at the Holborn Restaurant. Membership of the Association is open to all Entomologists, the amount of subscriptions being entirely optional. It is not intended to limit the Supper to subscribers, but it is hoped that all those who approve of the objects of the Association, and are in a position to subscribe, will become members, in order that a still larger number of Entomologists may attend.

In the South London Entomological and Natural History Society the following members have been nominated to be the Officers and Council of the Society for the ensuing year:—*President*: E. J. Bunnett, M.A., F.E.S. *Vice-Presidents*: K. G. Blair, B.Sc., F.E.S., N. D. Riley, F.E.S., F.Z.S. *Treasurer*: A. E. Tonge, F.E.S. *Librarian*: A. W. Dods. *Curator*: S. R. Ashby, F.E.S. *Assistant Curator*: T. L. Barnett. *Editor of Proceedings*: H. J. Turner, F.E.S. *Hon. Secretaries*: Stanley Edwards, F.L.S., etc. (*Corresponding*), and H. J. Turner, F.E.S. *Recorder of Attendances*: L. E. Dunster. *Hon. Lanternist*: A. W. Dennis. *Council*: T. L. Barnett. A. W. Buckstone, L. E. Dunster, O.

R. Goodman, F.E.S., T. H. L. Grosvenor, F.E.S., H. A. Leeds, G. S. Robertson, M.D., E. Step, F.L.S., E. Syms.

In the Entomological Society of London the following have been nominated as officers and members of Council for the ensuing year: *President*: The Rt. Hon. Lord Rothschild, D.Sc., F.R.S., etc. *Treasurer*: W. G. Sheldon, F.Z.S. *Secretaries*: S. A. Neave, M.A., D.Sc., F.Z.S., H. Eltringham, M.A., D.Sc., F.Z.S. *Librarian*: H. J. Turner. *Council*: R. Adkin, H. E. Andrews, E. C. Bedwell, J. E. Collin, F.Z.S., J. Davidson, D.Sc., F.L.S., J. J. Joicey, F.L.S., F.Z.S., F.R.G.S., etc., F. Laing, W. G. F. Nelson, Professor E. B. Poulton, M.A., D.Sc., F.R.S., etc., N. D. Riley, H. Rowland-Brown, M.A., J. Waterston, D.Sc.

SOCIETIES.

Entomological Society of Hampshire and the Isle of Wight.

November 5th, 1921.—Meeting at 47, Tennyson Road, Southampton. The President, Mr. W. Fassnidge, M.A., in the chair.

New Members.—Mr. J. C. Moberley, M.A., and Mr. B. Hobby, both of Southampton, were elected members.

The secretary reported that the authorities of University College, Southampton, had generously placed a meeting-room, two cabinets, and library accommodation at the disposal of the Society. One more meeting, the Annual General Meeting, will be held at Tennyson Road, on December 3rd, at which Mr. A. E. Burras, B.A., has consented to read a paper, and after that all meetings held in Southampton will be at the new headquarters. It was reported that the work of compiling the County Insect Fauna List was proceeding satisfactorily, and that the *Hemiptera* would now be in the charge of Mr. Rae Sheriffs, M.A., D.Sc.

Two short papers were then read by the President. The first was "On the Habits of the Larva of *S. spheciformis*," which gave a very interesting description of the habitat, illustrated by original photographs, and of the life-history of the larva. The second paper dealt with "A short entomological trip to the Vosges," and was well supplemented with photographs and specimens. Outstanding exhibits were *Argynnis cydippe* (*adippe*), var. *cleodoxa*, *Issoria lathonia* (partial albino), *Limenitis sibilla* (second brood), and a *C. xerampelina* with unicolorous left wings.

A general discussion on abnormal broods was raised, and the following reports read:—

Mr. A. E. C. Stowell (Alton): *Pararge megera*, third brood in October; *Porthesia similis*, second brood in October; *Eupithecia albipunctata*, and *Cleora lichenaria* in the same month; *Brenthis selene* on September 4th; *Nisoniades tages*, pale specimens of a second brood.

Mr. W. Fassnidge (Southampton): *Hesperia malvae*, second brood; *N. tages*, second brood in July; *B. selene*, a plentiful second brood in July: *Ourapteryx sambucaria*, October 3rd; *P. similis*, October 4th and later; *Plebeius aegon*, a perfect, newly-emerged male was captured at Lyndhurst on October 30th.

Mr. F. J. Killington (Eastleigh): *H. malvae*, second brood; *N. tages*, second brood at Portland in August; *Pieris brassicae* and *P. rapae*

* We are very pleased to welcome this new Society and have printed the Secretary's first report in full.

partial third broods; *A. paphia*, a single specimen in the first week of September; *B. selene*, second brood at the end of July; *O. sambucaria*, at light in October; *P. megera*, early October.

The Rev. J. E. Tarbat showed dwarf forms of *P. rapae*, *Rumia luteolata*, *Mamestra brassicae*, *Agrotis suffusa*, captured this year; Mr. S. W. Dale exhibited a six-spotted *Z. meliloti*; Mr. E. Cornell sent *Rumicia phlaeas* var. *eleus*, bred in a greenhouse at Ventnor. *Colias crocea* (*edusa*), a lemon-coloured male, *Pyrameis cardui*, with practically no markings on the hindwings, and *Epinephele tithonus* var. *mincki*, and var. *albida*, all of which he presented to the Society; Mr. F. J. Killington, a unicolorous female of *Hepialus humuli*, and varieties of the beetle *Coccinella bipunctata*.

At the conclusion of the meeting a hearty vote of thanks was passed to Mr. J. C. Moberley, who has presented the Society with a splendid library of entomological books, and a valuable collection of Lepidoptera including many rare species.

[The address of the Hon. Secretary is—Fredk. J. Killington, 1, St. Catherine's Road, Eastleigh.]

The South London Entomological Society.

June 9th.—Photographs of Mosses.—Mr. A. W. Dennis exhibited stereophotographs of the mosses *Mnium hornum* and *Bartramia pomiformis*.

Aberration of C. croceus.—Mr. A. A. W. Buckstone, series of *Colias crocea* (*edusa*) with extended black border of forewings.

Aberrations of British Lepidoptera.—Dr. G. S. Robertson, ab. *caeca* of *Aphantopus hyperantus* from the Lakes, forms of *Spilosoma menthastri* with spots tending to run together, bred from Horsley, pale forms of *Tiliacea aurago* from Box Hill and dark ones from Torquay, and var. *lavaterae* of *Hesperia malvae* from Bude, etc.

Exhibition of living imagines and larvæ of various insects.—Mr. K. G. Blair, living specimens of the Phasmid *Bacillus gallicus*, young larvæ of *Thais rumina* and *Papilio podalirius*, the asparagus beetle *Crioceris* 12-*punctata*, the pupæ of the glowworm, and the female of *Epichnopteryx* sp., on the life-history of which he communicated notes.

A captured melanic H. abruptaria.—Mr. O. R. Goodman, the melanic form of *Hemerophila abruptaria*, taken near its original locality in N. London.

Larvæ of P. plumigera.—Mr. F. B. Carr, larvæ of *Ptilophora plumigera*.

The Ant-lion.—Mr. Enifer, cocoon and pupa of the Ant-lion from S. France.

A living T. crabroniformis and a hybrid Zygænid.—Mr. Grosvenor, a living specimen of *Trochilium crabroniformis* and a hybrid between *Zygaena trifolii* and *Z. hippocrepidis*.

June 23rd.—Exhibition of Living Objects.—Insects, etc., from S. France.—Mr. H. Main, a number of objects obtained recently in S. France, including toads, crickets, centipedes, spiders, trap-door spiders, earwigs, harvesting-ants, larvæ of the ant-lion, of the *Ascalaphus morosus*, of *Palpares*, etc.

Galls in ash.—Mr. Coxhead, galls in ash leaves of the Dipteron *Perrisia fraxini*.

PHASMID, FIRE-FLY, AND GLOWWORM.—Mr. Blair, the Phasmid *Carausius morosus* from India, the glowworm *Lampyris lusitanica* from S. France, and the firefly *Photuris pennsylvanica*, bred from larvæ from U.S.A.

PARASITIC DIPTERA.—Mr. H. Moore, dipterous parasites from a pupa of *Sphinx ligustri*.

TRICHOPTERA.—Mr. Step, several species of Trichoptera.

LARVÆ OF C. BIPUNCTATA, ETC.—Mr. Enifer, larvæ of *Coccinella bipunctata* and of an *Anthrenus* with the grain weevil *Calandra granaria*.

SCORPION FLY LARVÆ.—Mr. Withycombe, larvæ of the Scorpion fly, etc.

LEPIDOPTEROUS LARVÆ.—Mr. Carr, larvæ of *Bithys quercus*, *Xanthorhoë montanata*, *Tephrosia consonaria*, etc.

July 14*th*, 1921.—NEW MEMBER.—Mr. G. S. Baker, of W. Brompton, was elected a member.

EXHIBITION AND DISCUSSION ON X. RIVATA AND X. ALTERNATA.—There was a short discussion on *Xanthorhoë* (*Cidaria*) *rivata* and *X.* (*C.*) *alternata* (*sociata*) introduced by Mr. Hy. J. Turner, who dealt at length with the nomenclature and differentiation and briefly with the variation.

Mr. A. A. W. Buckstone exhibited series from several localities and referred to a later and darker form of *X. alternata* (*sociata*).

Mr. Mera, series of both species and referred to the variation occurring in Britain dealing especially with the I. of Lewis dark race of the latter species.

THE PINEBEETLE H. ABIETIS.—Mr. Enefer read a note on his exhibit of *Hylobius abietis* a beetle recently becoming abundant in the S. of England.

ABERRATION OF A. BERENICE.—Mr. H. Moore, an ant-lion he had bred from the larva given him by Mr. Main, from S. France, and also an aberration of *Anosia berenice* with additional spotting from Florida.

WINGED FORM OF V. CURRENS.—Mr. Priske, the unusual winged form of the water Hemipteron, *Velia currens*.

AN AMERICAN FIRE-FLY.—Mr. Blair, the fire-fly *Phengodes laticollis* from Washington and read notes on its life-history.

CALIFORNIAN LEPIDOPTERA.—Mr. Turner, further species of Lepidoptera from California sent to him by Mr. G. B. Pearson.

July 28*th*, 1921.—DIGNE INSECTS.—Mr. Edwards, various insects taken by him at Digne in April, 1897.

DETAILS OF VARIOUS LIFE-HISTORIES.—Mr. Main, an example of the 2nd ecdysis form of *Gryllus campestris*; puparia of the Tsetse-fly from S. Africa; ova of the "Katydid" Locust of N. America; and a young trap-door spider, *Atypus affinis*, from Epping Forest.

THE ASHDOWN COCCINELLIDÆ.—Mr. Ashby, the *Coccinellidae* from the collection of the late Mr. Ashdown, 2,220 specimens.

DAUPHINE INSECTS.—Mr. Goodman, a nest of the wasp *Polistes gallicus* and a larva of *Hyles euphorbiae* from the Dauphiné.

C. DISPAR VAR. RUTILUS REPORTED.—Mr. Farmer said that it was reported that a specimen of the "large copper" had been taken at Limpsfield, and Mr. Edwards suggested that it was possibly an escape from Capt. Purefoy's rearing experiments in Kent.

Subscriptions for Vol. XXXIV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1922.]

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Desiderata.—Cratægata, Sambucaria, condition immateria.. *Duplicates.*—Dominula, mendica, and numerous common species.—*E. A. Cockayne, 65, Westbourne Terrace, W.2.*

Desiderata.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—*W. G. Pether, "Thelma," 4, Willow Bridge Road, London, N. 1.*

Duplicates.—Aglaia, Adippe, *Io, T. quercus, Coridon vars., *Fuliginosa (Reading), *B. quercus ♀, Tiliæ, Menthastri, *Linariata, Aurantiaria, Leucophæaria vars. Paniscus. *Desiderata.*—Pupæ of Dictæoides; Imagines of typhon, palpina, camelina (dark), Curtula, Pyra, and numerous others; Ova of Hispidaria.—*Harold B. Williams, 112a, Bensham Manor Road, Thornton Heath, Surrey.*

Duplicates.—Sybilla, Paphia, Io (2), Selene, Lucina (2), Ocellatus, Illustraria (autumn) Nastata, Roboraria ♂, Prunaria (4) ♂, Tipuliformis. *Desiderata.*—Castreusis ♂, Cucullina, Cribrum, Cinerea, Ravida, Ashworthii, Notata, Obfuscaria, Smaragdaria and others, also vars. and local forms.—*Harold E. Winser, Kent House, Cranleigh.*

Desiderata.—Volumes of *Ent. Mo. Mag.* for 1917, 1918, 1919, 1920, second-hand. State price.—*Hy. J. Turner, 98, Drakefell Road, New Cross, S.E. 14.*

Duplicates.—Cinxia, Bellargus, Coridon, H. Comma, Lineola, Galathea, Moneta, Nupta, and many others. *Desiderata.*—Blandina, Irish Icarus, Carmelita, Cuculla. Gonostigma, Ashworthii, Templi, Australis, Undulata, Smaragdaria, Testacea.—*W. Gifford Nash, Clavering House, Bedford.*

Duplicates.—Brevilinea, Cannæ, Lutosa, Straminea, etc. *Desiderata.*—Many species and melanic forms.—*E. B. Haynes, 25, Denmark Avenue, Wimbledon, S.W. 19.*

Duplicates.—*Atalanta, Sylvanus, *Urticæ, Phlæas, *Moneta, *Pisi, *T. cratægi, *Lucipara, *Filipendulæ, etc. *Desiderata.*—Paniscus, Actæon, Anachoreta, Tincta, Asteris, Absinthii, Notha, Socia, Festucæ, Rubi, Unangulata, Munitata, etc.—*Wm. Foddy, 39, York Street, Rugby.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. 1922, January 18th (Annual Meeting).

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. —*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E.3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

All MS. and editorial matter should be sent and all proofs returned to HY. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

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The Entomologist's Record

AND

Journal of Variation

CONTENTS.

FEBRUARY 15th, 1922.

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Communications have been received or have been promised from Rev. G. Wheeler, Messrs. Hy. J. Turner, H. Donisthorpe, Dr. Verity, E. B. Ashby, J. H. Durrant, Orazio Querci, Dr. Cockayne, P. P. Graves, R. S. Bagnall, J. W. H. Harrison, A. W. Stelfox, P. A. H. Muschamp, with Reports of Societies and Reviews.

Myrmecophilous Notes for 1921.

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

(*Concluded from page 5.*)

APHIDIDÆ.

Forda formicaria, Heyd.—In June Mr. Hallett found a number of the rare alate form of this Aphid at Penarth; they were resting quietly on the under surface of the stone over a nest of *A.* (*D.*) *niger*.

Tychea setulosa, Pass.—Specimens of this Aphid were taken in some numbers in a nest of *A.* (*C.*) *flavus* at Bristol in June by Mr. H. Womersley. This is the first record I have had of this species being found with ants.

Phorodon humuli, Schrank.—Mr. Phillips found a certain number of the "Hop Aphis" in nests of *A.* (*C.*) *mixtus* at Graiqurnamagh, Kilkenny, in June. He tells me the ants picked up the plant-lice and carried them into safety. As the specimens were nymphs it is probable part of the early life is passed in ants' nest.

Anoecia (*Schizoneura*) *corni*, F.—Mr. Stelfox sent me some Aphids taken in nests of *A.* (*C.*) *mixtus* at Mt. Garrett Wood on September 16th, and *A.* (*D.*) *niger* at Ferrybank on October 6th. Co. Wexford. I submitted them to Mr. Laing, who found they agreed with Buckton's slides of *Paracletus cimiciformis*. We found however that they did not agree with my specimens of the latter, and I told him I always doubted all records of *Paracletus* with any other ant except *Tetramorium caespitum*—Buckton records it from nests of *Formica rufa*. Laing has gone into the matter further and he writes—"Buckton states in his description of the genus *Paracletus* that the third, fourth, and fifth joints of the antennæ are nearly equal. This is correct for the diagnosis of *Paracletus*. In his figures of *P. cimiciformis*, however (Plate CII., fig. 4 and 4c), he shows the antenna with joint 3 much longer than the two following. His slides bear out these figures and show that they are not *Paracletus cimiciformis* at all, but *Anoecia corni*, F. I think that the evidence is conclusive that Buckton's records of *P. cimiciformis* should be wiped out; he does not appear ever to have had this species."

My own captures of *A. corni* with ants are as follows:—With *Myrmica laerinodis*, Balrath, Co. Meath, September 13th, 1910; *Formica fusca*, Hartlepool, October 10th, 1910, and Whitsand Bay, July 9th, 1911; *A.* (*C.*) *flavus*, on an Island in Tobermory Bay, September 15th, 1911, and Isle of Eigg, September 17th, 1911; *Myrmica ruginodis*, Isle of Eigg, September 18th, 1911; *Formica rufa*, Parkhurst Forest, September 8th, 1912; and *Myrmica scabrinodis*, Blackgang, August 26th, 1913.

Stomaphis quercus, L.—Although this is not a myrmecophilous species, it may be as well to record it here, both on account of its apparently extreme rarity in this country, and the fact that it was attended by ants when I discovered it. A few specimens were first taken on September 22nd on the trunk of an oak tree at Woking. They were in crevices and partly under the bark of the tree, and my attention was called to them by the clusters of *A.* (*D.*) *fuliginosus* ☿ ☿,

FEBRUARY 15TH, 1922.

which were attending them. The very long probosis of this plant louse is very remarkable. On October 7th I went down again to try and get specimens for Mr. F. Laing of the British Museum, to whom I am indebted for the identification of many species of *Aphididae*, and secured a few more which were also attended by the ants. The only other known British locality is Dulwich, where it was taken many years ago by the late F. Walker.

Acarina.

Uropoliella donisthorpii, Hull.—In the *Vasculum* for February [7 18 (1921)], the Rev. J. E. Hull described this new myrmecophilous mite from specimens taken by myself. These were taken in a nest of *A.* (*C.*) *flavus* at Box Hill on May 1st, 1910, and in plenty with *Myrmica laevinodis* on May 20th in the same locality. These were queried as *U. oratula*, Berl., by Mr. N. D. F. Pearce, and recorded doubtfully as such [*Ent. Rec.* **23** 170 (1911)]. I found another tube which contained a number of specimens taken in a nest of *Myrmica scabrinodis* v. *subuleti*, likewise from Box Hill, on May 20th, 1910. These were also identified as *U. donisthorpii* by Mr. Hull.

I took the true *U. oratula* in a *flavus* nest at Bradgate Park, Leicestershire, on May 3rd, 1909. These little mites are to be found in the bare galleries of the ants, in nests situated under stones.

According to Berlese, in his monograph on the Myrmecophilous Acarina, the males of the following three species are unknown to science. As I find I possess males of all of them, it seems as well to record the fact here:—

(1) *Sphaerolaelaps holothyroides*, Leon.—Mr. Crawley having told me he possessed a ♂ of this species, I proceeded to examine all my own material. I found two ♂ ♂, one I took in company with many ♀ ♀ in a nest of *A.* (*C.*) *umbratus* at Wellington College on June 19th, 1909, and the other with *A.* (*C.*) *mixtus* at Box Hill on May 23rd, 1913. The femur of the second leg in the ♂ is armed with a hook.

This curious mite was first recorded as British by me, from a specimen I took in a nest of *umbratus* at Bewdley on May 21st, 1908 [*Ent. Rec.* **21** 20 (1909)]. I remarked—"The mite is the same colour as the ant, and when it moved it looked like the abdomen of an ant walking by itself." I have since taken it with *umbratus* at Woking, Wellington College, Weybridge, and Box Hill; and with *mixtus* at Box Hill and Lundy Island. I have kept the species in captivity on numerous occasions. In 1911 I wrote:—"I introduced a number from Box Hill into my *umbratus* observation nest, where they lived for a few months. They sit about with the ants and run in and out among them. The ♀ ♀ sometimes appeared to threaten them with their jaws, but never bite them." [*Ent. Rec.* **23** 63 (1911)].

(2) *Antennophorus uhlmanni*, Haller.—This species occurred in great numbers in a nest of *umbratus* at Woking on May 5th, 1911, and again on May 10th. I find that nearly 90% of the material I took then are ♂ ♂. I subsequently took it with the same ant at Weybridge, and with *mixtus* at Box Hill. In my notes for 1911 [*Ent. Rec.* **24** 38-9 (1912)] I gave an account of the habits of this mite, and how it is fed, etc.

(3) *Antennophorus foreli*, Wasmann.—On July 12th, 1907, when at

Abingdon, near Oxford, I swept up a worker of *A.* (*D.*) *niger*, which had two specimens of this *Antennophorus* on its head, a ♂ and ♀, one on the chin of the ant, the other on the upper surface of its head. The mites were evidently courting, as they kept vibrating the front legs very rapidly, and tapping at each other round the ants' jaws. It is very unusual to find *Antennophori* on ants outside the nest.

In June, 1914, Mr. P. A. Buxton sent me up a few tubes of ants which he had taken on Caldey Island, Pembrokeshire. In one of these, which contained some specimens of *A.* (*D.*) *niger*, I found a few examples of *Antennophorus foreli*, one of which was a ♂.

These are the only British records for this species.

Spharolaelaps calcariger, Berl.—In searching through my material of *S. holothyroides* for ♂ ♂; I found a specimen of a mite (taken by me in a nest of *A.* (*C.*) *mixtus* at Box Hill on May 23rd, 1913) which I at once recognised as a distinct species, and which appears to me to be *S. calcariger*, Berl., a species new to Britain. Berlese records it from the same host. I have sent it to Mr. Hull for confirmation, but all he can say at present is that it is new to him and to Britain.

ARANEINA.

Tetrilus arietinus, Thor.—An immature ♂, and several ♀ ♀ (the *T. diversa*, Camb.) were captured in the Woking *fuliginosus* nest on October 7th. The adult male of this spider has only once been taken in Britain, when I first discovered the species here in a nest of *F. rufa* at Oxshott on April 19th, 1900. I am indebted to Dr. A. R. Jackson for the names.

Hippodamia variegata, Goeze.

By G. B. C. LEMAN, F.E.S.

I.—Descriptions of new aberrations :—

(1) ab. **Donisthorpei**, n.ab.

While going through Mr. Horace St. John Donisthorpe's series of this species, I noticed a variety with an arrangement of the spots, for which I have not found any name recorded.

The distinguishing feature is the somewhat unusual confluence in this species of spots $\frac{1}{2}$ and 3, and its formula is 1, $3+\frac{1}{2}$, 4, 5, 6. The marks on the thorax are the usual isolate two small spots and the short medial line.

Mr. Donisthorpe's specimen was taken by him on September 29th, 1920, at Barton Mills, and the type is in his collection.

Confluence with spot $\frac{1}{2}$ is not common in this species and occurs, as far as I can trace any records, in the following aberrations :—

ab. *ustulata*, Ws. [1879], formula 1, 2, $3+\frac{1}{2}$, $4+5$, 6.

ab. *italica*, Walt. [1882], formula 1, 2, $3+\frac{1}{2}$, 4, 5, 6.

ab. *macrostigma*, Gabriel [1905], formula $\frac{1}{2}+3+5$ (in an irregular design), 4.

According to Weise [B.T. 1885] it also occurs in a subvariation of his ab. *maculigera* :—

"b.)P. $4+5+6$ zu einer dicken und förmigen Zeichnung oder zu einer grossen, eckigen Makel vereint. Gleichzeitig kann auch P. $\frac{1}{2}+3$ verbunden sein, oder es fehlen die Punkte 3, 2, und 1 gänzlich. . . . v. *maculigera*, Weise."

So far, however, as the confluence of spots 4+5+6, coupled with the other spots mentioned by Weise, is concerned, this is the formula of ab. *turkmenica*, Zoubk., described in *Soc. Imp. Nat. Mosc.*, vi. p. 339 [1833], *viz.*, 1, 2, 3, 4+5+6 (in an irregular blotch), $\frac{1}{2}$. Weise appears to have overlooked Zoubkoff's aberration and to this extent, therefore, the ab. *maculigera*, Ws., sinks as a synonym of ab. *turkmenica*, Zoukb.

There remain, however, two subvariations of Weise's ab. *maculigera* for which no names exist and these I propose to name.

(2) ab. **Maculigera** (Weise) n.ab.

This aberration is described by Weise in his B.T. [1885] as a subvariation of his ab. *maculigera*, which latter with formula 1, 2, 3, 4+5+6, $\frac{1}{2}$ is a synonym of ab. *turkmenica*, Zoubk. [1833].

I propose to keep Weise's name for this aberration and its formula is: 1, 2, 3+$\frac{1}{2}$, 4+5+6, the latter three spots being in an irregular blotch.

(3) ab. **Zoubkoffi,** n.ab.

This aberration is described by Weise in his B.T. [1885] as a subvariation of his ab. *maculigera*, which with its formula of 1, 2, 3, 4+5+6, $\frac{1}{2}$ sinks as a synonym of ab. *turkmenica*, Zoubk.

I propose therefore to name this aberration after Zoubkoff to distinguish it from ab. *maculigera*, Ws. Its formula is: 4+5+6 (in an irregular blotch), $\frac{1}{2}$.

II.—Some observations on var. e. of Gyllenhall's *C. mutabilis* and on the true type of ab. *immaculata*, Gmelin:—

(1) While searching through the many authors who have written on this species, I have found recorded by Hummel [1829] in *Essais. Ent.* t. 1. No. 7. p. 33 on *C. mutabilis*, Gyll. [= *H. variegata*, Goez., ab. *similis*, Schrank, with 13 spots] an aberration which he refers to as the var. e. of Gyllenhall [1827] *Ins. Suec.* T. I. pars. iv. p. 211.

"Var. e. . . . elytra puncto tantum unico communi juxta scutellum. Habitat in plantis, oleribus, apud nos rarius; var. e. in Scania ad Ystad capta, a Dom. Prof. Zetterstedt communicata."

It will be noted that Gyllenhall distinctly states his var. e. has the $\frac{1}{2}$ spot and it cannot therefore be referred to ab. *immaculata*, Gmel., as Mulsant, Weise, Ganglbauer and others have grouped it.

Gmelin's [1790] original description from his *Ed. Linn.* I. 4. p. 1644. No. 155 runs as follows:—

"Immaculata. 155. *C.* coleoptris flavescentibus, immaculatis, thoracis macula nigra: punctis duobus albis. *Mus. Lesk.* p. 11. no. 211. Habitat in Suecia."

On referring to Zschach's [1789] description on Leske's Collection, he appears to describe, without assigning any specific name to it, an impunctate Coccinellid:—

"211. Cocc. impunctata, coleoptris flavescentibus, puncto nullo, thorace macula nigra, in quâ puncta duo alba."

I think it is quite clear from the above text and from Zschach's mode of describing other Coccinellids that he is using the term, "impunctata," in a purely adjectival sense and not as a specific name, and consequently the ab. *immaculata*, Gmel. stands for the aberration with no spots whatever on the elytra.

Mulsant [1846] *Secur.* p. 40 under *A. mutabilis* var. B. enlarges Gmelin's original description, a proceeding for which I find no authority :—

"Var. B. Elytres sans tache ou n'offrant qu'une tache juxta scutellaire, commune aux deux etuis."

"*Coccinella impunctata*, Zschach. *Mus. Lesk.* p. 11. no. 211. . . .

"*Coccinella immaculata*, Gmel., *C. Linn. Syst. Nat.*, p. 1644. 155.

"*Coccinella mutabilis*, Gyllenh., *Ins. Suec.* t. 4. p. [sic] var. e."

Similarly Weise [1879] B.T. incorrectly describes Gmelin's ab. *immaculata* as :

"a. Flg. mit 1 P. $\frac{1}{2}$ . . . v. *immaculata*, Gmel."

which, equally incorrectly, in 1885 he enlarges into :—

"a. Flg. ohne schwarze P. oder nur mit dem gemeinshaftlichen am Schildchen . . . v. *immaculata*, Gmel."

Stierlin [1886] in *Col. Helv.* II., Ganglbauer [1889] in *Käf. Mitteleur.* L'Abeille [1892] in *Jour. d.Ent.* T. xxviii. and Reitter [1911] in *Faun. Germ.* III. p. 137, No. 17, fall into the same error, following Weise's description of 1885.

I propose therefore to name the var. e. of Gyllenhall to distinguish it from ab. *immaculata*, Gmel.

(2) ab. **Scutellopunctata**, n.ab.

C. mutabilis, Gyll. [1827], *Ins. Suec.* T. 1, pars. 4, p. 211, No. 47, var. e.

This aberration is described by Gyllenhall, without any specific name, as having only the common scutellar spot.

It was subsequently grouped by Mulsant, Wiese, Stierlin, Ganglbauer, L'Abeille and Reitter under ab. *immaculata*, Gmel., but as this latter is devoid of any spots, it cannot be properly referred to such aberration.

The formula therefore for this aberration will be : $\frac{1}{2}$.

Gyllenhall states that his var. e. was taken in Scania at Ystad and that it is rare in his country (Sweden). His authority was Zetterstedt.

(3) To return to Hummel, he also describes a new aberration, but without assigning to it any specific name :—

"Thorace radio in medio brevissimo et punctis utrinque minutis albidis, elytris puncto unico pone medium ad marginem."

If as seems probable, as Hummel was writing on variations of *C. mutabilis* (which, as *H. variegata*, Goez., ab. *similis*, Schrank, has 13 spots including the $\frac{1}{2}$ spot), this aberration had the $\frac{1}{2}$ spot present, then it corresponds in its formula of 4, $\frac{1}{2}$ with the aberration named by Weise [1879] as ab. *hummeli*.

If, per contra, there was no $\frac{1}{2}$ spot, but only the single spot 4, I find no record of any such named aberration.

III.—On the distinguishing characteristics of the sexes of this species collated from various authors :—

While working out this species and its aberrations I have collated such information as I have been able to obtain from the many authors I have consulted on the differences in sex, and I venture to append such data, in case it may prove useful to any other Collector interested n this species and help him to distinguish the sexes.

(1) Mulsant [1846] *Sécur.* p. 39 gives the following general differentiation:—

"♂ Premier article des tarses antérieures ovale, sensiblement plus large dans son milieu que le deuxième article, garni de ventouses en dessous.

"♀ Premier article des tarses antèrieures subparallèle ou faiblement rétréci d'avant en arrière, plus étroit que le deuxième article, dépourvu de ventouses en dessous."

And on p. 41, adds the following particular differences:—

"Tête triangulaire; subperpendiculaire d'un flave faune (♂) ou noire (♀) sur le labre; parée sur le vertex et la partie postérieure au front d'un bandeau noir, ordinairement bidenté en devant; blanche sur l'épistome et la partie antérieure du front; souvent marquée de deux points ou traits noirs (♂) réunis en une tache presque carrée, isolée ou liée avec le bandeau noir précité (♀) . . . cuisses noires; les antèrieures en partie d'un fauve flave (♂). Jambes de la première paire entièrement de la même couleur (♂) ou obscures sur l'arrête (♀). Les suivantes en partie noirs. Tarses roussâtres avec l'extremité et les ongles noirs (♂ ♀)."

(2) Thomson [1866] *Skand. Col.* Tom. viii. p. 340:—

"Mas: tarsis anterioribus articulo 1: o fortiter ovali: dilatato: femoribus anticis subtus tibiisque totis ferrugineis.

"Femina: segmento 6: o medio striga impressa."

(3) Bedell [1892]. *L'Ab. Journ. d'Ent.* T. xxviii. No. 1, p. 10. Note on *C. mutabilis*:—

"L'épistome, entièrement blanc chez les mâles, porte, chez les femelles, deux points noirs fréquemment confluentes. Les trochanters et le dessous des fémurs antérieurs, ordinairement roux chez les mâles, sont noirs chez les femelles.—L.B."

(4) Ganglbauer [1899] *Käf. Mitteleur.* III.:

As to the head:—

"Der Kopf gelb mit einer breiten, schwarzen, meist zweilappigen Querbinde auf dem Scheitel und beim ♀ auch mit einem viereckigen, bisweilen in zwei Längstreifen aufgelösten Fleck auf der vorderen Partie der Stirn."

As to the tarsi:—

"Die Vorder—und Mitteltarsen, rothlichgelb, beim ♂ oft nur die Aussenseite der Vorderschenkel schwarz."

(5) Fowler [1889] *Col. Br. Isles*, III. p. 159:—

He distinguishes (inter alia) *H. variegata*, Goez., from *H. 13-punctata*, L., by the first joint of the anterior and intermediate tarsi of the former being dilated in the male. On p. 160 Fowler adds that the male has the first joint of the anterior tarsi oval and dilated.

A few Notes on Orthoptera in Croatia.

By MALCOLM BURR, D.Sc., F.E.S.

In spite of the splendid summer, I have had practically no opportunity of collecting this season, but been able merely to make a few notes and observations on the commoner species.

Every evening in the late summer, walking home from Zagreb along the Pantovchak, a road on a hill covered with villas and vineyards, I was greeted with a chorus of *Conocephalus mandibularis*, Charp., *Phasgonura viridissima*, L., *Pholidoptera griseoaptera*, De G., and *Ephippigera vitium*, Serv. The first has a strong and persistent note, recalling that of *Omocestus*, but with a distinctively locustrine timbre. I never heard it chirp before dusk: it sits in thick grass, in hedges, or vines: at the bottom of the garden there is a sluggish brook, with rank and reedy herbage where this species is fairly numerous, and this was the best place to catch it: I took one or two, which seem slightly smaller than those which I have captured in France and Spain. Its near relative, *Xiphidium fuscum*, Fabr., is numerous in the same place, and its stridulation is similar but proportionately weaker, and it requires patience to detect. This species I have always associated with reedy places, edges of brooks, etc., much as its northern brother *X. dorsale*, Latr., but its other brother, *X. hastatum*, Charp., with its extremely long ovipositor, I found in Serbia among scrub on dry chalky hillsides.

P. viridissima, L., is persistent: it is noticeably more vigorous in these southern latitudes than in England. I have noticed that in the hot southern sun in the Transcaucasus in the afternoon it will often take to wing, as though from sheer "joie de vivre," which I have never known it do in England, where perhaps the sun is never strong enough to tempt it to this feat; with its long straggling legs, and ovipositor, it has an odd appearance in flight. In southern Europe, too, it is fond of climbing up trees to carry on its vespertine concert, which I have never noticed in England; even on the street-side trees in the town and in gardens it is a usual occurrence to hear his unmistakeable song on warm summer evenings and nights. I have never noticed *Conocephalus mandibularis* to do this in Europe, though in Brazil I have heard members of this genus very persistently stridulating at night in trees, as does *P. viridissima* down here. He was common enough in trees, chiefly oak, in the artificial forests along the valley of the Drave, near the village of Pitomacha: I heard both these two species for the last time on October 15th, both on the Pantovchak.

Pholidoptera griseoaptera behaves exactly as in England. On the Pantovchak near Zagreb and near Pitomacha, one can always hear his characteristic *tss tss* in the evenings, beginning just before dusk, and carrying on till late at night. The latest date when I observed him was October 16th, on the Pantovchak.

Ephippigera vitium, Serv., is an interesting species. This group is extensively represented in northern Africa, especially in Algeria and Morocco, but is particularly developed in the Iberian Peninsula. Some species extend through France, one or two in Italy, and two reach the coast of Dalmatia. But this species ranges throughout central Europe. It occurs, as a rarity, in Belgium, and I have found it commonly in Normandy. Had it occurred in England, it is so prominent and so strange a creature, that it could not have escaped the attention of our British entomologists for so many years, so the presumption is that it has extended its range northwards from the distributing centre of the group, in south-western Europe, as far as Belgium and Normandy after Britain was separated from the

Continent, and that the common Praying Mantis and common Stick Insect are missing with us for the same reason. The Ephippigerids have one feature very distinctive from almost all other Orthoptera: the stridulating organs are equally well developed in both sexes, and, moreover, they chirp with rage when seized with the fingers. The stridulation has a peculiar squeaky timbre which is unmistakeable once heard. I was surprised to hear it along the road from Topchider to Rakovitsa in Serbia, near Belgrad, for I never expected to find a representative of this genus in the Balkans, excepting the coastal strip of Dalmatia, where I have taken *E. kraussi* and *E. sphacophilus* from Istria to the Bocche di Cattaro. Another peculiar feature about their stridulation is that they are noisy in the morning, which is unusual with Locustine Orthoptera, become silent in the afternoon and strike up again in the evening and keep it up late. The latest date I have recorded is October 15th on the Pantovchak.

In the dell at the bottom of my garden, between the Pantovchak and the Tushkanats, *Gomphocerus rufus*, L., is common enough on the slopes running down to the brook. The last specimens I saw there on October 10th, when I found *St. bicolor*, Charp., *Ch. parallelus*, Zett., *Platyphyma giornae*, Rossi, and *N. fuscum*, Fabr. *P. giornae* is always very prominent in the autumn in southern Europe, as he frequents open dry places, where he is easily seen; he lingers on in some numbers right up to the winter, when almost all other Orthoptera have disappeared, and the appearance of the numerous pairs hopping about together *in copula*, the very small male on the back of the mate who is twice his size, like so many little frogs, attract the eye. Other species in my garden were *Omocestus rufipes*, Zett., and *O. viridulus*, L., but not very numerous, *Acrotylus*, probably *insubricus*, Scop., and *Oedipoda caerulescens*, occasionally seen, an occasional *Caloptenus italicus*, L., and *Acrydium bipunctatum*, L. In Maximir Park, near Zagreb, I found *Ch. elegans*, Charp.

At Pitomacha, a village in the flat valley of the Drave, where everything is cultivated and artificialised, I came across little to add to this list, There are plenty of marshy fields there, dried up by the drought, and at Sedlaritsa, 9 km. further south, on the edge of a great forest. In these swampy fields *Mecostethus grossus*, L., *Chorthippus parallelus*, Zett., and *Ch. dorsatus*, Zett., are common. *Acrydium subulatum*, L., was common in a wood, *Ph. griseoaptera* in the hedges and *Phasg. viridissima* in the oaks.

As to Blattids, of course, *Blattella germanica*, L., is a "common object of the restaurants" in Zagreb, but I came across no other species. As to crickets, the Mole Cricket may usually be heard chirping on warm summer nights; I have noticed him at Pitomacha and near the Okrugliak, just outside Zagreb. *Gryllus domesticus*, L., chirrupped away cheerfully in the vicarage at Pitomacha, and *G. campestris* resounds all the spring and late summer, throughout the countryside. It was still busy at Pitomacha on October 4th, and round Zagreb on the Pantovchak as late as the 22nd. On the 4th, at Pitomacha, in a wood, there were minute Gryllid larvæ, which I think may well have been those of *Nemobius sylvestris*, Fabr. On October 22nd, a female *Phaneroptera falcata*, Scop., flew into my bedroom, attracted by the light. On the 16th, a bright sunny Sunday afternoon, in a clearing by some big woods near the Pantovchak, *St. bicolor*,

Charp., *Pl. giornae* and *G. rufus*, L., were both abundant and active, as though in midsummer, and I flushed *O. caerulescens*, and it did one good to see the blue flash of his wings when one knew winter was almost upon us, especially as the previous afternoon I had been down to the bottom of the garden and found no Orthoptera left. But the final goodbye to this long and splendid, but to me, entomologically speaking, wasted, summer, was on October 23rd. This was a warm day, but the sky was rather overcast and the long-waited rain seemed to be coming at last: there was a gusty wind and the dust was unpleasant. Still, we were able to lunch in the open air, and out for a stroll I picked up *St. bicolor*, a few pairs of *Pl. giornae* and a female *Calopteuus italicus*, L. That night there was a violent thunderstorm, and we looked out of the window next morning to see the countryside under a thick mantle of snow.

Later notes:—On the morning of 26th I found a belated male *Phaneroptera falcata* in the house, seeking refuge from the winter outside.

On 28th, a week after the first snow and several cold nights, I heard *Eph. vitium*, a single specimen, chirping as though to keep himself warm, after dark. This very late date shows what a hardy species this is, and helps to explain the fact that it is the only member of this family to extend beyond the boundaries of its warm, original home, in the Western Mediterranean countries, to Central and Western Europe.

November 1st.—The summer has returned; once more lunch in the garden, and on a sunny hillside found *St. bicolor*, *St. elegans*, *Gomphocerus rufus* and *Pl. giornae*, the first chirping away busily, for sheer light-heartedness, the mating season being long over.

Notes on Zygæna rubicundus, Hb.; Z. erythrus, Hb., and on the races of Z. purpuralis, Brünn, in Europe.

By ROGER VERITY, M.D.

This little group of species is interesting because it constitutes one of the extreme variations of the *Zygaenae*, that in which the nervural pattern exists alone. The result is that also the red markings of the secondary pattern form bands parallel to the neuration and are never divided up into spots, as in most species of the genus. A vestige of the true or transverse pattern only occurs exceptionally in very dark individuals of the male sex found in the northern races of *purpuralis*: form *sexmaculata*, Burgeff, in which the median and the posterior red bands are each divided in two. In *erythrus* there occurs the very rare *verityi*, Stefanelli [*Bull. Soc. Ent. Ital.*, lx., p. 255 (1909)], in which the median band is thus divided.

That these three species are perfectly distinct there can be no doubt, their larvæ are quite distinct from each other: that of *rubicundus* was discovered by Querci and described and figured in Oberthür's *Études de Lépidopt. Comparée*, v., fig. 824, and vi., p. 164. The imagines also bear constant differential features. *Z. rubicundus* always has white legs in both sexes and a white collar and epaulettes; these characters are only met with in the female of *erythrus* and very rarely and to a slight degree in that of *purpuralis*; in *rubicundus* the

space between the hindermost nervure, or second anal, of forewing, and the dorsal margin is entirely red; in *erythrus* there is a little red triangle at its base and the rest is dark; in *purpuralis* the base is invariably dark, and a dark streak along the dorsal margin always connects it with the outer-marginal band even when the anterior part of that space is red along the nervure; this character always allows one to separate the three species, even in the very extensively red specimens, which resemble each other most. Querci has found *rubicundus* and *purpuralis* together in the Sibillini Mts. and in the Mainarde Mts., and *erythrus* in a spot not far from them in the latter locality.

It is worthy of notice that the most extensively red *Zygaena* known, *rubicundus*, another of the most constantly red species, *erythrus*, and the reddest European races of *purpuralis* are proper to peninsular Italy, that is to say to the very region in which most species of this genus produce their most melanic races. It might appear at first sight that the *purpuralis* group reacts to the same surroundings in a way exactly inverse to the more usual one. Further consideration shows us that the same phenomenon occurs, on the contrary, throughout the genus: the nervural pattern reaches its full extent in the moist and colder climate of Central Europe, and tends to disappear in the arid and warmer southern regions; the primary, true or transverse pattern behaves exactly the other way, on broad lines. The result is that *purpuralis*, which has no transverse pattern, is left with very little dark marking in the south; *Z. carniolica*, Scop., which has a very limited capacity of developing a nervural pattern, is much more broadly red in the northern regions of its habitat and in the high mountains of the south. I have pointed out that species like *Z. filipendulae*, L., dealt with at length in a paper in these columns, in which both the nervural and the transverse patterns exist together and can both develop to a marked degree, produce their comparatively reddest races in an intermediate zone and develop darker races, due to the nervural pattern, to the north of this, and darker races, due to the transverse pattern, to the south. A beautifully harmonious law of variation thus unfolds itself before our eyes.

Races of Z. rubicundus, Hb.

This species may be said to be the least variable of the genus. Only once has Querci found a remarkable individual variety of the male in which the two cubital nervures of forewing were bordered with dark scales, so that the dark marginal band exhibited a projection towards the cell, similar to the one usually seen in the form of *purpuralis*, known hitherto as *polygalae*, Esp.; to this form I have given the name of *polygalaeformis* (*Bull. Soc. Ent. Ital.* xlvii. (1915), p. 71). In 1916 I suggested in the *Bull. Soc. Ent. de France*, p. 287, that some unusual looking specimens of *Zygaena* collected by Ragusa at Palermo might belong to a Sicilian race of *rubicundus* resembling *erythrus* much more than the usual continental one; this assumption I based on the forelegs of the male, which are white; I called this form *erythraeformis*. I must say however that I should like more materials to confirm this hypothesis, because the specimens in question might very well only be some weakly *erythrus*. The most northern locality known of *rubicundus* are the Sibillini Mts. (Piceno), where Querci has discovered

it and found it from Macerata up to as high an altitude as 1,200 m. (Bologna).

Races of Z. erythrus, Hb.

This species varies more than the preceding, but always remarkably little as compared to most others of this genus. Forms *irpina*, Zickert, and *verityi*, Stefanelli, constitute the least and the greatest degrees in the development of the dark pattern. Local variations consist chiefly in differences in the average size, but everywhere individual variation is very great in this respect. As Hübner's figure represents one of the largest forms, the name of *magna* published by Seitz is useless. Staudinger, in fact, only used it in his Price List for commercial purposes. On the contrary the opposite variation is well worth naming.

Race miserrima, mihi: Specimens I have received from Signor G. Gianelli of Turin and which he states he has collected on Mount Musinè, a hill near that town, have an aspect so different from the usual *erythrus* that for some time I could not make out whether they belonged to this species or to *purpuralis*. It was only when I established the constant differential character between the two, mentioned above, that I satisfied myself they must be *erythrus*. Both sexes only expand about 28mm., as compared to the usual 35 and 36 average; the result is they give the impression of only being about half the usual size. The scaling is very thin, the colour pale; the red markings are very extensive and confluent, as in the *irpina* form.

Race albipes, Verity (*Bull. Soc. ent. France*, 1916, p. 289): This is the large, brilliantly coloured Sicilian race, in which sometimes the male, as well as the female, has whitish legs and in which the latter exhibits the brighter silvery gloss already noted by Oberthür as characteristic of Sicily.

Races of purpuralis, Brünn.

Comparing series of this species I possess from various localities I notice that they are strikingly different from each other and it seems quite remarkable that they should not yet have been described. Beginning by those in which the dark markings are less extensive, I must first of all recall the discovery made by Burgeff (*Mitt. Munchner Entom. Ges.*, v., 1914, p. 42) that the specimen called *polygalae* by Esper is not, as was believed, a *purpuralis*, but a very unusually red *filipendulae*; the "type" is in the Nat. Hist. Museum of Wiesbaden. I notice that this fits in much better with certain details in Esper's figure and description than did the form of *purpuralis* it was usually referred to. Burgeff replaces the name of *polygalae* by that of *minos*, Herr.-Schäff. What I must point out is that this will not do: the name *minos* was not created by Herr.-Schäff.; it first appears three quarters of a century earlier in the *Syst. Verzeichniss der Schmett. der Wiener Gegend*, p. 45, and it is only a synonym of *purpuralis*, for which species it has been used by many. One might call rubrotecta, mihi, the individual form, whatever race it occurs in, in which the neuration is entirely covered over by red scaling and the resulting uniform patch spreads further back than the second anal, or hindmost, nervure on a greater or lesser extent of the latter, never reaching however the

margin. A transition to this form is *erythrusoides*, Rocci (*Atti Soc. Ligustica Scienze Nat. e Geogr.*, 1918); here the red markings are very extensive, but they are separated into bands by the darkened neuration; Rocci says in his description that there is "a red dash at the back of the hindmost nervure, as in *erythrus*, Hb., but less marked." I made him note that this could not be correct, because the chief specific difference between *erythrus* and *purpuralis* consists in the fact that the former has the base of the wing between that nervure and the dorsal margin constantly occupied by a red triangular patch, whereas in *purpuralis* that area is always dark and a dark streak extends from it along the dorsal margin, however great the extent of the red may be, as stated above. He answered I was quite right and that his description would have to be modified in this sense.

Race MIRABILIS, mihi. Burgeff says very rightly that form *minos*, as he calls *rubrotecta*, rises to be a "subvariety" in Southern and Central Italy, because its percentage surpasses that of the typical form. Something more, however, must be said about it: Querci has found at S. Fili, m. 900, on the Coast Range of Calabria what may well be called the finest race known of *purpuralis*. It is larger and more robust than any other; the dark markings are blackish; the red ones are also very saturated, so that a rich effect of colouring is produced; the red is unquestionably more extensive than in any other race and the most extreme examples of *rubrotecta* predominate in the female and are quite frequent also in the male. A race transitional to this one has been found in the Aurunci Mts., north of Naples, which might be called *mirabilis* trans. ad *fiorii*.

Race FIORII, Costantini (*Att. Soc. dei Naturalisti e Matematici in Modena*, serie V., vol. iii., 1916). Described from the Emilian Apennine (Cimone, Fiumalbo, Tagliole), this race seems to be quite the same in the whole of Central Italy; I possess series from localities as varied as that of "types," Palazzuolo di Romagna, Sasso di Castro, Mt. Senario (near Florence), the Sibillini Mts., the Mainarde (north of Naples). This is a much smaller and frailer insect than *mirabilis*, usually less highly coloured and often less densely scaled; the extent of the red is on the whole distinctly lesser, but it certainly comes next to it by the frequency of form *rubrotecta*, not unfrequent even amongst the males. A remarkable fact is, that notwithstanding this tendency to reduce the dark scaling of forewing, the hindwing has quite a comparatively broad marginal band, which in some individuals extends all along it, in a way not seen in any other race, except the darkest Alpine ones. The male and female figured by Seitz under the name of *polygalae* on Pl. 4 of *Gross-schmett.* are a fair representation of race *fiorii*, and no doubt they are Italian, as Northern and Central Italy is the habitat given for *polygalae* in the text.

Race ISARCA, mihi. The specimens collected by Wagner in the Isarco Valley in South Tyrol are very large and bright; the red is extensive, but not quite as much as in the Italian races just described; it does not extend further back than the second anal nervure, but the middle band spreads out at its further end in a broad fan-shaped area; the tone is of a slightly lighter carmine than in the races just mentioned and in the other Alpine ones, with a suspicion of yellow mixed in it, which makes it more brilliant and recalls the same difference existing in the series of *Z. filipendulae* race *ochsenheimeri*,

Brk., from those two regions. This fine race is probably that of many low, warm valleys in the Southern Alps.

Race MAGNALPINA, mihi. Corresponds to nymotypical *filipendulae* of the Alps, as *isarca* corresponds to *ochsenheimeri*. No doubt it is the most widespread race of the species in the Alps and in the Hautes Pyrénées. It is that which Oberthür [*Ét. d' Ent.*, viii., p. 27 (1884)] says is, round Cauterets, "superb, large, vividly coloured, about similar to the one found at Zermatt." He adds that in the Ariège, near Ax, one finds a smaller type, more vermilion in colour; this, I presume, is transitional to *nubigena*, Led. Race *magnalpina* is not quite so large as *isarca*; its chief characteristic is the intensity of the colouring; the dark markings are very opaque and black; the red is saturated and even colder than in *mirabilis*; its extent is considerably lesser than in the races described above; the fan-shaped area at the end of the median band is small. The hindwings have a slight black suffusion along onter margin. The series of Gédre, m. 1000 (Htes-Pyr.), received from Rondon is the most blackish I have seen, probably on account of the local causes which produce, there, also race *tristis*, Obth., of *Z. achilleae*, Esp. From Alt. Boron (Alpes-Maritimes Département) I have a pair of specimens which seem race *isarca* trans. ad. *magnalpina*.

Race PARVALPINA, mihi. At the Baths of Valdieri, m. 1375, in the Piedmontese Maritime Alps, I have collected a race which cannot be referred to the preceding on account of its much smaller size and on account of the distinctly more reduced extent of the red bands; the form usually called *pluto*, Ochs. (see this race, below), is very frequent; the hindwings have in most males a narrow, but distinct dark band along the whole of the outer margin. It otherwise agrees with *magnalpina* in the intensity and tone of colouring.

Race NUBIGENA, Led. [*Verh. zool.-bot. Ver. Wien*, ii., p. 93 (1852)]. Briefly, but effectively, described as "very thinly scaled (like *A. exulans*) the red of a pale crimson, the border of the hindwings rather convex," from a single male of the Pasterze glacier on the Gross Glockner. One might add that the body is covered with long hairs and that the red pattern is more extensive than in the two previous races. It is the race of very high altitudes, corresponding to *mannii*, H.-S., and *paulula*, Vrty., of *filipendulae*, L. I have Welsh specimens which are perfectly similar to my Alpine *nubigena*, Led. (not Birchall), and very distinct indeed from any other race. Tutt says the British specimens he has seen are identical with the continental type *purpuralis*, but whether he actually means the nymotypical race of Denmark it is not made clear. Anyhow it seems likely that these northern races should resemble each other.

Race MINOS, Schiff. (see above) = PLUTO, Ochs. [*Die Schmetterlinge*, II., p. 26 (1808)]. The name *pluto* is generally used, not for a race, but for the striking individual form in which the red bands are shortened so considerably that the median one ends abruptly just beyond the extremity of cell with a sharp rounded outline, its usual fan-shaped expansion being entirely obliterated. If we refer to Ochsenheimer's description, we find all he says of the red pattern is as follows: "the red spots are finer, the third is wedge-shaped and shorter, fading off towards the outside into the ground colour." The habitats he gives are "Hungary and the neighbourhood of Vienna." I have a little series from the latter

locality, received from Höfer, and I find that all the other characters given by Ochsenheimer describe it admirably; broader wings than in northern races, darker colouring, as in *magnalpina*, "black border of hindwing broadens at the angle." As to the red bands, one of my males does correspond exactly to the form usually called *pluto*, but the rest are only transitions to it, and Ochsenheimer's words fit them much better than they do this form. I conclude that this author never had in mind the individual form to which his name has been arbitrarily given, and that he meant his inclusive description for the entire race of the region mentioned. Original descriptions must be taken as they stand and the totality of their meaning must be taken into account when applying the name they refer to. We must, however, note that, taken in this sense, *pluto* next falls before *minos*, Schiff., also described from Vienna. I suggest the name of PLUTONIA for the individual form described above, independently of the race it may be found in.

Race BOSNIACA, Burgeff (*Mitt. Münchner Ent. Ges.*, V., p. 43, tav. v., fig. 1-3 (1914). I am not acquainted with this race, described from the Vlasic Mts., m. 1800, in Bosnia. It is described as "larger and more thickly scaled than *pluto*, O., of the Eastern Alps and having a darker appearance," the median red band of forewing extends towards the margin; the male has a marginal dark band on hindwing; the females are dusted with grey.

Race NORMANNA, mihi. This name I propose for the peculiar little race of Northern France, which Oberthür has noticed and described at length (*Ét. Lép. Comp.*, iv., p. 425) and of which I have received a series of Pont-de-l'Arche (Eure) from L. Dupont. It is one of the smallest races of this species; the dark scaling has a more brilliant indigo gloss than in any other race, in the male, and a silvery one in in the female; the red is not very saturated and it is limited in extent, the bands being distinctly separated from each other and short, so that the anterior, or subcostal one, ends at the level at which the median one begins; examples transitional to form *interrupta*, Stdgr., are thus quite frequent. The most peculiar character of this race, however, consists in the way in which, in the great majority of individuals, the median band is shaped at its further end: before the second median nervure it is quite as short and ends as abruptly as in form *plutonia*; instead, between this nervure and the first cubital or, in other words, on both sides of the third median, it extends outwardly in a long projection, sometimes nearly as far as the outer margin. In my paper on *Zygaena filipendulae*, L., I have pointed out that this particular character in the pattern of the *purpuralis* group shows the origin of the sixth spot in the former, making it particularly interesting. I think that here, as in other cases, the local race, with its various distinctive features, should receive one name and another should be given to the form exhibiting the last characteristic mentioned, so that it can be used to designate the individuals of the other races in which it is met with not uncommonly. The name of INCISA seems suited, because the red projection described is due to a more or less deep incision of the dark marginal band in the atrophied zone, as explained in the aforesaid paper.

Race JURAE, mihi. My large series of specimens, collected at Dombresson, m. 1000, in the Jura, by the late and much regretted

Bolle, belongs to a race quite apart from those I have described. It is more variable individually than any other and a considerable number of examples exhibit a type of structure quite unknown in the preceding races, on account of the shape of the wings, very narrow and elongated, with a sharp apex and the outer margin falling off rapidly, so that the anal angle forms a very broad curve. This shape points to that of *Hepialus humuli*, Z., and other low groups of Lepidoptera and, in fact, to that of the *Myrmeleonidae* Neuroptera, suggesting that this form of *purpuralis* may be one of the most primitive *Zygaena*. The scaling in the whole of this race is very thin, except in a few individuals, and the wings have quite a shiny surface, dark greenish indigo in male and silvery in female. The size is also very variable, but, on an average, about medium, as compared to the remaining races. The antennæ are longer and sometimes more slender than in the preceding ones. The variation in the pattern of the wings is greater than in any other race I have seen; it begins in both sexes by the most extreme *rubrotecta*, differing from the ones of Central Italy only by the fact that the red does not extend at the back of the second anal nervure and that it is so pale and transparent as to give quite a different look to the insect; all gradations are then found up to the other extreme form *interrupta*, Stdgr.; as a rule, however, even when the red bands are narrow, the median one extends well towards the outer margin either with the entire fan-shaped area or with the projection of *incisa*, and I have only one male which approaches form *plutonia*, even that one not quite reaching it. The capillary black streak on fringes of hindwing is nearly invariably excessively thin and in the female often interrupted by entirely red scales; in two example of this sex no trace of black is left, and the fringe is entirely pale red (form RUBROFIMBRIATA, mihi.), a form I have seen in no other race.

Race HERINGI, Zeller [*Stett. Ent. Zeit.*, V., page 42 (1844)]. I am not acquainted with this race from Stettin. The original description is not sufficient to give one a clear idea of it, to begin with because one does not know what race of "*minos*" its author compares it to. The antennæ are said to be more slender and the wings broader, a combination which would be certainly very unusual and nearly incredible; the red markings extend considerably towards the outer margin, "the middle spot . . . expanding suddenly very considerably;" the males have a little gray at the apex of the posterior wings. Hering still sustained in 1881 that this was a distinct species from *purpuralis*. Staudinger in his *Catalog* of 1901 does not even admit it as a variety, saying the larva is different, but the imago is very inconstant. Seitz makes very little of it, simply mentioning it in a few words. I am obliged to leave it at this.

Race PURPURALIS, Brunn. I am sorry not to have seen the nymotypical race from the Zealand island, the most important island of Denmark. Judging from German specimens of various localities, I presume that the races of this country belong on the whole to the same group as *jura*, always being thin-scaled and usually narrow-winged. The Danish one, no doubt, resembles them considerably and so does the British one.

The European races of *purpuralis* can, on broad lines, be divided into three groups: one, with very extensive red scaling, from the south, another, with that colour reduced to narrow bands, more or less

separate from each other, from the southern part of Central Europe, and a third, with elongated wings and thin scaling, found, as a rule, further north.

The Eastern Pyrenees, 1921.

By D. H. PEARSON, F.E.S.

Last year my brother and I were in the central and western Pyrenees, and this year decided to go further east. Leaving London at 8.20 a.m. on June 24th, we arrived at Vernet-les-Bains on the afternoon of the 25th. All the large hotels were shut up, but we stayed very comfortably at the pension of Madame Massina. After a cup of tea we started out for a short walk, and were delighted to take two *Melanargia lachesis*. The next morning we took a nice little series of this species, which became commoner as the days went on, but when we left Vernet, on July 5th, I realised that nearly all the captures were males, and we afterwards took a number of ♀s at Molitg-les-Bains. The species shows considerable variation. The markings are practically the same as in *galathea*, except that the black at the base of the upper wing and the central band in lower wing are replaced by the ground-colour. In most specimens there is a faint discoidal lunule, and in some this is composed of purple scales instead of the ground-colour. On the underside the hindwing has usually three spots at the anal angle, sometimes two, and occasionally four, and two spots near the costa, as in *galathea*. In two specimens these two costal spots appear on the upperside of the wing, and there are faint traces of them in others. Some have three well defined spots on the upperside in a complete ring of ground colour, some have two, some one. A few show no trace of spots, and some are represented by a tiny patch of purple scales. There is also considerable variation in the black submarginal band, which in one or two specimens is carried right round the lower wing with only a trace of the usual ground colour gap. They are all noticeably darker than specimens I have seen from Spain. The centres of the eye-spots are purple, in some consisting of a large patch, and in others confined to a few purple scales. These purple spots do not seem to be mentioned in descriptions of the species, though Kane refers to them in *syllius*, *arge*, and *ines*. On looking through my series of *galathea* I find several which have these purple eye-spots, *viz.*, from Polegate, Monkswood, Lulworth, Luchon, Briançon, etc., so that they appear to be common to the family. A few specimens of *lachesis* were taken with a yellow ground colour (var. *canigulensis*), but though we netted and examined a considerable number we failed to turn up the var. *cataleuca*, and understand from a local entomologist that this is a very rare form. I really ought to have taken a longer series, but that brother of mine looked upon me as a Herod among the Innocents, and I weakly allowed my ardour to be damped. From the train we saw what appeared to be *lachesis* most of the way up to Mont Louis, but we did not meet with it at Mont Louis itself. *M. galathea* was not seen at all during our trip, though it was common last year at Gavarnie.

On June 26th we took our first *Laeosopis roboris*, and managed during the next week to get a nice series of this insect. Our best locality was a steep bank under a watercourse on the left bank of the stream outside the grounds of the Grand Hotel, and we also took them

on the St. Vincent road, where they often left the trees to feast on the bramble blossoms on the road side. We only saw one specimen in the grounds of the Hotel Mercador during several visits. It is a species which does not last long in good condition, and it is therefore well to make hay while the sun shines. The first *Epinephele pasiphaë* was taken on June 27th, and it afterwards became fairly common, especially at Molitg, but its habit of keeping well inside a bramble bush is a bad one for thin nets. Visions of clouds of *Papilio podalirius* var. *feisthamelii* were called up by Keyne's article on Vernet, but we were unlucky and only managed to get four or five specimens out of the very few seen. We expected *Euchloë euphenoides* to be almost over, but it was barely out, all the males being in bred condition and only two or three ♀s seen, though we hunted carefully the spots where *Biscutella* grew. Probably owing to the drought emergence had been held back. The first *Melitaea phoebe* taken was a beautiful var. *occitanica*, and we eagerly sought for others, but were disappointed, as most of those taken would pass for ordinary Swiss specimens. *Scolitantides orion* was a species which we hoped to find, but only managed to get three, two of which were in fresh condition.

On the way up to the interesting Monastery of St. Canigou (which is being restored by the Government) I went for what seemed in the distance to be a lame bird on the road, but it proved to be a huge *Saturnia pyri* (*pavonia-major*) which almost needed a tin box to itself. Kirby gives its time of appearance as May. The white Cistus was here in full bloom and was a magnificent sight on some of the steep hillsides and we found a few dwarfer plants with pink blossoms.

On July 2nd we struck over the hills to the west and round to Villefranche, but found the country very much burnt up and very few butterflies. Near Villefranche we saw our first *Gonepteryx cleopatra* and afterwards took a good series in beautiful condition. On a tree near the river we also saw *Libythea celtis*, nicely out of reach, with his snout pointing heavenwards, and before we could devise anything for his undoing he flew over the river and was lost to sight, but we afterwards captured two near Vernet. A few nice light forms of *Melitaea dictynna* were taken and some large and curious forms of *M. athalia*, also three or four *M. deione*. We had hoped for *M. didyma* var. *meridionalis*, but got one only though we afterwards took two var. *occidentalis* at Molitg.

Several *Lycaena arion* were taken and among them one var. *unicolor* which is not common and one var. *obscura* from Molitg, which is only about 1475 feet above sea level. On a piece of fallow ground on the way to the Cascade des Anglais we took a nice little series of *Thecla* (*Nordmannia*) *acaciae* which were welcome, and near the same spot two very large *Plebeius argus* measuring 34mm. in expanse, though others seen were of quite ordinary size. We achieved the distinction of staying for nine days at Vernet without going up Canigou, but this was not entirely due to slothfulness. The Chalet Hotel was not open until just before we left and for various reasons we changed our plans and on July 5th went by train to Mont Louis instead. I could not find any reference to Mont Louis in the *Record* so presume it has not been much worked. The small town is completely surrounded by a wall and can only be entered by one gateway. It is situated at 5280 ft. on a large plateau, which is mostly cultivated, with a belt of

fir woods on the north side. *E. euphenoides* was evidently only just coming out as all those taken were quite fresh and ♀ ♀ were very scarce. We took a few very interesting *M. cinxia* with a strong tendency to increase of black markings on the underside, one having the central white band almost filled with black blotches. Unfortunately most of the specimens were hopelessly worn, though we had taken several in good condition at Vernet, nearly 3,000 ft. lower. Among the fir woods *Coenonympha iphis* was plentiful and showed variation in spotting and we also took three fresh *Pontia daplidice*. Three large hawthorn trees in full bloom on July 8th seemed rather out of date. A large group of Generals, Colonels and Red Hats were staying at our hotel for some time and touring the district and they made it a trifle overcrowded, so on July 8th we took train down to Prades and drove up to Molitg-les-Bains (pronounced Molitch) where we stayed most comfortably until July 14th. The valley is very narrow and the heat was very great and inspired a thirst like the one the toper said he would not take £5 for. On July 9th we were introduced to two new insects, *Satyrus circe* and *Epinephele ida*, both of which were just coming out—we had searched in vain for *S. circe* at Vernet. The *E. ida* were nearly all males but we took two ♀ ♀ and also two or three *E. tithonus*, which were easily mistaken for the ♀ when on the wing. In a damp irrigated meadow we took a nice series of *Erebia alecto* of both sexes in good condition and after a chase it was a joy to get into the river and wallow in a deep rocky pool. We tried the hills beyond Molitg village, but the country was quite burnt up and practically nothing was seen but a few *Hipparchia semele*. At the back of the old chateau which is perched on a rocky point we saw *H. briseis* but could not get at it as the ground was very steep and overgrown. A few *C. argiolus* were flying over the brambles by the roadside and with them *Nordmannia* (*Thecla*) *ilicis*, mostly of the type form. Flying with *N. ilicis* were a few *Klugia* (*T.*) *spini*, and one of these is the var. *lyncus* with a pale patch on the upper-wing and a wide yellow band on the lower-wing with dark veins running through it. The tails are also exceptionally long. A curious small form of *P. icarus* was taken, the upper side like *A. medon* but with a few blue scales, the lower side a reddish-brown with well marked orange lunules to both wings. As one of them is var. *icarinus* they are very difficult to separate from *medon*. A few *C. dorus* were taken, generally in the hottest and driest corners.

On July 11th we reluctantly started for home; we left Prades at 1.50, had a breakdown with the electric train and missed the Paris connection at Perpignan, travelled with numerous stoppages till we were turned out of our train at 2.30 a.m. at Toulouse owing to another accident (language quite violent but mitigated by the crippling foreign tongue), and being quite unable to get a bed, dozed in chairs until it was time for a 6 o'clock wash and breakfast. We arrived in Paris about midnight, crossing by the morning boat and reached home on the afternoon of the 16th. In the next day's paper we saw that our boat broke down just off Dover on the return journey and passengers had to be taken off in a rather heavy sea, so we narrowly missed an unpleasant finish to a very pleasant holiday.

CURRENT NOTES AND SHORT NOTICES.

"Marvels" indeed!!!—In *The Daily Telegraph*, Tuesday, January 24th, 1922, appears an article on "Plant Life Marvels," from which a correspondent culls the following choice devices for reproduction:—"Some seeds are covered with a capsule, which bursts and scatters them broadcast. Others get distributed in the excrement of birds and many foreign weeds are introduced to our lands by such means, and so are plants growing on walls, on church towers and other inaccessible places. Animals like the sheep will carry certain seeds of wild plants in their wool. Another remarkable growth is the fungus known as ergot, which thrives on the flowers of certain grasses in our meadows, and when eaten by sheep is said to produce the disease known as 'fluke' or perforation of the life organs by a sort of maggot."—W.H.B.F.

In the *Irish Naturalist* for November, 1921, Mr. R. A. Phillips gives some interesting notes on a number of nests of the ant *Stenamma westwoodi*, discovered by himself in Ireland. In the same number Mr. Donisthorpe records *Gymnetron squamicolle*, a beetle taken by himself in Co. Kerry, new to the British Isles.

We are pleased to hear that Messrs. F. N. Pierce, F.E.S., and T. W. Metcalfe, M.A., F.E.S., are about to publish the results of their investigation on the "Genitalia of the British *Tortricidae*." The volume will contain nearly a thousand outline drawings, and includes the female characters, which the authors consider to be of the greatest importance. They go so far as to give a classification of the group, and express their belief that the result indicates a distinctly natural system. The price of issue of this volume in advance is fifteen shillings and sixpence, to be raised after publication to twenty-five shillings. We have much pleasure in urging our readers to subscribe for this worthy object.

At a recent Council Meeting of the S. E. Union of Scientific Societies it was decided that a Zoological Section should be formed, it being left in the hands of the President, Prof. E. B. Poulton, F.R.S., Treasurer, R. Adkin, F.E.S., and two other well-known members, Messrs. H. J. Turner, F.E.S., and Stanley Edwards, F.L.S., to proceed on behalf of the Council in the formation of that Section.

We are advised that the plate 6 given in the last issued part of Vol. IV. of the *Bull. Soc. lep. Genève* is to be replaced by an entirely new one, which members of the Society will receive in due course.

The Publishers of Seitz' Macrolepidoptera Exotic Section, are now "Making the foreigner pay," they having increased their charge per part to 2s. for parts still to be published. This comes to about M. 80 per part at the present rate of exchange.

Those of our readers who have obtained a copy of Kennel's "Palæarctic Tortrices" should see that they get the very useful "Stammtafel" referred to on the title page, which should be placed opposite page 48 of the work.

Part III. and IV. of the *Transactions of the Entomological Society* for 1921 have been issued together at the end of January. A much earlier date for these parts than for many years past. Part V. which will complete the year's issue is in an advanced stage of preparation and should be in the hands of Fellows by Easter at the latest.

The Annual Address read to the Entomological Society by Lord Rothschild was a most interesting account of Algeria as a field for

natural history research, written by one who has spent holidays for many years past in this wonderful land on the confines of the Palæarctic Region. The lantern illustrations were a great aid to the audience in appreciating the remarks of the author.

The Entomological Society is anxious to obtain some of the back volumes of its *Transactions* which have become depleted. A few of the earlier volumes are now unobtainable, but in order to be able to supply sets to Fellows or to Societies who wish to purchase sets, the Council is advertising for copies of the issues for the years 1907, 1908 and 1912. Will those who have copies of these years and who do not require them kindly offer them to the Society.

The "Verrall" supper took place on January 17th in the old quarters at the Holborn Restaurant, with our colleague Dr. Malcolm Burr in the chair. The number present was less than usual, owing no doubt to the prevailing epidemic. A very pleasant evening was passed in renewing old acquaintance and meeting those one only knew by correspondence or repute. Among those present the following were noted :—Adkin, B. W., Adkin, R., Andrews, H. W., Ashby, E. B., Ashby, S. R., Balfour-Browne, F., Beare, Prof. T. Hudson, Bedwell, E. C., Bethel, G., Bethune-Baker, G. T., Blenkarn, S., Bouskell, F., Box, L. A., Brunetti, E., Burr, Dr., Cant, A., Carr, F. B., Carr, Prof. J. W., Champion, G. C., Cheetham, C. A., Collin, J. E., Collins, Joseph, Colthrup, C. W., Cottam, Major P. M., Cummings, B. D., Dixey, Dr. F. A., Dods, A. W., Donisthorpe, H., Dunster, L. E., Durrant, J. H., Edwards, Stanley, Ellis, H. Willoughby, Ford, L. T., Fox-Wilson, J. S., Frohawk, F. W., Fryer, J. C. F., Gahan, Dr. C. J., Goodman, O. R., Green, E. E., Grosvenor, T. H. L., Hall, T. W., Hallett, H. M., Hamm, A. H., Harwood, B. S., Harwood, P. H., Hunter, Dr. D., Image, Prof. S., Janse, A. T. T., Janson, O. E., Jordan, Dr. K., King, J. J. F. X., Leeds, H. A., Laing, F., Leman, G. E. B., Leman, G. Curtis, Lofthouse, T. A., Lucas, W. J., Lyle, G. T., Main, H., Mansbridge, W., Mera, A. W., Morice, Rev. F. D., Nell, L., Neave, Dr. S. A., Newman, L. W., Nicholson, C., Oldaker, F. A., Peed, J., Pickard-Cambridge, A. D., Pierce, F. N., Riley, N. D., Robertson, Dr. G. S., Rothschild, Rt. Hon. Ld., Scharff, Dr. R. F., Schmassman, W., Scott, H., Seabrook, Lt. J., Shaw, V. E., Sheldon, W. G., Stott, C. E., Stenten, R., Step, E., Talbot, G., Tamms, W. H., Thornley, Rev. A., Tomlin, J. le B., Tonge, A. E., Turner, H. J., Uvarov, B., Wainwright, C. J., Walker, Comm. J. J., Waterston, Rev. Dr. J., Watson, J. H., Wheeler, Rev. G., Withycombe, C. L.

To those who are working at the European Rhopalocera we would suggest that they consult Signor Querci, whose family have made extensive captures during the last few years in various parts of Italy and the Italian Islands. Many of the forms referred to in Dr. Verity's papers on Italian butterflies and Zygænids have been obtained in quantities, and the specimens are in excellent condition. We have before us examples of many Zygænid forms recently discussed in these pages, and must at least say that they are most controversial. One cannot identify these forms by any of our standard text books, most of which are based on Central European races and do not deal with those coming from the extreme parts of the Italian peninsula.

An appreciation of the late Dr. T. A. Chapman will appear in the March number.

Subscriptions for Vol. XXXIV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1922.]

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Desiderata.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—*W. G. Pether, "Thelma," 4, Willow Bridge Road, London, N. 1.*

Duplicates.—Aglaia, Adippe. *Io, T. quercus, Coridon vars., *Fuliginosa (Reading), *B. quercus ♀, Tiliæ, Menthastri, *Linariata, Aurantiaria, Leucophæaria vars. Paniscus. *Desiderata.*—Pupæ of Dictæoides; Imagines of typhon, palpina, camelina (dark), Curtula, Pyra, and numerous others; Ova of Hispidaria.—*Harold B. Williams, 112a, Bensham Manor Road, Thornton Heath, Surrey.*

Duplicates.—Sybilla, Paphia, Io (2), Selene, Lucina (2), Ocellatus, Illustraria (autumn) Nastata, Roboraria ♂, Prunaria (4) ♂, Tipuliformis. *Desiderata.*—Castreusis ♂, Cucullina, Cribrum, Cinerea, Ravida, Ashworthii, Notata, Obfuscaria, Smaragdaria and others, also vars. and local forms.—*Harold E. Winser, Kent House, Cranleigh.*

Desiderata.—Volumes of *Ent. Mo. Mag.* for 1920, second-hand. State price.—*Hy. J. Turner, 98, Drakefell Road, New Cross, S.E. 14.*

Duplicates.—Cinxia, Bellargus, Coridon, H. Comma, Lineola, Galathea, Moneta, Nupta, and many others. *Desiderata.*—Blandina, Irish Icarus, Carmelita, Cuculla, Gonostigma, Ashworthii, Templi, Australis, Undulata, Smaragdaria, Testacea.—*W. Gifford Nash, Clavering House, Bedford.*

Duplicates.—Brevilinea, Cannæ, Lutosa, Straminea, etc. *Desiderata.*—Many species and melanic forms.—*E. B. Haynes, 25. Denmark Avenue, Wimbledon, S.W. 19.*

Duplicates.—*Atalanta, Sylvanus, *Urticæ, Phlæas, *Moneta, *Pisi, *T. cratægi, *Lucipara, *Filipendulæ, etc. *Desiderata.*—Paniscus, Actæon, Anachoreta, Tincta, Asteris, Absinthii, Notha, Socia, Festucæ, Rubi, Unangulata, Munitata, etc.—*Wm. Foddy, 39, York Street, Rugby.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. 1922, March 1st; March 15th; April 5th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. February 23rd, Lantern Slides; March 9th, Paper with Lantern—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E.3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40; Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

All MS. and editorial matter should be sent and all proofs returned to HY. J. TURNER 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

Subscriptions for Vol. XXXIV. are now due.

Vol. XXXIV. **No. 3.**

The Entomologist's Record

AND

Journal of Variation

CONTENTS.

MARCH 15th, 1922.

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Communications have been received or have been promised from Rev. G. Wheeler, Messrs. Hy. J. Turner, H. Donisthorpe, Dr. Verity, J. H. Durrant, Orazio Querci, Dr. Cockayne, R. S. Bagnall, J. W. H. Harrison, Mrs. R. Page, G. T. Bethune-Baker, Alfred Sich, W. Daws, with Reports of Societies and Reviews.

I.

II.

I. Hesperia x. (? species). II. H. sibirica.

The Genus Hesperia.—A Correction.

(With Plate I.)

By B. C. S. WARREN, F.E.S.

In the volumes of the *Entomologist's Record* for 1917, 1918, and 1919, there appeared a series of articles on the genus *Hesperia*, by the late Dr. T. A. Chapman, accompanied by several plates. In vol. xxix. (1917), on plate 8, the armature of three species is shown; fig. 2 being named *andromedae*. In looking over this article some months ago, and coming to this plate, I was at once struck by the obvious fact that fig. 2 did not represent the armature of *andromedae*, or, on closer inspection, that of any known Palæarctic species. I wrote to Dr. Chapman, and called his attention to the fact that by some accident a wrong photograph had got published for *andromedae*. What had actually happened was this. When Dr. Chapman was selecting examples of his microscopic mounts for photographing, he took the best preparation marked *andromedae*, without looking to see whether it was typical or not, and sent it to be photographed, and subsequently published the photograph without further thought.

The great interest about this photograph is, as already noted, that it does not represent the genital armature of any known species. The actual specimen from which the dissection photographed was made, had been captured in 1907, in Witim, N.E. of Lake Baikal, by Max Bartel, from whom Dr. Chapman received it, labelled *andromedae*. At the same time he got several specimens of *H. sibirica*, and must have passed the specimen over as that latter species when he had it under the microscope; and afterwards relying on the number of the mount, and Bartel's label on the specimen, he marked the mount *andromedae*. I was corresponding with him about the matter until the day of his death, and he was endeavouring to obtain further specimens so as to be able to determine what it really was, before correcting the oversight. He was not, however, able to do so, and I have since heard that Bartel died quite ten years ago; so the chances of getting further specimens are very slight.

It is a noteworthy fact that the photograph has stood as *andromedae* for the past five years; and goes to emphasize the complete confidence that entomologists both at home and abroad, placed in any statement vouched for by the name T. A. Chapman. Had anyone thought of comparing the illustration with a specimen, the difference must instantly have been remarked. I do not suppose I would have ever noticed it myself, only some time before I had, at the request of Prof. Reverdin, agreed to undertake a book on the Hesperiids; and was consequently going over any thing recently published on the subject very critically.

Thanks to the kindness of the Misses Chapman, I was able to examine the specimen we have been considering, and which for clearness sake I will refer to in this article as X.

Superficially, it is indistinguishable from *sibirica*; while, anatomically, the differences are such, that had one a series of the insect it must undoubtedly be considered a distinct species. Since then, another specimen has been found. Having permission to take any specimens which would be of value to me from the Hesperiids in Dr. Chapman's collection, except those corresponding to mounted preparations of the genitalia (for all Dr. Chapman's anatomical preparations and the speci-

mens from which they were made, are being given to the British Museum), I selected among others a specimen of Bartel's *sibirica*, in which there was a well-developed central basal spot, on the underside of the hindwing; a feature I had not previously noted in specimens or illustrations of that species, there being usually only the costal one present. This additional spot did not exist in X. I sent this specimen, together with photographs of the genitalia of *sibirica* and X to Prof. Reverdin, explaining the facts and asking his opinion. He tells me he mounted the genitalia of the specimen, and found it to be similar to X, and that on anatomical evidence he believes *sibirica* and X to be distinct species: though he cannot separate them superficially. As there are only the two specimens known, however, an element of doubt must remain, it being possible that they are isolated, variable specimens of *sibirica*. The difference in the armature between *sibirica* and X is, as Prof Reverdin pointed out when writing, considerably greater than the difference existing between *andromedae* and *cacaliae*; but all the same, for want of a greater number of specimens, one cannot come to any definite conclusion.

This note, however, will serve to correct the oversight in regard to *andromedae*. Fig. 1, on plate i., is the form X, done from the same photograph as was published in 1917. Fig. 2 is type *sibirica*.

Writing of Dr. Chapman in this month's *Entomologist* (February), Mr. W. G. Sheldon says, "'The Doctor' in his work, as in everything else, was absolutely unselfish; his sole anxiety in dealing with a scientific problem was that it should be solved; it did not signify to him one iota whether he or someone else solved it; provided it *was* solved."

A letter I had from Dr. Chapman just three weeks before he died, illustrates this comment very aptly. He had been accumulating material on the Hesperiids for many years, he told me, and had studied that group extensively, making numerous mounts of the genitalia of nearly all the Palæarctic forms; he then added, "It seems then that what I have so far done would be most useful if placed at your service for your book." In this generous manner he was prepared to give me, a mere acquaintance, the benefit of what must have represented months of careful work; because it would be "most useful" to science, so.

Unfortunately he did not live to put the full details of his work on paper, but such notes as he left have been given to me by Miss Chapman.

On the habits of Stenamma westwoodi in Ireland.

By A. W. STELFOX, M.R.I.A.

In the *Irish Naturalist* for November, 1921, Mr. R. A. Phillips, M.R.I.A., records the finding of numerous colonies of this ant in an old oak wood near New Ross; of two colonies in Killoughrum Forest, another native oak wood; as well as of odd workers and a male in Camlin Wood. All these localities are in Co. Wexford.

Mr. Phillips's first finds were made in May, 1921, when he reported and sent me specimens from two nests. Being aware that no nest of this species had been taken in the British Islands, and that even on the continent some well-known myrmecologists of the past had regarded this species as being an inhabitant of other ants' nests, it was with

considerable pleasure that I joined Mr. Phillips at New Ross on September 17th, 1921, to attempt to obtain specimens of the sexes. The result of our afternoon's work is fully dealt with by Mr. Phillips in his paper, suffice it to say that we examined over forty nests of *Stenamma*, many of which contained between 50 and 100 workers. In some of these nests we found males and deälated females, but no winged females.

I take it, therefore, that the marriage flights had taken place, and that the males were either late examples, or those that had crept back into the nests. My chief object is to bring Mr. Phillips's paper before English myrmecologists and to give my own impressions of the habitat, as the nests of *Stenamma* may have been overlooked in parts of England,

The locality I visited with Mr. Phillips, known locally as Mount Garret Wood, lies about a mile north of New Ross, and occupies for some distance the almost precipitous rocky eastern bank of the River Barrow. The vegetation is entirely native, mainly oak, with much holly and bramble scrub; it is an exceptionally dry and sun-baked spot, and the ground is covered in places with large flat stones, derived from the Ordovician rocks of the district. In places where the wood has been cleared, nearer New Ross, numerous other species of ants were found—*Donisthorpea flava*, *D. nigra*, *Formica fusca*, *Myrmica ruginodis* and *M. scabrinodis*—but in the wood itself we saw but one nest of *M. ruginodis* and a single worker of *D. mixta*. These were, however, not very close to the *Stenamma*.

It might also be well to note, in view of the apparent carnivorous habits of *Stenamma*, that whereas the nests of all the species seen in the clearing were tenanted by large numbers of the woodlouse, *Platyarthrus hoffmanseggii*, none of this myrmecophilous Crustacean were seen in the nests of *Stenamma*.

Mr. Phillips describes carefully the nests that we examined, found always under deeply embedded stones, each with its little central chamber and radiating galleries. Owing to the tenacity of life exhibited by this ant we were enabled to send a mixed colony alive to Mr. Donisthorpe, and as he reports that the ants have settled down in their new home, it is to be hoped that many obscure points connected with their life-history will be added by him to Mr. Phillips's narrative.

The French Alps of Haute Savoie in July, 1920.

By Lt. E. B. ASHBY, F.E.S. and Memb. Soc. ent. de Fr.

Leaving Gex in the French Jura on July 4th I arrived in the evening at Annemasse, where I put up for the whole of my stay at the Hotel de France, which I can recommend, Annemasse being a good centre from which to work the surrounding mountains without necessitating entering Switzerland. On the journey from Gex to Annemasse I managed to escape being overhauled by the customs at Bellegarde, which formality is generally unavoidable.

July 5th.—This morning I wandered around Annemasse getting a few Diptera, among them being a *Tabanus* sp., a *Vespa sylvestris*, the beetle *Rhagonycha unicolor*, and *Ichneumon primatorius*, Först. In the afternoon I went up to Mornex on the Petit Salève, a limestone mountain overlooking the Lake of Geneva and the Juras beyond. The

route is by tram to Etrembières and thence by funicular railway to either Bas Mornex or Haut Mornex station. I was disappointed in the results. Nearly all the flowers could have been found on a similar limestone formation in England and amongst the insects very little except *Melanargia galathea*, *Hipparchia semele* abundant and fresh, *Hesperia sao*, *H. carthami*, *H. flava*, *Aricia medon*, several species of Burnet-moth, *Zygaena*, including *lonicerae* and *Z. alpina*, with a specimen of *Ino geryon*. The moths *Ethmia bipunctella*, *Pseudoterpna pruinata* and *Crambus carnella* fell to my net. These with a few *Parnassius apollo* and *Argynnis aglaia* on the higher slopes of the Petit Salève completed my observations among the Lepidoptera. The Orthoptera produced *Stauroderus bicolor* in abundance together with *Stenobothrus lineatus* and also *Oedipoda miniata*, Pall., with its crimson wings, very complete black alar fascia and greyish elytra with dark transverse markings, which I took for the first time in France. I also took two males and a female quite fresh of *Arcyptera fusca*, Pall., with the larva of a species of *Oedipoda*. The beetle *Lina populi* was also common.

July 6th.—To-day I spent on the range of hills known as Les Voirons. Arriving at St. Cergues station about 10 a.m. I made for the village which lies back under the hillside. Reaching the first part of this straggling village, I took the first turn sharp to the right which leads from a café-restaurant up towards Montauban which I reached about midday. On the way I took *Lycaena arion* male, *Limenitis camilla* female, and *Nordmannia ilicis*, one of each, and saw little else except one worn *Apatura iris*. After déjeuner at the Hotel at Montauban, I walked up to the Chalet de la Rive and on the way took a large fine female of *Papilio machaon* ab. *rufopunctata*, males of *Heodes hippothoe* and *H. virgaureae*. On the way back I took a *Brenthis amathusia* very fresh, and *Chiasmia clathrata*, and below the Hotel on the stony descent two specimens of the beetle *Cicindela hybrida*, L., with a quite fresh *Polyommatus damon*. The dates and emergences this forward year are rather puzzling. Between St. Cergues village and the station I took a fine female of *L. arion* and the Dipteron *Volucella inanis*, L., and concluded a hot day's tramp under a broiling sun for a very small bag of specimens worth keeping.

July 7th.—This afternoon I ascended the Grand Salève by the funicular as far as Les Treize Arbres station and walked on to the summit. Close by I had the pleasure of meeting M. Boulanger who was studying the various *Rosaceae* on the Salève. The view of the High Alps from the summit to-day was grand. There was very little of interest on the summit itself except *P. machaon*, which was abundant. The two little ponds just by the summit produced the dragon-flies *Libellula depressa*, the blue mature form, male and female of *Calopteryx splendens*, but I could get neither, as they decided not to settle near. Towards the descent by the Grand Gorge I took several *H. carthami* and females of *Polyommatus semiargus* (*acis*), also *Erebia oeme*, and discarded numbers of *Satyrus alcyone*, which were all chipped. From the higher ledges which overhung the narrow path there flew out the moth *Lignicolor* (*Cinophos*) *furrata*, W.V., which I promply secured, the only other specimen I have taken was at St. Martin Vèsubie on July 27th, 1914. I don't think it is very common. *N. ilicis* was abundant and in good condition on the way down, and on

the higher slopes I had found quite fresh specimens of *P. damon*, but not abundant. They and both sexes of *A. aglaia* and *Aglais urticae* were the most generally distributed butterflies on "levels" between the highest point of the Saleve and the point where the Grand Gorge begins. After a tedious descent after a hot day I finally found myself resting at Archamps station at 7.0 p.m., and was not sorry to reach Annemasse about 8, after an afternoon of a good deal of fatigue without great results. A small larva of an Orthopteron of the genus *Anisoptera* with very long antennæ I have not succeeded in identifying.

July 8th.—To-day ascending the Grand Salève, I walked down from Les Treize Arbres station to Monnetier-Eglise, an easy two hours' walk in ordinary weather, but the heavy showers of rain compelled me to shelter frequently. Whilst sheltering, I found a swarm of the ant, *Formica rufa*, around one tree-trunk and in a state of great activity. However, I got a good series of *P. damon* males picked off the flower heads, together with the first male of *Agriades coridon* which I had seen this year, quite perfect, and a few Burnets. A fellow passenger in the train in returning had brought down from the Salève a fine specimen of the great Yellow Gentian (*Gentiana lutea*) in flower which he had dug out with its roots. He told me it took him quite 10 minutes to dig it out, so deeply is this plant rooted into the limestone. It is common on the higher parts of the Jura, Les Voirons, and the Grand Salève, and doubtless in many other localities as high or higher. This evening I took at light another male of the Moth *Malacosoma neustria*, as well as a specimen of the Dipteron, *Syrphus balteatus*.

July 9th.—To-day I took the morning train to St. Jeoire on the line towards Samoëns and ascended the Mole, 6,130 ft. The day turned out disastrously, as the sun never appeared, the rain descended and the floods came, and I ended with "déjeuner" in a small châlet near the summit with a cowherd, his wife and boy, two horses, three cows and half-a-dozen chickens. However, I was thankful for the shelter. After the rain stopped I got a few flowers I wanted and a specimen of the moth *Boarmia consortaria*, with a few Burnets, including *Zygaena alpina* and *Z. lonicerae*, together with the Diptera *Chrysotoxum festivum*, L., *Rhagio* (*Leptis*) *conspicuus*, otherwise the day was a blank. However, whilst returning to Annemasse in the evening the sun came out and the sunset and sky gave promise of better weather.

July 10th.—This morning the sun rose with a cloudless sky and shone like a giant all day. I took the 8.50 a.m. train from Annemasse to Bossey-Veyrier, and leaving that station worked up through the woods parallel with the foot of the Grand Salève towards Bossey and on to the smaller hamlet of Crevin. Soon after leaving the station I took a fine *Euvanessa antiopa* in good condition close by a café, and walking on by some small clearings found *P. damon*, *A. coridon* and *P. icarus*, all males, in abundance, together with a sprinkling of *N. ilicis*, males and females, all in good condition. Walking on through the woods towards Bossey I came later to a small fir plantation in which I got the dragon-fly *Aeschna cyanea*, Müll., two, one in good condition and one rather worn. In this plantation is a small pond round which I took the small dragon-flies *Pyrrhosoma nymphula*, 2 males and 2 females, together with male specimens of *Ischnura elegans*, and of *Agrion pulchellum*, Lin. Leaving the plantation where

A. pephia was common on brambles, I turned into rough pastures where I found *L. arion* (2), *P. semiargus* (*acis*) abundant, and a female var. *daridor* (?) of *Plebeius aegon*. There is a good restaurant at Bossey. After lunch I tried an artificial sheet of water there, used in connection with an horticultural establishment, for dragon-flies, but without success, getting only a small and immature *Agrion*. Reaching Crevin, I made my way slowly back to Bossey-Veyrier station, taking on the way *Bithys* (*Thecla*) *quercus*, a male; a male of the dragon-fly *Calopteryx virgo*, a female of which I also noticed, and a small specimen of *Eugonia polychloros*. *Pyrameis atalanta*, *Vanessa io*, *Aglais urticae* and *A. aglaia* were flying about thistle-blossoms, and a number of the commoner Burnet Moths were abundant, including *Zygaena achilleae*, many quite fresh. Altogether the day was the most interesting I so far had here. This evening I took at light a specimen of the Hemipteron, *Reduvius personatus*.

July 11th.—This afternoon I went up by funicular to Monnetier-Marie and spent a few hours collecting there, and on to Monnetier-Église, where there are some good hotels and generally some English visitors. To-day being Sunday a large number of people had come up, as is their wont, from Geneva and Veyrier, and the little village was crowded with a swarm of quiet, happy people. *P. apollo* was flying in some numbers about 4 p.m. in the higher fields between Monnetier-Marie and Monnetier-Église, and I made a good selection with some fine fresh females included. The females of *A. coridon* were out and those of *P. damon* were becoming more numerous. I also took the beetle, *Silpha obscura*, L., and the Burnet Moths *Zygaena achilleae*, Esp. and *Zygaena alpina*, and a fine male of the Orthopteron *Locusta* (*Phasgonura*) *viridissima*, L. I got little else and the heat was intense on the Salève. I found on getting home that I had also captured a specimen of the pretty red and black Rhynchota *Pyrrhocoris apterus*.

July 12th.—To-day I took the P.L.M. early morning express to La Roche-sur-Foron, whence I walked via Le Cret, the Châlets de Balme to the Col de Balajoux, 1560 metres. It was a long walk up to Orange, and it is necessary to carry food for déjeuner these times, but I got on to very good collecting ground immediately above the Châlets de Balme onwards that repaid the hard morning walk in the hot sun. I did not cross the Col down to S. Pierre sur Rumilly as I had intended but returned to La Roche-sur-Foron in the late afternoon the same way I had ascended in the morning. Above the Châlets de Balme I found the males and females of *Brenthis amathusia* flying in abundance and very fresh, together with *Erebia manto* and *E. ligea*, the latter less commonly. Both these *Erebiae* were in excellent condition. I also took one male of *H. virgaureae*, a male and female of *Colias phicomone*, the male had apparently just emerged, and one or two specimens of *Lycaena arion*. I saw a large dragon-fly in the mountain woods which I failed to identify. I also got a fine specimen of *Argynnis niobe* var. *eris*. My bag, for the day totalling to 33 perfect specimens, constituted my best day's outing this year. I saw nothing at all below the Châlets de Balme. This evening I took a specimen of *Porthesia chrysorrhoea* at light at my hotel at Annemasse.

July 14th.—The National Fête Day in France. I took the 6.48 a.m. train from Annemasse to St. Jeoire on the steam tramway line to

Samoëns and reached St. Jeoire about 8.15 a.m. I climbed the Pointe des Brasses, which takes quite three hours, to the summit, but a good deal of shade is obtainable on the way up if an early start is made. At the beginning of the ascent I found *S. alcyone*, *D. paphia*, and *Pontia daplidice* in some numbers. About half-way up I took *L. camilla* and *Pyrameis atalanta*. *P. apollo* was flying about here and there from the base to the summit. Reaching the only châlets situated on the lower Alps, the path ceased, and the only way to reach the steep summit was by circular ascent. From here onwards, I took males and females of *H. virgaureae*, *Brenthis amathusia* (one), *Coenonympha satyrion*, males and females of *Colias phicomone*. On the summit *P. machaon* was in good condition, also the moth *Agrotis corticea*, Hb., and *Erebia* sp. ?, with the Burnet Moths *Zygaena carniolica* and *Z. lonicerae*; *A. coridon* and *P. damon*, males swarmed everywhere, the only blues. I took a male specimen of the Orthopteron, *Stauroderus scalaris*, F.W.; also a specimen of *Chrysochraon brachypterus*, Ocksay. I made the mistake in descending of trying an unknown path which looked inviting, but which terminated about half-way down in a dried-up rivulet course under bramble and oak, and it is a marvel that I reached the base alive with only one serious fall, as the descent was tedious and difficult under a blazing sun with the Diptera very hostile. I got a good bag of fine specimens on a long and tedious day. This evening I took in the Hotel a specimen of the Coleopteron *Harpalus ruficornis*, F.

July 15th.—This afternoon I collected under the Petit Salève and the Grand Salève, between Etrembières and Veyrier. Soon after passing Etrambières Church a path leaves the main road on the left, just by a level crossing, and continues approximately for three kilometers in the direction of Bossey-Veyrier below the Salève. All this path is good collecting ground, reminding one somewhat of the famous walk under the cliffs from Vernayaz to Martigny, only that the path at the base of the Salève is not in any way overhung by cliff. Along this path *Satyrus alcyone* were flying to-day at intervals, together with *Pararge megera* and *P. aegeria*, also *Aglais urticae*, *A. cordon*, males and females, *P. damon*, males, *Anglades sylvanus* and *A. flava* (*thaumas*) together with odd specimens of *L. arion*, *P. aegon*, including one fine specimen of the female var. *flaridor* (?), with very pronounced orange bands on both sides of all four wings, *Scolitantides orion*, *Klugia spini* and *Thecla w-album*. *M. galathea*, *E. jurtina* and *E. hyperantus* swarmed everywhere and amongst the Burnet Moths, conspicuous alike on blossoms of the common marjoram and on the devil's bit scabious, were *Zygaena filipendulae*, *Z. lonicerae* and *Z. carniolica*, of which last species I took a series in good order, but I did not find *Zygaena fausta* var. *jucunda* which I was especially working for. Amongst the Burnets I took a larva of a Rhynchota of the genus *Carpocoris*, but have not been able to ascertain the species. The day was very fine and oppressive, the hottest here this year I am told. Towards the quarries by French Veyrier round and over which the funicular railway slowly mounts up from Veyrier to Monnetier-Eglise, *Lycaena arion* was fairly abundant and mostly in good condition, in fields where *Medicago sativa* and *Onobrychis sativa* were conspicuous. I saw *Papilio podalirius* for the first time this summer flying to-day close to Etrembières on the main road. In the evening I took at the

hotel electric light a species of the Moth *Hecatera serena*, a *Boarmia crepuscularia*, a specimen of the Neuropteron *Chrysopa vulgaris*, Schn., together with the Hymenopteron *Pimpla instigator*, and the moth *Idaea similata*, Thunb.

July 16th.—This afternoon I collected for the last time on the Grand Salève, taking the funicular railway up to Les Treize Arbres where there is a decent restaurant. Round the summit *P. machaon* were still numerous and fresh, and I was glad to add to my list for this tour the Beetle *Mylabris variabilis*, Pallas. I also found *L. arion* in quite good condition near to the summit and several good specimens of *Z. carniolica*, together with a specimen of the Rhynchota *Pentatoma juniperis*. I found the males of the Orthopteron *Aeropteryx fusca*, Pallas, still in quite fresh condition to-day and I took also a specimen of *Staurodcrus scalaris*, F.W. *Erebia tiyea* were in excellent condition, also the Skipper *Hesperia serratulae*, Rbr., and *Endrosa aurita*. I took the very large Bee, *Psithyrus rupestris*, close by the summit and one specimen of *Z. fausta* var. *niveae*. Amongst the flowers the most noticeable were *Campanula glomerata* in great quantities and the pretty red *Cyclamen perse* which was in blossom in some quantity on the lower slopes of the Salève. A good many moths frequently came to the electric light at the Hotel de France, where I was staying at Annemasse, the most noticeable being the Brown Tail Moth in some quantities; one Lobster Moth, *Stauropus fagi*, also appeared.

I left Annemasse in the evening of July 16th and arrived in Paris next morning, I took the early afternoon train out to the station of St. Germain en Laye, in the Fôret du Saint Germain, from the Gare St. Lazare. This part of the forest is no good for collecting as all the undergrowth is trodden down and I saw few plants of interest, but further out from Paris, on the main line of the Chemin de Fer d'Etat from the Gare St. Lazare, I saw from the train many parts in which it would probably pay to collect judging by the abundance of plants in blossom.

I reached London on the evening of July 18th after an interesting tour. My thanks are due amongst others to Mr. Durrant, Capt. Waterstone, Mr. Prout, and Dr. Uvaroff, at the Natural History Museum, and also to the Rev. F. D. Morice, for helping to name many of the species mentioned in this article and in the previous one on collecting in the French Jura at Gex in June-July, 1920.

Amongst the most interesting plants in blossom in the Annemasse district which I noted were:—(1) On the Petit Salève, *Erythraea centaurium*, *Jasione montana*, *Ornithogalum umbellatum*; (2) On Les Voiron, *Gentiana lutea*, *Visum arvense*, *Genista pilosa*; (3) On the Grand Salève, *Adenostyles albifrons*, *Digitalis lutea*, *Genista sagittalis*, *Campanula glomerata*, *Campanula rhomboidalis*; On the Mole, *Aquilegia vulgaris*, *Astrantia major*, *Digitalis grandiflora*, *Gentiana lutea*; (5) On the Point des Brasses, *Geranium sylvaticum*, *Dianthus sacritragus*, *Dianthus sylvestris*, *Centaurea montana*, *Digitalis ambigua*, *Gentiana verna*, *Dianthus superbus*.

Sale of the Farn Collection.

On February 14th last there was sold at Steven's Auction Rooms the first portion of the above well-known collection, formed by the

late A. B. Farn of Ganarew, Monmouth, who was a President of the South London Entomological Society in 1875-6. The writer was well acquainted with this very estimable gentleman, who was a man of great character and charm, and fine presence. He possessed considerable knowledge of all orders of insects and birds, and was a most interesting correspondent, with a beautiful handwriting which remained perfect until the end. A very long life was devoted to forming his collection and he was happy in keeping it in excellent order. He was at all times willing to go through the cabinets, with anyone interested, and the writer remembers that on the last occasion he was looking at the Rhopalocera, Mr. Farn said that very recently he had spent rather a tiring time going through every drawer with a lady visitor, who when asked what her impression of the collection was, said that the thing that struck her most was the immense number of pins used!

The portion of the Collection under notice included the earlier genera of the Rhopalocera down to *Epinephele tithonus*, and comprised 400 lots, there being very numerous remarkable aberrations and gynandromorphous specimens. Generally speaking the lots were in excellent condition and well set, and quite the best collection from this point of view that has been sold in recent years. A large number of buyers congregated and the owners of several famous collections were present and intent on bidding.

Among the *Papilio machaon* the best aberration realised 90s., the remaining lots fetching from 7s. to 22s. each. Seven good *Pontia daplidice* brought 35s. to 55s. per pair, and a single female, 50s. A remarkable dark var., somewhat diaphanous, of *Pieris napi*, fetched 180s. *Aporia crataegi*, from 12s. to 16s. for nine. A cream-coloured *Leptosia* (*Leucophasia*) *sinapis* brought 80s. and a var. *erysimi*, with a specimen with body and markings light brown, 65s. A gynandromorphous *Gonepteryx rhamni* brought 55s. and a female with margins of male tint 32s. 6d.

An extraordinary female specimen of *Euchloe cardamines*, with large patches of orange on upperwings, persuaded a bid of £9, and another with two thin streaks of male colour on underside, 40s. Beautiful series of *Colias edusa*, with ab. *helice* and *Colias hyale*, were comprised in lots 42 to 79, and those together realised over £62, the best individual prices ranging from 30s. to 80s.

Some beautiful *Dryas paphia* were next disposed of: a male with spots united and forming oblong blotches, fetched £4, and two similar, slightly defective, £4 10s.

Lot 97.—A fine and perfect gynandromorph, right side male, left female, taken by Mr. Charles, at Brockenhurst, brought £8.

Lot 98.—A fine female, with spots large and united, fetched £4, and lot 99, a beautiful var. with fore- and hindwings black, except basal portion, and partly rayed hindwings, realised £12. Two exceptionally black females, not in the best of condition, fetched 30s. and 25s. each, and six very interesting and rare intermediate forms between the type and var. *valezina*, brought 90s.

Lot 105.—A fine var. *valezina*, black and spotless, with outer row of streaks in hindwings greenish black, excited keen competition, and cost the fortunate buyer £17. This insect the writer knows last changed hands at the price of £7 7s., thus turning out a good investment, bu

in those days the prices paid for aberrations were very modest compared to present day prices. The form is undoubtedly a remarkable one, and exceedingly rare—an ab. of an ab. in fact.

The next lot attracting deep interest was No. 117—this was a silvery or creamy white female of *Argynnis cydippe*—and cost £20. This insect formed a complete contrast to the black *valezina* of *D. paphia*, but was not so attractive as an aberration. Apart from this one lot, there was nothing very remarkable about the series of *Argynnis cydippe*, which realised from 6s. to 30s. per lot.

Lot 124 was a splendid dark male *Argynnis aglaia*, rich black with rayed borders, and cost the highest bidder £12. Other lots of this species realised from 8s. to 25s., and lots 133, 134, 134a, each being a fine ab. *charlotta*, cost respectively 90s., £10 10s., and 60s. Lot 134 was an exceptionally aberrant form. Fifteen *Issoria lathonia* now came along, and produced from 22s. to 30s. for males, and 35s. to 52s. 6d. for females, according to condition. Two good undersides went for 40s. each. Two fine vars. with black blotches on disc of forewings sold for £8 and £2 each, the latter being in rather poor condition.

Brenthis selene next came to the table and included some fine vars. Lot 155 a light var. with spots and markings mostly absent, cost only £2 2s. and was remarkably cheap in view of the extreme rarity of this form as compared with melanic aberrations. Lot 158, a really beautiful form, black with median band in forewings and marginal streaks, realised £8 10s., and Lot 159 with light forewings, blotched with black, £6 10s. Lots 166 to 189 comprised the *Brenthis euphrosyne*. A silvery-white var. fetched 60s., and one, Lot 175, with light forewings and nearly black hindwings cost £8 10s. Another with large costal blotch and zig-zag band through forewings went for £6 10s. Lot 185, a specimen almost entirely black cost the bidder £10 10s. Other aberrations fetched from 18s. to 55s. each. Lot 188, a remarkable underside, rayed with upperside black brought £8 10s.

Lots 190 to 199 comprised the *Melitaea aurinia* from various localities, and single specimens brought from 25s. to 70s., the latter being pale ochreous brown without markings. A curious subdiaphanous specimen without markings went for 25s.

Melitaea cinxia consisted of eight lots, the only very striking var. being one figured in the *Entomologist* for August, 1896. This realised £6 10s. Some nice varieties of *Melitaea athalia* were now brought into view—an ab. *obsoleta* with fulvous wing fetched £6, a good var. *tesselata* £5 10s., and two var. *navarina* 30s. and 90s. respectively. A white var. of *Pyrameis cardui*, catalogued as unique, cost £16, and a var. of *P. atalanta* smeared with white at apex of forewings, and richly coloured underside realised £10 10s. Eleven *Euranessa antiopa* varied in price from 30s. to 45s. each, according to condition. A var. of *Vanessa io* with ocelli in forewing replaced by costal patch and small in hindwings, realised £6, and a light var. with disc of forewings pale orange £7 10s.

Some extra good aberrations of *Polygonia c-album* produced good prices. A white var. with small spots fetched the satisfactory price of £21, and another with large confluent blotches on costa and inner margin of forewings, disc of hindwings all black £10. Other lots of one or two insects 25s. to 55s. each.

The *Aglais urticae* tempted buyers and six or seven single lots fetched from 25s. to £2 2s., £4 15s. and £5 each.

Limenitis sibilla with bands more or less obsolete fetched from £1 1s. to 50s. each.

Apatura iris still maintains the high prices at present existing and type specimens averaged about 8s. each. A fine var. without bands and spots cost £11, and one somewhat similar, but not so large and good £4 10s.; another only brought 21s.

Now came the sensation of the sale, the much figured and well-known black variety of *Melanargia galathea* taken at Chattenden in 1871 by Mr. Doran. After keen competition a bid of £32 was successful, this being the record price paid for a British butterfly. Another very light var. fetched £3 10s.

A remarkable var. of *Hipparchia semele* with three large spots forming a band on forewings, owing to its poor condition only fetched £2 10s., but it is of some interest as aberrations of this species are uncommon.

A golden-brown *Epinephele jurtina* realised £1 10s., and others with wings more or less bleached, realised from 12s. to 50s. Several very interesting vars. of *Aphantopus hyperantus* fetched good prices—a pale golden ochreous var. realised £7, one with pale ocelli fig. in Mosley £3, and one with broad buff borders to ocelli £3 10s. Two var. *lanceolata* of rather small size fetched 25s. to 30s. each.

White *Coenonympha pamphilus* lotted with four var. *lyllus* fetched 28s. to 27s. 6d. each. A fine pale golden male, var. *pallescens*, realised £3 10s.

This was the end of a very successful sale, although the prices for the extreme vars. with several exceptions did not reach the high average experienced in several previous sales, the less conspicuous aberrations realised exceptionally good prices. The total sum I believe approximated £850. The collection was effectively catalogued by Mr. Janson, whose descriptions are roughly followed by the writer. The sale of the remainder of the butterflies takes place on the 14th March, when some remarkable blues and coppers will be shewn.—S.G.C. R.

NOTES ON COLLECTING, Etc.

Second Broods in 1921.—On the Downs at the back of Worthing *Hesperia malvae* and *Nisoniades tages* were taken on August 6th. *Brenthis selene* also appeared in some numbers during August. *Nola cucullatella* came into the house at Worthing on September 9th. *Porthesia auriflua* and *Ourapteryx sambucaria* were taken on a gas lamp at Worthing on October 3rd. *Pararge megera*, third brood, was in fresh condition on the Downs at Sompting on October 2nd.—H. McD. Edelsten, Oakhurst, Balcombe Road, Haywards Heath.

Correction.—*H. variegata*, Goeze.—I regret to find the quotation from Weise (B.T. 1885) is not correct in my paper on this species in vol. xxxiv., p. 23. It should have read as follows: "h) P. 4+5+6 zu einer dicken C.-förmigen Zeichnung oder de ae." Will subscribers please therefore in their copies alter the words "und förmigen" into "C-förmigen."—G. B. C. Leman, F.E.S.

Myrmecophilous mites.—I see from Mr. Donisthorpe's "Myrmecophilous Notes for 1921" that the mite *Antennophorus forcli*, Wasm.,

has only been recorded twice in this country. It therefore seems worth while to put on record that I took this mite in nests of *Lasius niger* in 1898 at Oddington near Oxford. It was present in considerable numbers and both sexes were observed. Vide *Ent. Rec.*, **23**, 23 (1911), for notes on its habits in artificial nests. Two other species were found in the same year in the same locality, undoubtedly *A. grandis* with *L. fuliginosus* and *A. pubescens* with *L. flavus* (*Ent. Rec., loc. cit.*). I still possess a slide containing two ♀ ♀ of *A. foreli* (determination verified by Mr. J. E. Hull) prepared in 1898.—W. C. Crawley.

[On first reading the above short note I was much afraid that I was at fault, as I rather pride myself on having indexed every British record of ants, or myrmecophiles, into my Pilot files, etc. However, on looking up the reference given by Mr. Crawley, the mystery was explained. He had very unfortunately not mentioned any locality (the note does not even indicate that the ants in question were British), nor the names of the mites (except *A. grandis*); though any *Antennophorus* found on *Acanthomyops* (*Donisthorpea*) *niger* would of course be *A. foreli*, Wasm.

In 1910 I pointed out [*Ent. Rec.* **22**, 69 (1910)] that the *Antennophorus* recorded by Crawley on *A.* (*Dendrolasius*) *fuliginosus* ♀ ♀, would be *A. grandis*: a species I had added to the British list in 1906.—Horace Donisthorpe].

CURRENT NOTES AND SHORT NOTICES.

The first portion of the Farn Collection of Aberrations of British Lepidoptera was a record we understand both for the company in the room and for the prices realised. We print a review of it in the present number. The rest of the aberrations will be sold on March 14th, when no doubt another fine sale will take place. Attractions to buyers fall thickly just now, for on the following day, March 15th, the bulk of the Library of the late Dr. Chapman will be disposed of. Probably this is one of the most perfect libraries of entomological books ever dispersed. All notable authors are represented. Of many works there are two or three copies. Old and modern work, complete series or long runs of British and foreign periodicals, quantities of assorted separata bound in half morocco will be sold. Practically all the volumes are in very good bindings and in excellent condition. There should be another record for Stevens' Rooms.

SCIENTIFIC NOTES AND OBSERVATIONS.

L. hirtaria.—A male *Lycia hirtaria* emerged on March 23rd, 1921, and paired the same day with a recently emerged female. On March 27th it paired a second time with a very large female, which had emerged on March 9th and had been laying a few infertile eggs since the 17th. On March 31st it paired with a third female, on April 2nd with a fourth, and on April 4th with a fifth. All these pairings were actually observed. Meanwhile two other females, which had been kept in the same cage had started laying eggs, which proved to be fertile. As far as I know parthenogenesis does not occur in this

species, and no other male had had access to them. About two-thirds of the eggs laid by the second female, and some laid by one of the others were infertile, but all the others were fertile. It is well-known that males of some species pair quite readily more than once, but very few instances have been recorded. There is little doubt that this *hirtaria* paired with seven females, and might have paired with more had they been available.—E. A. Cockayne, Westbourne Grove, *January 27th*, 1922.

SOCIETIES.

The Entomological Society of London.

October 5th, 1921.—The President announced that owing to the illness of Mr. H. Rowland Brown, Dr. H. Eltringham, M.A., F.Z.S., had kindly consented to act as Secretary for the remainder of the session.

The Treasurer called attention to two portraits that had been bequeathed to the Society by the late Dr. Longstaff. A vote of thanks to Mr. J. Joicey, F.L.S., F.Z.S., F.R.G.S., for his generous gift of a lantern to the Society was passed unanimously.

New Fellows.—Messrs. Charles L. Fry, 1621 Vallejo Street, San Francisco, California; William F. N. Greenwood, Lautoko, Fiji; Henry W. Dobson, 14/16, Finkle Street, Kendal; Kalidos D. Shroff, Nahani, Surat, India; Arnold Roebuck, Edgmond, Newport, Salop; the Rev. J. Wesley Hunt, 116, Cross Street, Kroonstadt, Orange Free State; and Miss Amy Castle, Assistant Entomologist, Dominion Museum, Wellington, New Zealand.

Habits of A. manicatum.—Mr. E. E. Green, F.Z.S., communicated an extract from his journal on the habits of the bee *Anthidium manicatum*.

Zygænidæ.—Mr. T. L. H. Grosvenor exhibited some British species of *Zygæna* and remarked on the results of crossing certain species and varieties. Dr. Cockayne, M.A., F.R.C.P., commented on the question of the identity of *Zygæna tutti*.

Birds capturing Lepidoptera.—Professor E. B. Poulton, D.Sc., F.R.S., etc., exhibited an example of *Danaida chrysippus* that had been captured and subsequently rejected by a young shrike in South Africa.

Insects taken from a trout.—He also exhibited on behalf Dr. R. C. L. Perkins, F.R.S., a collection of terrestrial insects taken from the stomach of a trout in Derbyshire. Mr. M. E. Mosely expressed surprise that such a large amount of surface food had been taken.

Papers.—"On *Boreus hyemalis*," by Mr. C. L. Withycombe.

"Some apparently new S. African Genera and Species of the family *Pyralidae*," by Mr. A. T. J. Janse.

"The African Species of the Genus *Neptis*, Fab., by Dr. H. Eltringham, M.A., F.Z.S.

"The number of joints in the antennæ of *Haliplidae* and *Paussidae* (Coleoptera)," by Mr. T. G. Sloane.

"Observations in the Structure of some *Homoneura*, including the Diagnosis of two new families of Lepidoptera."

Lantern Slides.—Mr. A. T. J. Janse gave an account illustrated with lantern slides on methods of collecting insects when travelling in South Africa.

October 19th. Presentation. The presentation by Mr. H. Donisthorpe of a drawing of Mr. T. W. Bates to the Society was announced, and a special vote of thanks was passed to the donor.

New Fellows.—The following were elected Fellows of the Society: Messrs. H. J. Wilson, O.B.E., M.A., F.Z.S., 139, Bishops Mansions, S.W.6; Alexander John Nicholson, University of Sydney, New South Wales; F. N. Chasen, M.B.O.U., Assistant Curator, Raffles Museum, Singapore; Baron J. Bouck, Springhill, South Godstone, Surrey; and Percy A. Glick, 903, West Illinois, Urbana.

New Guinea Lepidoptera.—Mr. G. Talbot exhibited on behalf of Mr. J. J. Joicey new and rare Lepidoptera collected by Mr. Pratt in the Weyland Mountains, New Guinea, and also read a letter describing the country from which the specimens came.

African Papilios.—M. F. Le Cerf on behalf of Mr. J. J. Joicey exhibited several new forms of African Papilios; comments were made on this exhibit by the President and Professor Poulton.

P. cristana and O. literana.—Mr. W. G. Sheldon exhibited a series of 1300 specimens of *Peronea cristana*, including examples of all the 72 named forms; also a series of about 250 specimens of *Origrapha literana*.

A New Race of R. phlaeas.—Professor Poulton exhibited examples of a form of *Heodes phlaeas* from S.W. Uganda, and discussed its relations with *H. abbotti*. He read some details of the genitalia of these forms supplied by Dr. Chapman. He proposed to treat *abbotti* as a race of *phlaeas*, and suggested the name "*ethiopica*" for the new race from Uganda.

Rare Coleoptera.—Mr. Donisthorpe exhibited examples of *Cymnetron squamicolle* from Ireland; the pupa and larval skin of *Cassida nebulosa* taken on *Chenopodium album*; and larvæ both dead and living of *Trionodes hirtus*.

I. erosus, etc.—Mr. W. J. Atkinson exhibited examples of *Ips erosus* found breeding in the Forest of Dean, and read some notes on this bark beetle and on allied species.

Paper. "New or little known Exotic *Tipulidae* (Diptera)," by Professor C. Alexander.

Lantern Slides.—Mr. A. T. J. Janse gave a further account on methods of collecting when travelling in South Africa, illustrated with lantern slides.

The South London Entomological Society.

August 11th, 1921.—The Apple Scale.—Mr. Edwards exhibited apples infested with the apple-scale *Mytilaspis pomorum*.

Pupa of P. atalanta.—Mr. Hy. J. Turner, a chrysalis of *Pyrameis atalanta* from Betws-y-Coed, N. Wales.

Local Coleoptera.—Mr. Blenkarn, *Melanophila acuminata* from Crowthorne, taken from actually burning pine-stumps, *Lebia cyanocephala* from Box Hill, *Cassida fastuosa* on *Senecio jacobaea* at Box Hill, *Dianous coerulescens* from the Mole near Box Hill, *Liparus germanus* on hogweed in Kent, *Aromia moschata* in London, *Bythinus glabratus* in a nest of *Lasius flavus* at Box Hill, etc.

Taken at the Field Meeting.—Mr. Ashby, *Stauropus fagi* and *Asthena blomeri* taken at the Chalfont Field meeting.

Variation in A. thetis.—Mr. T. H. Grosvenor, six distinct shades

of blue in *Agriades thetis*, including a unique specimen with scattered black scales, and a very pronounced ♀ ab. *ceronus*, from Surrey.

LIVING P. PODALIRIUS.—Mr. K. G. Blair, a living bred *Papilio podalirius* from S. France and a *Gryllus bimaculatus* taken in the docks.

STEREOSCOPIC SLIDES.—Mr. Withycombe, stereoscopic slides of ova of a Hemipteron, and of the Tineid *Harpipteryx xylostella*.

THIRD BROOD OF P. ÆGERIA.—Mr. Tonge, a presumably third brood specimen of *Pararge aegeria* bred from a female captured at Chalfont on June 26th.

RACES OF E. TYNDARUS.—Mr. Goodman, two distinct races of *Erebia tyndarus* from La Grave and the Engadine.

August 25th.—THE CHERRY APHIS AND "WHITE-FLY."—Mr. Edwards exhibited the black "cherry-aphis," *Myzus cerasi*, and the greenhouse "white-fly," and referred to the methods of control of the latter pest.

LOCAL FORMS OF H. SEMELE AND R. PHLÆAS.—Mr. Barnett, dark heath forms of *Hipparchia semele*, light banded forms of the same, a dark *Rumicia phlaeas*, etc.

S. AMERICAN LEPIDOPTERA BRED AND SENT BY MR. LINDEMAN.—Mr. Turner, a cocoon of *Rothschildia aurata* from which a large imago had emerged, with ova laid by it; a chrysalis of *Papilio thoas* remarkably resembling a piece of rotten stick; and a pupa of *Eacles magnifica*, pointing out the rough file-like surface characteristic of the genus.

A NEW FRENCH RECORD.—Mr. Withycombe, *Ascalaphus ottomanus* from Digne, a new record for France.

A GALL ON DOGWOOD.—Mr. Coxhead, a Dipterous gall *Oligotrophus cornu* on dogwood.

LIVING INSECTS.—Mr. Enefer, living examples of *H. semele*, the beetle *Apion miniatum*, and the shield-bug *Sgromastes marginatus*.

THE REARING OF N. INTERRUPTUS (COL.).—Mr. Main, in his terrarium the larva of *Necrophorus interruptus* reared from ova; it would probably pupate in the spring.

SPECIES OF HEODES AND CHRYSOPHANUS.—Mr. Goodman, European species of "coppers" for comparison, *Heodes virgaureae*, *H. hippothoë*, var. *eurybia*, *Chrysophanus dispar* and var. *rutilus*.

ABERRATIONS OF ARCTIA CAJA.—Mr. Coppeard, one of six similar aberrations of *Arctia caja* in which the usually cream-coloured banding had a beautiful pink flush.

September 8th.—NEST OF VESPA GERMANICA.—Mr. H. Moore exhibited a nest of *Vespa germanica* from Kent, with 1052 dead wasps, another 100 or 200 in the nest, and several grubs still alive.

ZYGAENIDAE HYBRIDS.—Mr. T. H. Grosvenor, several hybrid Zygaenids from *Z. trifolii* taken *in cop* with *Z. hippocrepidis*, various forms of *Z. trifolii* including ab. *nigricans*, ab. *obscura*, a white specimen, very large and very small specimens, confluent spotted forms, with minute 6th spot, with wide border to hindwings, etc., and of *Z. filipendulae*, very large and very small forms, confluent spotted forms, several fine yellow forms, etc.

RACES OF ORNITHOPTERA.—Mr. Hy. J. Turner, males and females of race *poseidon* and race *hecuba* of *Ornithoptera priamus* from Queensland and Key Island respectively.

ABERRATIONS.—Major Cottam, the chalk form of *Plebeius aegon*

from N. Kent, *Euchloë cardamines* with yellow hindwings, very pale *Hypocrita jacobaeae*, etc.

CHRYSOMELIDAE (COL.).—Mr. Syms, *Chrysomela graminis* from Yorkshire, and *C. banksi* from the Isle of Wight.

LARVAE OF A SAWFLY AND A LOCAL GRASSHOPPER.—Mr. K. G. Blair, the living larvae of the sawfly *Eriocampa orata* with its waxy secretion, and the living subapterous grasshopper *Leptophyes punctatissima*, from Oxshott.

REPORTS ON THE SEASON.—Numerous reports were made on the season and a discussion took place on immigration.

September 22nd.—LANTERN SLIDES.—The evening was devoted to the demonstrations on a long series of lantern slides by various members.

Mr. H. Main, slides of the various phases in the life-history of the oil-beetle, *Meloë proscarabaeus*, a parasite in the larval stage of the *Anthophora* bee. Practically the whole of the details of the biology of the beetle were illustrated.

Mr. Withycombe, slides showing the habit, structure, growth, and development of the bladderwort *Utricularia* which entraps small crustaceans and larvae in water, and of *Pinguicula* the leaves of which capture and digest small insects, by means of their tentacles.

Mr. G. T. Lyle, slides of details of Lepidopterous structure, habits and development.

Mr. W. J. Lucas, slides illustrating the Black Pond area near Oxshott before and after the devastation; slides showing the fruiting of many shrubs and bushes; and a few of "other orders."

Mr. Bunnett, slides of various larvae and imagines, etc.

Mr. Dennis, a slide of the ova of a *Cimex* sp., etc.

October 13th.—NEW MEMBER.—Mr. A. W. Vesterling, 107, Castle Street, Battersea, was elected a member.

LECTURE.—Mr. Soar lectured on "The Hydracarina or Water-mites," and showing a large number of lantern slides and coloured drawings of species and structural details.

EXHIBITS.—Mr. Grosvenor, the chief Palaearctic species of the genus *Zygaena*. Mr. Blenkarn, the scarce weevil, *Epipolaeus caliginosus*, from Dover. Mr. Newman, *Rumicia phlaeas* with ab. *obsoleta*, ab. *suffusa*, a golden form, and ab. *parripuncta*; he reported *Euranessa antiopa* seen by his son at Bexley. Messrs. O. R. and A. de B. Goodman exhibited *Nordmannia ilicis* var. *cerri*, and v. *aesculi*, with *Aliugia spini* having (1) straight white line below, (2) concave ditto, (3) and greatly widened ditto, all but the last two from Digne.

October 27th.—NEW MEMBER.—Mr. J. A. Vernon, "Lynmouth," Reigate, Surrey, was elected a member.

A LIVING SCORPION.—Mr. H. Main exhibited a female *Scorpio europaeus* with her family from Hyères, and gave notes on the life-history. Mr. Grosvenor had seen a N. Indian species carry its young similarly.

LOCAL SERIES OF E. ATOMARIA.—Mr. A. A. W. Buckstone, several local series of *Ematurga atomaria* from Southern areas with var. *unicolorata* from Burnley, including a very dark form from Horsley and some pale yellow forms from Otford.

VARIATION IN M. NEUSTRIA.—Capt. Crocker, long series of *Malacosoma neustria* bred from two pairings from Otford: (1) all light with narrow band; (2) mixed light and dark forms. He also shewed a very long series including ab. *alba*, ab. *ignita*, ab. *intermedia*, ab. *obliterata*, ab. *caerulcopunctata*, ab. *radiata*, ab. *turcicus*, ab. *suffusa*, and others with unnamed and intermediate forms.

ABERRATION OF M. ATHALIA.—Mr. O. R. Goodman, ab. *nararina* of *Melitaea athalia* from St. Martin Vésubie.

PHOTOGRAPHS.—Mr. Dennis, photographs of the English *Cimex lectularius*, and the tropical *C. rotundatus* which latter had conspicuous sculpturing.

COMMUNICATIONS.—Mr. Turner read extracts of letters from Mr. G. B. Pearson in California, and showed a specimen of *Echinocactus wislizeni* from the Californian desert sent by him.

November 10th.—NEW MEMBERS.—Rev. R. E. E. Frampton, M.A., Halstead Rectory, Kent, and Dr. H. D. Smart, Huddersfield, were elected members.

LECTURE.—Mr. Laurence Chubb, of the Commons Preservation Society, gave a lecture with lantern illustrations.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

October 17th.—Exhibitions were numerous and varied, as is usual at the opening meeting of the session. The Hon. Secretary exhibited, on behalf of Mr. O. J. Wilkinson, photographs of (*a*) *Pyrameis cardui* pupating; (*b*) larva of *Hadena pisi*; (*c*) an unusal variety of *Rumicia phlaeas*, taken at Delamere, having the right side var. *schmidtii* and the left side typical.

Mr. W. Mansbridge showed Lepidoptera from N. Lancs., *Vanessa io*, with nearly blind eyespots on hind-wings from Cark; *Plebius aegon* var. *masseyii* from Witherslack, and a short series from Delamere for comparison. From Arnside, Westmorland, *Brenthis euphrosyne* with pale ground colour, *Ruralis betulae*, *Nisoniades tages*, *Asphalia dilata*, *Phytometra viridaria* and *Ennychia octomaculalis*; from Formby, near Liverpool, a series of *Ebulea crocealis*, and from Cark a short series of *Gnophos obscuraria* of a dark grey colour.

The Rev. F. M. B. Carr showed a long series of *Epunda lutulenta* from his garden at Alvanley and said it had been abundant there in the autumn; also two fine varieties of *Asphalia flavicornis* and several *Pyrameis cardui* from Delamere.

Mr. S. P. Doudney showed Northern insects as follows:—*Cupido minima*, *Hyria muricata* and *Strenia clathrata* from Witherslack; *Erebia epiphron*, *Coremia munitata*, *Larentia caesiata* and *Venusia cambricaria* from Cumberland. In the same exhibit was a fine under-side aberration of *Plebeius aegon*, with elongated spots, captured at Delamere.

Mr. S. Gordon Smith was unable to be present but sent a fine drawer of *Mimas tiliae* and a large number of varieties of other species captured or bred this season in various localities; prominent among the latter was a specimen of *Triphaena pronuba* with hindwings nearly white, bred from a wild pupa dug at Tarvin near Chester, an ab. of *Aglais urticae* with nearly black hindwings captured at Llwydiarth, N. Wales, *Triphaena fimbria* with crescent mark on hindwings bred from Delamere, two vars. of *Nemeophila russula* also with hindwings black

nearly all over taken in the New Forest, confluent forms of *Zygaena trifolii*, *Boarmia roboraria*, *Phorodesma pustulata*, *Pterostoma palpina* and *Leucania turca* from the New Forest; a fine series of *Dysstroma truncata* from various localities, comprising vars. *centum-notata*, *comma-notata*, *perfuscata*, etc., was much admired, and a long series of *Boarmia repandata*, which contained several examples of the Penmaenmawr melanic form, characterised by whitish submarginal blotches on the black ground.

Mr. Chas. P. Rimmer had a box of micro lepidoptera taken this year, chiefly round Liverpool, also his fine series of *Hibernia defoliaria* from Delamere.

Mr. A. W. Hughes exhibited from Witherslack a long series of *Carsia paludata*, *P. aegon* and *Coenonympha tiphon*, and *Brenthis euphrosyne* from Cartmel.

Mr. R. Tait brought Wicken insects as follows:—*Catocala nupta*, *Apamea leucostigma* and var. *fibrosa*, *Calamia phragmitidis*, *Noctua umbrosa*, *Hadena trifolii*, and *Phibalapteryx rittata*, with a few *Papilio machaon*, bred from ova found in 1920. *Plusia moneta* is now well established in Cheshire, as shown by a long series from Carrington in this exhibit. The New Forest was represented by *Hemaris fuciformis* and *Hamearis lucina*, and N. Wales by a nice series of *Agrotis ashworthii*.

Mr. J. B. Garner-Richards, Mr. J. W. Griffin, and Mr. H. B. Prince, also made interesting exhibits.

Dr. T. A. Chapman, F.R.S.—An Appreciation.

Our much loved colleague has passed away at a ripe old age. Up to the last his intellect was so clear, and his charming manner remained so untouched by the asperities which usually develop with advanced age, that one did not realise he had passed by nearly a decade man's allotted three score years and ten. His love for entomology was probably lifelong, for we find that his father was a constant contributor to the *Entomologist's Weekly Intelligencer*, and on September 4th, 1861, reported to its pages the fact that his son had taken nineteen specimens of *Colias edusa* in the Isle of Wight since August 21st. He also compiled a M.S. List of the Lepidoptera of Glasgow and neighbourhood. This list still exists, and only a few months ago we had the pleasure of taking it for "the Doctor's" perusal from the Library of the Entomological Society, where it had gravitated. The skill in microscopical manipulation, which he early acquired in training for his medical degree at the University of Glasgow, and the knowledge and practice of surgery he obtained during a year spent as demonstrator to the late Lord Lister, were a huge aid to one, who already possessed an inclination for the experimental side of the study of nature. That this love of biological investigation had become engrossing to him we are assured, for when the hospital authorities wished to avail themselves of his skill as a surgeon he refused, nor would he become an ordinary practitioner, but, no doubt guided by his innate desires, he took an appointment at Abergavenny, where hours of duty would be definite and restricted. That he had early passed the stage of the collector of "a thing of beauty" we know, for in 1870 he contributed a paper on the "Life-history of *Rhipiphorus paradoxus*" to the *Annals* and *Magazine of Natural History*, after having made an

exhaustive study of the interrelations between the Coleopteron and the Hymenopteron.

During the period of his service in the public institutions at Abergavenny and Hereford, at the latter of which he presided as medical officer for the major portion of his life, his time was much taken up with his exacting professional duties, but even then he sought every opportunity to make observations in all orders of insects. His holidays during that period were mainly spent in wandering on foot in and around Alpine Europe, not collecting Lepidoptera as he did when he became intimately involved in the work of our late Editor, J. W. Tutt, but observing plants and insects, their habits and peculiarities in this entrancing environment. At Hereford he made a local collection of British Lepidoptera, which, however, he gave to the county Museum on his retirement from his professional duties early in the nineties. Most of the British species, including many micros, he had bred, and he would often refer to the "kittens," Acronictas, and other "good things," which he was accustomed there to look for year by year.

At Hereford he had an intimate friend in the late Dr. Wood, for whose contributions to our knowledge of the minute structure and life-history of the Micro-lepidoptera and the smaller Diptera he was able to contribute much material. All this was a gradual acquiring of detail and a self-education, later to be brought to bear on greater and broader questions, the relationship and phylogeny of the various families of the Lepidoptera, and other subjects upon which he subsequently threw so much light. Still his chief pleasure was the investigation of details in insect life-histories, and whether of Lepidoptera, Diptera, Coleoptera, or Hymenoptera, it was always to discover an intricate relationship, to investigate some curious habit, some hitherto evasive economy. In this way he strongly urged the importance of the study of ancillary appendages, he proved in numerous cases the absolute dependence of Lycaenids on their association with ants, he discovered the habits of numerous sawflies in their various stages. For many years he noted examples of teratology in insects, and after collecting information from all sources and pondering for years on the possible causes of such, he finally made a long series of experiments on the early stages of *Liparis dispar*, and contributed the remarkable results of his investigation in a paper read at the Oxford International Congress of Entomologists in 1912, entitled "Some experiments on the Regeneration of the Legs of *Liparis dispar*," shewing therein by a wealth of detailed and purposeful experiments the probable imaginal results of definite injury in early stages, and the power and limit of regrowth which the living system possesses. To this subject he had recently returned, and he was actually working at it to within a few hours of his death. During the evening meal he expressed his pleasure that what he had been doing was successful as far as it had gone, but said that the results would not be finally available until midsummer. Alas! that he was unable to see the end.

When he left Hereford for good he sought a spot with surroundings the best suited for his studies, and where at the same time he could readily attend the meetings of the various societies he was now able to join, the Entomological, the Linnean, the Zoological, the South London, and the City of London, to get in touch with men of like interests with his own. His choice fell on Reigate, probably one of the most suitable of localities, with its various formations of chalks, sands, clays, and its consequent wealth and variety of fauna and flora, while

at the same time it was easy of access to London; an environment well fitted for an ardent, active lover of nature. Over this district he wandered until he knew intimately the North Downs from Guildford to Caterham, the Holmesdale Valley from Godstone to St. Martha's, the Surrey uplands from Ewhurst to Tilburstow Hill, and the Weald from Crowborough to Balcombe and the Forest. Often has it been the writer's delight to accompany him on these rambles, not collecting, but wandering, observing, learning from nature, sitting by the wayside or on "coigns of vantage," like Leith Hill, or Crowborough Beacon, for a frugal repast, getting tea in an out of the way hostel or cottage like the sylvan retreat at the back of Box Hill, or the like at Coldharbour.

Generous beyond the common run of men, no one ever helped his study but he repaid him manifold. To one a lens to aid his work, to another a cabinet to keep the specimens previously passed over, to another material to continue his studies, to another a plate to illustrate his article, to help a magazine with illustrations, to aid a struggling society, wherever help to further his beloved science was needed he never refused, in fact, his aid was often proffered before it could be invited; he seemed to know intuitively aid was wanted. It is not exaggeration to say that much of the entomological work of the last quarter of a century was helped by him as far as he was able in one way or another. His natural modesty forbade him to thrust his own views forward with insistence, and yet it came to be that not only was his opinion sought by many, but it was respected by all, and in Society discussions it was recognised as bearing the weight of knowledge and facts, and based on the practical experience of a master in scientific study.

In the family circle and to his intimate friends he was known as "The Doctor," and to be admitted to his study and library was a privilege to be experienced to be appreciated. One was always made interested in the work he was doing at the moment. Surrounded by his valuable library, with all the best books of this age and the last, with quantities of separata on every entomological subject, which friends and correspondents literally showered upon him, he kept himself apace with all advance, and could support or discredit a thesis with abundant facts and figures. Not only was his name familiar in the literature of entomology of this country, but he was known far and wide: workers on the continent, in the colonies, and in America, never omitted to send him their brochures, to appeal to him on knotty problems, to send him material for his study and quoted his work and opinions constantly. As a master of detail, shown in his description of minute insect structures in Tutt's *British Lepidoptera*, he was supreme. One of the aims of his life was tersely expressed, when the writer somewhat deprecated the working out of such detail, by his remark, "I am satisfied if I can add to the sum total of human knowledge," and then he added, "Some fellow may come along who wants this and there it is."

Now the writer is free from daily duties it was his intention to live nearer "the Doctor": he too had looked forward to a renewal of the delightful rambles which had been interrupted by his recent indispositions. But this was not to be, he is gone and we mourn him as one of those leading us forward, to whom we always looked with confidence. Truthfully can it be said that no deprecatory word was ever uttered of ought he did or said. We ne'er shall see his like again.—H.J.T.

Subscriptions for Vol. XXXIV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1922.]

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Duplicates.—Aglaia, Adippe, *Io, T. quercus, Coridon vars., *Fuliginosa (Reading), *B. quercus ♀, Tiliæ, Menthastri, *Linariata, Aurantiaria, Leucophæaria vars. Paniscus. *Desiderata.*—Pupæ of Dictæoides; Imagines of typhon, palpina, camelina (dark), Curtula, Pyra, and numerous others; Ova of Hispidaria.—*Harold B. Williams, 112a, Bensham Manor Road, Thornton Heath, Surrey.*

Duplicates.—Sybilla, Paphia, Io (2), Selene, Lucina (2), Ocellatus, Illustraria (autumn) Nastata, Roboraria ♂, Prunaria (4) ♂, Tipuliformis. *Desiderata.*—Castreusis ♂, Cucullina, Cribrum, Cinerea, Ravida, Ashworthii, Notata, Obfuscaria, Smaragdaria and others, also vars. and local forms.—*Harold E. Winser, Kent House, Cranleigh.*

Desiderata.—Volumes of *Ent. Mo. Mag.* for 1920, second-hand. State price.—*Hy. J. Turner, 98, Drakefell Road, New Cross, S.E. 14.*

Duplicates.—Cinxia, Bellargus, Coridon, H. Comma,, Lineola, Galathea, Moneta, Nupta, and many others. *Desiderata.*—Blandina, Irish Icarus, Carmelita, Cuculla. Gonostigma, Ashworthii, Templi, Australis, Undulata, Smaragdaria, Testacea.—*W. Gifford Nash, Clavering House, Bedford.*

Duplicates.—Brevilinea, Cannæ, Lutosa, Straminea, etc. *Desiderata.*—Many species and melanic forms.—*E. B. Haynes, 25, Denmark Avenue, Wimbledon, S.W. 19.*

Duplicates.—*Atalanta, Sylvanus, *Urticæ, Phlæas, *Moneta, *Pisi, *T. cratægi, *Lucipara, *Filipendulæ, etc. *Desiderata.*—Paniscus, Actæon, Anachoreta, Tincta, Asteris, Absinthii, Notha, Socia, Festucæ, Rubi, Unangulata, Munitata, etc.—*Wm. Foddy, 39, York Street, Rugby.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. 1922, March 15th; April 5th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. —*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E.3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

All MS. and editorial matter should be sent and all proofs returned to HY. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

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The Entomologist's Record

AND

Journal of Variation

CONTENTS.

APRIL 15th, 1922.

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New British Cecidomyiidæ. 3.

By RICHARD S. BAGNALL, F.R.S.E., F.L.S., F.E.S., and J. W. HESLOP HARRISON, D.Sc., F.R.S.E.

(*Continued from vol. xxxiii., p. 169.*)

The following is a list of species to which it has been impossible to apply names. It will be followed by a further list of unnamed larvæ.

I. Inquilines of other galls.

Cecidomyidarum sp.

An inquiline on *Andax hypochoeridis* with orange-red larvæ.
DURHAM, on coast just south of Seaham Harbour and not rare.

Cecidomyidarum sp.

Inquiline in galls of *Macrolabis pilosellae*; larvæ deep red to crimson.
KENT, Penshurst, September, 1920.

Cecidomyidarum sp.

Inquiline deforming gall of *P. ulmariae*: larvæ red.
Probably not uncommon and widely distributed.

Cecidomyidarum sp.

On Nettles. Inquiline of *P. urticae* galls; larvæ pale orange-yellow.
DURHAM, Gibside.
NORTHUMBERLAND, Hexham.

Cecidomyidarum sp.

Inquiline in galls of *Perrisia rosiperda*.
NORTHUMBERLAND, Corbridge, June, 1918.

Cecidomyidarum sp.

Inquiline in galls of *Neuroterus fumipennis*; larvæ pale.
DURHAM, Gibside and near Birtley.

Cecidomyidarum sp.

Inquiline in galls of *Dryophanta divisa*; larvæ nondescript, or pale whitish.
DURHAM, near Birtley, September, 1920.

Cecidomyidarum sp.

Inquiline in galls of *Andricus inflator*; larvæ orange-yellow.
DURHAM, Fatfield, June, 1918.

Cecidomyidarum sp.

Inquiline in galls of *Biorrhiza pallida*; larvæ flat and coccid-like, orange.
DURHAM, near Birtley, September, 1920.

APRIL 15TH, 1922.

2. Phytophagous and others.

Cecidomyidarum sp.

On the Alga, *Rhizoclonium* in a saltmarsh.
Durham, Greatham.

Cecidomyidarum sp. (*a*)
Cecidomyidarum sp. (*b*)

Two species in pods of *Ulex* affected by Lepidopterous larvæ.
(*a*) With dull orange-red larvæ.
(*b*) With red shining larvæ of free living type.

Cecidomyidarum sp.

Orange larvæ at base of calyx on imported oranges.
Durham, Birtley.

Cecidomyidarum sp.

On Aphidid on *Salix cinerea*.
Northumberland, Staward.

Cecidomyidarum sp.

On *Helianthemum vulgare*. Minute (? flower) bud gall, bright red containing several yellowish horn-coloured translucent larvæ.
Durham, Ryhope Dene, several, July, 1920.

Cecidomyidarum sp.

On *Helianthemum vulgare*. Flowers remaining closed, bunched together, with atrophy hardening and thickening the walls; larvæ in cells, pale, fleshy pink.
Durham, Ryhope Dene, rare, July, 1920.

Cecidomyidarum sp.

On *Vaccinium oxycoccus*. Terminal leaves hypertrophied to form gall.
Northumberland, Prestwick Carr, August, 1920, old galls only.

Cecidomyidarum sp.

On *Vicia hirsuta*. Mid-rib of leaves slightly thickened, margins folded or rolled, twisted.
Kent, Fordcombe, September, 1920.

Cecidomyidarum sp.

On *Lathyrus macrorrhizus*; flower closed, small.
Durham, Langdon Beck.

Cecidomyidarum sp.

On *Lathyrus silvestris*, rolled leaflet, feebly thickened; larvæ white. ? *Perrisia silvestris*.
Devon, Sidmouth, September, 1920.

Cecidomyidarum sp.

On *Galium aparine*.
Northumberland, Warkworth, June, 1921.

Cecidomyidarum, sp.

On *Galium verum*.
Northumberland, Warkworth, June, 1921.

Cecidomyidarum sp.

On *Galium boreale*, H. 5192.
Durham, Upper Teesdale, August, 1920.

Cecidomyidarum sp.

Houard 5216, on *Galium mollugo*. Stem swelling at point of whorl of leaves which are slightly hypertrophied at base; larvæ orange.
Devon, Torquay, October, 1918. Sidmouth, September, 1920.

Cecidomyidarum sp.

Houard 5211. On *Galium mollugo*. Leaves of the last whorl enlarged, incurved, forming a spherical gall containing a single red larva.
Devon, Torquay, October, 1918.

Cecidomyidarum sp.

On *Galium mollugo*, H. 5217.
Devon, Tipton St. John, September, 1920.

Cecidomyidarum sp.

On *Origanum*. Margins of leaf rolled.
Devon, empty galls, Branscombe, September, 1920.

Cecidomyidarum sp.

On honeysuckle. Larvæ white, in angles of leaves or in loosely crumpled terminal leaves which are blotched yellowish green.
Durham, Gibside, August, 1920.

Cecidomyidarum sp.

On Foxglove. Decaying flower containing small reddish-grey or orange larvæ, gregarious on top of seed case.
Apparently widely distributed.

Cecidomyidarum sp.

On Foxglove. With above, larvæ larger, pale yellowish white.
Devon, Sidmouth, September, 1920.

Cecidomyidarum sp.

On *Atriplex portulacoides*. Parenchymatous leaf pustule.
Devon, Dawlish Warren.

Cecidomyidarum sp.

On *Geum urbanum*, leaf crisp and folded; larvæ red.
Northumberland, Hexham; Durham, on the Wear near Durham, June, 1918.

Cecidomyidarum sp.

On Elm and Wych elm, small pouch-shaped parenchymatous leaf-galls depending upon a nervure, yellowish and containing a single white larva.

Frequently in the north of England though it is not yet recorded as British; also in South Devon.

Cecidomyidarum sp.

On *Cornus sanguineus*, leaves discoloured, pustule on upper surface and depression below.

South Devon, Torquay district, October, 1918; too late to secure larvæ.

Cecidomyidarum sp.

On Beech (*Fagus*); larvæ feeding on leaf below, no deformation other than discoloured spot.

Tunbridge Wells, September, 1920.

Cecidomyidarum sp.

On *Crataegus oxyacantha*, Houard, 2940. Fruit swollen, surface irregularly tuberculate, containing greyish-white larvæ apparently solitary in cells.

London, Putney, June, 1920.

Cecidomyidarum sp.

On *Pyrus aria*, Houard, 2918. Leaf folded and crinkled, seemingly lightly pilose.

Surrey, Hindhead, June, 1920.

Cecidomyidarum sp.

Hazel. Discoloured spots on leaves, a rather large white larva suspended from each on underside of leaf.

Durham, Allansford, June, 1920.

Cecidomyidarum sp.

On Lime (*Tilia*): minute discoloured pustules on upper surface with corresponding depression below; only 1·0 to 1·5 mm. in diameter; generally situated near angles of nervures, larvæ hyaline, feeding naked below; some leaves with minute cocoons, about 1·0mm. long in each depression.

South Devon, Torquay district and Dawlish Warren, October, 1918.

Durham, Gibside, July.

Northumberland, Otterburn, August, 1920.

Cecidomyidarum sp.

Lime, *Tilia*. Flower closed, somewhat hypertrophied and hardened, containing a single larva of a clear pale amber or greenish colour.

London, Hampstead, June, 1920.

Cecidomyidarum sp.

Sycamore. Minute irregular parenchymatous pustule with minute

hole (? capped) for exit of larva at end of either upper or lower surface of leaf.

NORTHUMBERLAND, Ovingham, July, 1918; Bamburgh, September, 1918.

Cecidomyidarum sp.

Sycamore. Spot yellowish, without depression or excavation, Houard, 3988.

DURHAM, Gibside.

Cecidomyidarum sp.

On *Galeopsis tetrahit*. Swelling about 3 mm. in length, one side of the stem containing a bone-white larva. Swelling discoloured, yellowish with dark margins.

DURHAM, Beamish, July 20th, 1918.

NORTHUMBERLAND, near Ryton on Tyne.

Cecidomyidarum sp.

On *Cytisus scoparius*. Terminal internodes shortened and leaves bunched.

DURHAM, Hamsterley, Gibside.

Cecidomyidarum sp.

On *Saxifrage aizoides*. Flower closed and deformed, larvæ pale flesh colour.

DURHAM, Upper Teesdale, August, 1921.

Cecidomyidarum sp.

On *Deschampsia flexuosa*. Thickened swelling at base of leaf.

NORTHUMBERLAND, Corbridge, June, 1918.

Cecidomyidarum sp.

On *Chrysanthemum* sp. and *Matricaria* sp. Minute parenchymatous galls as described from *Senecio* spp.

Apparently widely distributed in gardens.

Cecidomyidarum sp.

On *Senecio erucifolius*. Flower slightly swollen near base; like *Stictodiplosis hypochaeridis* but with larvæ, which are gregarious, of a fleshy reddish pink and apparently non-leaping.

NORTHUMBERLAND, Seaton Sluice. DURHAM, Ryhope, July.

Cecidomyidarum sp.

On *Senecio erucifolius*. Small pustule on upper surface sheltering a minute white broad and flat larva in depression below.

DURHAM, Ryhope sea banks, July, 1920.

Cecidomyidarum sp.

On *Senecio* spp. Minute, pale or discoloured parenchymatous galls irregular in shape, each containing a minute white larva. Often numerous examples on a single leaflet.

NORTHUMBERLAND and DURHAM, apparently common.

Cecidomyidarum sp.

On *Senecio jacobaea*. Red larvæ in angles of nervures.
NORTHUMBERLAND, Otterburn, August, 1920.

Cecidomyidarum sp.

On *Senecio cineraria*. Crimson larvæ in old heads, apparently solitary: capitulum lumpy, florets browning in patches.
DEVON, Torquay, October, 1918.

Cecidomyidarum sp.

On *Santolina rosmarinifolia* var. Flower head partly closed, seeds irregular in size and florets incurved. Possibly the form noticed by Tavares in Portugal (Houard, 5256).
SOUTH DEVON, Torquay district, October, 1918.

Cecidomyidarum sp.

Flower of *Geranium sylraticum* remaining closed, larvæ white, gregarious.
DURHAM, Allansford, June, 1918.

La Granja, 1921.

By ROSA E. PAGE, B.A. (Lond.).

Spain had been calling us back ever since we left it in August, 1914, and now on July 21st, we were at last on the way. The journey taking longer than it did before the war, and there being an awkward delay at Irun, we decided to stop there for the night and go on next morning. At the Station Fonda we had an excellent dinner with delicious white wine at two pesetas (1s. 6d.) a bottle, and through the manager succeeded in getting a very clean room for the night. We had already had our baggage examined by the French at Hendaye for "*oro*" (gold), but on leaving Irun next morning a further search was made for "*ropa nuera*" (new clothes). Passports also were examined, and we were herded with a crowd of filthy peasants, like so many sheep, until the customs officers saw fit to let us through to the platform. A special visa was issued for those going to Madrid, owing to the recent political troubles there. The heat was terrific, even for Spain, and all the Spaniards on the train were complaining that they could scarcely breathe.

We had decided on a semi-circular trip, entering at Hendaye-Irun, going on to La Granja, then Segovia, Madrid, Toledo, Saragossa, Barcelona, and out at Cerbère, so that our only collecting was done at La Granja, where we accordingly made the longest stay.

We found the Hotel Roma under new proprietors, the rooms expensive and the food poor. The Europa—the only other hotel—is always full and has a good name, but it would be advisable to book ahead to avoid disappointment.

On July 26th the morning was a perfect one, glorious sunshine with cool breezes. The Minister, who issues permits for the Royal Park was "ill," so we were to go in and out as we wished, said the kindly attendant at the gate—an old soldier covered with medals.

The Park is a glorious place to collect in, shady and breezy, the

air full of perfume from the trees, with everywhere the sound of running water. There are many avenues, each being planted with a single species of tree. We found two only with ash trees, and searched them for *Lacosopis roboris*, but only found three and these on the trunks. The avenues are bordered with tall hedges of hornbeam; these enclose, with many gaps in them, parts of the woodland which clothes the mountain side. Round the oak trees, quite high up, *L. roboris* flies in the morning and many rest on the leaves—but about mid-day numbers of them come down and settle on the hornbeam hedges or on the roads, where they are not difficult to net. We took on the 26th 15 specimens, chiefly ♀ ♀s. The next day Mr. Page went over to the farm spoken of in Mr. Sheldon's article *vide* vol. xviii., pp. 60 et seq., expecting a bag, but he took a single specimen only from a small ash sapling. So on the 30th we went back to the Park, where we obtained about 30, most of them in good condition, with a few *Dryas pandora*, *Nordmannia ilicis*, and *D. paphia*. The tree trunks at mid-day were covered with resting Satyrids, chiefly *Satyrus circe*, *S. alcyone* and *Hipparchia semele*, sometimes 6 on a trunk. On July 30th and 31st we collected up what I shall take the liberty of calling "Sheldon's brook," a most delightful place. Giant thistles edged the brook and on them hung crowds of *Melanargia lachesis* with many var. ♀ *cataleuca*, and *M. japygia* var. *cleanthe*, *Colias edusa* (small), *D. pandora*, and *D. paphia*, all these (and especially the *M. lachesis*) so lazy that it was easy to examine them at leisure and select just what one wanted. We were late, however, and many were worn. *Epinephele tithonus* was in clouds everywhere, the commonest insect. *Aricia astrarche* (a fine form) were not so numerous. *Heodes virgaureae* var. *meigii* were seen, but only one here and there on the brambles, whilst *Celastrina argiolus* were flying about up and down the stream and resting on damp patches. A beautiful *Polygonia c-album* persisted in settling on my hand. One felt intoxicated with the rhythmic floating, swaying and gliding of the insects all around one, the golden light, the singing of the brook with the clearness of its pools, the vibrant heat, the novelty of tree, bush, and flower, and the delicate tinting of the line of mountains behind La Granja. The red tiles surmounting the cream or pink houses of the town contrasted with the green foliage of the trees and the light blue sky, quite unlike the deep azure Italian sky as seen the year before from Le Lauteret in the Dauphiny Alps.

Besides clumps of a species of *Compositae* and of thyme, there were still many small flowers, among them being clover, foxgloves and lavender. The sweet-briar gave out a delicious fragrance as we passed, and we trampled the thyme under our feet. A pair of *Gonepteryx rhamni*, sporting along, glowed with reflected sunlight. Under the acacia trees bordering the road back to La Granja were some quite fresh *Klugia spini* resting on the ground and imitating the shadows cast by stones. Further up the road beyond the brook we found some ash trees, and on brambles near these were worn *L. roboris*.

August 1st, a steaming hot day, with steady sun and no air stirring, found us again in the Park. *L. roboris* were seen, but only eight specimens taken as they were practically over. The insects in the rides had all disappeared as if by magic. But in a small clearing in the pines we found a brood of *Gonepteryx rhamni* just emerged, and

took about 30 from thistles together with *Argynnis aglaia* var. *chlorodippe*, *Aricia astrarche*, *Pieris napi*, *Issoria lathonia*, *Coenonympha arcania*, and one *Limenitis camilla*.

In the evening we went out by the Gate of Segovia, turning sharply to the left. The ground here is much over-run by picnicing parties, as there are fine views of the Guadarramas, and is useless for collecting.

Next day we went up the mountain (Pico de Peñalara), at first parallel to the Park wall, then to the left along the crest through bracken (in places up to the armpits) and grass, to the remains of an old glacier. At the foot were a good number of *C. pamphilus* var. *lyllus*, which were useful. The views were good, but the collecting disappointing; we saw *E. tithonus*, *E. lycaon* with one *Pyrameis atalanta* and one *Satyrus statilinus*. When we had descended most of the slope we entered a more or less level tract dotted with bushes, where *S. circe* was flying freely. A few only were taken for comparison with those taken some years ago at Digne (Basses Alpes). Except that the Digne specimens were on the average larger, there was nothing worthy of note.

On August 3rd *S. statilinus* was just emerging along the road leading to the brook, and another *P. atalanta* was seen resting on oak scrub. Insects were now going over. The thistles were crowded with worn *M. lachesis* and an occasional *C. edusa*: there was a fresh brood of *C. argiolus*, only a few. *C. virgaureae*, some fresh and some worn, *A. astrarche* were still good and *E. tithonus* were everywhere. We left La Granja the same day and did no more collecting. The only notes in my diary after this which refer to entomology are as follows:—

Between Segovia and Madrid, as our train crawled along in true Spanish fashion, a medium sized *Erebia* could be seen flying in some numbers, apparently in good condition, on August 6th, on railway banks on both sides of the station of Otero de Herreros in the Guadarrama Mts.

Pontia daplidice were seen flying along the banks of the Linares and Jalon, almost all the way from Madrid to Saragossa, but there is much cultivation around the city.

At Toledo we walked across the Puerta de Alcantara which spans the Tagus gorge, and over some rough ground along the opposite bank to the Puerta de San Martin, through which one enters the city on its north-western side. We saw only one or two worn *E. ida*, but we were told that in May there were many varieties of butterflies to be found there. The late Dr. Chapman had suggested to us the Montes de Toledo as interesting ground waiting to be explored, but, at present, we are unable to get away early enough.

Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera.

By ROGER VERITY, M.D.

(*Continued from page 15.*)

As recently as June, 1908, I remarked in *Rhopalocera Palaearctica*, page 159, how surprising it was that such a common species as *Pieris rapae*, L., should have been so neglected by entomologists that very little was known concerning its geographical and seasonal variations.

All the *Pieridae* have been left in an equally sad state of neglect for years, as compared with many much scarcer species. Since that time both Querci and I have devoted much attention to this interesting family and much light has been cast on the subject both by us and by others. Turati, in 1910, in his *Note critiche sulla Pieris ergane*, H.G. [*Atti Soc. Ital. Scienze Nat.*, xlix.] gave a lucid account of the three generations of this species. Rostagno, in 1911, in his *Rhopalocera Faunae Romanae, Addenda* [*Bull. Soc. Zool. Ital.*, xii.] attempted to establish that all the *Pieridi* had three generations in Rome; he made the mistake, however, of mixing up the second and the third generation into one, so that he never saw their distinctive features; he also started from the preconceived idea that all these species had what he called a third generation in October (in reality the fourth, when it exists), so that in the case of *daplidice*, of *napi*, and of *ergane*, which do not produce it, he actually described its features from a few laggard weaklings of the preceding. Stauder, in 1913, in his *Weitere Beiträge zur Kenntniss der Makrolepid. der adriatischen Küstengebiete* [*Bull. Soc. Adriatica di Scienze Naturali*, xxvii.], gave an excellent account of the three principal broods and of their features in several *Pieris* and in *Colias croceus*; he entirely overlooked, however, the fourth emergence. I had not read this paper when in 1919 I published in this Journal (vol. xxxi.; *The various modes of Emergence, etc.*), the conclusions I had reached by my own observations in Tuscany and by the long and patient researches of Querci in Central Italy. We were very interested to learn subsequently that they exactly confirmed Stauder's. In my *Nuove osservazioni sui Lepidotteri Ropaloceri dell'Isola d'Elba* in the *Bull. Soc. Ent. Ital.*, xlviii., p. 180 (separatum distributed in December, 1916), I pointed out the features distinguishing the two summer broods of *P. rapae*, L. In this Journal, of May, 1919, I did the same in *C. croceus*, *P. daplidice*, *P. manni*, and *M. brassicae*, as we shall see more at length. Finally, also Rocci devoted some attention to this subject and made some interesting observations in the neighbourhood of Genoa: *Osservazioni sui lepidotteri di Liguria* (*Atti Società Ligustica di Scienze Nat. e Geogr.*, xxx., n. 1, of which I received the separatum on the 8th of April, 1919, and n. 4, received in 1920). In the first of these papers he deals with the *Pieridi*, but unfortunately he overlooks, like Rostagno, the existence of two summer generations and confuses their characteristics; he describes well, instead, the fourth generation of *brassicae* and of *rapae*, although he, of course, calls it third, and in his second paper that of *Colias croceus*.

We thus see that to get to a tolerably clear knowledge of the number of broods and of their features it has required several years and the work of many. What I intend doing here is to collect and summarise the main lines of it, correcting some mistakes of the past and adding a few notes at the same time. I will not deal with the species which do not produce a complex seasonal polymorphism. On the contrary, I will have to devote special attention to *Leptosia sinapis*, L., because this species has been entirely neglected by the writers mentioned above.

Gonepteryx rhamni, L., and *cleopatra*, L.—Mr. J. A. Simes published in the *Ent. Rec.* of November 15th, 1920, a very interesting paper on the careful observations he has carried out in several localities

to ascertain whether *cleopatra* has one or more generations yearly. He concludes most positively it has only one. I was surprised on reading this, because for years I have collected this species in Florence, and I have found that very fresh-looking specimens are to be met with in the early spring, as noted also by Simes, that the insect is on the wing in June and again quite commonly in the autumn, after a long summer period, during which it entirely disappears, and finally that the colour of the underside of the wings is different in specimens collected during the three periods of flight. All this had led me never to doubt the existence of three generations. In the *Ent. Rec.* of May 15th, 1919, I pointed out that males with a bluish-white underside predominate amongst specimens of all three of the periods, that those with a vivid green underside are only found in the early spring and that those of a uniform yellow or of a reddish ochreous constitute about a quarter of the individuals of the second and third period and are never found in the first. During 1921 both Querci and I directed our attention particularly to the *Gonepteryx* and, much to our astonishment, I confess, we could find no proofs that they reproduce more than once a year. None of the ova or larvæ, so easily found in April and May, were detected later, nor did the young autumn shoots of the *Rhamnus* show any signs of having been attacked: no copulations were observed in June and, what is more, not a single female was seen on the wing during the third period of flight of the male sex. We next examined carefully all available specimens and we noticed that the very freshest June ones, evidently just emerged, have a velvety or chalky wing surface, which is never seen in those of the two other seasons. We have thus come to the conclusion that, if positive proofs to the contrary are not found, Röber and Simes must be right in holding there is only one emergence, in the early summer, although it is quite wonderful how some individuals can live from June till April and still have a perfectly fresh look, save for the velvety surface, which they lose. A still more difficult phenomenon to explain is the difference in colour on the underside. The only hypothesis I can make is that when the surface of the wings becomes more smooth and shiny, as noted above, the scales of some parts of the wings acquire a bluish sheen, which, combined with the yellow pigment contained in the scales, turns the yellow individual forms into green ones, thus abolishing the entirely yellow ones of June, still in existence in September, and turning them into the vivid green ones, only found in the early spring. The whitish-blue individuals would, of course, simply become of a less milky and more intense blue and this would correspond to the fact that specimens obviously old and worn are more blue than fresh ones. The same remarks would apply to the undersides of the females: those, which are white when they emerge, turn pale blue, so that the white form is never seen in the spring; those, which are at first whitish-blue, acquire the very intensely blue colour, often to be found after hibernation. In the case of *G. rhamni* I had never been quite satisfied as to the existence of three generations; I had never observed more than two periods of flight in the same locality; late winter and June in Florence and early spring and end of August to September at Forte dei Marmi, on the Tuscan coast. I had been struck by the difference in the colour of the underside in specimens of these two periods, similar to those of *cleopatra*, and this I had taken to

be a proof of the existence of at least two generations. As I had never conceived the possibility of any butterfly living nine or ten months at the imago stage in a climate such as that of peninsular Italy, I had concluded that an autumn emergence must take place also in Florence, though the insects did not show themselves on the wing at that time of year. Last year we have actually had a proof of the longevity of *rhamni*: Querci in September found a female still alive in a paper, where it had been placed in July. When it was taken out it made no attempt to fly, but remained motionless till February, notwithstanding the warmth of the room, when on a sunny day, it was suddenly heard knocking vigorously against the window-panes.

Colias hyale, L., and *C. croceus*, Fourcr.—The first generation of these two species I have figured and described at length in *Rhopalocera Palaearctica* (April, 1909), under the name of *vernalis*. Stauder, not being aware of it, gave that of *croceus* the name of *mediterranea* in 1914. The features of *vernalis* in both species are: great individual variability; small size in most individuals; paleness of colour; increased extent of yellow powdering; of streaks on neuration; and of spaces, according to the sex and the species, in the marginal dark band; this is reduced in extent; so is the discocellular spot; more or less thick and extensive green powdering on underside; prominent pre-marginal row of spots on this surface; costa and fringes conspicuously pink. In *C. hyale* the two summer broods of June and of the end of August and September are quite similar to each other, as far as I have been able to make out from my series of Central Italy; they belong to the form I have called *calida* in the *Ent. Rec.* for May, 1916, p. 99, taking as typical a Tuscan couple figured in *Rhop. Pal.*, pl. xl., figs. 31 and 36; they stand opposite to *vernalis* by all the characters mentioned above. The fourth emergence, which begins towards the 10th of October in Florence, usually consists only in a few sporadic individuals; in exceptionally favourable autumns, such as this last one of 1921, quite a fair number make their appearance (over 200 were collected in one locality in 1921), but whether they reproduce and their offsprings join the first generation in the following spring, so that one can really speak of the October emergence as of a fourth extraordinary generation in some years, probably depends entirely on the time when the first severe frosts take place; when they are not too precocious they may allow the larvæ to reach the very definite fourth stadium in which, only, it seems that hybernation can safely be accomplished. Anyhow the October individuals afford striking features of their own: the chief one consists in the extremely pale tinge, more whitish in male than *vernalis*; the marginal dark band is as developed as in *calida*, or rather more so, on an average; the underside is always conspicuously dusted with green. We thus have a mixture of some characters of *calida* with some of *vernalis*. I have pointed out in 1916 (*l.c.*) that this form quite resembles the summer generation of the more northern parts of the habitat of the species, and thus answers to the English insect of Petiver's figure, which is the first quoted by Linnæus; besides, as the two other seasonal forms have been named, this, also by exclusion, would remain the nymotypical one of the species.

As to *C. croceus*, there is quite a difference between the

second generation of the end of spring and early summer, and the third of late summer and early autumn. Strangely enough, it is only last year I realised this! The June emergence was more plentiful than usual and Querci gave more attention to it, so that a large series was obtained. We were then struck by the fact that it differed from the more familiar look of the third generation just as much as does the series of the second generation collected in May near Palermo and named by me *ampla* in the *Ent. Rec.* for May, 1919, p. 87 (placed by a miss-print under the heading of *P. daplidice*, as stated at page 121). The characters I had taken to be geographical and peculiar to a Sicilian race turned out to be simply seasonal, except perhaps that the average size in Florence is a trifle smaller. The second generation is, however, always quite a giant as compared to the first, and very much larger than the third. The orange is lighter and brighter than in the latter, it has more yellow mixed with it, especially in the costal and radial zone; in the female the hindwing is not so much darkened, the yellow spaces inside the marginal band are in many individuals very broad and more uniform in size, forming a complete row across the wing, of a bright colour on forewing and a band on hindwing; on underside there is never any trace of green dusting. These characters remind one, on a minor scale, of the differences between *C. aurorina*, H.-S., race *transcaspica*, Chr., and race *libanotica*, Led., as shown by my figures 21 and 23 on Pl. xlv. of *Rhop. Pal.* On looking up Stauder's paper of 1913 on the Eastern Adriatic coast, I find he, too, had noticed the lighter colouring of the second generation as compared with the third, whereas in his paper of 1911 he had not detected the existence of two summer broods. The third generation of the later half of August and of September, is by far the primary one by the number of its individuals. It is curious how these are distinctly less active than the restless ones of the other generations; they settle more frequently and longer on flowers, whilst the others are always flying wildly about, as if ill at ease; this, no doubt, is the cause of the well-known spring excursions towards the north. The fourth emergence is less scarce than that of *hyale* and the larva is not limited to a single stadium or moult, as regards hybernation; in fact, a brood I bred in Florence in the open went on slowly feeding and growing, whenever there were spells of weather not too cold for them, all through the winter; we can thus talk with no hesitation of a fourth partial generation in the case of this species. In 1921 emergence took place in great numbers from October 7th to 22nd, when some cold, rainy days cut it short; an extensive series of 3,000 specimens was collected by Querci; this is most interesting on account of its enormous variability and contrasts sharply with the comparatively uniform aspect of the third generation. The individual variations of the fourth embrace those of all three of the others and tiny *vernalis*, with all their characteristics just as prominent as if the larvæ had undergone the frosts of winter, flew together with gigantic *ampla*, which might have grown in the hot days of late spring. The name of *autumnalis* has been given by Rocci (*Bull. Soc. Ligustica di Scienze Naturali*, 1920, p. 18) to definite features, intermediate between those of *vernalis* and of what he took to be a single summer generation. The form he describes is found individually, and, as a rule, predominantly; I also have examples of it collected late in April, at the

end of the first generation. The compound name of *vernalis-ampla-croceus* might in some localities and years be applied to the fourth generation, to be exact. There thus exists: *C. hyale*, L., race *hyale*, L.: I. gen. *vernalis*, Vrty.; II. gen. *hyale*, L.—*C. hyale*, L., race *calida*, Vrty.: I. gen. *vernalis*, Vrty.; II. gen. *calida*, Vrty.; III. gen. *calida*, Vrty.: IV. partial emergence or extraordinary gen. *hyale*, L.—*C. croceus*, Fourcr., race *croceus*, Fourcr.: I. gen. *vernalis*, Vrty.; II. gen. *ampla*, Vrty.; III. gen. *croceus*, Fourcr.; IV. partial gen. *vernalis-ampla-croceus*, Vrty.-Fourcr. (in some localities and years), or *autumnalis*, Rocci. According to Tutt, as far north as England, the individuals of *C. croceus* which reach it in the spring may, in favourable years, produce two other generations. As the different features of the various generations have only so recently been established in the south, where they are probably more prominent, we have as yet no knowledge as regards these in Central Europe, including Paris, whence the species was described. That is why I abstain from designating the southern race by a different name. It may be that *ampla* is peculiar to it and should be used for the entire race, as distinguished from race *croceus*, consisting only of *vernalis* and *croceus*. Barrett records, however, that in June, 1877, particularly large and bright *croceus* were produced in Pembrokeshire by larvæ which had survived the English winter, extremely mild that year; they may have been *ampla*, but anyhow, this remark shows that in the north seasonal polymorphism is much more erratic than in the south, because the small *vernalis* was cut out.

(To be continued.)

Notes on the Zygænidæ of Provence (France).

By G. T. BETHUNE-BAKER, F.L.S., F.Z.S.

One of my objects in visiting Provence in 1920 was to investigate, so far as circumstances might permit, the local races of the genus *Zygaena*. The distribution of *Z. astragyi*, Bkh. = *hippocrepidis*, Hb., is as far as I can trace quite a matter of hypothesis, as is its relation to *Z. transalpina*, Esp., and also to *Z. alpina*, Boisd. I take it for granted that all those who have studied this group are now satisfied that none of these species, including also *Z. angelicae*, are local races of either *Z. filipendulae* or *Z. stoechadis*; whilst another point of interest is the relation of this group with the little assemblage of species named by Oberthür *centralis*, *i.e.*, *centralis-centralis*, *centralis occidentalis*, and *centralis-provincialis*. Before considering this question I should like to again raise the synonymical value of *Z. loti*, Schiff. Dr. Verity is of the opinion that the name should be used for *transalpina*, Esper, but he has unfortunately given us no reasons for such use. I went very fully into this synonymy in vol. 32, p. 76 (1920), of this magazine, and will not therefore repeat it here except to remind my readers that judging from Esper's figure, *loti*, Esp., is probably *filipendulae* var. *cytisi*, and *loti-cera* (*loti*, Schiff.) is most likely referable to *meliloti*. With the name *loti*, I shall shortly deal in detail. But to return to the *Zygaenidae* I observed in Provence.

From the point of view of numbers actually captured and seen *Zygaena centralis* v. *provincialis* was much the most abundant. I took about one hundred-and-fifty specimens at la Sainte Baume and at

Mont Ventoux; Monsieur Oberthür has very kindly sent me labelled specimens of the various forms (referred to in his *Lepidoptera Comparée*) of the *transalpina*, *filipendulae*, and *lonicerae* groups, so that I am fortunate in having his determinations, and the majority of my Sainte Baume specimens are thoroughly typical of the specimens he sent me, which were taken in Var and also at Montrieux. In a long series we, of course, find variations, and many of my specimens have broad margins to the secondaries, there is, however, wonderfully little variation in the spots of the primaries, there are a very few specimens with largish spots, but even this is rare. The series from Mont Ventoux is not quite typical. Here I took about twenty-five specimens and all have the margins to the secondaries almost linear, whilst the spots in the primaries are decidedly larger in all the specimens, and in half of them they are more or less inclined to confluence, but not to the extent obtaining in *centralis-occidentalis*, these are a well marked group and apparently *centralis* will prove to be a distinct species. In the neighbourhood around St. Martin Vésubie the species belonging to the *transalpina* section that I found plentifully was *maritima*, Obth., it also seems to be easily distinguishable.

Monsieur Oberthür kindly sent me half-a-dozen specimens labelled *hippocrepidis* v. *alpina*—no doubt this is Boisduval's insect. Whilst at Digne in 1911, and again the year before last, I took a fair series of a *Zygaena* in the Dourbes mountains and elsewhere that I have endeavoured to fit in with Oberthür's examples, but I cannot make them agree either in the pattern or in structure. I have dissected out the genitalia of each and there are certainly two species, that is to say *alpina* does not agree with my series from Digne, and I regret that I cannot yet identify with any certainty my specimens though I hope to do so later. *Zygaena filipendulae*, *Z. trifolii*, *Z. lonicerae*, *Z. fausta*, and *Z. carniolica* will be referred to later on, but it is interesting to note that at Old Nans, some 800 feet below la Sainte Baume, I took a single specimen of *Z. occitanica*. In no place did I take *transalpina* and *centralis* together, the latter in its form *centralis-provincialis* seems to replace *transalpina* at la Sainte Baume.

The most interesting feature of this genus in this district is the fact that at la Sainte Baume I took a fair series of *filipendulae*, about two dozen individuals, and that half of them are a five-spotted form. I could have taken many more but did not realise that I was taking two species until I came home, and even then it was only (being somewhat doubtful of one or two specimens) the examination of the genitalia that revealed for certain what I had before me. The specimens in question are rather smaller than the average six-spotted *filipendulae*; they are somewhat thinly scaled and of slighter build, generally the margin of the hindwings is narrowly black, but in several specimens it is as wide as in the *trifolii* that I took alongside them, and as a matter of fact in the first instance I placed all the five-spotted form under that species, especially as most had not a sixth spot on the underside. I took also several at Digne and one at St. Martin Vésubie; these, however, unlike the majority of those from la Sainte Baume, have a well marked trace of the sixth spot on the under-surface. It seems to me that we have a well marked form being here developed and that it is quite worthy of a name. I therefore propose to call it *filipendulae* var. *quinquemacula*, the la Sainte Baume

specimens being the type form. *Zygaena trifolii* in its race *orobi* was common at la Sainte Baume, but I did not take it elsewhere, except that I captured one typical *trifolii*, *i.e.*, with the central spots confluent, at Bedoin.

Z. lonicerae was rare at la Sainte Baume, but very common in its fine race *major*, Frr., everywhere around St. Martin Vésubie, where I took a long and beautiful series. Four specimens of *Z. meliloti* fell to my net. I do not know whether this species has been recorded from la Sainte Baume before, the genitalia prove them to be this insect though I had no doubt of it from their general appearance. *Z. stoechadis* var. *dubia*, Stgr., was very common at St. Martin Vésubie especially in the higher parts, the specimens being large and handsome and also somewhat variable; the great majority had five spots in the primaries but I took a few six-spotted specimens. The hindwings were likewise variable, all being richly red, but the dark borders varied considerably, some were comparatively narrow and very even in width; some few had very broad borders with the fold well invaded below vein 2; whilst between these two extremes there are many grades. I did not take this species at la Sainte Baume at all.

We spent two or three days at Digne, and in that short visit I netted three specimens of *Z. ephialtes*, but none were of the type form. I took one *peucedani*, one *prinzi*, and one *aurantiaca*.

Turning now to the *carniolica* section, this species was not rare at la Sainte Baume, all the specimens being of the *hedysari* form. I took but one at St. Martin Vésubie, which is the var. *diniensis*; at Digne the species was very common, the majority being also of the *diniensis* variety, but I took a fair series of the type form also, these being smaller than Herrich-Schäffer's variety. *Z. fausta* occurred sparingly at la Sainte Baume, it was only coming out as we left. At Mont Ventoux where it was going over I took several nice specimens, whilst at Digne it was very common indeed, though all were of the type race.

Z. achilleae occurred only at Digne, where it was not uncommon, in July. Of *Z. brizae* I took a small series at la Sainte Baume, where I also captured two specimens of *Z. sarpedon*. *Z. purpuralis* did not occur at la Sainte Baume, that is to say, we did not take it there, but it was common around St. Martin Vésubie. Of the genus *Ino* I took but three specimens, one beautiful male of *I. pruni* and two worn males of *I. statices* var. *crassicornis*.

The Farn Collection.

On March 14th last the sale of the above was continued, the first 196 lots comprising the remainder of the Rhopalocera.

A dark *Pararge aegeria* fetched 20s. and another dark form with spotless hindwings, 35s.

Pararge megera var. *bipupillata* (*alberti*) realised 5s., 7s. and 8s. per lots of two, three and six. Series of *Coenonympha tiphon* from various localities realised 42s., and two lots of undersides each of 48 and 46, 60s. and 80s. Included in these were several fair forms of the rare aberration *lanceolata*. Fifty-one *Erebia aethiops*, several slightly varying, fetched 56s., and 53 undersides 20s.

The series of Theclas included nothing special, excepting a broadly orange banded *Thecla pruni*, which realised with others £2 2s.

A gynandromorph specimen of *Zephyrus quercus*, not in the best of condition, was cheap at £1 10s., and a female of the same species with the purple colour greatly extended, £1 1s.

Twelve *Chrysophanus dispar*, mostly in fine condition, realised each £9 9s., £11 11s., £9, £5 10s., £12, £9, £11, £10 10s., £9, £7 7s., £6, £6, the two latter being undersides, one having elongated spots.

A whole drawer contained the series of *Rumicia phlæas*, most of which came originally from the Sabine Collection. There were many aberrations among the long series, the best being a bred specimen with broad band of blotches across the centre of forewings. A true gynandromorph, although not in bred condition, was remarkably cheap considering its rarity at £1 15. Lots 53 and 54, each containing four rich golden specimens bred by Sabine, realised 60s. and 55s. each. A female without the band of spots on the forewing fetched 60s. Various silvery white forms (ab. *alba*) brought from 30s. to 80s. each, and two pale golden forms 81s. and 88s. each. The entire series realised about £60.

A pale and a dusky male, *Polyommatus agestis*, went for £1 10s. the pair. Two lots each containing a pale lilac male and about 50 *Polyommatus agestis* realised 18s. and £2 15s. each, the latter lot containing many females marked with blue (ab. *cassei*). A perfect gynandromorph in bred condition, right side male, left female, was not dear at £5 10s., and other lots of the species brought 7s. to £2 2s. per lot. An aberration of *Aricia astrarche* with white underside with broad streaks on upper wings realised £9.

A specimen of *Lampides telicanus* taken by Sabine at Dartford brought £9.

An entirely black *Polyommatus icarus* cost £8, and a true gynandromorph rather small but in good condition £2. Three other gynandromorphous specimens 18s. A male underside pale with broad stripes on forewings £7. A cream coloured underside almost spotless £3 10s. Lot 109, a superb streaked underside fig, in South was cheap at £10 10s. Among the *Agriades corydon*, lot 121, containing 8 ab. *fowleri* fine Swanage forms went cheaply for £3 5s. A male with one black forewing with narrow streaks of blue realised £5 10s. A fine streaked underside fetched £9, and 27 other lots varied from 10s. to 15s. each. Lots 116, 117, 118, each containing 12 reputed hybrids between *P. icarus* and *A. thetis* (*P. Mays*), taken by Sabine at Rainham in 1886-7, realised £20, £5, and £3, the prices varying according to the number of perfect specimens in each lot. The colouring is nearer to *P. icarus* than to *A. thetis* in these insects, but it would be difficult to say definitely that they were hybrids. The fact that they were caught in successive seasons and that the ground was then cut up, is interesting: in form generally, except colour, the specimens favoured *A. thetis*. The writer has taken females of *A. corydon* in copulation with *A. thetis*, and *A. thetis* pale with female *P. icarus*, and it is, of course, possible that imagines might result from these illicit connections. An ochreous-grey male of *A. thetis* (*P. Mays*) realised £6 10s., and an entirely black male 30s. Another black male larger and perfect fetched £8 10s., and a dark smoky grey specimen £2. One of pale greenish hue and one a dull blue 35s. the pair. Lot 160, a beautiful *semi-ab.* underside aberration fetched £20, and this specimen was

one of the most extreme and beautiful of any *ab.* form of "blue" seen by the writer. A fine series of 19 females, brown and blue, fetched £2.

The *Polyommatus semiargus* (*acis*) in two lots of six each, brought 45s. and 70s. each lot. *Lycaena arion* in lots of about 20 fetched from 15s. to 80s. Lot 182, containing one almost spotless underside, and an underside with few spots only, brought £8.

Lot 188, an ab. of *Cyclopides palaemon* with black forewings and confluent spots in hindwings brought £5.

A pale smoky *Augiades sylvanus* realised £2. The cabinet of 36 drawers cost the buyer 58 guineas.

The result of the sale (without the cabinet) I believe was about £450, which together with the total realised in the first sale (£850) brought the total sum realised for the Rhopalocera to approximately £1,300—a highly satisfactory result. The total for the corresponding portion of the Webb Sale was, I think, in the neighbourhood of £1,400—but the figures are only approximate. Fourteen *C. dispar* were reserved for the concluding Farn sale.—H.J.T.

Judging from an article in the current issue of the *Weekly Dispatch* by a "leading expert on Collections," some of the insects were remarkably cheap. The article contains such statements as the following:

"The *adonis* butterfly is now so rare in this country that an example sold for £20. A man whom the author knew bought a cabinet of butterflies at Stevens', one drawer of which was stuck, and in consequence the cabinet fetched merely a nominal price. On forcing the drawer open the new owner found two fine swallow-tails (*podalirius*) and one Arran brown (*Ligea*), which he sold for considerably more than he had given for the whole lot."

"At a country sale, a whole mass of butterflies in a glass case was bought and the purchaser found half a dozen long-tailed blues—*bactica* and one *adonis* blue, which he sold for quite a substantial sum. The author once saw a little group of these butterflies together in the South of England, and a Mr. MacArthur caught one or two of them."

"The author also caught a large copper (*dispar*) in the South of England, but damaged, as it was probably blown over, and in 1890 saw two beauties caught at St. Davids."

"The purple edged copper (*Chrysels*) was caught in the author's early days in Epping Forest and the Weaver's Fritillary (*dia*) and *apollo*. He is also sure that *apollo* can still be found in the Lake district, and has seen two on the wing within the last two years."

Personally I do not recognise the name of this "expert on Collections," but in all my wadings through back numbers of the Entomological journals I have never read of any one equalling his exploits.—S.G.C.-R.

NOTES ON COLLECTING, Etc.

ZYGAENA FAUSTA VAR. NICEAE.—It was very pleasing to read Mr. Ashby's diary (pp. 13-18) on that little corner of France, that Geneva people consider to be far more Swiss than French. Of course both Gex and the Salève belong politically to France, but from their position their fauna and flora have always been claimed by the Genevese. Mr. Ashby seems to have missed a good deal of the booty generally gathered

on the Grand Salève in July, but he may congratulate himself on having netted *Z. fausta* var. *niceae*. Is Mr. Ashby quite sure that this is what he has picked up? I should very much doubt it. Although forms of *fausta* are common enough all along the Jura, I have even taken a few at Gex, whence Mr. Ashby had come, but have never heard of the type being found on the Salève, much less a southern form. Of course many extraordinary things have been vaguely reported from that most popular and rich locality. I have even seen a *Gonepteryx cleopatra* that is reported to have been captured there many years ago. Still, though few believe in the report, *cleopatra* MIGHT possibly fly so far north, or be carried by the winds, whereas *niceae* could not. I should imagine that Mr. Ashby has simply netted a *jucunda*, which is found in small numbers at several points on the top of the Salève as well as in tremendous numbers at its foot. *Jucunda* varies greatly both in size and in colouring, and a very long series can be made in an hour or two, but July 15th is perhaps rather too early to expect to find many. *Jucunda* is not to be differentiated from the type by the lack of a red abdominal girdle, for more often than not there are traces of this, and it is sometimes of very fair size, the wing dimensions too, vary from that of a normal *fausta* to a tiny little moth that may be hidden beneath one wing of its big sister.—P. A. H. MUSCHAMP.

NEW ABERRATIONS OF LEPIDOPTERA.—The following forms have recently been described in the *Revue Mensuelle* of Namur.

Brenthis euphrosyne ab. *rabesina*.—The basal portion of the wing is almost entirely black, except that in the middle of this area there is a spot of the usual ground colour in the centre of which lies the discoidal cellular spot. Captured at Virton, May 25th, 1920.

Brenthis ino ab. *cadmeis*.—The submarginal spots are all very large and elongated, occupying half, or almost half, the space between the median line of spots and the marginal border. Captured at Sugny, June 30th, 1921.

Issoria lathonia ab. *chlorographa*.—The median area of the forewing is of a whitish yellow (subflavoalbida). Taken at Virton, April 28th, 1921.

Argynnis cydippe ab. *callisto*.—All the black markings of the median area of all the wings much enlarged, and united to form an irregular band separating the basal and marginal areas. The black markings are all enlarged and very deep in tone, and the ground colour is slightly dusky. Taken at Virton, June 14th, 1921.

M. l'abbé Cabeau is the describer, January 25th, 1922.

Brenthis selene ab. *halplantsi*.—The black marginal chevrons of the forewings are irregular in shape and depth of black, in the nervular spaces 2 and 3 they are strikingly aberrant. On the underside the forewings are of the usual colour, but there is no trace of black chevrons, while almost all the other markings are present and emphasised. The lower wings below have no little black dots, and the basal area is intensely black, as is also the anal angle. Taken at Bergh, May 17th, 1921.

Brenthis dia ab. *interligata*.—On the upper side the two black spots above the middle of the inner border are united by a black extension. Taken at Fées, May 10th, 1921.

M. l'abbé Cabeau describes these, March 25th, 1922.—Hy. J. T.

CURRENT NOTES AND SHORT NOTICES.

On the evening of March 14th we went to the "Old Vic" in the Waterloo Road, to hear a lecture by Prof. E. B. Poulton, F.R.S., on "Animal Camouflage." The lecturer explained the meaning and origin of the term (which is now, somewhat incorrectly, used for protective resemblance in animals), and gave numerous examples in mammals, birds, reptiles, fish and insects, illustrated by a set of very fine lantern slides. The Professor was in excellent form, and all that he had to say carried conviction with it. We were both surprised and pleased to notice the great interest and attention displayed by the large local audience.—H.J.D.

We regret to record the death of an old and valued correspondent, M. L.-J. L. Lambillion, of Jambes-lez-Namur, vice-president of the Société Entomologique Namuroise, and one of its founders. He died unexpectedly on March 12th, being apparently in his usual health the day before. He was the author of a very useful work on the Butterflies of Belgium, and also compiled a Catalogue of the Lepidoptera of the country: he was a constant contributor and supporter of the *Revue Mensuelle* of Namur. His age was 69 years.

Some time ago we received the Report of the Imperial Entomologist (F. Bainbrigge Fletcher, F.L.S., F.E.S.) of the Indian Government on Insect Pests in 1920-21. Like all the work done in India, it is not useful unless it be thorough and detailed. The principal work done was a continuation of the investigation of borers in sugar-cane and other gramineous plants, carried out by observations and countings on various experimental plots. A bad attack by Aphids on an experimental crop was checked in a few days by the liberation of large numbers of Coccinellid beetles collected elsewhere. An attack of Red-spider was controlled by spraying with crude oil emulsion and sulphur. The rearing of insects to record life-histories is an important part of the work done. In the present report there are plates and groups of figures pourtraying the life-histories of *Haematopota javana* (Dip.) on the roots of indigo, an Agromyzid fly on the leaves of rape, *Gonocephalum elongatum* (Col.) on the roots of *Polygonum*, *Exelastis pumilio* (Pterophorid) on a wild vetch (*Alysicarpus vaginalis*), an Anthomyiid fly on Dabbi grass, *Olenecamptus bilobus* (Col. *Cerambycidae*) on the bark of *Ficus glomerata*, *Lithocolletis neodora* (Lep.) mining leaves of *Rhynchosia minima*, and *Acrocercops syngramma* (Lep. Tin.) mining leaves of mango. There has been included a new coloured plate of the Noctuid *Cosmophila sabulifera*, the well-known pest of jute. In addition work has been done on Surra (the dreaded camel disease) and the connection of Tabanid species with it. The breeding of mosquitoes in connection with the fauna of tree-holes has also had considerable attention during the period. We congratulate Mr. Fletcher and his staff on the steady progress made, of which the adequate reporting and publishing is no mean branch.

SOCIETIES.

The Entomological Society of London.

November 2nd.—Donation to the Library.—The presentation by the President of a rare copy of Scopoli's "Deliciæ Floræ et Faunicæ"

was announced, and a vote of thanks to him was carried with acclamation.

New Fellows.—Messrs. Norman E. Miller, Dar-es-Salaam, East Africa; Oliver Richardson Goodman, 210, Goswell Road, E.C. 1; K. P. U. U. Nair, M.A., Training College, Trivandrum; Frank Balfour-Browne, M.A., F.R.S.E., F.Z.S., Oaklands, Fenstanton, St. Ives, Hunts; E. Melville Du Porte, M.Sc., Ph.D., Macdonald College, Quebec, Canada; Oliver C. Cassels, D.F.C., N.D.A., West Hill, Ottery St. Mary, Devon; O. C. Ollenbach, Survey of India Dept., Dehra Dun, India; J. B. Corporaal, Pieter Bothstraat, 39, The Hague, Holland; Douglas Cator, 13, Westminster Mansions, Great Smith Street, S.W.; Marco Pallis, Tatoi, Aigburth Drive, Liverpool; and Samuel Walker, 53, Micklegate Hill, York.

Exhibits.—Mr. W. G. Sheldon exhibited a series of *Epinephele jurtina* from Sutherlandshire, showing an approach to var. *hispulla*; also *Pieris napi* showing an approach to var. *bryoniae*; Mr. Bethune-Baker a series of *Zygaena filipendulae* ab. *chrysanthemi* from Birmingham; Mr. F. W. Edwards a remarkable new insect from Kashmir, which, though probably representing a new family of Diptera, shows curious resemblances to the Mayflies; Mr. L. Newman a gynandromorphous example of *Amphidasis betularia* ab. *doubledayaria*, and an Ichneumonoid parasite from *Sphinx ligustri*; Professor E. B. Poulton, F.R.S., the warble-fly of the reindeer captured with its model *Bombus lapponicus* var. *arnureanicus*; he also read a note regarding observations made by Mr. Arthur Loveridge on the oviposition of the Mylabrid beetle, *M. oculata*, Thunb., var. *tricolor*, Gerst; Canon St. Aubyn Rogers, butterflies from East Africa, including remarkable females of *Papilio dardanus*, examples of *Papilio rex* and *Mimacraea marshalli* var. *dohertyi*; Dr. W. A. Lamborn, an oriental Danaine butterfly brushing the brands on its hindwings; Mr. G. Talbot (on behalf of Mr. J. J. Joicey), new and rare butterflies from New Guinea and Peru; Mr. H. Donisthorpe, a rare British Aphid, *Stomaphis quercus*, L.

Lantern slides.—Mr. A. T. J. Janse concluded his account on methods of collecting while travelling in South Africa, illustrated with lantern slides.

November 16th.—After some discussion it was decided to hold an informal meeting on January 4th, 1922, from 5.30-7.30 p.m.

Exhibits.—Mr. W. J. Kaye, a new race of the Ithomiine butterfly, *Dircenna lenea*, from Trinidad, with a series of the typical forms from the Potaro district of British Guiana; Mr. A. W. Bacot, enlarged microphotographs of the eggs of bed bugs; Mr. W. G. Sheldon, Lepidoptera from Sutherlandshire; Dr. E. A. Cockayne, an example of *Pyrameis atalanta* with larval head; Professor E. B. Poulton, F.R.S., discussed the question of fluorescence as evidence for the evolution of the pigments of mimetic females from those of their non-mimetic males, and said that with the help of Dr. Cockayne, he had been able to examine for fluorescence the Nairobi forms of *Papilio dardanus* that had been shown by Canon St. A. Rogers at the last meeting; Mr. H. Donisthorpe, specimens of the Chalcid, *Spalangia erythromera*, together with its Dipterous host, and the ant *Acanthomyops fuliginosus* in the nest of which these insects live.

Communication.—Dr. Neave read a translation from the German of an amusing skit on modern systems of Zoological Nomenclature.

Subscriptions for Vol. XXXIV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E.14 [This subscription includes all numbers published from January 15th to December 15th, 1922.]

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Desiderata.—Cratægata, Sambucaria, condition immateria.. *Duplicates.*—Dominula, mendica, and numerous common species.—*E. A. Cockayne, 65, Westbourne Terrace, W.2.*

Desiderata.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—*W. G. Pether,* "*Thelma,*" 4, *Willow Bridge Road, London, N. 1.*

Duplicates.—Aglaia, Adippe, *Io, T. quercus, Coridon vars., *Fuliginosa (Reading), *B. quercus ♀, Tiliæ, Menthastri, *Linariata, Aurantiaria, Leucophæaria vars. Paniscus. *Desiderata.*—Pupæ of Dictæoides; Imagines of typhon, palpina, camelina (dark), Curtula, Pyra, and numerous others; Ova of Hispidaria.—*Harold B. Williams, 112a, Bensham Manor Road, Thornton Heath, Surrey.*

Duplicates.—Sybilla, Paphia, Io (2), Selene, Lucina (2), Ocellatus, Illustraria (autumn) Nastata, Roboraria ♂, Prunaria (4) ♂, Tipuliformis. *Desiderata.*—Castreusis ♂, Cucullina, Cribrum, Cinerea, Ravida, Ashworthii, Notata, Obfuscaria, Smaragdaria and others, also vars. and local forms.—*Harold E. Winser, Kent House, Cranleigh.*

Desiderata.—Volumes of *Ent. Mo. Mag.* for 1920, second-hand. State price.—*Hy. J. Turner, 98, Drakefell Road, New Cross, S.E. 14.*

Duplicates.—Cinxia, Bellargus, Coridon, H. Comma, Lineola, Galathea, Moneta, Nupta, and many others. *Desiderata.*—Blandina, Irish Icarus, Carmelita, Cuculla. Gonostigma, Ashworthii, Templi, Australis, Undulata, Smaragdaria, Testacea.—*W. Gifford Nash, Clavering House, Bedford.*

Duplicates.—*Atalanta, Sylvanus, *Urticæ, Phlæas, *Moneta, *Pisi, *T. cratægi, *Lucipara, *Filipendulæ, etc. *Desiderata.*—Paniscus, Actæon, Anachoreta, Tincta, Asteris, Absinthii, Notha, Socia, Festucæ, Rubi, Unangulata, Munitata, etc.—*Wm. Foddy, 39, York Street, Rugby.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. 1922, May 3rd; June 7th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. —*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E.3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

All MS. and editorial matter should be sent and all proofs returned to HY. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

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AND

Journal of Variation

EDITED BY

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Editorial Secretary.

CONTENTS.

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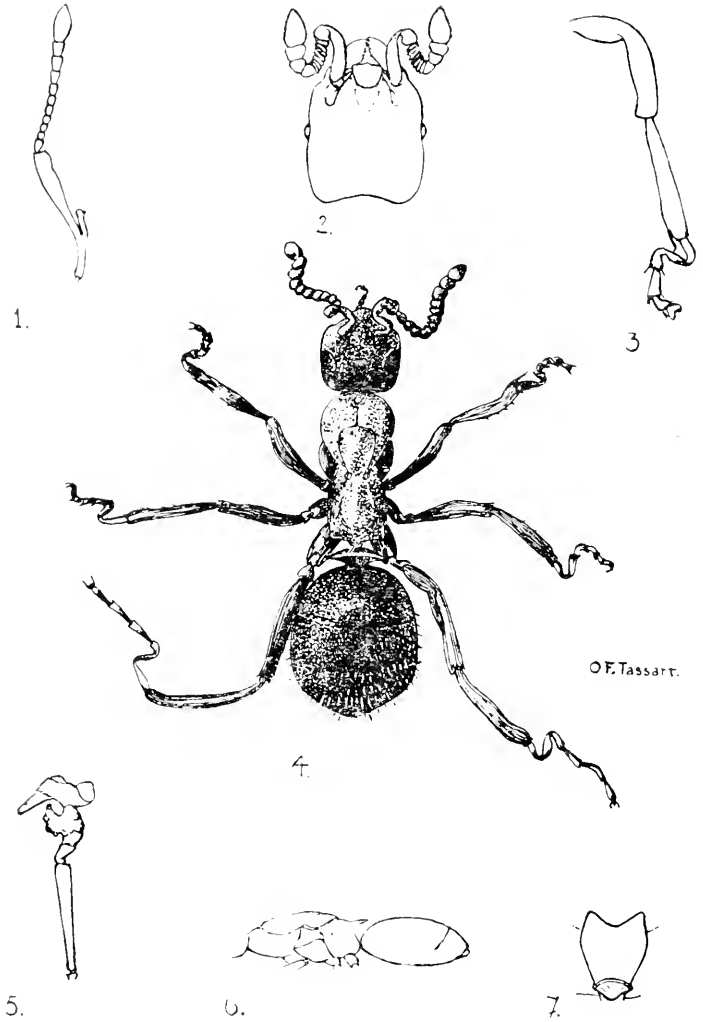

Abnormalities in Ants.

On some Abnormalities in Ants.

(With Plate II.)

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

In 1917 the late H. Viehmeyer published a short paper on abnormalities in the skeleton of ants, embracing certain cases of malformation, variability, intermediate forms, and gynandromorphism, which had come under his observation in the course of time [*Entom. Mitt.*, **6**, 66-72 (1917)].

The first category included a *Camponotus* (*Dinomyrmex*) *gigas*, Latr., ♂, with a projection proceeding from the inner side of the left fore tibia, which he regarded as a second half tibia; an *Orerbeckia subelarata*, Viehm., ♂, with a deformed thorax; specimens of *Camponotus vagans*, Scop., ♀, and *Formica pratensis*, Retz., ♀, with deformed scales, etc.

The second category included certain variations in the scales of *Camponotus* (*Myrmoturba*) *maculatus-chloroticus*, Emery, ♀, *Formica rufa*, L., ♀, and *F. pratensis*, Retz., ♀; and of the petiole in *Myrmica* (*Neomyrma*) *rubida*, Latr., ☿ ☿.

The third category consisted of *Myrmica bergi*, Ruzsky, var. *barchanica*, Ruzsky ☿, and *Myrmica ruginodis*, Nyl., var. *ruginodo-laerinodis*, Forel. This from the description is evidently a Pterergate. The fourth an ergatandromorph of *Myrmica rugulosa*, Nyl.

I have for some time past been collecting similar cases to those recorded by Viehmeyer; and am here describing and figuring a certain number which come into the first two categories.

As the third and fourth belong to phenomena of quite a different nature, I do not propose to deal with them in this paper.

No. 1. (Fig. 1.) *Myrmica ruginodis*, Nyl., ☿, taken at Weybridge, July 28th, 1919. This ant was walking about on the heath, and although to the naked eye it appears to be normal, yet there was something about its movements which caused me to bottle it. Under the microscope there can be seen a short growth projecting from the basal third of the inner side of the scape of the left antenna; a tiny point occurring at the end of the projection. It may possibly be a portion of a half-formed second scape; the point at the end being the spot whence the funiculus would arise. This growth may be due to an injury, caused by pressure or otherwise, in an earlier instar; the wound being the starting point of a super-regeneration of a second scape. As pointed out by the late Dr. Chapman in a paper on some experiments on the regeneration of the legs of *Liparis dispar*, L.—"Where crushing takes place and possibly, therefore, division of the group of embryonal cells that provides for regeneration, there may take place various supplementary portions, branches, and duplication of limbs." [*Trans. Int. Ent. Cong. Oxford*, **2**, 305 (1912).]

No. 2. (Fig. 2.) *Myrmecina graminicola*, Latr., ☿. Both antennæ are deformed, being bent and curled round like a ram's horns; otherwise it is perfectly formed. This may be the result of some injury, but I am more inclined to think that the pupal skin had not been properly removed from its antennæ by its fellow workers when it was a callow. The result being that they had become stiff and fixed in one position.

MAY 15TH, 1922.

This individual was bred in my observation nest of *M. graminicola*; the colony of which I obtained at Box Hill on May 1st, 1910, and have still under observation. It pupated in May, 1911, emerged in July, and died on December 15th. It was a pugnacious little ant and would attack a paint-brush when presented to it. It was generally to be found wandering about the nest, or sitting by itself, away from the other ants.

No. 3. (Fig. 3.) *Formica sanguinea*, Latr., partly winged ♀. Dug up in a *F. sanguinea* nest at Woking, on June 12th, 1914. The right posterior leg is short, and deformed, the femur being short and abruptly bent, the tibia short, and the tarsus twisted and deformed. The tarsal claws are short and blunt, being almost absent. The right forewing, though broken, was still present, which would appear to show that this female dated from, not less than, the year previous to that of capture. The formation of the leg may be due to injury received during an earlier instar; or possibly to neglect, as in the case of the antennæ of *M. graminicola* recorded above. This latter supposition, however, is not so likely to occur in a nest in nature as in one in captivity; moreover, the shortness of the femur and tibia, etc., are against this.

No. 4. (Fig. 4.) *Formica rufibarbis*, F., ♀. Both the antennæ, the labial palpi, and all six legs are deformed, being twisted in all directions. This ant (and a similar specimen) was reared in an observation nest of *F. rufibarbis*, the colony of which was taken at Weybridge, on July 10th, 1912. These two cripples, though quite unable to walk, lived for some time in the nest. I am inclined to consider their condition to be due entirely to neglect; their pupal skins not having been properly removed. Although I had the nest in question under observation for six years, and the queen laid eggs regularly, very few ants were reared. The workers appeared to resent captivity, and I eventually liberated them.

No. 5. (Fig. 5.) *Formica fusca*, L., ♂. Taken at Cratloe, Co. Clare, Ireland, in 1895, and presented to me recently by Mr. Stelfox of the Dublin Museum. The left antenna is deformed; the scape being shorter than that of the right one, which is of normal length, and the joints of the funiculus are soldered together into a sort of spiked club (see figure). Although most of the joints of the funiculus are so mixed up, yet it is almost possible to recognise 12, which is the normal number of joints (not counting the scape, which makes it 13) in the ♂ of *Formica*.

This ant is otherwise quite normal; excepting that the mandibles possess 4 or 5 well-developed teeth. This latter character, though remarkable* in itself, has nothing to do with the deformity of the

* This struck me as being remarkable as, though I have examined hundreds of male specimens of *F. fusca*, I have never seen a specimen with toothed mandibles before; moreover, in the following works, both in the tables and under the descriptions of the species, the ♂ of *F. fusca* is stated to possess mandibles without teeth—André, *Spec. Hym. Europe* (1881); Donisthorpe, *British Ants* (1915); Emery, *Palaearktische Formiciden* (1909); *Formicidae Italianae* (1916); Forel, *Fourmis de la Suisse* (1874). Nevertheless Wheeler, in his *Revision of the Ants of the Genus Formica* [*Bull. Mus. Compar. Zool.*, **53**, 495 (1913)], when describing the ♂ of *F. fusca*, L., states that the mandibles are "often, if not always, denticulate"; so the fact was evidently well known to him.

antenna; as Mr. Stelfox has shown me a number of other *F. fusca* ♂ ♂ (taken in Ireland by Mr. Phillips) with toothed mandibles, which are in every other respect normal and perfect.

No. 6. (Fig. 6.) *Leptothorax acervorum*, F., deäl. ♀. Taken in a mixed nest of *L. acervorum* and *M. ruginodis*, at Manley Bog, Keighley, by Mr. Butterfield, on April 26th, 1918, who kindly presented the specimen to me. It is a small deälated female, rather dark in colour, and is *exceedingly* remarkable in that it possesses no trace of either a petiole or a post-petiole! The gaster is joined directly on to the epinotum by the small neck which joins the post-petiole to the gaster in normal ♀ ♀. It measures 3·3mm. in length. The gaster shows the usual four segments (though this is not apparent in the figure) to be seen in ants which possess a two-jointed pedicel. The peculiar construction of this specimen would appear to represent a reversion to an ancestral form. One of the chief characters by which ants can be distinguished from all the other members of the order Hymenoptera is the construction of the abdomen, which is divided into two very distinct regions, a slender very movable pedicel of one or two joints, and a larger posterior portion, the gaster; though in certain low forms in the *Ponerinae* the construction of the abdomen comes nearer to that of some of the Fossores.

No. 7. (Fig. 7.) *Acanthomyops* (*Donisthorpea*) *niger*, L., del. ♀. Bloxworth, Dorset, from the collection of the late Rev. O. Pickard-Cambridge, and kindly given to me by his son, Mr. A. W. Pickard-Cambridge.

The scale is very emarginate, otherwise the insect is quite normal. This is a simple case of variation; the scale in the female of *A.* (*D.*) *niger* usually being somewhat emarginate, but not to the extent shown in this specimen. In the genus *Formica* the scales in the females and workers of *F. rufa*, L., *F. pratensis*, Retz., and *F. exsecta*, Nyl., are known to vary in this way. The scales in the workers of *F. rufa* are usually not emarginate, though I have found colonies in which all the ants possess emarginate scales. In *F. exsecta* the scales are usually considerably emarginate, though less so in some cases.

This paper is No. 111 of a series of notes and papers, etc., on Myrmecology which I have published up to date. As the last list published [*British Ants*, *Bibliography*, p. 357 (1915)] only gives such papers up to No. 74, it has been suggested to me that I should publish a list of the rest:—

No. 75. "Genital Armature of the Male Ant," *Proc. Ent. Soc. Lond.*, **1915**, l.-liii. (with a Historical Chart).

No. 76. "Marriage-flights of *Donisthorpea* species on August 8th, etc.," *Ent. Record*, **27**, 206-207 (1915).

No. 77. "British Ants, their Life History and Classification," Brendon and Son, Plymouth (1915). (pp. xv. + 379, with 18 plates and 92 text figures).

No. 78. "The Type of *Camponotus* (*Myrmoturba*) *maculatus*, F.," *Ent. Record*, **27**, 221-22 (1915).

No. 79. "Descriptions of a Pterergate and two Gynandromorphs of *Myrmica scabrinodis*, Nyl., with a list of all the known cases of the latter," *Ent. Record*, **27**, 258-60 (1915).

No. 80. "*Myrmica schenckii*, Emery, an ant new to Britain," *Ent. Record*, **27**, 265-66 (1915).

No. 81. "Myrmecophilous Notes for 1915," *Ent. Record*, **28**, 1-4, 33-37 (1916).

No. 82. "The eggs of *Clythra 4-punctata*," *Ent. Record*, **12**, 238 (1900). (= 8a, missed out of all previous lists.)

No. 83. "Probable Myrmecophilous Habits of the genus *Astilbus*," *Ent. Record*, **12**, 335 (1900). (= 9a, missed out of all previous lists.)

No. 84. "Note on *Leptothorax nylanderi*, Först.," *Ent. Record*, **14**, 130 (1902). (= 12a, missed out of all previous lists).

No. 85. "*Epitritus wheeleri*, n.sp., an Ant new to Science; with Notes on the Genus *Epitritus*, Emery," *Ent. Record*, **28**, 121-22 (1916).

No. 86. "The Ants of the Netherlands and their Guests," *Ent. Record*, **28**, 228-29 (1916). (Review of Father H. Schmitz's book.)

No. 87. "Synonymy of Some Genera of Ants," *Ent. Record*, **28**, 241-44, 275-77 (1916).

No. 88. "Myrmecophilous Notes for 1916," *Ent. Record*, **29**, 30-33, 48-52 (1917).

No. 89. "The Ants of the Baltic Amber," *Ent. Record*, **29**, 112-16 (1917). (Review of Prof. W. M. Wheeler's paper.)

No. 90. "*Dolichoderus* (*Hypoclinea*) *crawleyi*, n.sp., a species of Ant new to Science; with a few notes on the Genus," *Ent. Record*, **29**, 201-202 (1917).

No. 91. "Some Notes on a Paper by Dr. Leach on Ants and Gnats in 1825," *Ent. Record*, **30**, 8-9 (1918).

No. 92. "Myrmecophilous Notes for 1917," *Ent. Record*, **30**, 21-24 (1918).

No. 93. "A List of Ants from Mesopotamia; with a description of a new species and a new variety," *Ent. Record*, **30**, 165-68 (1918).

No. 94. "Myrmecophilous Notes for 1918," *Ent. Record*, **31**, 21-26 (1919).

No. 95. "*Coccinella distincta*, Fald., and its association with *Formica rufa*, L.," *Proc. Ent. Soc. Lond.*, **1919**, xix.-xxii. (1920).

No. 96. "Ova of *Coccinella distincta*," *Proc. Ent. Soc. Lond.*, **1919**, xix.-xxx. (1920).

No. 97. "*Coccinella distincta*," *Proc. Ent. Soc. Lond.*, **1919**, xlvii.-xlviii. (1920).

No. 98. "The Myrmecophilous Lady-Bird *Coccinella distincta*, Fald., its Life History and Association with Ants," *Ent. Record*, **31**, 214-222 (1919); **32**, 1-3 (1920). (With two plates.)

No. 99. "The Ants of France and Belgium," *Ent. Record*, **32**, 71-76 (1920). (Review of Mons. J. Bondroit's book.)

No. 100. "British Oligocene Ants," *Ann. Mag. Nat. Hist.* (S. 9), **6**, 81-94 (1920). (With one plate.)

No. 101. "Colonizing of a nest of *Acanthomyops* (*Dendrolasius*) *fuliginosus* by Myrmecophiles," read February 2nd, 1921, *Proc. Ent. Soc. Lond.*, **1921**, vii.-ix. (1921).

No. 102. "Myrmecophilous Notes for 1920," *Ent. Record*, **33**, 21-25 (1921).

No. 103. "Le Monde Social des Fourmis du Globe comparé à celui de l'Homme," *Ent. Record*, **33**, 59-60 (1921). (Review of Dr. A. Forel's book.)

No. 104. "The Subfamilies of *Formicidae*," *Proc. Ent. Soc. Lond.*, **1921**, xl.-xlvi. (With 4 text figures and 1 diagram.)

No. 105. "*Nabis latirentris*, Boh., a Myrmecophilous Insect," *Ent. Mo. Mag.*, **57**, 136-38 (1921).

No. 106. "The Colony Founding of *Acanthomyops* (*Dendrolasius*) *fuliginosus*, Latr.," *Biol. Bull.*, **24** (1922). Boston, U.S.A.

No. 107. "Mimicry of Ants by other Arthropods," *Trans. Ent. Soc. Lond.*, **1921**, 307-11 (1922).

No. 108. "*Ripersia europaea*, Newst., as a British species," *Ent. Mo. Mag.*, **57**, 234-5 (1921).

No. 109. "Myrmecophilous Notes for 1921," *Ent. Record*, **34**, 1-5, 21-23 (1922).

No. 110. "*Ponera punctatissima*, Roger," *Ent. Mo. Mag.*, **58** (1922).

Formicidae.—A new species and variety.

By W. C. CRAWLEY, B.A., F.E.S., F.R.M.S.

Anochetus **evansi**, sp. nov. ♀ L., 5·2mm. (with mandibles.) Entirely castaneous. Pilosity as in *ghiliani*, Spin., from which it differs in its small size, shorter body, and in having the posterior part of the corselet smooth and shining.

All joints of funiculus except the three apical ones, considerably shorter than in *ghiliani*, the second in particular being hardly longer than broad. Thorax rather shorter proportionately than in *ghiliani*, and the incision between the mesonotum and epinotum is hardly marked. The scale is lower and thicker, especially at the top, where it is more rounded.

Head similarly sculptured to that of *ghiliani*, but the scattered punctures on the back half are much more numerous and distinct, and larger. Thorax and epinotum almost entirely smooth and shining, with only a few small points on the base of the epinotum, and a few fine transverse striæ on the declivity. Otherwise like *ghiliani*.

1 ♀, Sar-i-Pal, Persia, 1919. (Evans, no. 16.) Recorded in *Ent. Rec.*, **32**, 163 (1920), as *A. ghiliani*, Spin., though at the time I considered it a variety. Emery, however, is of opinion that it is a distinct species.

Type presented by Mr. Evans to the British Museum.

Crematogaster auberti, Em., var. *sorokini*, Ruzsky., ♀ N.E. Baghdad, 1918 (Evans). Recorded in *Ent. Rec.*, l.c., as *C. scutellaris?* var. Emery has now identified it with Ruzsky's variety, which I have not seen.

Leptothorax sculptiventris, Mayr., var. **distincta**, var. nov. ♀ L., a little over 5·0mm. (type 4·0mm.). Differs only in the colours, which are more sharply defined. Thorax and petiole pale yellow; head, mandibles and basal third of gaster slightly deeper in colour. Funiculus and apical third of scape dark chocolate-brown; tip of apical segment of funiculus and remainder of scape yellow-brown. Apical joints of tarsus, the basal fifth of femur, the apex of coxa, and apical half of tibia pale yellow; the remainder and apical two-thirds of gaster dark chocolate-brown.

The femora are very swollen. In addition to the lateral teeth of the petiole, this segment bears a small sharp tooth beneath. The postpetiole bears on each side behind a small tubercle carrying a short stiff hair.

1 ♀, South America (Dr. Swale).

Type W.C.C. coll.

Observations on the Family Coleophorides.

By ALFRED SICH, F.E.S.

(*Continued from vol. xxxiii., page 133.*)

In the last observations I described some of the different forms that occur in the ova of this family. Here the period of time spent in the oval stage can have no influence on the form of the ovum because all the species mentioned lie in the ovum for the same period. This is curtailed or extended by the degree of warmth existing in the atmosphere during the time and ranges in my experience from ten days to three weeks. I believe these periods will stand good for all Coleophorids under normal conditions. As a rule in England the eggs of the early flying species are laid in May and those of late ones, mostly seed-feeders, in September, but the great majority of species being on the wing in July will oviposit in that or in the following month. The rule will I think hold good for central Europe but not for the south. On the shores of the Mediterranean Sea, the great home of the Coleophorids, much of the vegetation is dried up in July and the moths probably lay their eggs earlier in the year. Although the ova exhibit so great a variety of form the larvæ that hatch out of them are in all particulars except one very similar. In 1904, I called attention to the fact that certain larvæ of this genus have lost the fourth pair of ventral prolegs (*Proceed. South Lond. E. and N.H. Soc.*, 1904-5, p. 9). In this respect these particular larvæ resemble those of the genera, *Gracilaria*, *Lithocolletis* and one or two others.

Since February, 1904, some thirty additional species of this genus have been examined. I believe the presence or absence of ventral prolegs is not a factor of great phylogenetic significance. To most Lepidopterous larvæ they are a convenience, but to some they are not useful or necessary in early life and they then appear only at a later stage. In the Coleophorids, as far as I have observed, the newly hatched larva is already provided with these processes. The Coleophorid larva possesses three pairs of well developed true legs, and though in freedom not a very active caterpillar, it has to move about its foodplant and it does so by means of these true legs only. The newly hatched larva of *fuscedinella* uses its true legs only when after leaving the egg shell it seeks a convenient spot at which to commence its mine. It is then unencumbered by any case. In crawling it arches its body upwards dragging the extremity behind, not throwing it aloft as do some newly hatched Psychids. The larvæ when taken out of their cases and placed on a flat surface progress in the same manner. So highly is the centre of the body arched that an inequality in the surface or a breath of air may overturn the larva. It soon, however, rights itself, but it retains the curved position even when lying on its side. The only exception that I am aware of is the larva of *ornatipennella*. In the first three stages of larval existence, this,

when taken from the mine, crawls in the ordinary way without arching the body, and I think it probable that some of the seed-feeding larvæ which only make cases late in life may be found to crawl in the same manner during the earliest stages. But even in the case mentioned the true legs afforded the means of progress. The Coleophorid larva has three or four pairs of *ventral prolegs* and a pair of fairly well developed *anal claspers*. These four or five pairs together are employed during progression to maintain the case in its proper position, and also when the larva is more or less exposed while feeding to withdraw the body into the case when necessary. Besides these functions the prolegs and claspers must perform an important office during the process of skin-casting. It is probably by their means that the old skin is firmly fixed, and while the larva creeps out of it the old skin will be retained in position by the old crotchets belonging to it. These ventral prolegs of the Coleophorids are small, short, and weak, and more difficult to see than those of many smaller larvæ belonging to other families. When taken from its case the larva has a habit of contracting the prolegs to such a degree that when viewed in the lateral aspect it appears to have none at all, but when viewed in the ventral aspect the dark crotchets will usually show where the prolegs are situated. When examining the prolegs it is always well to use the microscope. The larva may be placed on its back on a piece of moistened stamp paper where it will remain long enough to allow of an examination being made. Normally the crotchets on each proleg lie in an anterior and a posterior row not connected, each row consisting of about half-a-dozen points. They vary in number and are occasionally absent. In one larva of *genistæ* there were none on one leg and the other legs each carried a different number, while in a larva of *siccifolia* all these legs were without crotchets.

In the genus *Coleophora* there are a greater number of characters present which may be used to distinguish the different species than is perhaps found in any other genus. Besides these characters which may exist in the imago, pupa, larva and ovum, we also have the larval case in its essentially different forms, to consider when we attempt to divide into groups the very numerous species. With so many factors to work on this division would seem to be an easy task but as certain species stand out alone and others show gradations of these characters or apparently strange combinations of them, no hard and fast lines can be drawn, at least with our present knowledge. Nevertheless certain natural groups do exist though we cannot yet clearly define their limits. From certain evidence to be considered later we may conclude that there are two main divisions, the one consisting of those species whose larvæ feed on the seeds of plants, the other containing the species whose larvæ mine in the leaves of plants and further that the seed-feeders are the more ancient of the two. That the loss of the prolegs belonging to the sixth abdominal segment which occurs in some of the larvæ has been brought about by reduction, lies beyond dispute. The cause of this reduction I propose to consider later. There is a group of rather small species whose larvæ feed on the seeds of *Juncaceæ*, and in their earliest stages some, probably all of them, live without a case in the seed heads of these plants. This group probably contains the most primitive species now known. All those examined have four pairs of ventral prolegs. They

are the following species: *caespititiella*, *glaucicolella*, *obtusella*, and *murinipennella*. Another group may be formed of those species which are marked on the forewings with scattered dark dots as well as pale longitudinal lines. They are chiefly coastal species and feed on *Chenopodiaceae* or *Compositae*. *Laripennella* and *artemisiella* (the latter examined by Mr. H. J. Turner) belong here and both have four pairs of ventral prolegs.

Virgaureae and *argentula* have also four pairs and are the British representatives of what I consider another group. The small group with metallic forewings, whose larvæ feed on the seeds of *Papilionaceae*, probably all have four pairs of ventral prolegs. Unfortunately I had no living larvæ of this group, but I possess two blown larvæ of *frischella* from the late Dr. Mason's collection. These show the four pairs very distinctly. The last of the seed-feeders to be mentioned is *albicosta*, which is one of these species which seem to stand alone. The larva feeds on the seeds of *Ulex europaeus*, and probably does not form a case in its earliest stages. It has four pairs of ventral prolegs. There is a a small, but highly interesting, group which may be considered as a bridge between the seed-feeders and the leaf-miners. In their youth they eat the seeds of species of *Labiatae*, but after hybernation the larvæ mine in leaves of grasses. One species, *ornatipennella*, does not in reality make a case till after hibernation, but hides itself in a seed-capsule, another, our *lixella*, may do likewise. Both these species have four pairs of prolegs. *Goniodoma limoniella*, belonging to this family and feeding in the flower-head of *Statice*, has also four pairs.

Thus we see that in the few larvæ of the seed-feeders which have yet been examined there is no exception, they are all four-paired. Among the leaf-miners *alcyonipennella*, which may belong to the above-mentioned metallic group, also has four pairs. There is a veined group whose larvæ mine in the leaves of *Compositae*. *Therinella*, and *troglodytella*, represent it here, they both have four pairs. The larva of *solitariella* also carries four pairs, and so does that of *tinealea*. Ottmar Hofmann was the first writer to apply the theory of descent to the Coleophorids, when, in 1869, he described some of the members of the *viminetella* group. All the species of this probably have four pairs of ventrals, *viminetella*, *bicolorella*, and *orbitella*, certainly have.

Paripennella, a member of another unicolorous group, also has four pairs. I believe all the species hitherto mentioned also agree in another character, that is that they only form one case during their larval life. We now come to a pair of small unicolorous species, which in neuration and other particulars are evidently closely allied, one of them, *laricella*, has four, while the other, *juncicolella*, possesses only three pairs of ventral prolegs.

Discordella and *albitarsella*, though widely separated species, agree in two particulars, their larvæ have but three ventrals and form but one case. The group containing, among others, *trigeminella*, *badiipennella*, and *limosipennella*, consists of very similar species; the three mentioned have only three pairs of ventral prolegs. The first of these species may make but one case, the second forms two, and the third three cases. One species, *conyzae*, differs from those with which it is usually placed in that it makes two cases, it has also only three pairs. *Gryphipennella* and *siccifolia* are closely allied, the former, I believe, and the latter certainly makes three cases, and both have only three pairs of ventrals. Of another group of closely united species,

nigricella, *fuscedinella*, and *lutipennella* occur in Britain as well as *hemerobiella*, which though differing so much in appearance from the others is, I believe, connected with this group. They all have only three pairs of ventrals and all agree in making a somewhat peculiar first case and a second more simple case.

The group of white species whose larvæ spin their cases out of their own silk without admixture of vegetable matter is from the proleg point of view an especially interesting one. The largest species which spins a more complicated case than the others has three pairs of ventrals and there is no trace at all of the fourth pair. This is *palliatella*. In *anatipennella* and Stainton's *ibipennella* there are also only three pairs, but the ventral surface of the sixth abdominal segment, instead of being quite smooth as in *palliatella*, is marked by two scars lying in the situations which would have been occupied by the fourth pair of prolegs had they been present. From this it may be gathered that these two species have lost the fourth pair at a later period. In another group we have *vibicella*, this also has but three pairs of active ventrals, but it still carries the remnants of the fourth pair in the shape of two minute points on the sixth abdominal segment. It is one step behind *anatipennella* in the process of reduction. Among the three-paired species I think we may include *conspicuella*. The first observer to notice the absence of prolegs on the sixth abdominal was the faithful artist who drew the figures of the larvæ of *limosipennella* and *conspicuella* in Stainton's *Natural History of the Tineina* (vol. iv., pl. II., fig. 2*a*, and vol. v., pl. IX., fig. 2*a*), as both these larvæ are there shown with only three pairs. It is now many years ago since I first noticed these figures, but I believe the sight of them first induced me to examine the prolegs of Coleophorid larvæ.

In considering the loss of the fourth pair of prolegs, as we find four-paired larvæ within the genus, we need not go outside this but from the fact that the allied families, Gracilariides and Lithocolletides, have also lost the same pair, we may argue that there exists a tendency to lose this pair in the group of families forming this particular branch of the stirps. I have already described the arched position assumed by the larva when taken from its case, and I believe it retains this position as far as it is able to do so when carrying its case, that is to say, that the anal claspers are bent slightly under the body in contact with the floor of the case, while the dorsal parts of the abdominal segments are pressed against the roof of the case. The first two or three pairs of ventrals would be, owing to the confined space afforded by the case, also in contact with the floor, but owing to the incurved anal claspers, the fourth pair may be held above the floor. If this be so then it follows that the fourth pair will be less used than the other pairs, and it may follow that from disuse it gradually dwindles away till it is finally lost. This last condition has only been reached by certain species.

(*To be continued.*)

Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera.

By ROGER VERITY, M.D.

(*Continued from page 73.*)

Leptosia sinapis, L.—This species produces on the eastern coast of the Adriatic a remarkable race, which by its gigantic size and other

features resembles some of the Asiatic ones, both in the summer *major*, Grund, and in the spring *croatica*, Grund; I have figured and discussed at length these interesting forms in *Rhopal. Palaearctica* (pp. 202 and 343) and described an intermediate race from the south of Russia under the name of *majorides* (p. 344). Series from various localities in Austria, sent by C. Höfer, are striking by the shape of their wings, when compared with the more western races, and evidently point to the very acuminated and even slightly falcate *croatica*, because the difference in length between the radial and the anal nervures is greater and the termen is less convex. This Austrian race is well worth distinguishing by the name of ACUTA. Apart from these, all the European races of the species are characterised, to my knowledge, from Scandinavia and England to Sicily and Andalusia, simply by their size or by grades in the extent of the dark pattern along one single line of variation. Features identical with the geographical ones also produce seasonal polymorphism. This is all exactly as in *Rumicia phlaeas*, L. (see *Ent. Rec.*, xxxii., p. 5), and the same law is followed by the two species in that they return to a form common to all regions in the first generation, whilst the local racial characteristic is usually and principally exhibited by the second generation. Various grades in the extent of the dark pattern have been described and fixed by names. I will first mention them and I will then endeavour to summarise briefly what I know of their distribution, as a first attempt to define the seasonal and racial variation of *sinapis*, so widespread and abundant and yet so neglected by entomologists and so vaguely known. Beginning by the lesser extent of dark pattern, we have:—

Grade I.: *deserticola*, Vrty., *Rhopal. Pal.*, p. 202 (November, 1908); small size, frail build, wings rather narrower than in most *sinapis* and with no other dark markings on either surface but a very reduced apical spot above, placed quite at a distance from the margins, dark grey rather than black, as a rule, and always shading into the white ground-colour all round. This form constitutes the race of Beyrouth in Syria, whence came my "type," entirely. It is however found also in the extreme south of Europe, evidently in the most hot and dry localities, as shown by the two specimens in my possession collected by C. Ribbe in the Sierra de Alfacar in Andalusia: the one I have figured in *Rhop. Pal.*, pl. xxxix., fig. 36, is absolutely identical with my Syrian "type." Whether *deserticola* may in some European localities constitute a race, as in Syria, I do not know; from Italy I have never seen a well characterised specimen. The third generation is the only one likely to produce it.

Grade II.: *diniensis*, Boisd.; usually a little larger and more robust than the preceding; there always is a light grey shading at the base of forewing on the underside, but none above; the apical spot is considerably darker and larger than in *deserticola*, but its outline shades into the white and it just falls short of reaching the margin, all round; it is usually more or less round in shape. I have observed a form, which one can consider collateral to this grade, because it has, like it, only one black spot at apex above, but here the spot is considerably more extensive and distinctly quadrangular in shape, reaching both margins; my "types" of the second generation (June), from the Pian di Mugnone, m. 200, near Florence, are also notably larger (mm. 37 to 40 in male and to 42 in female, between the ends of the fifth

radial nervures) than the average size of the species (mm. 34 to 38); on this account I call it GRANDIS.

Grade III.: *birittata*, Vrty., *Ent. Rec.*, 1916, p. 98, with pattern above as in grade II., but with the grey suffusion at the base of forewing also on upperside; the apical patch is never as reduced in extent as it sometimes is in that grade; two sharply defined, though narrow, dark streaks across the underside of hindwing. This grade too has a collateral variation consisting in a greater wing-surface, due to broader wings and more convex margins, which make it appear considerably larger, although the expanse is not as much more as one would expect it from the look of the insect. My "types" of *birittata* are of the second generation, from Mt. Conca, m. 400, above Fontebuona di Vaglia, a cold and damp locality, although not many miles away from the blazing hot Pian di Mugnone, where *grandis* is produced. The large form of grade III., just described, I propose calling MAGNA, taking as "typical" a little series of the second generation collected by me at the Baths of Valdieri, m. 1375, in the Maritime Alps; in this locality *sinapis*, like *P. napi*, actually succeeds in producing a second generation at the end of July, when *lathyri* laggards of the first are still surviving, and a third at the end of August; the latter consists in form *birittata*, with a few *diniensis*, all strikingly smaller than the second generation. I expect this may be the rule in most Alpine localities, because I have found it in S. Tyrol wherever I have collected. It is interesting to record that the second brood collected by Querci on the Coast Range of Calabria at 900 m., is perfectly identical with the Valdieri one, thus differing, as noted in several species, from the other races of Peninsular Italy, and resembling the Alpine one. Occasionally and more or less frequently, according to localities, one meets amongst the *magna* with individuals exhibiting very slight or no traces of dark pattern on underside of hindwing; they differ, notwithstanding, from *grandis*, by their expanse never being so large, by the broader and convex wing noted in *magna*, by the presence of the gray suffusion at base, by the apical patch above not being quadrangular nor nearly as extensive as in *grandis*, although it is usually a little more so in the second brood, and consequently in *magna*, than in the third one. This individual form, combining the features of *magna* and those of *diniensis*, I should deem it useful to designate by the name of MAGNA-DINIENSIS. In the same way the minority of *grandis* which have the dark streaks of *birittata* on underside might well be called GRANDIS-BIVITTATA. A record of their percentage in the different localities and years will be interesting.

Grade IV.: *transiens*, Vrty., *Ent Rec.*, 1916, p. 98, similar in size, shape, and upperside pattern to *birittata*, but on underside of hindwing the two dark streaks are more broad, diffused, and shadowed in outline, and the latter gives out projections along the nervures which often connect the two streaks; a cloud of a lighter gray, because it consists of more sparse dark scales, is seen in some individuals between the streaks and along the dorsal margin; the ground colour is, on an average, of a brighter yellow than in the preceding grades; the underside thus approaches *lathyri* more or less considerably, whereas the upperside has distinct summer features. I pointed out in my original description that the English summer brood generally consists of this

form, and my "types" are, in fact, July specimens of the New Forest. Series of the second generation of Central Europe, as far north as Chantonny in Vendée, I possess, are chiefly composed of *birittata*, with an occasional *diniensis*. The third brood of the damper localities of Central Italy, such as the one near Florence mentioned above, which produces my typical *birittata* in the second brood, or such as Poggio, m. 400, in the Isle of Elba, exhibit in the majority of individuals *transiens* perfectly similar to the English second generation. An interesting series of third brood was collected by the Quercis from the end of August to the middle of September, 1921, in the Mainarde Mts., at Atina, m. 500; it exhibits at first a majority of *birittata*, then, as the season goes on, *transiens* supersedes it entirely and becomes more and more like *lathyri*, till at the end of the emergence two *lathyri* were found, quite similar to the spring form.

Grade V.: *lathyri*, Hübner, is the first generation of all the localities of the species, except those very special ones where the following extreme one replaces it, and it is so well known that I need not describe it here in detail. Its individual variation is far greater than that of the other broods, but all the series I possess from several latitudes and altitudes seem alike on an average, except for size, and the lighter or deeper tone of gray of apical patch; the one from Waidbruck in S. Tyrol is, on the whole, the largest; the Florence series is the smallest, although, curiously enough, it is the one which produces the remarkably large *grandis* in the second generation; the third generation from this locality is, however, again a particularly small *diniensis*. These marked seasonal differences in size can be explained by a knowledge of the surroundings: there are no springs of water in the Pian di Mugnone, but during the spring months the ground becomes very swampy, when it is on a level, on account of the winter and spring rains; the vegetation then becomes very luxuriant in the hot days of the end of spring. There then follows the summer drought, when the ground becomes baked and vegetation extremely scanty, and this produces the small *diniensis*. Autumn rains bring out a fresh crop of grasses, but evidently not sufficient for the larvæ of *lathyri*, which are then feeding, to grow large.

Grade VI.: *nigrescens*, Vrty., *Ent. Rec.*, 1919, p. 87, can be described as the highest expression of the *lathyri* features, more accentuated than they are in the vast majority of cases. The basal suffusion is distinctly blackish instead of gray on both surfaces; it fills the cell and extends far beyond it on forewing above: it also exists at the back of cell, along the dorsal margin; the apical patch is very broad and stretches backwardly by a tapering point as far as the first cubital nervure; both the cubital nervures have a black streak at their ends; the aforesaid patch is always black, as it often is in northern races, but only exceptionally in the usual races of Central Italy, such as *grandis*, which might well be called CANA in the first brood by its very pale gray tinge, evidently due to the same causes as the crescent of that tinge so often produced in the *Pieris* of this region: also the underside of *nigrescens* is more extensively darkened and of a colder tone. This race I discovered at the mouth of the Arno on such swampy grounds that they are under one or two feet of water after the winter and spring rains; in the last days of May the water had just retired and male *sinapis* was beginning to emerge, whereas in the

plains of Tuscany it is quite over by that time; it makes one wonder whether the chrysalids of *nigrescens* get submerged.

I must mention the name of *sartha*, Rühl. (*Pal. Gross-Schmett.*, p. 143), a large form described from "the south of Europe and Asia Minor," but I am quite unable to refer the characters he gives to any form of *sinapis* I know, especially as regards "the underside of hind-wings entirely yellowish-green, weakly sprinkled with dark." As to the form which should be the nymotypical one of *sinapis*, I have stated in other papers that the specimen left by Linnæus is a *lathyri*, Hb. I understand most entomologists are inclined to disregard specimens. In that case the data of literature alone work out as follows: Linnæus's description applies to any *Leptosia*; his only quotation is *Fauna Svecica* and no habitat is mentioned; the Scandinavian race is thus nymotypical. Hübner was at liberty to name any form he chose, and by calling the first brood *lathyri* he restricted *sinapis* to the summer one. I have designated two more grades of variation by the names of *birittata* and *transiens*. That of nymotypical *sinapis* is thus restricted to individual forms standing between these two, and such as would, in fact, I presume, be most numerous in the second generation of Scandinavia. Form *transiens* and spring-like *lathyri* probably outnumber them in damper localities, but I doubt *birittata* being more than exceptional even in the hottest summers. In Central Europe the latter seems, on the contrary, to predominate, with fluctuations towards *transiens* or towards *diniensis*. We thus have:—

In Northern Europe: Race *lathyri*, Hb., with only one generation. Races *transiens*, Vrty., and *sinapis*, L., with *lathyri* as first generation.

In Central Europe: Races *diniensis*, *birittata*, *magna*, *sinapis*, and *transiens*, all with *lathyri* as first generation; a third generation certainly exists in the southern portion.

In Southern Europe: Race *deserticola*, Vrty., may occur locally in the extreme south. The following have been found in Italy:—Race DINIENSIS, B.: I. gen. *cana*, Vrty., or *lathyri*, Hb.; II. and III. gen. *diniensis*. Race GRANDIS, Vrty.: I gen. *cana*, Vrty.; II. gen. *grandis*; III. gen. *diniensis*. Race BIVITTATA, Vrty.: I. gen. *lathyri*; II. gen. *birittata*; III. gen. *transiens*, Vrty. Race MAGNA, Vrty: I. gen *lathyri*: II. gen. *magna*; III. gen. *diniensis*. Race NIGRESCENS, Vrty.: I. gen. *nigrescens*; II. and III. gen. unknown. There remains to establish the distribution of these races; to my present knowledge, it is, on broad lines, as follows: race *diniensis* is by far the most usual and widespread, at all altitudes, in Peninsular Italy; it is probably very frequent in dry localities of Northern Italy; *grandis* may be found to be peculiar to Central Italy; it is produced in hot localities, where the spring vegetation is particularly luxuriant; *birittata* is presumably the most widespread in Northern Italy; in Central Italy it is found in damp localities; *magna* is the race of the Alps, where the vegetation is luxuriant in the early summer, and of the Coast Range of Calabria; *nigrescens* is the marsh race. No fourth generation, or even emergence of sporadic individuals, of *L. sinapis* has ever been observed anywhere as far as I know.

(To be concluded.)

Entomological Notes from Putney, 1921.

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

Jan. 9th.—*Coccinella 11-punctata*, L. ab. *9-punctata*, L. out on fence on Putney Common.

Jan. 24th.—The honey bee (*Apis mellifera*) flying in garden.

,, 30th.—*Coccinella 7-punctata*, L. on fence.

Feb. 15th.—Queen Wasp (*Vespa vulgaris*) flying in garden.

,, 20th.—*Corticaria fulva*, Com. in scullery.

March 14th.—*Harpalus aeneus*, F. in garden.

,, 18th.—Queen Wasp flying in garden.

,, 23rd.—*Blaps mucronata*, Lat. in scullery.

,, 24th.—*Omosita discoidea*, F. on the wing in garden.

,, 25th.—*Cicabrus nigritulus*, Gr. in garden.

,, 28th.—*Dorcus parallelopipedus*, L. emerged from a log of firewood. The log was given to me by a neighbour on March 4th, 1920; when a large Lamellicorn larva could be seen in a burrow in the wood. The hole was soon filled up with frass.

April 3rd.—Many small *Coccidae* (♂ ♂) were flying in the garden in the late afternoon.

April 4th.—*Rhizophagus ferrugineus*, Pk. caught on the wing in garden.

April 12th.—The small white (*Pieris rapae*) flying in garden; another in the High Street on 13th.

April 13th.—*Blaps mucronata*, Lat. on pavement in street.

,, 14th.—*Anchomenus parumpunctatus*, F. on path.

May 12th.—*Dermestes lardarius*, L. in scullery.

,, 13th.—*Acupalpus meridianus*, L. in garden.

,, 15th.—*Hylastes angustatus*, Hbst. in bath room. This may be *H. attenuatus*, Er.; though I am not satisfied that the two species are distinct. This rare species must have flown into the house.

May 18th.—*Philonthus politus*, F. in garden.

,, 19th.—*Osmia*, sp., the bee entering small hole in post in Putney Station.

May 25th.—Lace Wing Fly out in garden.

,, 28th.—*Carabus violaceus*, L.; several in drain in garden.

,, 29th.—*Niptus hololeucus*, Fall. in cupboard in kitchen.

June 3rd.—*Lucanus cervus*, L. ♂ on fence in Hazelwell Rd.

,, 23rd.—*Aleochara succicola*, Th. on window in study.

,, 24th.—*Lucanus cervus*, L. ♀ a very small specimen on pavement near East Putney Station. This female only measures 26 mm. I possess a specimen of *Dorcus parallelopipedus* which I took at Ryde I. of W., which measures 27 mm.

July 15th.—*Xantholinus glabratus*, Gr. in garden.

,, 15th and Aug. 27th.—The Holly Blue *Celastrina* (*Cyaniris*) *argiolus* in garden.

August 28th.—The Red Admiral (*Pyrameis atalanta*) flying in garden.

August 29th.—*Aphodius rufipes*, L. on pavement.

Sept. 3rd and 14th.—The small Copper *Rumicia* (*Chrysophanus*) *phlaeas*, in my garden. I have not noticed this butterfly in my garden before.

Sept. 10th.—*Oxypus ater*, Gr. in garden. This species is rare inland. Rye recorded it from Wimbledon and I have taken it at Penge.

Sept. 27th.—Wasp (*Vespa vulgaris* ♀) observed to catch and carry off a fly. It is as well to record such cases as some entomologists have expressed doubts on the subject. In the *Irish Naturalist* 28 107 (1919)] I recorded various instances.

Sept. 27th.—*Otiorhynchus scabrosus*, Marsh, in garden.

Oct. 23rd.—*Oxypus oleus*, Müll. running on pavement.

,, 24th.—Male wasp (*Vespa vulgaris* ♂) flying in garden.

,, 29th.—*Pseudococcus gahani*, Green. I noticed large numbers of this Coccid on the trunk of a tree in Oakhill Road. I took some of the leaves to the Museum and am informed it is *Laburnum vulgaris*. The leaves are pointed, whereas the leaves of a Laburnum tree in my garden are rounded. The Coccids are still as abundant today, Dec. 26th, as they were in October. Last year I recorded the capture of specimens on my study window; these I subsequently traced to the creeper on the wall outside.

Nov. 5th.—The "woolly apple aphis" (*Eriosoma lanigerum*) again abundant on the same shrub (*Cotoneaster* sp.) in my front garden.

Nov. 6th.—*Pterostichus madidus*, F. on path in road.

Dec. 10th.—*Hibernia defoliaria*, a specimen in the porch of my house.

NOTES ON COLLECTING, Etc.

References for Digne in July-August.—*Ent. Record*, vol. xix., p. 154, 222; vol. xxii., p. 9; vol. xxiii., p. 173; vol. xxiv., p. 67, 99; vol. xxvi., p. 220. *Ent. Mo. Mag.*, vol. xxvi., p. 280. *Ent.*, vol. xxiii., p. 78; vol. xxxii., p. 104; vol. xxxviii., p. 49; vol. xl., p. 78; vol. xliv., p. 5; vol. xlv., p. 96, 133.

References for Grindelwald.—*Ent. Record*, vol. xvi., p. 305; vol. xxiv., p. 288. Evidently a locality which has been, to say the least, not patronised by entomologists. It is well worth a visit, as many species in our series testify.—Hy.J.T.

[Other lists will be published in mid-June if readers will send a card stating their locality at once. No replies will be sent by post.]

Hibernation of Pyrameis atalanta.—This morning I captured in the garden here a female *Pyrameis atalanta* feeding at Aubretia blossom. The day was bright with a cold north wind. On 1st of the month we had five inches of snow followed by a thaw and a hard frost that night. The 2nd was fairly fine, but the 3rd brought nearly two inches of snow and sleet. The Quantock Hills, some six miles to the south and west being still covered with snow. After the bad weather of the past week it is hardly possible that *P. atalanta* can be an immigrant. I am keeping the insect to try to obtain a batch of eggs.—(Capt.) Robert Troup, The Grove, Wimbledon, Bridgwater, *April 4th.*

Pyrameis atalanta in Spring.—While in the woods to-day (April 30th), I saw *P. atalanta* visiting sloe-blossom. Taking the recent severe weather into consideration I conceive it is much too early for an immigrant.—Edwin P. Sharp, 1, Bedfordwell Road, Eastbourne.

CURRENT NOTES AND SHORT NOTICES.

As we go to press we deeply regret to hear of the death of Henry Rowland Brown, M.A. An obituary will appear, we hope, in our next number.—G.T.B.-B.

Late in the year 1921 the London Natural History Society issued its *Transactions* for 1920. Entomology does not come largely into this report, which contains matter dealing with Ornithology and Botany chiefly. As is expressed in the Council's Report, "the size of the annual volume has been much reduced owing to the change in money values" and "one of the most important features" has had to suffer. Still we note that no less than twenty-one field meetings have been held by the various sections of the Society, and that much good work has been done, and that on an income of only about £60. We wish them a brighter time.

We have received a copy of *The Macro-lepidoptera of County Tyrone* from its author, our correspondent, Thomas Greer, who for many years has been a most enthusiastic observer of the butterflies and moths of his own neighbourhood, one rich in local forms. Entomologists will find this list of much use, as it collects in one brochure the details of all these local races, *e.g.*, of *Pieris napi*, *Euchloe cardamines*, *Melitaea aurinia*, *Pararge aegeria*, *Epinephele jurtina*, *Coenonympha tiphon*, *Polyommatus icarus*, etc., among the butterflies, *Hydroecia crinanensis*, *Zygaenidae*, and many more of the Heterocera. It is ably done, and will be most useful.

The Report of the Fourth Entomological Meeting, held at Pusa, in February, 1921, contains fifty out of the fifty-two papers which were read, with many plates, some of which are coloured, and over 400 pages of letterpress. The matter has been prepared from MSS. sent in and notes taken by the Joint Secretaries, Messrs. R. Senior-White and G. R. Dutt, and edited by the Imperial Entomologist, T. Bainbrigge Fletcher, R.N., F.L.S., F.E.S. The papers read were classified as dealing with, I., Crop Pests, *e.g.*, cotton, sugar, mango, etc.; II., Forest Enemies; III., Medical and Veterinary Entomology, *e.g.*, Surra and flies, mosquito distribution, chemical reactions, etc.; IV., Household and Store Pests; V., Lac Pests; VI., Life-histories and Bionomics, *e.g.*, Protective movements, range of vision in Platypezid Flies, Oviposition on parasites of various pests, etc.; VII., Insect Preservation; VIII., Systematic Entomology, *e.g.*, List of *Coccidae* of India, List of Parasitic Hymenoptera of economic importance; IX. and X., Other practical and administrative matters. A most interesting paper to us is one by Prof. E. B. Poulton, on a comprehensive collection of specimens of *Papilio polytes*, sent to him from Baghownie and other places. It is noted that all were taken, damaged or perfect. The author states, "The injured specimens are of special interest, being in nearly all cases symmetrically shorn, or torn at the anal angle of the hindwing, injuries evidently the work of birds or lizards." Tabulation is given of the ♂-like ♀ *cyrus*, the *aristolochiae*-like ♀, including ab. *stichius*, and the *romulus* ♀ *hector*-like form. The discussion of various difficult points in the theory of mimicry, which this tabulation and the circumstances surrounding the making of the collections, is most enlightening and instructive. We suggest that all interested in the theory read the facts and arguments here brought forward to counter some facts which, at the first glance, are strongly negative in their bearing.

Nearly a score of separata have been received during the last few months from the Proceedings of the U.S. National Museum. Prof. T. D. A. Cockerell deals with further fossil insects from the Eocene of Colorado and Wyoming in two articles; S. A. Rohwer contributes three articles on Sawflies, in one dealing particularly with description and habits of the larvæ; in two others H. L. Viereck and R. A. Cushman treat of Ichneumon-flies: the Coleoptera are the subject of three papers by C. Schaeffer, A. B. Wolcott, and W. M. Mann, the last describing three new myrmecophilous species; galls and parasitic *Cynipidæ* are dealt with in two papers by L. H. Weld; W. Schaus has a paper on new Lepidoptera from S. America; S. A. Rohwer contributes one on wasps; C. H. Kennedy one on Dragonflies; H. E. Ewing one on Spider Mites; R. V. Chamberlain one on Centipedes; and C. T. Greene and W. L. McAtee on Muscoid and Bibionid flies respectively.

The Annual Report of the Smithsonian Institution for 1919 (published 1921), which has just reached us, contains an article, with 15 plates, on the "Division of Insects in the United States National Museum," by J. M. Aldrich, Associate Curator; another on the "Seventeen Year Locust," with 5 plates, by R. E. Snodgrass, Bureau of Entomology; and a third treating of "Entomology and the War," by Dr. L. O. Howard, Chief of the Bureau of Entomology, U.S. Department of Agriculture.

This Bureau employs "a very large staff of entomologists in economic work throughout the United States," and aims at forming "a large and well-classified collection of foreign insects," especially with regard to their life-histories. The number of named species in all branches of Entomology is given as 98,925, including 30,653 species of Lepidoptera, and the total number of specimens as 2,125,180 (Lepidoptera 275,920).

Dr. Howard shows that "war conditions have intensified the work of entomologists and have enabled them to make the importance of their researches felt as never before." Besides the work done in connection with typhus and trench fevers, special efforts were made against the insects which injure grain and forage crops, and much damage was prevented. Competent inspection and fumigation or other requisite treatment of products stored for shipment was regularly carried out by men experienced in the study of insect pests. Increased production of honey due to intensive work on bee diseases, and prevention of damage and loss of valuable timber required for aeroplanes, are other results of their work.

Incidentally, complaint is made of the lack of appreciation of their work, even in "certain high official circles."—R.E.P.

The South London Entomological Society have issued their programme of fixtures for the summer and autumn, it includes field meetings at Ranmore Common, Canvey Island, Horsley and Eastbourne, with a Fungus Foray later on. The papers promised are by Messrs. R. Adkin, C. W. Young, W. J. Lucas, T. H. L. Grosvenor, and the Rev. J. Waterston. In addition there are the usual evenings set apart for the exhibition of members lantern slides and the Annual Exhibition. The Society seems not only to have coped successfully with the strain of the past few years, but to have gained fresh vigour and a much increased membership.

The Mosquito Committee of the S.E. Union of Scientific Societies will be grateful for information on the following points:—

1. Of records of any of your captures of adult *Anopheles plumbeus* during and since last summer *with dates*.

2. Whether you found living larvæ in tree-holes at any time during that period.

3. Does *A. plumbeus* deposit her eggs:

(*a*) on the water;

(*b*) on floating or stationary objects;

(*c*) on the wet margins of tree-holes.

4. Any information as to the hatching of eggs and their retention of vitality after desiccation, not only of *A. plumbeus*, but also of other, and which other, species of mosquitoes.

5. Any other information relating to the possible hibernation of the species in the egg stage.

The Committee will be glad if correspondents will reply to the above questions as soon as they can reasonably do so, but in any case not later than June 15th next.

Attention is called to the fact that the recent rains having filled tree-holes which were previously dry, an early examination and report of the presence of larvæ in these is important.

Communications should be sent to the Rev. T. W. Oswald-Hicks, B.A., Hon. Sec., Lesware, Linden Road, N. 15.

We regretfully have to record the death of an old friend and supporter of the South London Entomological Society, Mr. Lachlan Gibb, F.E.S., of Blackheath and Canada, who passed away a few weeks ago at the age of 68. Although he made no collection he was interested in aught entomological, and freely gave his captures both in Canada and at home, to his friends. The Society is indebted to him for its large sixty-drawer cabinet, and also a typical collection of Canadian butterflies, as well as for many additions to their reference library. He was a most pleasant and genial companion, and when in England came to all the field meetings of the Society.

SOCIETIES.

The Entomological Society of London.

December 7th.—New Fellows.—Messrs. W. Bevan Whitney, B.Sc., A.M.Inst.C.E., Glen Doone, Gerrards Cross, Bucks; Edward Nevill Willmer, Trafford Hall, near Chester, and Corpus Christi College, Oxford; and John Glover Hugo Frew, M.Sc., 262, Church Road, Yardley, Birmingham, and Rothamsted Experimental Station, Harpenden.

Exhibits.—Professor H. Maxwell-Lefroy exhibited on behalf of Dr. A. Moore a new method of preserving insects.

Mr. G. Talbot discussed the existence in Africa of a remarkable *Papilio* of the *antimachus* group, and also exhibited on behalf of Mr. J. J. Joicey a gynandromorphous example of *Argynnis hyperbius* var. *castesti*.

Mr. R. Adkin brought for exhibition a series of *Aglais urticæ*; this exhibit gave rise to some discussion on the comparitive rarity of *A. urticæ* in 1921, and on the relative abundance and apparent spread in the South of England of *Vanessa c-album*.

Mr. W. J. Kaye exhibited *Heliconius* from Trinidad, and a remark-Erycinid, *Nymphidium maravalica*, with its supposed model *Adelpha iphicla*.

Professor E. B. Poulton, F.R.S., exhibited black varieties of the Longicorn beetle, *Gramoptera analis*, on behalf of Mr. Joseph Collins; he also gave an account of some observations of Mr. A. H. Hamm on the third brood of *Lumicia phlaeas* from the Newbery district in 1921, and exhibited the specimens referred to.

Mr. R. Stenton exhibited some living Mantids bred from an egg-case taken by Mr. J. C. F. Fryer on an imported Japanese maple.

Papers.—"Descriptions of South American Micro-Lepidoptera," by Mr. E. Meyrick, B.A., F.R.S., F.Z.S.

"Notes on Orthoptera in the British Museum, II. Group, *Callip-tamini*," by Mr. B. Uvarov.

Mr. C. Nicholson read some notes on *Vespidae*, and on a remarkable nest of *Vespa vulgaris*, illustrated with lantern slides.

OBITUARY.

Arthur Bacot, F.E.S.

With the deepest regret, we have to record the passing of Arthur Bacot on April 12th, at the Fever Hospital, Abbassia, and with pride we record an additional name to be inscribed on the Roll of Martyrs to the cause of science.

It seems only a short time since the late J. W. Tutt remarked to the writer that Bacot had the making of a brilliant entomologist, and what a pity it was he had not the opportunity of developing his studies. This must have been in 1900 when he was a clerk engaged in a city office. However, at length his talents were recognised and he became Entomologist to the Lister Institute of Preventive Medicine in London, and soon made for himself a European reputation, more particularly in connection with insect-borne diseases. His name is especially known through his brilliant work on the exact mechanism of the infection of man with Plague, by means of the rat-flea—a piece of work which entirely altered existing ideas on the role of insects as transmitters of bacterial disease. The results of his studies on this problem were universally recognised in 1912, and since then but little has been added to his work. He was the author of many contributions to scientific literature, almost all bearing on the same question of insect-transmission of disease. Besides this he contributed frequently to the pages of *The Entomologist's Record, etc., vide* vol. iv., pp. 199; vol. vi., pp. 32, 173; vol. vii., pp. 227, 246, 261, 319; vol. viii., pp. 150, 151, 241, 248, 278 and 308 et seq.

Two years later, in 1914, he went out to Freetown to study the *Stegomyia* mosquito for the Yellow Fever Commission and gave us a complete account of the bionomics of that deadly creature.

When he came home he settled down to study lice, and his work on them was, after long efforts, recognised and applied by the War Office to the de-lousing of our soldiers for the prevention of typhus and trench fevers, of which the infection is conveyed to a large extent by lice.

In 1920 his services were lent to the American Red Cross for their

investigations of typhus in Poland. While in Poland he was infected with trench fever, from the lice with which he was working, and lay in Praga Hospital, only anxious to get out to complete his work. Some of his letters from Warsaw show, amongst other things, how fully he was aware of the danger of typhus infection from the excreta of infected lice, a danger to which, a few days ago, he succumbed, knowing full well before he started, that, at his age, the mortality from typhus is over 50 per cent.

During the past two years he had been working at the typhus-virus in lice, and in January he was lent to the Egyptian Government. His previous illness had broken his health, besides showing what danger was involved; but he knew he was the one man in England who could do the entomological work, and so he went to his death like the gallant gentleman he was. He and his fellow worker, Dr. Arkwright, for whose recovery we hope, were both infected by the excreta, almost unmanageable when dry, of the known-to-be-infected lice with which they were working, at the Public Health Laboratories, Cairo.

Our lamented colleague died of "pulmonary complications following on an attack of Typhus Fever contracted in the course of his work."

The funeral service at the new British Cemetery, Old Cairo, which was conducted by the Rev. C. C. Hamilton of All Saints, was attended by a large number of people representing various branches of scientific work in Cairo. The body was carried to the grave by his friends and colleagues both British and Egyptian, and a touching mark of the appreciation of his work was the large number of Egyptian doctors and scientists present.

Arthur Bacot had no more medical qualifications than Louis Pasteur, but he belongs to the same illustrious line of the real makers of medicine; and to yet another, of the martyrs of science. Our loss is the country's loss, Europe's loss, the World's loss.—H.E.P.

Corrections.—1. I am grateful to Mr. Muschamp in *Ent. Record*, vol. xxxiv., p. 78, for kindly criticising my article in l.c. pp. 43 to 48. He is quite right, I find now that I did not take *Zygaena fausta* var. *nicaea* on the Grand Salève, as stated by me on page 48. The specimen is *Z. fausta* var. *jucunda*. It was wrongly identified by a friend in London.

2. Thanks to the Rev. G. Wheeler, I wish to correct another mistake on page 47, lines 36 and 37, to delete "including a fine specimen of the female var. *flaridor*," and to substitute "and a large female of *Plebeius argus* (*argyrognomon*)."

3. I also wish to thank Dr. Verity for his kind criticism of my "Notes on Collecting in Italy," which occurs on p. 206 of vol. xxxi. In my notes on collecting at Arquata, in 1918, and at Turin, in 1919, "*Hesperia malvae*" should read "*Hesperia malvoides*" in all cases.

4. In the note on Arquata "*aragonensis*" should be substituted for "*coridon*," vol. xxxi., pp. 134, 170, 171, and 173; "*ilicis*" in place of "*pruni*," in all cases l.c. pp. 171, 172; and "*spini*" for "*pruni*," l.c. p. 186. I took *Klugia spini* at Arquata from June 16th, 1918, to July 10th, but omitted the record of it.

5. On p. 210, vol. xxxi., "*Satyrus arethusa*" should read "*Satyrus statilinus*." With many apologies to readers.—E. B. Ashby (F.E.S.), 36, Bulstrode Road, Hounslow.

Subscriptions for Vol. XXXIV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 **[This subscription includes all numbers published from January 15th to December 15th, 1922.]**

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MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. 1922, June 7th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. May 20th, Field Meeting at Ranmore Common. Leaders, Messrs. Buckstone and Turner; May 25th, Paper, by R. Adkin, F.E.S.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E.3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

All MS. and editorial matter should be sent and all proofs returned to HY. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

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Vol. XXXIV. **No. 6.**

The Entomologist's Record

AND

Journal of Variation

CONTENTS.

JUNE 15th, 1922.

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Hippodamia variegata, Goeze.—Description of some further new aberrations, and observations on ab. 3-punctata, Haw., and ab. 9-punctata, Haw.

By G. B. C. LEMAN, F.E.S.

1. ab. *externepunctata*, n.ab.

This aberration has the common scutellar spot and one isolate spot No. 2.

Weise in his B.T. (1879) gives as formula of his ab. *inhonesta* 5, $\frac{1}{2}$, but subsequently, in 1885, he appears not only to give it the new formula of 2, $\frac{1}{2}$, but to group it with 3- and 5-spotted aberrations under the omnibus name of var. *5-maculata*, Fabr., where obviously neither can remain.

I was unable to obtain or trace any copy of Weise's B.T. (1885), and for the following extract I am indebted to Professor Kölbe of the Zool. Mus., Berlin:—

> "(*b*) Fld. mit 3 bis 5 Punkten; aa. 3 P., Z.B. 5, $\frac{1}{2}$ oder 4, $\frac{1}{2}$ oder 6, $\frac{1}{2}$ oder 2, $\frac{1}{2}$ (*inhonesta*, Ws.); bb. 5 P., Z.B. 3, 5, $\frac{1}{2}$ oder 4, 5, $\frac{1}{2}$ oder 2, 3, $\frac{1}{2}$ oder 1, 5, $\frac{1}{2}$ oder 5, 6, $\frac{1}{2}$ oder 4, 6, $\frac{1}{2}$ oder 4 + 5, $\frac{1}{2}$ . . . . . v. *5-maculata*, Fabr."

Of the above 3-spotted aberrations 5, $\frac{1}{2}$ = ab. *3-punctata*, Haw. (Syn: ab. *inhonesta*, Ws.); 4, $\frac{1}{2}$ = ab. *hummeli*, Ws. (1879); 6, $\frac{1}{2}$ = ab. *sesquipunctata*, mihi: 2, $\frac{1}{2}$ = ab. *externepunctata*, mihi; and of the 5-spotted series, 3, 5, $\frac{1}{2}$ = ab. *artemisiae*, Ws. (1879); 4, 5, $\frac{1}{2}$ = ab. *5-maculata*, Fabr.; 2, 3, $\frac{1}{2}$ = ab. *binisesquipunctata*, mihi; 1, 5, $\frac{1}{2}$ = ab. *obliquepunctata*, mihi; 5, 6, $\frac{1}{2}$ = ab. *5-punctata*, Walt. (1882); 4, 6, $\frac{1}{2}$ = ab. *lugubris*, Walt. (1882); and 4 + 5, $\frac{1}{2}$ = ab. *commaculata*, mihi.

In the circumstances I propose to give the aberration with formula 2, $\frac{1}{2}$ the name of ab. *externepunctata* and Weise's ab. *inhonesta* (1879), with formula 5, $\frac{1}{2}$ sinks as a synonym of ab. *3-punctata*, Haw.

Formula: 2, $\frac{1}{2}$.

2. ab. *3-punctata*, Haworth, *Trans. Ent. Soc. Lond.*, i., 276.10.E. (1812).

> "10. *C.* 7-*notata* . . . . . (*e*) *3-punctata*: Coleoptris rubris, punctis nigris tribus, uno communi, altero in singulo elytro, pone medium suturam versus, caetera fere ut in ultimâ varietate (*i.e.* δ *5-maculata*, Fabr.) Long. Corp. 2 lin. *Coccinella 3-punctata*, Linn., Syst. Oper. et ejus Musaei. Communicavit S. Wilkins. Variat. duplo major."

The reference to Linnæus is obviously wrong, as the latter's specimen = *C.* 11-*punctata*, L. ab. *3-punctata*, L., while *C.* 7-*notata*, Haw., = *H. variegata*, Goez., ab. *constellata*, Laich., and his var. β (9-*notata*) is in fact the type.

Weise appears to have been unaware of Haworth's paper on *Coccinella*, and the latter's ab. *3-punctata* has priority over Weise's ab. *inhonesta* (1879).

Formula: 5, $\frac{1}{2}$.

3. ab. *sesquipunctata*, n.ab.

This aberration as mentioned above is wrongly grouped by Weise (1885) under ab. *5-maculata*, Fabr.

June 15th, 1922.

There appears to be a typographical error in Mulsant's description of this aberration in *Séc.* (1846) under var. C.γ. of "cinquième" for "sixième" as his var. C.β has already dealt with the "cinquième" spot. I need perhaps hardly remark that Mulsant reckons his spots from suture to margin instead of from margin to suture.

Formula: 6, ½.

4. ab. *obliquepunctata*, n.ab.

This aberration is again wrongly grouped by Weise (1885) under ab. 5-*maculata*, Fabr.

Formula: 1, 5, ½.

5. ab. *binisesquipunctata*, n.ab.

The last observation applies also to this aberration.

Formula: 2, 3, ½.

6. ab. *commaculata*, n.ab.

The same observation equally applies to this aberration, which differs from ab. 5-*maculata*, Fabr., in the confluence of spots 4 and 5.

Formula: 4 + 5, ½.

7. ab. *latreillei*, n.ab.

Latreille in his *Hist. Nat. Crust. et Ins.* t. 12. 57. 15. f. et g. (1802), under *C. mutabilis* describes this aberration as follows:—

> "f. Corselet de même; élytres à neuf points, un à la base, le deux répondant aux deux de la seconde ligne des variétés qui en ont treize, manquant.
>
> "g. Elytres de la précedente: corselet de la var. C."

The reference to the corselet (Thorax) in (f.) is:

> "Bord jaune et extérieur du corselet jetant dans son milieu et postérieurement un petit rameau ou dent jaune."

and that of (g):

> "Bordure jaune et antérieure du corselet trifide."

It will be noted that Latreille attempts to make two aberrations of a specimen with the same elytral formula of spots based on minor variations of the thorax. Other authors in this species have done the same, but fortunately for the most part, as in Latreille's case, without assigning to such thoracic variations any specific name. I do not consider these minor variations of the thoracic markings justify separation for purposes of nomenclature, and I propose to bracket Latreille's vars. (f) and (g) under the above name with

Formula: 1, 2, 3, 6, ½.

(8) ab. *bearei*, n.ab.

This aberration with 9 spots has the three posterior spots 4, 5 and 6 confluent. The isolate spot is No. 1 and the common scutellar spot is present.

Costa in his *Faun. Reg. Nap.* fasc. 65. 15. 1 (f) (1849), under *A. mutabilis* describes without name an aberration which appears to have some affinity to my aberration:—

> "(*f*) elitre comme nella varietà precedente—(*i.e.* (*e*) = type form)—coi tre punti posteriori dilatati e ligato insieme, ora il solo quarto col quinto, ora anelie il quinto col sexto."

Such affinity extends, of course, only to the "tre punti posteriori dilatati e ligato insieme," and while he states that spots 4, 5 and 6 are dilated and confluent, he does not define clearly whether such confluence is so dilated as in fact to form the irregular black blotch which is found in ab. *turkmenica*, Zoubk. (1833), ab. *zoubkoffi*, Leman (1922) and ab. *maculigera*, (Weise) Leman (1922), but is not found in this aberration. I have the honour with his permission to name this aberration after Professor T. Hudson Beare, B. Sc., F.R.S.E., F.E.S. Type in his collection, taken at Southport on 13 June, 1903.

Formula: 1, 4 + 5 + 6, $\frac{1}{2}$.

9. ab. *costae*, n.ab.

Included in Costa's var. (f) is in fact another unnamed aberration in which spots 5 and 6 are confluent—"ora anelie il quinto col sexto."

The aberration with spots 4 and 5 confluent—"ora il solo quarto col quinto"—included in Costa's var. (f) = ab. *angulosa*, Ws. (1879).

Formula: 1, 4, 5 + 6, $\frac{1}{2}$.

10. ab. *weisei*, n.ab.

This aberration with formula 2, 4 + 5, 6, $\frac{1}{2}$ is grouped by Weise (1885) in another omnibus group of 9-spotted aberrations under v. *carpini*, Fourcr. (= *H. variegata*, Goez., type form), where it cannot remain and I cannot do better than append a further extract of this group:—

> "e. Fld. mit 9 P. aa. 1, 4, 5, 6, $\frac{1}{2}$ (9-*punctata*, Schrank; *carpini*, Fourcr.); bb. 1, 4 + 5, 6, $\frac{1}{2}$; cc. 1, 2, 3, 5, $\frac{1}{2}$; dd. 1, 3, 4, 5, $\frac{1}{2}$; ee. 2, 4, 5, 6, $\frac{1}{2}$; ff. 2, 4 + 5, 6, $\frac{1}{2}$; gg. 2, 3, 4, 5, $\frac{1}{2}$ (*arenaria*, Sajo); hh. 3, 4, 5, 6, $\frac{1}{2}$ (*biconstellata*, Sajo) . . . v. *carpini*, Fourcroy."

As regards this group:—aa. = type form; bb. = ab. *angulosa*, Ws. (1879); cc. = ab. *simplex*, Ws. (1879); dd. = ab. *campestris*, Ws. (1879); ee. = ab. *basilaris*, Ws. (1879); ff. = ab. *weisei*, mihi; gg. = ab. *arenaria*, Sajo (1881) and hh. = ab. 9-*punctata*, Haw. (1812) and has priority over ab. *biconstellata*, Sajo (1881).

This aberration differs from ab. *basilaris*, Ws. (1879) f. nn. and (1885) e.ee. in the confluence of spots 4 and 5.

Formula: 2, 4 + 5, 6, $\frac{1}{2}$.

11. ab. *thompsoni*, n.ab.

This aberration has in addition to the isolate spots 2, 5, and $\frac{1}{2}$, the unique confluence of spots 4 and 6.

Type in the general collection at the Nat. Hist. Museum, S. Kensington (1904, 229).

Taken by Mr. F. M. Thompson (July, 1902) at Tientsin.

Formula: 2, 4 + 6, 5, $\frac{1}{2}$.

12. ab. 9-*punctata*, Haworth. *Trans. Ent. Soc. Lond.* I. 275 6, 10. Y. (1812).

> "10. *C.* 7-*notata* . . . . . γ. 9-*punctata*. Coleoptris punctis parvis novem. viz. uno communi, caeteris duplo majore, altero minuto ante medium, singulo elytro, suturam versus, tribusque posticis triangulatim positis parvis. Caput flavum vertice nigro, thorax margine

antico lateribusque albidis disco triradiatim albido. Communicavit ejus captor. Rev. J. Burrell. Varietas rarissima."

Sajo in describing his ab. *biconstellata* in *Ent. Nachr.* 273. 3. (1881) as under:—

"3. var. *biconstellata*, mihi—Flügdd. mit 9 Punkten: 3, 4, 5, 6, $\frac{1}{2}$.

appears to have been unaware of Haworth's earlier name for this aberration and consequently ab. *biconstellata*, Sajo sinks as a synonym.

Taken by Mr. H. St. J. K. Donisthorpe (1920) at Barton Mills.

Formula: 3, 4, 5, 6, $\frac{1}{2}$.

13. ab. *julii*, n.ab.

This aberration, which differ only from ab. *relax*, Ws. (1879) in the confluence of spots 4 and 5, is first mentioned by Weise (1885) in his omnibus group of ab. *neglecta*, Ws. (1879) and for reference I append an extract of this group:—

"f. Fld. mit 11 P. aa. 1, 3, 4, 5, 6, $\frac{1}{2}$ (*neglecta*, Ws.); bb. 1, 3, 4 + 5, 6, $\frac{1}{2}$; cc. 1, 2, 4, 5, 6, $\frac{1}{2}$; dd. 1, 2, 4 + 5, 6, $\frac{1}{2}$; ee. 2, 3, 4, 5, 6, $\frac{1}{2}$; ff. 2, 3, 4 + 5, 6, $\frac{1}{2}$ . . . . v. *neglecta*, Weise."

Of this group:—aa. = ab. *neglecta*, Ws. (1879); bb. = ab. *abbreviata*, Ws. (1879); cc. = ab. *relax*, Ws. (1879); dd. = ab. *julii*, mihi; ee. = ab. *undecimpunctata*, Schrank (1781) and ff. = ab. *erertsi*, mihi (1922).

Formula: 1, 2, 4 + 5, 6, $\frac{1}{2}$.

14. ab. *erertsi*, n.ab.

This is the aberration ff. of Weise's (1885) group of f. wrongly grouped under ab. *neglecta*, Ws., where it cannot be left.

It is in fact in the spots 4 and 5 a confluent form of ab. *undecimpunctata*, Schrank.

Formula: 2, 3, 4 + 5, 6, $\frac{1}{2}$.

15. ab. *lunetta*, n.ab.

This aberration with thirteen spots has two confluences, *viz.*, $3+\frac{1}{2}$, and 5 + 4 + 6, the latter confluence being so far as I know quite unique, and the inverse of ab. *bearei*, mihi.

In form this latter confluence resembles the "merry-thought" of a fowl, and I have therefore ventured to give it the name of "*lunetta*," after "lunette," the French for "merry-thought."

Taken at Tientsin by Mr. F. M. Thompson, in July, 1902.

Type in General Collection of the Nat. Hist. Museum, S. Kensington (1904, 229).

Formula: 1, 2, 3 + $\frac{1}{2}$, 5 + 4 + 6.

16. ab. *comma*, n.ab.

This aberration has also thirteen spots, with Nos. 1 and 3 confluent in the shape of a comma, hence its name. Spots 4, 5 and 6 are unformly large.

Taken at Njoro, B.E.A., by Mr. T. J. Anderson.

Type in General Collection of the Nat. Hist. Museum, S. Kensington (1911, 384).

Formula: 1 + 3, 2, 4, 5, 6, $\frac{1}{2}$.

17. ab. *andersoni*, n.ab.

This is a very remarkable aberration by reason of the extensive confluence of spots 3 + 1 + 2 + 4 + 5, the only isolate spot being No. 6, which is large. The scutellar spot is present.

Also taken at Njoro, B.E.A., by Mr. T. J. Anderson.

Type in General Collection of the Nat. Hist. Museum, S. Kensington (1911, 384).

Formula: 3 + 1 + 2 + 4 + 5, 6, $\frac{1}{2}$.

18. ab. *blairi*, n.ab.

This aberration with thirteen spots is a very striking one, in view as well of the two bold confluences of spots 2 + 1 + 3 and 4 + 5, as of its entirely black thorax. In this latter respect it is, so far as I can trace, unique, and the antithesis of ab. *albicollis*, Chobaut, with its white thorax.

In this aberration the only isolate spots are Nos. 6 and $\frac{1}{2}$.

I have with his permission named this aberration after Mr. K. G. Blair, B.Sc., F.E.S., of the Natural History Museum, S. Kensington, as a slight acknowledgment of his invaluable help, while I have been working at the Museum on this species.

Taken at Njoro, B.E.A., by Mr. T. J. Anderson.

Type in General Collection of the Nat. Hist. Museum, S. Kensington (1911, 384).

Formula: 2 + 1 + 3, 4 + 5, 6, $\frac{1}{2}$.

Somatic Mosaics in Lepidoptera.

By E. A. COCKAYNE, M.D., F.E.S.

In August, 1917, Mr. H. B. Williams obtained a pupa of *Vanessa io*, L., at Holmwood, the two sides of which were different in colour. He has kindly given me the pupa-case, the imago, which emerged from it, and a photograph he took before emergence. The division between the two colours is quite sharp and runs exactly along the middle line. The pupal skin of the right side is darker in colour and covered with a fine dark reticular pattern, that of the left side is pale and only shows faint indications of the reticular pattern; the dorsal spines of the right side are deeply pigmented down to their bases, those of the left are only pigmented at the tip. The imago which emerged appeared to be a female, and the wings showed no difference in colour or pattern on the two sides. Its only abnormality was a slight crumpling of the posterior border. The palpi and antennæ were of equal length.

Dissection of the dried abdomen was fairly successful. Both ovaries were identified, as were the cement glands, the ductus bursæ and the bursa copulatrix. The spermatheca were broken. The external genitalia were normal and female. There was no contrast in the surroundings, in which the larva pupated, nor do I know of any evidence that in a larva susceptible to its surroundings during pupation a dark background on one side and a light one on the other will produce a difference in colour on the two sides of the pupa.

I think it belongs to the group which I described in the *Journal of Genetics*, 1915, v., p. 87, under the name "Heterochroism." Had the species been a more variable one the imago also might have shown a difference in colour on the two sides.

The only example in the literature in which heterochroism was noticed in the larva, pupa, and imago, is the one described by Oertel in *Chaerocampa elpenor*, L. The larva was dark brown on one side and bright green on the other, and the pupa and imago were dark (dunkel) on one side and light (hell) on the other. The division was sharp and down the middle line. Unfortunately the sex is not mentioned. (*Intern. Ent. Zeitschr.* Guben, 1910-1911, iv., pp. 48 and 49.)

In the case of imagines a good many examples have been recorded, and in some of these it is known that the colour of one side is a Mendelian dominant to that of the other. The following list gives all the examples I can collect, and since most of them are indexed as aberrations the references may be useful.

Psilura monacha, L., female. Left side typical, right side ab. *eremita*, O. Thorax and abdomen halved. Bad Elmen, Magdeburg. (*Berl. Ent. Zeitschr.* 1911, lvi., p. (29).)

Psilura monacha, L., female. Left side typical, right side ab. *eremita*. Thorax and abdomen quite black except for a white shoulder tuft on the left side. Left antenna thicker. (Stichel., *Zeitschr. f. Wiss. Insektbiol.* 1912, viii., p. 41, fig.)

Aglia tau, L., female. Left side typical, right side var. *lugens*, Stndfs. Thorax and abdomen half typical, half melanic. Bred by Hartmann, 1887. (*Berl. Ent. Zeitschr.*, 1888, xxxii., p. 239.)

The melanic forms of these species are Mendelian dominants.

Colias croceus, Fourcr. (*edusa*, F.), female. Right side ab. *helice*, Hbn., left side typical. (*Entomologist*, 1878, p. 49, coloured plate.)

Colias croceus, Fourcr. (*edusa*, F.), female. Right side typical, left ab. *helice*, Hbn. Mrs. Hemming. Shown at the South Lond. Ent. and N. H. Soc. (*Proceed.*, 1912-13, p. 126.)

Colias philodice, Godart, female. Left side typical, right side the white form but smaller and misshapen. (*Psyche*, 1904, ii., p. 113, plate x.)

Dryas paphia, L., female. Right side typical, left side ab. *valesina*, Esp. J. A. Clark coll. (*Ent. Record*, 1910, xxii., p. 20.) A doubtful example.

C. croceus and ab. *helice*, and *Dryas paphia* and ab. *valesina*, breed on Mendelian lines, the aberrational forms being dominants.

Mimas tiliae, L., female. Sharply divided into two colours down the middle line of the head, thorax and abdomen, the right side being of the green colour of the type, the left the red-brown of ab. *brunnea*, Bartel. *Soc. Ent.*, Zurich, 1895-1896, x., no. 23, p. 182.)

The brown ab. *brunnea*, is a simple Mendelian recessive to the green form.

Seven females and two males of *M. tiliae* have been recorded with the forewings differing on the two sides, the spotless form, var. *centripuncta*, Clark, var. *costipuncta*, Clark, var. *transversa*, Tutt, and the typical form being represented. I have seen two of these, a male and a female, which are clearly examples of pathological asymmetry, probably due to injury. The others were most likely produced in the same way. (*Ent. Mitt.*, 1917, vi., p. 199; *Illustr. Zeitschr. f. Ent.*, 1900, v., p. 72; *Proc. South Lond. Ent. and N. H. Soc.*, 1912, p. 80.)

Thecetra pavonia, L. Sex not mentioned. Right side of the normal southern coloration, left side of the unicolorous yellow shade often seen in northern specimens. (G. C. Hodgson, *Ent. Record*, 1907, xix., p. 243, and *Trans. City of Lond. Ent. Soc.*, 1907, p. 9.)

Acronicta leporina, L. Sex not mentioned. Left side typical, right var. *bradyporina*, Tr. Thorax and abdomen exactly halved. (Bond, *Proc. Ent. Soc. Lond.*, 1872, p. x.)

Jaspidea celsia, L. Sex not mentioned and impossible to determine from figure. Left side typical, right ab. *inritata*, Schultz. (*Allg. Zeitschr. f. Ent.*, 1901, vi., p. 184, pl. fig. 6.)

Noctua (*Triphaena*) *pronuba*, L. Sex not mentioned. Right side typical, left side var. *innubia*, Tr. Blagg says the right forewing was mottled with dark brown, and the thorax was dark with a pale collar, the left side was light reddish-yellow. Division between the two colours was exactly down the middle line of the thorax. (*Entomologist*, 1893, xxvi., p. 250.)

It is also described by South (*Proc. Ent. Soc. Lond.*, 1893, p. xxxii.) and by Barrett, who says one side was dark brown, the other a pale slaty grey (*Brit. Lepidopt.*, vol. iv., p. 26). It was taken by Blagg and Woodforde in Dovedale, Derbyshire.

Lithocolletis concomitella, Bankes. Sex not mentioned. Left side nearly typical, right side var. *detherella*. Both forms occur in the locality in which it was taken. (Sich, *Ent. Record*, 1909, xxi., p. 87.)

Spilosoma menthastri, Esp. Left side ab. *walkeri*, Curtis, right side typical. The figure shows it to be a male. (*Entomologist*, 1909, xlii., p. 224, fig.)

Spilosoma menthastri, Esp. Left side ab. *walkeri*, right side typical. Reichert, Leipzig. (*Iris*, 1905-1906, xviii., Taf. ii., fig. 14.) The figure shows that it is a male.

Spilosoma menthastri, Esp. Female. Left side approaching ab. *walkeri*, right side typical. Maddison coll. (Oberthür. *Études. Lep. Comp.*, 1912, vi., pl. cxxii., fig. 1082.) A similar specimen was in the Robertson collection.

Papilio glaucus, L., female. Coalburgh. Left side the black mimetic form (*glaucus*, L.), right side black and yellow like the male (*turnus*, L.). Abdomen with left half black. (Edwards, *Butterflies of North America*, 1884, vol. ii., pl. v., fig. 4.)

Papilio polyxenes, Fab., female. Right side with the big yellow spots on the forewing and continuous yellow band and very little blue on the hindwing, like the common form in the male. Left side with small pale cream spots on the forewing, interrupted band of spots and broad blue band on the hindwing; the black mimetic form of female. (Ibid, pl. xi., fig. 1.) Edwards calls these biformed females.

Apatura iris, L. Right side typical, left side ab. *iole*, Schiff. Sex not mentioned. Budapest. (*Berl. Ent. Zeitschr.*, 1911, lvi., p. (4).)

Apatura iris, L., male. Right side ab. *transtennata*, Cabeau, left side ab. *deschanqei*, Cabeau. Virton, July 24th, 1916. (*Rev. Ent. Soc. Namuroise*, 1919, p. 7.)

Apatura ilia, Schiff., ab. *hemisilvia*, Cabeau. Right side with ground colour black with white spots (typical), left side rich fawn colour (ab. *silvia*, Cabeau), the three apical spots on the forewing white, the others pale fawn. The violet reflection less pronounced on the wings of the left side. On the underside the colour of the right side is typical, that of the left ab. *silvia*. It is a male with no sign of hermaphroditism. The specimen is badly chipped on the left side. (*Rev. Ent. Soc. Namuroise*, 1912, pp. 87-88, pl. i.)

Abraxas grossulariata, L., female. Left side black with a few mar-

ginal white streaks (near ab. *nigra*, Raynor), right side typical. Thorax and abdomen perfectly halved. The inheritance of ab. *nigra* does not seem to be a simple Mendelian one. This halved example was bred by R. Tait, jun. (*Journal of Genetics*, 1915, v., p. 87, pl. xxi., fig. 2.)

Cabera pusaria, L. Sex not mentioned. One side typical, the other var. *rotundaria*, Haw. Both typical specimens, and those of the variety were bred at the same time as this abnormal one. (*Proc. South Lond. Ent. and N. H. Soc.*, 1891, p. 137.)

Arctia caia, L. Left side typical, right side melanic with both wings completely brownish black, ab. *obscura*, Cockerell. Bred from a Huddersfield larva. (Mosley, *Varieties of British Lepidoptera, Chelonia*, pl. vi., fig. 3.) From the figure this appears to be a female.

Arctia caia, L., female. A similar specimen in the Wiskott collection. (Standfuss, *Handbuch Paläarkt. Gross. Schmett*, p. 206.)

Arctia caia, L. Left side typical, right side melanic, ab. *obscura*, except for a small patch of typical colour at the apex of the hindwing. Tring Museum. The melanic ab. *obscura* is well known, but rare.

Arctia caia, L., female. Right forewing much whiter than left. Right hindwing with the dark spots feebly marked and confusedly united with one another, approximating to var. *confluens*, Rbl. Left side normal. Frings, 1897, Bonn. (*Illustr. Zeitschr. f. Ent.*, 1900, v., p. 73.)

Arctia villica, L., female. Right side normal, left with all the black markings replaced by creamy white, hindwing of the usual rich yellow, but with the black markings not quite like those of the other side. Thorax with right half black, left half creamy white. (O. Schultz, *Ent. Zeitschr*, Stuttgart, 1906-1907, xx., p. 26.)

Arctia villica, L., female. Right side typical, left forewing all yellowish except for a black stripe along the costa, a black discal spot, and black spotted fringe. Left hindwing yellow all over, except for a black fringe at apex. Base of left antenna yellow, femora and tarsi of second and third legs yellow. Abdominal spots on left side paler and fewer. The aberrant side is near ab. *illustris*, Schultz. (*Berl. Ent. Zeitschr*, 1888, xxxii., p. 495, Taf. vii.; and *Ent. Zeitschr*, Guben., 1904, xviii. p. 114.) Specimens of *villica* with both sides resembling the aberrant side of these two are known, but are very rare. Their pale colour is not due to absence of pigment or defect of scales.

Zygæna filipendulæ, L. Right side typical, left with spots united and forming three wedge-shaped blotches, ab. *trivittata*, Tutt. (Tutt, *Brit. Lepidopt.*, vol. i., p. 509.) Sex not mentioned.

Z. filipendulæ, L. Right side typical, left with all the spots confluent (? ab. *conjuncta*, Tutt). V. E. Shaw, Dover, 1910. (*Trans. City of Lond. Ent. Soc.*, 1911, p. 5.) The sex is not recorded, but I have examined the specimen with a microscope, and the shape and size of abdomen and the external genitalia are female. The wings on the two sides are equal and perfect. Confluent aberrations are not very rare at Dover.

Z. filipendulæ, L. Confluent on left forewing only. Sex not mentioned. Joicey coll. (*Entomologist*, 1917, L., p. 45.)

Z. loniceræ, Scheven. Spots on left forewing confluent, separated on right. Sex not mentioned. (Oberthür, *Études. Lep. Comp.*, 1910, v., p. 514; and Tutt, *Brit. Lepidopt.*, vol. i., p. 469.) Confluent aberrations are uncommon in this species.

Z. trifolii, Esp., male. Right side typical, left ab. *minoides*, Selys., with spots confluent. The specimen, which has well-formed valves on each side, was in Mr. Bright's collection. (*Entomologist*, 1909, xlii., p. 224, fig.)

Z. trifolii, Esp., female. Right side typical, left with spots 3, 4, and 5 confluent, and 3 nearly confluent with 1 and 2. (Ibid.)

Syntomis phegea, L., female. Left forewing with five white spots, right forewing with three spots. (O. Schultz, *Illustr. Zeitschr. f. Ent.*, 1900, v., p. 72.)

Pieris napi, L., male. Right forewing with a black middle spot, which is not present on the left. Not a gynandromorph. Cologne. (O. Schultz, *Illustr. Wochenschr. f. Ent.*, 1899, iv., p. 309.)

Chrysophanus (*Rumicia*) *hippothoë*, Bdv., male. Left side typical, right side var. *fasciata*, Streck. (*Psyche*, 1907, p. 89, fig.)

Vanessa io, L. Sex not mentioned. Right side typical *io*, left side ab. *antigone*, Fischer. (E. Irmscher, *Illustr. Zeitschr. f. Ent.*, 1899, iv., p. 314.) Irmscher states that it was bred and compares the aberrant side with the figure of *antigone* given by Fischer, ibid, fig. 68. This aberration has been produced by exposing pupæ to cold.

Euranessa antiopa, L., ab. *hygiea*, Heydr. Both wings on the left side with a broader yellow border than on the right. Two small blue spots present on the right hindwing, the spots are entirely supplanted on the left by a broader border. Sex not given. Schlesien. (O. Schultz, *Illustr. Wochenschr. f. Ent.*, 1899, iv., p. 310.) The ab. *hygiea* is sometimes produced by cold, but like the other cold forms met with in *Vanessida* is sometimes captured wild or bred under normal conditions. Possibly specimens which can produce the aberrational form differ genetically from the others, but usually require abnormal external conditions in order to show it.

Aglais urtica, L. Left side melanic, right side normal. Examples wholly normal, and two wholly melanic appeared in the same brood. E. Joy, Folkestone. (*Proc. South Lond. Ent. and N. H. Soc.*, 1887, p. 71.) Mr. Joy has kindly lent these to me for examination. The "melanic" ones are the semitransparent violaceous form, and the asymmetrical one is a female with the fulvous colour of the left side, and part of that in the right hindwing dull violet and semitransparent. The fulvous scales are twisted up into a tight spiral and look almost like hairs. There was a similar specimen in the Percy Richards collection, with the left side normal and the right side dull brown. These cannot be regarded as somatic mutations.

Callophrys rubi, L., male. Right hindwing underside ab. *immaculata*, Fuchs., left typical. (*Illustr. Wochenschr. f. Ent.*, 1899, iv., p. 309.)

Polyommatus icarus, Rott., male. Left side typical, right ab. *obsoleta*, Clark. (Sabine, *Entomologist*, 1887, xx., p. 288.) Other less striking examples in *Lycænidæ*, with one side partially obsolete or striated, have been described, but it is doubtful whether these forms are not pathological. They are often associated with undoubted pathological defects.

Agriades coridon, Poda, female. Right side larger than left, but both well formed. Right side ab. *aurantia*, Tutt, on upper side, and ab. *parisiensis*, Gerh., on underside. Left side typical. Royston. (*Journ. of Genetics*, 1915, v., p. 90, pl. xxii., figs. 11 and 12.)

A. coridon, female. Wings on left smaller with some blue scales on upperside and nearly obsolete on underside. Wings on right larger, quite brown above, and with larger spots on underside. Leeds, Royston, 1915.

Polyommatus icarus, Rott., ab. *biformis*, Tutt. The upper surface of the right side a beautiful blue *icarus* colour, bearing a row of marginal black spots, inwardly edged with red on both fore- and hindwings. The left side of ordinary female colour with orange marginal band well developed. The ground colour of the right underside a lighter brownish grey than is usual in a female, that of the left side a more typical brownish grey. Captured at Hochstedt, near Hanau, 1904. It was described originally as a gynandromorph. Tutt considers it to be a female, but gives no reason for this. No description states that the wings are equal in size, or that the blue is distributed as in a blue female, and most important of all no mention is made of the absence of androconia. (*Soc. Ent.*, Zurich, 1905, xx., p. 132; *Ent. Zeitschr*, Guben, 1906, xx., p. 157; Tutt, *Brit. Butt.*, vol. i., p. 148.)

Plebeius argus, L. (*aegon*, Schiff.), ab. *duplex*, Cockerell. The wings on the right side brown, those on the left strongly shaded with blue. Both sides equal in size. According to Tutt this was not a gynandromorph, but a female showing a different form of female colouring on each side. Again no mention is made of androconia or of the distribution of the blue scales. It was taken in the New Forest, where intersexes are found. (Bond, *Ent. Month. Mag.*, 1872-1873, ix., p. 200; *Entomologist*, 1889, xxii., p. 6; Tutt, *Brit. Lepidopt.*, vol. x., p. 188.)

Plebeius argus. This year I took a specimen which can be referred to ab. *duplex*. On the right side the wings are brown except for a very few blue scales at the extreme base. On the left side the forewing has a splash of blue at the base, and scattered blue scales running out to the marginal area, the hindwing is heavily marked with blue, which extends to the outer lunules. The blue scales are serrated like those of a female, and no androconia are present. The wings are equal in size, and the underside and abdomen are female. (*Trans. Ent. Soc. Lond.*, 1922, plt. vii., fig. 2.)

Agriades coridon, Poda, female. The right side is lightly sprinkled with blue scales at the base, extending out beyond the disc on the forewing and hindwing. The right hindwing has tiny blue wedges internal to the lunules. The left side is heavily sprinkled with blue, extending out beyond the discal area in the forewing. The left hindwing is so blue that it approaches ab. *semisyngrapha*, and has large blue wedges internal to the first lunules, but posterior to nervure 3 it is all blue. No androconia or coarse hair-scales are present. The wings are equal in size, the underside, ab. *parisiensis*, Gerh., on both sides, and the abdomen, are female. L. W. Newman, Royston, 1920. I am told that two other similar specimens were taken in the same locality in 1921.

Agriades coridon. Three examples were captured at Royston in 1920, females with the wings on one side brown, and on the other resembling ab. *syngrapha*, Kefers., but of a deeper blue. I think these are really extreme forms of ab. *inaequalis*, Tutt, and are probably a form of intersex, although they do not possess androconia. It is unlikely that they are somatic mosaics, half type, half ab. *syngrapha*, because only one completely blue female has been recorded from Roys-

ton. This was the same tint as these half blue specimens and may be a completely blue intersex genetically quite different from *syngrapha*.

Ennomos hybrid *winni*, Harrison (*subsignaria* ♂ + *quercinaria* ♀). A male showed on the left side the usual mixed characters of both parents, but on the right those of the male parent *subsignaria*. Even in the external genitalia the division was apparent. (Harrison, *Entomologist*, 1916, xlix., pp. 53 and 59, fig. 8.)

The specimens of *Syntomis phegea* and *Acidalia virgularia*, included in my former list, were gynandromorphs, and ought to have been included in the list of gynandromorphs showing a division into typical and varietal or aberrational colour, as well as into male and female characters.

Morgan discusses the origin of these heterochroic specimens, which he calls somatic mosaics. This name is a better one, because it includes mosaics of different structures as well as those of different colours and patterns. He states that they may arise in three different ways. Firstly by the elimination of an autosomal chromosome, as opposed to a sex chromosome, the elimination of which produces a gynandromorph. This elimination must take place at the first cell division of the fertilised ovum, in cases in which the halving is perfect, at a later one, where the distribution of the mosaic is unequal. Secondly, by the fertilisation of a binucleate ovum, an event which Doncaster has proved to occur. Thirdly, by a recessive somatic mutation in a sex chromosome.

If elimination of an autosomal chromosome were as common as that of a sex chromosome, these mosaics of colour alone would be as common as mosaics of colour combined with sex, mosaic or heterochroic gynandromorphs. As a matter of fact they are much rarer, but this may be explained by the way in which the sex chromosome lags behind during cell division. Loss of an autosomal chromosome is thought to be incompatible with life, but there is no evidence that loss of one such chromosome in half the cells of the body would be fatal, even if loss in all the cells would be. In the insects under discussion half the cells would have their full complement of chromosomes.

In any case this theory will not explain cases in which the somatic factor in question is carried by the sex chromosome. It excludes those in which a mosaic of the same somatic characters is known both alone and associated with gynandromorphism, such as the ones occurring in *Colias*, *Dryas*, *Papilio*, *Psilura*, *Aglia* and *Zygaena*, unless these gynandromorphs are produced in the unusual way from binucleate eggs.

The great majority of gynandromorphs in *Drosophila* have been proved to be due to the elimination of a sex chromosome. If all somatic mosaics arise from binucleate eggs their number should not exceed that of gynandromorphs with the same origin, but the number is considerably greater. Some may be due to this cause, but it is unlikely that all are produced from binucleate eggs.

Morgan considers this to be the origin of one example of a mosaic of somatic without sexual characters, which appeared in a female *Drosophila*, but admits that loss of an autosomal chromosome explains it equally well.

The third theory is that of somatic mutation. If a somatic mutation occurs in only one chromosome of a pair, as it seems to do in germ

cells, the immediate result will not be seen except in the case of a dominant mutation, but there is evidence that these are much rarer recessive ones. But if a recessive mutation should take place in the sex chromosome of *Drosophila* it would show at once in a male in those parts of the body, of which the cells contained the mutant gene, because the male has only one × (sex) chromosome. Should a recessive mutation occur in one × chromosome in the female its effect would not be apparent, because there are two × chromosomes in the female, and the normal allelomorph in the other would conceal it. From this it will be seen that on the first two theories an equality of the sexes is to be expected in somatic mosaics, whereas on the theory of somatic mutation they should all be males in the case of *Drosophila*. Actually ten were males out of twelve. One of the females I have mentioned above, the other is a complex case, and to have produced it an additional abnormality must have taken place. Morgan discusses it very fully on page 69.

In the case of Lepidoptera a recessive mutation in one sex chromosome would be apparent only in the soma of the female, because it is the female in the order, which is heterozygous for sex, and has a single × chromosome, whereas the male is homozygous for sex and has two. Thus in a male a recessive mutation in one × chromosome would be concealed as in the female *Drosophila*, and cause no effect on the outward appearance of the insect.

In a female, if it occurred at the first cell division of the ovum, in one of the daughter cells it would produce an equally divided somatic mosaic.

The proportion of the sexes in somatic mosaics in Lepidoptera is very important, a fact which I did not realise when I published the list in the Journal of Genetics. In the present more complete list I have given the sex whenever it was possible.

It contains in all 38 females, 12 males, and 15 in which the sex is uncertain. If we omit the seven female and the two male *M. tiliae*, probably due to injury, and the pathological *A. urticae* and the male hybrid *icinni*, we have left 30 females and 9 males. Omitting the three probable intersexes of *coridon* and the five females of *coridon* and *argus*, 22 females and 9 males remain. Of these a higher proportion of males than of females are doubtful examples, and the preponderance of females is understated rather than overstated. This is in favour of the explanation that a number are due to a recessive mutation of the sex chromosome of one of the daughter cells, formed by the first division of the fertilised ovum. The true somatic mosaics in males must be due to elimination of an autosomal chromosome or fertilisation of a binucleate ovum, or to some still more uncommon cause, as in the hybrid *icinni*. And since these causes are as likely to produce mosaic females as males, an equal number of females are probably due to one or other of them.

It must be admitted that all the examples of a mosaic known to be due to Mendelian factors are female, but this is probably because we know so little of the inheritance of colour in Lepidoptera. Asymmetry due to some pathological condition attributable to environment and unconnected with heredity may explain some males, but I feel sure that others, for instance the male *Apatura ilia*, are somatic mosaics.

In addition to the high proportion of females, which supports the theory of somatic mutation, Morgan brings forward another argument. He says that some of these aberrations are so rare that the chance of their appearance in coincidence with chromosome elimination, itself a rare phenomenon, is very remote.

It is true that *Arctia caia* ab. *obscura*, the creamy aberrations of *A. villica* and *Abraxas grossulariata* ab. *nigra* are very rare, but the majority of the varietal or aberrational forms, which are present on one side of these mosaics are fairly common locally. In the case of some of the captured specimens both forms are known to occur in the locality, from which they came, and in the case of some of the bred ones it is stated that they were bred from a strain in which the aberrational form was known to occur. In these the origin from a binucleate egg, or even by loss of a chromosome, seems more probable than by a fresh mutation.

The *coridon* and *argus* are omitted from my final count, because they all come from localities where asymmetrical intersexes are found. The intersexes are most likely due to some abnormal arrangement of chromosomes and these apparent somatic mosaics may arise in none of the three ways suggested. Harrison's hybrid *Ennomos* cannot be explained by any of the three theories discussed above. He himself regarded it as due to the entry into one ovum of two spermatozoa, one of which conjugated with the ovum and produced the side with hybrid characters, while the other developed alone and produced the side with characters like *subsignaria*. Morgan points out that this explanation is untenable, because the single nucleus with its one × chromosome would produce female parts, although they would be pure *subsignaria*.

Fertilisation of an egg with two nuclei would not explain the absence of *quercinaria* characters on one side. Morgan's suggestion that two or more spermatozoa entered an egg and fused and then gave rise to the side with purely paternal characters explains this fact and also accounts for the sex being male, because in that case more than one × chromosome would be present in every cell.

It is, however, highly speculative, and I do not know of any cytological evidence to support it.

T. H. Morgan and C. B. Bridges: *The Origin of Gynandromorphs*. Carnegie Institution of Washington. Publication No. 278, pp. 26-32, p. 69 and p. 93.

California in October and December.

By G. B. PEARSON.

I have just got back from my fourth visit to Palm Spring this year. My friends are always enthusiastic about this part of the country, with always the chance of getting something rare. We visited there in October from 15th to 18th. My younger and more agile friends went to a canyon five miles away and one of them secured nearly a hundred of the rather rare *Synchloë californica* and a number of *Catephelis borealis*, also rather rare. The common butterfly was *Anosia strigosa*. It was flying before sunrise, probably then it was startled. They were feeding on the flowers of a small desert tree and were easily

caught. Some twenty-four miles further south, at Indis, we caught on a patch of alfalfa a few *Lemonias palmeri*, a scarce thing, and also saw *Anosia plexippus* [*archippus*], *Colias eurytheme*, *Terias nicippe*, many *Dione vanillae*, a number of "skippers," *Pyrameis cardui*, *P. huntera*, *P. caryae*, and a few of the smaller *Lycaenidae*. A specimen of that lovely blue-black *Atlides halesus* I just failed to capture. While there we visited a date factory and orchard, where we saw the process of date culture, from the "cradle to the grave" as it were. There were over 2,000 trees in bearing, each with about 50 lbs. on them. Selling as they do here at 50 cents a lb. I should fancy there would be a handsome profit.

On this trip (December) we only spent from Saturday night until Monday morning. Four of us slept under the stars and two occupied a small shack. About three a.m. I was aroused by an overpowering smell and then heard my friends inside laughing. When we came to sum up we found that a skunk had forced his way into the cabin, presumably after the chicken, which formed part of the provisions. Anyhow he was disturbed and promptly went but left his card behind him. It was not so bad as it might have been, but was bad enough and made it uncomfortable for all that Sunday. We were surprised to learn of a skunk being able to pick up enough nourishment in such a dry locality, as where we were was right in the desert. All that day we were collecting, but considering it was December 11th there was not much about. Strange to me was the fact of so many *A. strigosa* still being about; a few I caught were in excellent condition, some were badly battered; one pair I caught in coitû. I presume it may hibernate there although when we were there in the March previously we saw no signs of it. I do not know its food plant and I do not see where it can feed, the trees seem to be all limbs and tiny grey shrivelled looking leaves. The only flowers that were out were of the sand verbena (and the small flowering trees) that was scattered in patches for miles. The temperature in the daytime was about 80° and at night about 50°.

We have not had any rain now for about two months and the hose is in constant use, and even with that I cannot prevent my lawn being scorched. For an easterner these are really glorious days, a brilliant sun in an Italian blue sky ad infinitum apparently. I have just noticed (December 14th) in my garden now, one *Euranessa antiopa*, one *Pyrameis cardui*, two *Terias nicippe*, one *Pieris rapae*, one *P. protodice*, one *Hesperia tessellata*, one *Colias eurytheme*, a few bees and grasshoppers, one humming-bird, a few linnets (Californian), and two mocking-birds. Hollyhocks, antirrhinums, petunias, portulacca, verbena, sweet peas, stocks, sunflowers, nasturtiums, candytuft and roses everywhere, all just coming into full bloom. The dahlias succumbed to a frost a few weeks ago.

I wished I could send you some of the barrel cactus [*Echinocactus wislizeni*] that I saw on Sunday, great fellows five feet high. Frost does not occur where they grow, nor snow.

NOTES ON COLLECTING, Etc.

COLEOPTERA RECORDS.—*Cassida murraea*. Four specimens were taken flying, one in Barnstaple and three on Braunton Burrows

(Devon), on May 6th. 1922. *Cassida nobilis*. One was taken at the latter locality on May 13th, 1922.—R. Beck, 87, Pilton Street, Barnstaple.

D. livornica: an early visitor.—I took in my garden here, May 13th, a very fine specimen of *Deilephila livornica*, hovering at dusk over the flower of the large Saxifrage (*Megalea cardifolia*). It was a very cold evening, and this moth is the first one of any kind that I have taken this year. I have never taken it or seen it in this district previously.—R. Barnard Cruickshank, Alverstoke, Hants., *May 16th*, 1922.

CURRENT NOTES AND SHORT NOTICES.

The Mosquito Investigation Committee of the South-Eastern Union is very actively continuing its investigation of *Anopheles plumbeus*. They have forwarded another Report to the Ministry of Health in reply to the queries as to the results of the investigations carried on by various field workers in the S.-E. area of England. Even dry as the summer period was, many water-holes in trees remained sufficiently moist, or even retained water enough to allow the larvæ to resist the influence of the general drought.

Correspondents have written asking where a list could be obtained containing the varietal, aberrational, and racial names which the intensive study of variation in our common species of Rhopalocera is making more or less necessary. This we hope shortly to print in our pages. It is being compiled by Dr. Verity and Signor Querci, and will we understand give the reference of the original description, and also the locality from which the described species or form was brought. No doubt this will be a great help to students of variation, save a deal of time spent in research, and of a certainty obviate much duplication of names.

We are glad to find an awakening of Entomology in Poland; may the study of it increase in that little known area. M. Tenebaum, of Warsaw, has sent us two separata of articles of which he is the author. (1) Contains a description of a new Coleopteron from the island of Crabrera (Balearic Isles), *viz.*, *Colotes cabrerensis*, with a figure of the imago; it is written in French and Polish. (2) Contains an annotated list of the Rhynchota of the Warsaw area comprising some 194 species, with dates and localities. This latter is in Polish alone.

Prof. T. D. A. Cockerell, of Colorado, has contributed a series of articles on the "Fossil Arthropods in the British Museum," to the *Annals and Magazine of Natural History*. We have just received from him copies of parts vi. and vii., both containing accounts of the "Oligocene Insects from Gurnet Bay, Isle of Wight," with figures of practically all the species mentioned. Copies of these notes may possibly be obtained by those interested on applying to the London Societies, to whom the author has sent a number for distribution.

Among the deaths of entomologists recently recorded are those of Prof. Gilbert Storey, F.E.S., at the early age of 31, the entomologist of the Department of Agriculture at Cairo, V. R. Perkins, of Wootton-under-Edge, an ex-president of the South London Entomological Society, who had reached the advanced age of 91, and Hans Fruhs-

torfer, after an operation at Munich, whose addition of thousands of new names to our lists will not cease to give trouble to all systematists and students of racial distribution.

The South London Entomological Society propose to celebrate its Jubilee this year by a Pocket-box Exhibition, to be followed by a Supper, after the manner of the Verrall Supper. A committee is to be appointed and arrangements will be made to carry the proposal into effect in the autumn.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.

February 1st, 1922.—The President announced the Vice-Presidents for the ensuing year to be Mr. R. Adkin, Mr. E. C. Bedwell, and Professor E. B. Poulton, D.Sc., F.R.S., etc.

The Treasurer read a letter from the Hon. N. C. Rothschild, announcing the death of Mr. W. Purdey, of Thanet Gardens, Folkestone, and a vote of condolence was passed to his relatives.

The Rev. F. D. Morice also gave a short account of the life of the late Mr. F. W. Sladen, who was accidentally drowned in Canada.

NEW FELLOWS.—Dr. R. E. McConnell, Arua, Uganda; H. T. Fernald, Ph.D., Professor of Entomology, Massachusetts Agricultural College, Amherst, Mass., U.S.A.; and Alfred Moore, M.D., 31, Alfred Place, South Kensington.

EXHIBITS.—The President, Mr. Sheldon, and Mr. Adkin, all brought for exhibition some remarkable series of *Cidaria truncata*, *C. citrata*, and *C. concinnata*.

The Rev. F. D. Morice made a short communication on the life-history of a British sawfly, *Pristiphora pallipes*, Lep.

Mr. H. J. Turner exhibited, on behalf of Mr. Thomas Greer, a series of aberrations of British Lepidoptera from Co. Tyrone.

Mr. Ashby exhibited some butterflies from Piedmont, Italy, and said that he considered the Val di San Bartelemi, close to Nus, to be one of the best collecting grounds in Northern Italy.

Mr. J. H. Durrant, on behalf of Dr. Gahan, exhibited some living examples of the Cassid beetle, *Aspidomorpha sanctaecrucis*, from India: the causes of the brilliant metallic coloration of this beetle were discussed by Mr. Arrow, and by Mr. Willoughby Ellis, and Dr. Neave commented on the habits of similar African species.

PAPER.—A paper by Mr. Martin E. Mosely was read on "Two new British species of *Hydroptila*."

March 1st.—NEW FELLOWS.—The following were elected Fellows of the Society:—Mrs. Margaret Rae, Courthill, Birkenhead; A. F. Rosa, M.D., 28, Pitt Street, Edinburgh; Mr. Frank Russell, F.G.S., Auldam House, Worksop; and Captain Francis Moysey, Suffolk Regiment, Talodi, Nuba Mountains, Sudan.

TREASURER'S ANNOUNCEMENTS.—The Treasurer made a statement on the Wicken Fen Fund. He called attention to the valuable work that is being done on this Nature Reserve, and made an appeal for contributions towards its maintenance. He also announced that the late Mr. G. A. J. Rothney had bequeathed the sum of £150 to the Society.

DECEASE OF A FELLOW.—The President announced the death of

Professor Geldart, and a vote of condolence with his relatives was passed.

EXHIBITS. Dr. Waterston exhibited a Brazilian bee, *Melipona scutellaris*, Latr., taken near Brighton; also a stem of *Arundo phragmites*, from which numerous pupæ of a Chalcid, *Cleniocerus flavimanus*, Thom., were projecting. Mr. H. Mace exhibited a number of butterflies from the neighbourhood of Khartoum. Mr. R. Adkin exhibited *Diaphora mendica* var. **venosa**, new form, from Co. Tyrone, and compared it with other races of the species. Mr. E. B. Ashby exhibited numerous insects of various orders from Piedmont, Italy. Professor E. B. Poulton read some notes on the utilisation of derived plant pigments in the colouring of Lepidoptera; he also read a communication from the late Dr. T. A. Chapman on germinal "factors" and their independent existence and development. Mr. Hugh Main read some notes on the metamorphoses of *Onthophagus taurus*, L., and illustrated them with some remarkable lantern slides.

PAPERS.—The following papers were read:—"Gynandromorphous *Plebeius argus*, L.," by Dr. E. A. Cockayne; "Butterflies from the Nile," by Mr. H. Mace; "Types of Oriental *Carabidae* in the Stettin Museum," by Mr. H. E. Andrews; and "New Genera and Species of Neotropical *Curculionidae*," by Dr. G. A. K. Marshall.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.

December 8th.—NEW MEMBER.—Mr. H. Worsley-Wood, of Acton, was elected a member.

VARIATION IN D. MENDICA.—Mr. R. Adkin exhibited a series of *Diaphora mendica* from Co. Cork and Co. Tyrone, Ireland, pointing out the var. *rustica* males white and slightly spotted of the former series, and naming the latter series as var. **venosa** in which both sexes were pale grey spotted with black and veins dark grey.

GALLS ON CRAB-APPLE ROOTS.—Mr. Staniland, large galls on the roots and branches of crab-apple from N. London formed by the woolly aphis *Schizoneura lanigera*.

GENERAL EXHIBITS.—Mr. H. Leeds, the heart of a cauliflower with extensive fasciation and of a green coloration.

Mr. B. Adkin, specimens of *Brenthis selene* and *B. euphrosyne* and enquired what was the upperside difference if any.

Mr. H. Moore, a short series of *Teracolus punicens*=*hetaera* from Nairobi.

Mr. K. G. Blair, a *Papilio machaon* without the red spot at the anal angle of the forewing, and a very light form of *Crambus pascuellus* from Tring.

Mr. Blenkarn, the local Coleoptera, *Pentarthrum huttoni* from Killarney and *Lissodema cursor* from Ranmore Common.

Mr. Dennis, the oak "spangle" gall, *Neuroterus numismatis*, from N. Essex.

Mr. Bunnett, the var. *doubledayaria* of *Amphidasis betularia* with an intermediate form from S.E. London.

Mr. R. Adkin read a Report as the Society's Delegate to the Conference of Corresponding Societies of the British Association.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

November 21st.—NEW MEMBER.—Mr. J. E. Campbell-Taylor,

Kingswood, Church Road, Thornton-le-Fylde, was elected a member of the Society.

Paper.—A paper by Hugh Main, Esq., B.Sc., entitled "Metamorphoses of some Common British Beetles," was then read to the Society. Mr. Main had sent a set of lantern slides which embodied his most recent observations upon the habits and life histories of some of our well known beetles. The paper opened with a description of the important piece of apparatus devised by Mr. Main for the purpose of his studies, the "Subterrarium," which alone had made accurate observations of underground insects possible. Hitherto debateable or erroneous statements regarding habits or metamorphoses had been investigated and the results were shown upon the screen in a very convincing manner. Some of the subjects were the common tiger beetle, *Cicindela campestris*; dung beetles, *Geotrupes typhœus*, *G. spinifer* (*stercorarius*), and *G. mortuorum*; the cocktail beetle, *Oxyporus olens*; sexton beetles, *Necrophorus humator* and *N. mortuorum*; the bloody-nose beetle, *Timarcha tenebricosa*; the rose chafer, *Cetonia aurata*; the water beetles, *Dytiscus marginalis* and *Hydrophilus piceus*, all had some salient feature portrayed, the whole making a very fine exhibition. At the close a cordial vote of thanks was passed to Mr. Main for this exceptionally interesting exhibition.

Exhibits.—Mr. A. E. Wright exhibited the Tineid moth *Blastobasis lignea*, Wslm., and its variety *adustella*, Wslm., taken in N. Lancs. and new to Britain, also a specimen of *Eromene ocellea* captured at light at Grange in September last. Mr. W. Buckley showed a series of *Polyommatus icarus* including a specimen of the underside var. *radiata* all taken at Delamere last May. Mr. W. Mansbridge showed the best forms selected from a large number of *Peronea hastiana* bred last autumn from larvæ found on the Lancashire coast: vars. *autumnana*, *albistriana*, *leucopheana*, *mayrana*, *divisana*, and *radiana* were represented.

December 19th, 1921.—Annual Meeting.—Election of Officers.—The following were elected Officers and Council for the ensuing year, *viz.*:—*President:* J. W. Griffin, F.E.S. *Vice-Presidents:* Robert Tait, F.E.S., S. Gordon Smith, F.L.S., F.E.S., E. G. Bayford, F.E.S. *Hon. Treasurer:* Dr. John Cotton. *Hon. Secretary and Hon. Librarian:* Chas. P. Rimmer. *Hon. Sec. for Records:* Wm. Mansbridge, F.E.S. *Council:* Messrs. W. A. Tyerman, S. P. Doudney, A. E. Wright, A. R. Warnes, A.I.P., A.I.Mech.E., A. W. Hughes, R. Wilding, W. Webster, F.R.S.A.I., Hugh Main, B.Sc., F.E.S., B. H. Crabtree, F.E.S., E. F. Studd, M.A., F.E.S., and the Rev. F. M. B. Carr.

Presidential Address.—Mr. R. Tait read the Presidential Address entitled "The Life history of *Agrotis ashworthii* up to date." A vote of thanks to the President for his address and for his services in the chair was carried unanimously.

New Members.—Dr. Frederic Chas. Garrett, O.B.E., West Croft, Elvaston Road, Hexham, and Mr. A. J. Wightman, 35, Morris Road, Lewes, were elected members of the Society.

Exhibits.—Mr. W. Mansbridge exhibited a short series of *Tephrosia consortaria* bred from a female taken at Wimbledon by Mr. A. A. W. Buckstone in 1920: the series varied from typical to very dark brown forms.

OBITUARY.

HENRY ROWLAND-BROWN, M.A., F.E.S.

It is with a feeling of pain, coupled with a sense of real loss, that we have to record the "Home Call" of one of the best loved entomologists of our day, one who is mourned by a very wide and varied circle of friends. Henry Rowland-Brown passed from among us on May the 23rd. The telegram to the writer "At Peace," fitly describes our dear friend's end.

Since the sudden commencement of his illness, just over a year ago, his suffering had often been intense, and more than once hope was given up. His robust constitution however pulled him through for a time, and it should be recorded that never a murmur passed his lips, as he lay helpless for long, and his patience was beyond words.

Whilst building his house at Harrow-Weald his father came to Pinner temporarily, and here it was that our friend was born, on May 19th, 1865, "when all the world was up and stirring in the radiant spring time," as his sister writes of his coming, for whom he has ever "been the central figure of life," and "The daisy chains of old link us together with gyves that can never be broken." So must we indeed tender to that sister our deep and heart-felt sympathy. A passion for flowers was inherited by both of them from their father, who loved his garden and his flowers greatly.

In his baby days, when he could little more than toddle, Rowland-Brown evinced a lively interest in, and had no fear of the "hairy and many-hued caterpillars" which his sister then rather shuddered to touch.

We pass on to the brother and sister's first visit to the Isle of Wight, where "iridescent Blues and small Coppers danced in open spaces over rest-harrow, hawkweed, the pretty lemon-scented, lemon-coloured agrimony, and the Painted Lady, haunted the roadside thistles," to quote from Rowland Grey's *Myself when Young*. But before this at quite an early age he had developed much decision of character, for once being in trouble with his governess over the Church Catechism he was taken down stairs to his mother, when he defended himself with vigour, and with some logic, as Rowland Grey writes :—"She asks me my name. I tell her every morning. She knows it quite well. She asks me what my godfathers and godmothers did then for me. I tell her 'nothing whatever,' and that's true enough."

Rugby was at that time at the height of its fame, and it was here that he went in 1879, doing well in his studies as well as in sports, his reports being always good. "Leaves with an excellent character, cheerful and trustworthy," means much more from a man like Dr. Jex Blake than would a more detailed account from other less stringent headmasters. This took place in 1883. In 1887 he took his B.A. degree at Oxford, and his M.A. in 1891. He was at University College, and no doubt the Hope Museum strengthened his love for Natural History, though by this time he was an energetic Lepidopterist. He then took up the law and was called to the Bar in 1889.

He early developed a love of music and became an accomplished musician, and in sympathetic company would often improvise very beautifully. It is generally known that he, like his sister, had strong literary powers, and belonged to the Savage Club and the Garrick ; he

contributed much to the *Times* and to several of the foremost magazines, whilst his two volumes of poetry* show him to be an imaginative artist of very considerable power. His sonnet "Hyères" is a most beautiful word picture of that lovely country, so true to life, so full of love and insight, that I must quote a few lines of it.

". . . . Beneath my feet a maze
Of gemmed mosaic, where the cistus white
Showers the earth with limpid chrysolite;
Hedges of rosemary, and upland ways
Thickset with lavender; warm rocks ablaze
With red valerian; and, flashing bright
Among the black-branched ilex, butterflies
Sulphur and scarlet-robed, by poets named
'The Glory of Provence.' With such fair dreams
I charm the solitude that darkest seems
Here in England when, 'neath sullen skies,
Spring on the threshold lingers all ashamed."

Turning now to his Entomological work, he was without doubt the first British authority on French Rhopalocera, his numerous travels there, his love of the country, and his close intimacy with his dear friend, Charles Oberthür, gave him the opportunities and fitted him specially to shine in that subject. Well does the writer remember meeting him quite unexpectedly at Gavarnie somewhere about the summer of 1910, and many a happy day was spent together then. His writings in our contemporary, *The Entomologist*, are voluminous, and always interesting and instructive, whilst some of his larger papers in the *Études de Lepidoptérologie Comparée* and elsewhere, are most valuable contributions to the science he loved so well.

Many will remember him as one of the Hosts of the Entomological Club, when his gatherings were always happy and bright and entertaining, when also his literary powers and his powers as a conversationalist came brilliantly to his aid. His services as Hon. Secretary to the Entomological Society of London were a great asset, an office he held for over ten years, for he was one of the most congenial and helpful of Secretaries, and he served well in other capacities also.

How little did the writer think, when he saw him in February for the last time, that he would not meet him again in this world. He was then so bright and full of conversation, delighting to talk of various parts of France well known to each, and so keen to show some of his treasures both in his own cabinets as well as in those that formerly belonged to his old friend the Rev. F. E. Lowe, his magnificent series of the genus *Melitaea* being then much in the forefront of his mind. It seemed then as if our dear friend was really going to recover, but alas it was not to be, for soon another relapse came on bringing with it severe suffering—borne as ever with the utmost bravery—then came a few days relief accompanied with joy and peace, and so, on May 3rd the end came and his spirit returned to Him who gave it. "At Peace."

We must not close without tendering to his aged mother and his sister (to whom he was all in all), our deepest sympathy.—G.T.B-B.

* *Rhymes and Rhapsodies* and *Preludes and Symphonies*, by Oliver Grey.

Subscriptions for Vol. XXXIV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1922.]

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Desiderata.—Cratægata, Sambucaria, condition immateria.. *Duplicates.*—Dominula, mendica, and numerous common species.—*E. A. Cockayne, 65, Westbourne Terrace, W.2.*

Desiderata.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—*W. G. Pether, "Thelma," 4, Willow Bridge Road, London, N. 1.*

Duplicates.—Aglaia, Adippe, *Io, T. quercus, Coridon vars., *Fuliginosa (Reading), *B. quercus ♀, Tiliæ, Menthastri, *Linariata, Aurantiaria, Leucophæaria vars. Paniscus. *Desiderata.*—Pupæ of Dictæoides; Imagines of typhon, palpina, camelina (dark), Curtula, Pyra, and numerous others; Ova of Hispidaria.—*Harold B. Williams, 112a, Bensham Manor Road, Thornton Heath, Surrey.*

Duplicates.—Sybilla, Paphia, Io (2), Selene, Lucina (2), Ocellatus, Illustraria (autumn) Nastata, Roboraria ♂, Prunaria (4) ♂, Tipuliformis. *Desiderata.*—Castreusis ♂, Cucullina, Cribrum, Cinerea, Ravida, Ashworthii, Notata, Obfuscaria, Smaragdaria and others, also vars. and local forms.—*Harold E. Winser, Kent House, Cranleigh.*

Desiderata.—Volumes of *Ent. Mo. Mag.* for 1920 and 1921, *Entomologist*, 1918, 1920 and 1921, second-hand. State price.—*Hy. J. Turner, 98, Drakefell Road, New Cross, S.E. 14.*

Duplicates.—Cinxia, Bellargus, Coridon, H. Comma, Lineola, Galathea, Moneta, Nupta, and many others. *Desiderata.*—Blandina, Irish Icarus, Carmelita, Cuculla. Gonostigma, Ashworthii, Templi, Australis, Undulata, Smaragdaria, Testacea.—*W. Gifford Nash, Clavering House, Bedford.*

Duplicates.—*Atalanta, Sylvanus, *Urticæ, Phlæas, *Moneta, *Pisi, *T. cratægi, *Lucipara, *Filipendulæ, etc. *Desiderata.*—Paniscus, Actæon, Anachoreta, Tincta, Asteris, Absinthii, Notha, Socia, Festucæ, Rubi, Unangulata, Munitata, etc.—*Wm. Foddy, 39, York Street, Rugby.*

Duplicates.—Cinerea ♀, fine forms, grey, brown and blackish, Maritima and vars. Immorata and other East Sussex species.

Desiderata.—Pupæ. Lutcago (Barrettii), Caesia, Albimacula, Alpina, Xanthomista, Sparganii, Dissoluta (Arundineta), Graphalii. Also imagines of extreme forms Noctuæ in fine condition only.—*A. J. Wightman, 35, Morris Road, Lewes.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. 1922, October 4th and 18th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. July 15th, Field Meeting at Horsley. Leader, F. B. Carr.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E.3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

All MS. and editorial matter should be sent and all proofs returned to HY. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

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The Entomologist's Record

AND

Journal of Variation

EDITED BY

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and

HENRY J. TURNER, F.E.S.,
Editorial Secretary.

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Communications have been received or have been promised from Messrs. Hy. J. Turner, H. Donisthorpe, Dr. Verity, J. H. Durrant, G. T. Bethune-Baker, Alfred Sich, W. Daws, the late Dr. T. A. Chapman, Lt. E. B. Ashby, with Reports of Societies and Reviews.

HENRY ROWLAND-BROWN, M.A., F.E.S.

Polyommatus and Agriades.

By the late Dr. T. A. CHAPMAN, F.R.S.

Tutt (*British Lepidoptera*) adopted or accepted *Polyommatus*, Latr., and *Agriades*, Hb., as distinct genera, with *icarus* as the type of the former and *coridon* of the latter. Except, however, by indicating these species as types, he gave us no character by which the species could be allocated to their proper genera.

Can we maintain these as distinct genera? This cannot be discussed without some preliminary agreement as to what we mean by a genus. It will probably be agreed that a genus is a group of species more nearly allied to each other than to other species; as a theoretical position this is unaffected by the practical difficulty, of intermediate forms that might be put in either of two genera that, nevertheless, we more or less agree should be treated as distinct. I do not think we can accept Tutt's contention that a separate genus is due, if a few (or even one) species have distinctive characters in common. In tabulations of species in any large genus, it is usual to find "groups" distinguishable from each other by some common characters. Tutt viewed each group as a distinct genus. As a matter of fact, I not only assert as my own opinion, but as a nearly universal one, though comparatively few persons will admit that their attitude is really one of agreement in this dictum, that a genus is entirely arbitrary; so far as its extent is concerned, it is a matter of convenience. It is desirable if we can find characters by which to define them, to substitute two or more moderate-sized genera, in place of one large one. On the other hand, however, we maintain genera containing only one species, because that species has no very close allies, and we wish to observe what we may call the average amount of differences by which genera are separated from each other.

To return to *Polyommatus*: *Polyommatus* and *Agriades* comprise a large number of species which it would be convenient to sub-divide into two or more genera. Tutt seemed to see that these fell into two groups *Polyommatus* and *Agriades*, which he was able to distinguish and which presumably had characters separating them. One, at once asks, if this be so, what are these characters. Tutt did not tell us. If there be no such characters, only Tutt can tell us, beyond the type species, *icarus* and *coridon*, what species belong to either genus. This is an impossible position, and if we stay there the two genera must be combined. It remains, however, that Tutt did see some characters, not easy to seize for description, and which he did not attempt to describe because he felt that a closer acquaintance than he had with a larger number of species was necessary to do so with any valuable effect.

Considering that the separation of these two genera, if possible, was for convenience desirable, I was pleased to be able to find a definite structural difference between them, which I described in *Ent. Rec.*, vol. xxii., p. 101. I must admit, therefore, that I am to some extent the upholder of these two genera as distinct. I seriously demur, however, to being asked, "Am I really prepared to found genera on one character in the ♂ genitalia." As a general question, I think it possible a case might occur when one should do so, but broadly, I should answer as decidedly as the questioners believe I ought to do, because they have cornered me, "Decidedly not."

JULY—AUGUST 15TH, 1922.

Be it noted that these two genera are not founded on one (or any) genitalic characters, nor did I found them. They (as at present understood) were founded by Tutt without any reference to genitalic characters. These characters, however, coming in support of an already adopted position, are of vastly greater force, than if they were the original and only basis for these genera.

Mr. Bethune-Baker again asks me how I should separate these genera apart from the *aedocagus*. So far as the imagines go, I answer at present, "I don't know." I should expect there is some character, but for its discovery I fear we must wait until we have another Tutt, with more time than Tutt had, to devote to this question.

As regards my negative answer, it is largely founded on the discovery of *Agriades alexius* as a species distinct from *Polyommatus icarus*, these have been accepted by everybody, Tutt says for more than the last 50 years, as merely varieties of one species. As there are still amongst English Entomologists not a few who are sceptical as to the value of the male appendages for systematic purposes, it may be well again to reiterate what I believe to be a correct estimate of their use for this purpose.

Broadly, they are on all fours with any other characters. Definite and constant differences in two forms imply the two forms are distinct species. The exception to this is where the differences are not great, and where the two forms seem to be geographical varieties. They are in fact incipient species. In such cases, of course, where the two forms are neither two "good" species, nor yet one homogeneous species, the appendages no more than other characters will say they are either one or the other. It is possible for two forms that are unquestionably distinct to have very similar appendages, but as a matter of fact I cannot call to mind any instance where this is certainly the case.

It is to be remembered that the appendages are not one simple organ, but are two whole segments (out of fourteen), and important segments at that, of the insect, with their appurtenances; they are of very definite and distinct hard chitinous structure, enabling their conformation to be ascertained with certainty. In not a few cases there can be little doubt that they are a chief item in species being or remaining distinct from each other. No very long separation of a species into two segregated groups is perhaps necessary, for these parts (which are not bound in natural selection by the general environment, as most other characters are), for one group to drift away from the other in their morphology; a small group perhaps very rapidly; as it is only constrained so far that all individuals within the group shall vary together.

The conclusion I arrive at is that if it be desirable and convenient to separate these two genera, adequate characters on which to define them are not wanting; if on the other hand it be neither desirable or convenient to do so, it is no more necessary to do so, than it was for Linnaeus to place *machaon* and *brassicae* in different genera. I myself regard it as desirable for convenience of study to keep them separate.

Whitsuntide in the Midlands.

By RUSSELL E. JAMES.

The date of Whitsun this year falling during the first few days of June, my son and I made arrangements to run down to one of the favourite haunts of *Carterocephalus palaemon* in Northamptonshire.

My son had never taken this species nor *Strymon pruni*, so we broke our journey on the way to Peterborough on the morning of the 3rd, to try for the latter in the original Monk's Wood locality. The wood, alas! is fast vanishing under the hands of a Canadian Timber Company, but I have hopes of sufficient blackthorn surviving for the maintenance of *S. pruni*, as it is only the oak and ash that they are after.

The season was difficult to gauge, but we found that the hot spell had more than balanced the cold March and April, and things were now very forward. *S. pruni* larvae had all gone, except a sickly-looking ichneumoned specimen and a dead one that had succumbed for the same reason, but we managed to obtain three pupae which have since emerged—the first as early as June 9th. *Ruralis betulae* were not uncommon and *Trichiura crataegi* more plentiful than I have known before and almost full-grown. A good many were seen sunning themselves on the higher outside branches. Other blackthorn feeders such as *Miselia oxyacanthae*, *Nola cucullatella* and of course *Diloba caeruleocephala* were in numbers and frequently imagines of *Hylophila prasinana*, gorgeous in their freshness, fell into the umbrellas. Several *Poecilocampa populi* and *Agriopis aprilina* larvae and a freshly emerged *Craniophora ligustri* were found on tree trunks, and as the latter was on an oak with no ash quite near, the larva evidently must sometimes wander before pupating.

Just after leaving the wood my boy espied a large nest of *Eriogaster lanestris* on a blackthorn. They were changing to their last skins and leaving the nest, so we took as many as we wanted and they are doing well. The delay thus caused left us none too much time for our train, but we managed to catch it, well satisfied with our three-and-a-half hours work in the wood.

During a tedious wait at Peterborough, we discussed the early season and the chances of *C. palaemon* being over. I also half-jokingly mentioned that *Tapinostola concolor* was taken somewhere in this corner of the county (the locality unknown to me) and with things so forward might already be out.

This suggestion proved to be prophetic. We visited our *C. palaemon* wood the same evening, put on some treacle, and while dusking in an open grassy ride my boy called out that he had netted a "Wainscot," and immediately after had another before I could arrive to inspect. They were both in the net together and it was obvious at once from the small size and robust thorax that they must be *T. concolor* and not *Petilampa arcuosa*, and so they proved to be. Two others followed immediately—both falling to my son—and then the flight was over. I noted the time exactly.

The first was taken at 9.40 (summer time) and the last at 9.50. We searched over the ground with lanterns later, but took no more. The next night we were on the spot early, but the night turned chilly and few things flew. Again, however, at 9.40 (almost to the minute) I netted a specimen and two more at intervals of ten minutes—the last, at ten o'clock was seen to fly down into the grass and settle near the roots. My boy this time drew a blank, so our combined total for the two evenings was seven specimens.

Whether our locality is the one where the species has been turned up in recent years or a new one I do not know, but given a little later

date and a warm night, I feel sure they would be plentiful. I imagine our locality has not been worked much at night, as I could not detect the faintest trace of any treacle marks on the trees.

With us, treacle only produced about a couple of dozen moths—mostly *Crammesia trigrammica*, but the night was clear moonlight and so chilly that our hands were almost too cold to box easily. Among the visitors were *Cymatophora or*, *Thyatira batis*, *Xylophasia hepatica*, *Hadena thalassina*, and *Pharetra rumicis*. The wood is full of ash trees and small aspens, and would, I should imagine, yield plenty of *Craniophora ligustri* and *Cymatophora or* a little later.

The next morning our doubts about *C. palaemon* were soon set at rest, as we found them almost before we got into the wood.

They were in immense numbers, but had evidently been out some time and wanted a lot of picking over. A few *Hamearis lucina* were among them and butterflies generally were in great numbers. *Brenthis euphrosyne* was getting worn, but we saw no *B. selene*; *Pararge megera* was everywhere and *P. aegeria*, although ragged, was very common.

Gonopteryx rhamni, *Euchloë cardamines*, *Polyommatus icarus*, *Rumicia phlaeas*, *Hesperia malvae*, *Nisoniades tages*, *Augiades sylvanus*, *Euclidia mi*, *E. glyphica*, *Hypocrita jacobaeae* and other species made up a great host of day-fliers and numbers of worn *Plusia gamma* and occasional *Pyrameis cardui* in similar condition are probably heralds of a later abundance of these species.

I am told that further south these two migrants have *Colias croceus* (*edusa*) in their company in which case we may hope for a real "edusa" year again

More larvae of *P. populi* and *A. aprilina* were found on tree trunks, but not many moths were in evidence during the day. A few *Tephrosia crepuscularia*, *Triaena psi*, *Lobophora hexapterata*, and odd *Zonosoma punctaria*, and *Bapta temerata*, were the only species on tree trunks and a newly emerged female *Dasychira pudibunda* was found on the grass.

At dusk before the *T. concolor* were taken there were plenty of Geometers on the wing, the best perhaps being *Acidalia subsericeata* in some numbers. Others were *Melanthia ocellata*, *Aspilates strigillaria*, *Ligdia adustata*, *Anaitis plagiata*, *Cidaria russata* and among them an occasional *Cilix glaucata* and *Cymatophora or*. After *T. concolor* commenced to fly, however, we gave little attention to anything else and may have missed other things at later dusk. We travelled back on Monday afternoon very well satisfied with the results of our two and a half days collecting.

Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera.

By ROGER VERITY, M.D.

(*Continued from page 90.*)

Pontia daplidice, L.—The specimens from many regions I have seen during the last few years confirm the statement I made in the *Ent. Rec.*, of April, 1916, that this species has a very limited variability in Europe. The only geographical variation I have detected consists in the occurrence of form *nitida*, Vrty., *Rhopal.*

Palaearctica, p. 132, pl. xxx., fig. 9 (Jan., 1908), in a greater or lesser number of individuals, chiefly of the third generation. This takes place in particularly arid localities of the extreme south (I have found it, however, as far north as Piedmont, where I collected it on a barren hill above Ponzone, m. 600, near Acqui), and then only in certain regions. In Italy, for instance, well characterised specimens are scarce and only transitions are to be met with, as a rule, even in apparently most suitable localities, so that I know none in which one could extend the name to the entire race, as can be done to series from the Bosphorus, whence came my "type," or from Andalusia (Sierra di Alfacar). The features of *nitida* consist in its small size, short and broad wings, absence of gray basal suffusion, and sharply defined outline of black markings, which are also of a very deep tone. It evidently is a grade of variation towards the North African and Corsican *albidice*, Obth., which is another grade along the same line of variation, leading up to the extreme race *aethiops*, de Joannis and Verity, *Bull. Soc. Ent. Ital.*, xliv., p. 120, fig. 2 (1913), of Abyssinia, figured also in *Rhop. Pal.*, *l.c.*, fig. 7; the latter, however, deviates from that line by its large size in some cases, and by its limited, but sharply defined, underside green pattern, which does not tend to turn pale yellow and disappear, as in *albidice* (see pl. xxx., fig. 29, of *Rhop. Pal.*). Race *aethiops* points remarkably to *P. glaucoinome*, Klug. The characteristics of the small first brood of *daplidice*, described and named *bellidice* by Ochsenheimer a century ago, are so well known (see pl. xxx., figs. 17 to 25 of *Rhop. Pal.*), that I need waste no words on it. What I must point out here, because, curiously enough, as in the case of the other *Pieridi*, no writer seems to have perceived it, is the difference between the second and the third brood. In the former the average size is considerably larger (43 to 44 mm. of expanse, as compared to an average of 39 to 40, and a maximum of 40 in male and of 43 in female of third brood), and giants of over 45 mm. are not unfrequent. The black markings of upperside are often pale and dusted with gray, thus recalling *bellidice*, in this respect, in extreme examples; this faintness of the pattern is particularly striking in some females. On the underside the tinge of the green tends to be lighter and more yellow, so that females in which that colour is replaced by yellow (form *flavopicta*, Vrty., *Rhop. Pal.*, p. 166, pl. xxx., fig. 11 (June, 1908), are found more often. Talking of this character I might mention that, in *daplidice* in general of the summer broods, the female is on an average considerably yellower than the male. I have given the name of *expansa* to the second generation in the *Ent. Rec.* of May, 1919, but at that time I thought even within the boundaries of Tuscany, whence I described it from Florence, the large form was only produced locally; instead, I since have clearly seen that it is constant in all the European localities, from which specimens have been sent, in Italy, Switzerland, France, Spain, and Southern Russia. A slight difference is to be noticed in the number and size of the giant individuals; dwarfs are found everywhere, but strike one as aberrations, not being connected to the average size by a decreasing series of intermediate forms (ab. *nana*, Vrty., *Rhop. Pal.*, p. 166); in my series of "types" of *expansa*, from Mt. Fanna, m. 600, near Florence, there is one with the features of *nitida*. As to the third generation, I think it should bear the name of *daplidice*, except in the

rare instances in which the more usual form is outnumbered by *nitida* or *albidice*, as stated above. Linneus's description could apply to almost any form of the species; the habitat he gives is "Southern Europe and Africa"; the first figure quoted by him is Petiver's; the specimen left by Linneus with his own label belongs to the form which is by far the commonest in the third generation (see pl. xxx., fig. 3, of *Rhop. Pal.*); the names subsequently given to various forms by other authors all restrict the Linnean one to this form; so, there seems to be no doubt possible. I have mentioned in my introductory remarks to these paragraphs on the *Pieridae* (page 69) that Rostagno thought all the *Pieridi* had a partial autumnal generation. He names *zapellonii* and describes that of *daplidice* as follows: "half the size of typical form; black spots of upperside less intense and more reduced; prevalence of the yellow dusting on underside." This was grounded on specimens collected in 1910 by Querci at Formia (Caserta). Since then the latter has made careful observations every year, and he has concluded that those were only laggard weaklings and that *daplidice* never produces that late emergence even as sporadic individuals. The extraordinarily favourable 1921 did not produce any and has been conclusive. Besides, one might remark that Rostagno's underside character consisting in an abundant yellow colouring is in no way a transition to the spring form *bellidice*, but just the opposite, whereas it is quite a rule that the fourth emergence should approach the first in aspect. I conclude that nearly everywhere in Europe there exists only the one race *daplidice*, with: I. gen. *bellidice*, O.; II. gen. *expansa*, Vrty.; III. gen. *daplidice*, L. In rare instances the third generation must be named *nitida*, Vrty., or even *albidice*, Obth., as shown by a series from Corsica in the British Mus., and in these cases the entire race should, of course, bear these names.

Pieris napi, L.—This is one of the most variable of European butterflies, individually, seasonally and geographically. Much has been written about it by many authors, evidently attracted by its striking forms, both Palæarctic and Nearctic. A considerable number of these have been named and discussed at length. The European ones have been dealt with, for instance, by Wagner (*Verhandl. zool.-bot. Ges. Wien*, 1903), by Röber (Seitz's *Gross-schmett.*, 1907), by myself (*Rhop. Pal.*, 1908 and 1911), by Stichel (*Berl. Ent. Zeit.*, 1908), by Schima (*Verhandl. zool.-bot. Ges. Wien.*, 1910) and single forms have been described by many. The work done, however, has been nearly entirely analytical and it might be pushed on this line considerably further, without achieving any very interesting result. What one feels the want of now are synthetical conclusions drawn from it, enlightening one as to how the various forms stand to each other and fall into a natural classification, as to how many, and by what sort of lines of variation they are produced and then as to their geographical distribution and the part they have in characterising races and generations. To develop these subjects thoroughly would require an enormous amount of materials and a large monograph. It would be very attractive and, no doubt, it will be done in time by some specialist. I have, myself, devoted much attention to this fascinating species and I have collected quite a considerable number of series from all sorts of regions, but I fully realise how far I still am from what would be

required. In *Rhopal. Pal.* I have pointed out several striking Asiatic races, but, concerning Europe, I have not gone far beyond illustrating what was already known. Since then I have published some notes in the *Linnean Soc. Journ.* of May, 1913, on the Linnean specimen and on the southern *rulgaris*, Vrty., in the *Ent. Rec.* of April, 1916, including a description of two British races, and in that of December, 1921, describing an Italian one. In June, 1920 (*Boll. Lab. Zool. Scuola Agric. Portici*, p. 52), I made some remarks on *meridionalis*, Rühl, and on the misuse, which is so generally made, of Esper's name of *napaeae*. I think I can now venture an attempt at drawing out in very broad lines the geographical and seasonal variations of *P. napi* in Western Europe, although a great many gaps must remain, to be filled in future.

The generation which emerges from hybernated chrysalids, whether of the single-brooded races or the first of the double- or triple-brooded ones, is by far the most variable, both individually and geographically, and the most abundant, as a rule. This explains why it has been worked out more. There are several features which vary considerably and their various combinations are so complex that for a long time I thought it was hopeless to try and classify the innumerable individual forms, so as to show how they stand to each other and make out the main and the collateral lines of variations. These remarks apply especially to the upperside of the female, which exhibits all the characters much more prominently, although they are fundamentally the same as those of its underside and of both surfaces of the male. For this reason I shall make use of the former in the following study, it being understood that the two latter usually follow on a minor scale, except when especially stated. It was only when I had made out the key to the main line of variation in the genus *Zygaena*, described in my papers on *Z. filipendulae*, L. (*Ent. Rec.*, 1921, p. 105), and on *Z. purpuralis*, Brünn. (*l.c.*, 1922, p. 30), and I had noted its remarkable resemblance to that of the *Pieridi* in general and of *P. napi* in particular, as stated in the first of these papers, at page 107, that I was able to unravel the variation of this species. In this case, as in that one, it is a question of noticing and bearing in mind all through that there are two sorts of wing-markings: the nervular suffusion or pattern and the true or transverse pattern, which can vary in extent independently of each other, according to surroundings. Dampness, of course, increases the extent of both, but cold and dampness develop the nervular pattern, whilst heat and dampness develop the true or transverse pattern, as much as the specific capacity, so limited in *napi*, will allow the latter to develop, considering it only consists in a series of spots across the middle of forewing, one costal spot and a series of thickenings, equivalent to these, sometimes detectable on the dark streaks of the underside of hindwings, and in the thickenings at the end of the nervules on outermargin, which may blend at apex into a crescent and then extend to a triangle, especially when the latter blends also with the first, or costal, of the spots mentioned above. One finds evidence in this and other *Pieridi* that the dark streaks on the terminal part of the nervures may be either of nervular or of internervular origin (blending of the two centers placed on each side of nervure) or still more often of a mixture of both, in the same way as the marginal band of the *Zygaenae*. The independent development of

the nervular and of the transverse patterns produces two principal series of forms in those grades of the variation of the species in which the nervular markings are highly developed. In one series the transverse pattern becomes less and less conspicuous as the nervular one gets more extensive, in the other series the two patterns exist together and their extent varies about equally in the different individual forms. I notice that in the true *bryoniae*, O., of the Alps one only meets, as a rule, with the latter case, so that the better characterised individuals of the male sex, with broad nervular streaks on underside, always have an extensive black crescent and marginal streaks above, and the corresponding females, with diffused bands on nervures above, always have a prominent apical patch and large discal spots. Instead, in the arctic region, forms of the first series mentioned are more abundant than the latter: males with prominent streaks underneath may be entirely white above and females may be nearly entirely darkened by the diffused nervular bands and yet scarcely show any signs of the apical patch or of spots (see fig. 36 mentioned below). These dark arctic forms I have named *pseudobryoniae* in *Rhop. Pal.*, p. 146 (January, 1908), taking as "type" my figs. 36 and 37 of Pl. XXXII.; as this name is not mentioned in the explanation of the plate, Fruhstorfer overlooked it in the text and renamed my figure 37 *adalwinda* in the *Ent. Zeitr.* Guben, III., p. 88 (1909); it is quite out of the question to base the differences between the races of Alaska and of Finmark on these two figures as suggested by Fruhstorfer. Röber's *radiata* is the very rare culminating form in the arctic variation direction, described from a specimen found near Vienna, with no trace of true pattern left. Another important point to be noticed, if one wishes to classify the female forms of *napi* with prominent nervular pattern, is that, when it is reduced in extent, it follows two different lines. It either does so uniformly on the whole of the neuration, so that the streaks end up by being very thin, but stand out sharply in an even network, or else the streaks dwindle away in the basal part of the wing whilst on the outer part of it they remain quite broad. The first of these lines of variation is obviously that followed in nearly the totality of cases by *napi* of both sexes on the underside of hindwings and here it is usually the outer part of the wing in which the nervular streaks get thinnest earlier: on the upperside of the female it predominates in the arctic races, both palaearctic and nearctic (see fig. 35 on my Pl. XXXII. mentioned above and LXVII., fig. 16 and 17); it is also the commonest line in the wonderfully variable race of Mödling, near Vienna, and virtually in most races of the plain, though in these it is not striking on account of the inconspicuous streaks. The second of the two lines of variation just mentioned is the only one, to my knowledge, followed by the true *bryoniae* race of the Alps on upperside of female; the basal part of the wings may be nearly devoid of nervular streaks, whilst the outer part exhibits broad triangles tapering inwardly to sharp points (form **emibryoniae** mihi). This line of variation is carried on by the summer forms of the species in general and it is particularly obvious in races of damp warm localities, where the females have a comparatively very extensive dark pattern on upperside, whilst their underside follows the other line of variation and may not exhibit any streaks at all or very reduced ones near the base, just like some females of *bryoniae*. If one notes the two sorts of variation described

above, each causing two parallel lines to exist, and one furthermore bears in mind that the tone of the dark pattern varies from pale grey to black and that of the ground colour from white to yellow (the black and the yellow being, on broad lines, the result of dampness), one can classify very fairly the principal variations of the first generation of *P. napi*, which at first sight seem so hopelessly complex as to defy any such attempt. To do this in connection with all the individual variations would, however, be quite outside the object of this paper. To be interesting and useful it must be done on a large scale and systematically, not only in the entire species, but sorting out the characters which are generic and comparing them with their equivalents in the other *Pieridi* and even with broader groups. What I want to do here is to try and grasp the characteristics of the geographical races on the whole, such as can only be done and clearly seen by comparing adequate series from each locality. It becomes obvious, by so doing, that the vast majority of the innumerable individual variations run through all or most of the races and can be ignored from this point of view, so that European races are reduced to quite a small number. As in the cases of *Rumicia phlaeas*, L., *Aricia medon*, Hufn., *Leptosia sinapis*, L., and other species I have studied in this way in these columns, we find that the features of the races of *P. napi* consist simply in a series of grades along one single line of variation; as in *A. medon*, the main line bifurcates at its two ends by producing variations which are certainly not successive, but collateral to each other. The order in which the races fall in the most natural way is the one which begins by those whose nervural streaks are most highly developed and leads down to their minimum extent. The latter meet and partly overlap the features of the summer generations, which take up variation at this point, gradually reduce and abolish the nervural pattern and tend to develop the transverse pattern alone, or nearly so.

Grades in the extent of the dark pattern, taken on the whole, and races of *P. napi*, L., in Europe, detectable in the first generation :—

Grade I. : *concolor*, Röber, in Seitz's *Gross-Schmett.*, p. 49 (1907), is the name which has been given to "individuals in which the yellowish ground-colour, especially on the forewing, is almost entirely suppressed by the greater extension of the dark scaling." I have noticed that in some regions of the Alps and, to my knowledge, more precisely in the Austrian ones, this extreme form of *bryoniae* is frequent, whereas in others, such as the Maritime Alps, it never occurs, and the females are, in a general way, much less heavily scaled with dark. This observation seems to make it necessary that the darkest forms of *bryoniae* should be introduced as a grade in geographical variation. One may anticipate that the name of *concolor* will be extended to a race, although I lack the necessary material to establish this now.

Grade II. : This may be described as having broad nervural streaks over the entire wing, separated from each other by narrow spaces of clear ground-colour. As individual forms they are very definite and characteristic, including all those usually known in a general way under the name of *bryoniae*. As races it is very restricted, because, as a rule, the forms just mentioned do not predominate, but are found amongst individuals belonging to the following less heavily marked grades, and the average extent of the dark pattern falls well

within the next one. It is worthy of notice, however, that in Alpine races of this sort, consisting in a mixture of very different individual forms, the vast majority of female individuals do not exhibit the average extent of pattern, as might have been expected, but divide into two groups approaching respectively the two extremes, whilst intermediate forms are comparatively scarce. If a curve of frequency were drawn from statistical data it would consist in two cusps, with a strong depression between them. This evidently points to a tendency to dimorphism, somewhat similar to that of female *Colias croceus*, Fourc., with its distinctly either orange or white forms and extremely rare intermediate ones, or similar to *Dryas paphia*, L., with either fulvous or grey females. Grade II. is the one which exhibits most distinctly the secondary variation I have dealt with above. The main line may be mentally pictured as broadening out into parallel lines; the extreme one on one side consists in those forms in which the nervural and the true, or transverse pattern are equally extensive (the true Alpine *bryoniae*, as figured on pl. xxxii. of *Rhop. Pal.*, fig. 27, and the Arctic equivalent *adalwinda*, Frhst., fig. 37); the median line consists in forms in which the transverse pattern is very much reduced as compared with the nervural (*pseudo-bryoniae*, Vrty., as represented by fig. 36); the line on the other side consists in forms with only the nervural pattern, and Röber's *radiata*, as figured by him in Seitz's *Gross-Schmett.*, pl. 21, corresponds precisely to the level of grade II., as regards the extent of this pattern. My nymotypical *caucasica*, fig. 22, also belongs to this grade, but whether the entire race does, still remains to be established with more material at hand than I possess.

Grade III. can be roughly described as including those forms which are intermediate between those known in a broad way as *bryoniae* and as *napi*. High Alpine and Arctic races, of most localities, have an average extent of pattern corresponding to this level, and so does the wonderful race of Mödling, near Vienna, of which the first generation should, I think, be called *interjecta*, Röber., because in it there exists a large predominance of the individual form so named by this author and most characteristic of grade III. At this grade one can detect more clearly than at others the two parallel lines of variation in connection with the reduction in the extent of the nervural pattern noted above. On one of these lines we can imagine the gradual transformation of the Alpine *bryoniae* through *cmibryoniae*, Vrty., at the level of grade III., on to the following grades; my fig. 26 on pl. xxxii. of *Rhop. Pal.* might bear this name, but it is not well characterised, because the streaks on basal half of wing are too pronounced; my fig. 8 on pl. xxxiii. of female *ochsenheimeri*, Stdgr., shows instead the features of *cmibryoniae* well; this Asiatic mountain sub-species of *napi* (I scarcely think it is a distinct species) is, in fact, the culminating degree of the *cmibryoniae* line of variation and fixes it as a constant characteristic. On the other line we have *interjecta* and the Arctic forms similar to my figure 35 of pl. xxxii., with thin streaks of uniform breadth on the entire neuration; it is the predominating Arctic individual form, and by the extent of the pattern it falls, as a rule, in grade III., so that race *arctica*, Vrty., belongs to this grade, on an average. Here again the Asiatic races fix this line of variation as a constant characteristic in Eastern Siberia, in Northern China, and in Japan (*pseudomelete*, Vrty.), being much less variable indi-

vidually than the European races; they belong, however, by the extent of their pattern, on an average, to the two following grades and not to this one.

Grade IV. can best be conveyed by referring the reader to pl. xxxii., fig. 5, and to pl. lxvii., fig. 16, of *Rhop. Pal.*, which represent about rightly the lesser and the greater extent of the dark pattern to be included herein. It will be seen that it is distinctly more extensive than that of the races of the plains of Central Europe, taken on the whole. The second figure mentioned represents an individual form of race *arctica*, Vrty., lighter than the average in this race, but still commonly found in it. The first figure represents a female *britannica*, Vrty., the race of Ireland and northern Scotland, which I consider typical of this grade, because its average extent of pattern, to my knowledge, falls here; it is the last race which recalls *bryoniae* and *arctica* by producing now and then a female with yellow ground-colour and some with thick nervural streaks, which would belong individually to grade III. As far as I know, also the race of Southern Sweden has its average at this level. It is quite distinct from *arctica* of the north, and it is the nymotypical race *napi*, L., because Linnæus gives *Fauna Suecica* as first quotation, and the former having been subsequently named, Linnæus's name is restricted to the southern race.

Grade V. includes the widespread races of the lowlands of Central Europe and of some particularly damp localities of Southern Europe. For the present I detect amongst them two perfectly distinct races. By far the commonest is the one I have named *septentrionalis* in the *Ent. Rec.*, xxviii., p. 79 (April, 1916), taking as typical the English race, as represented by a series from Westcliff-on-Sea and by another from Epping Forest. I have since ascertained that this race spreads as far as Central France and Switzerland in the plains. It must be noted that the grey tinge of the dark pattern predominates over the black one in *septentrionalis*. In the race which I have called *umoris* in the *Ent. Rec.* for December, 1921, p. 210, the extent of that pattern is, on the whole, about the same, but it is very predominantly black. I described it from swampy grounds on the coast of Tuscany, but I have evidence that it spreads into Northern Italy and probably to Central Europe in particularly damp localities. I notice a perfect resemblance, quite surprising, considering the very different surroundings, between my typical series and the whitest individual forms collected at the Baths of Valdieri, m. 1375, in the Maritime Alps, in company with much scarcer *bryoniae*, O. In Tuscany the second generation of *umoris* is *micromeridionalis*, which I will describe further on; further north *submapacae*, also to be described, and *leorigilda*, Frhst., are to be expected.

Grade VI. stands strikingly apart from the preceding when well characterised series are compared. I take as typical of this grade my first generation *vulgaris* of race *meridionalis*, Rühl., as represented by series of specimens from the neighbourhood of Florence, whence were my "types." In the *Linnean Society's Journal—Zoology*, xxxii., p. 177 (May, 1913), I had proposed this name for the more widespread *napi* as contrasted with *bryoniae* and with the Linnean Scandinavian race, which I grouped with the latter. I now fully realise such a distinction of two large groups of races can in no way be made, because they blend into each other and overlap. The name of *vulgaris* however

can perfectly stand for the Florence first generation, which, as far as I have made out, is the predominant one over the whole of southern Europe and extends locally also to Northern Africa. Fig. 7, on pl. XXXII. of *Rhop. Pal.*, gives an excellent idea of its aspect and it is quite identical with many Florentine individuals, although it represents a female from Le Tarf in Algeria. Stauder in his *Weitere Beiträge*, describes and figures it from Illyria. The characteristic of grade VI. is the strong tendency to total obliteration of the greater part of the dark pattern, especially on upperside. This is due both to the tone of its colour, which in typical series is constantly pale grey in all the individuals and extremely pale in many, and to the marked reduction in its extent, as compared with the races mentioned in grade V. The basal suffusion is limited; the nervural streaks scarcely stretch beyond the surface of the actual nervure and are entirely abolished in many individuals; the apical crescent and the spots are small, the hinder one not unfrequently being obliterated; the extreme form has been named ab. *thusnelda* by Stauder from Görz specimens; the streaks on undersides of hindwings are thin and of a lighter greenish-gray. These characters are distinctly most prominent in the most dry and warm localities. A series from Milan, in the Turati collection, could well be called race *vulgaris* trans. ad *umoris*, Vrty.; Milan is so much damper than Florence that it produces individuals similar to average *umoris* mixed with others, which are quite *vulgaris*. My fig. 6 on pl. xxxii. represents an exceptional individual in my series of *umoris*, which by the extent of the pattern belongs to the latter, but by the pale gray tone is similar to *vulgaris*. In Florence such individuals are found now and then as extreme variations, overlapping grade V.

The following, to my knowledge, are not found in Europe, but I must mention them to complete the series of grades we are dealing with:—

Grade VII. seems to be the result of surroundings as bad for this species as it can survive in, on account of heat and drought. It is reduced to meagre dwarfs; not only is the upperside pattern still more obliterated and paler than in *vulgaris*, the little that remains consisting in all the males, and in many females, solely in true or transverse pattern, but even the streaks of underside are entirely absent on forewing, and are reduced on hindwing to sparse and scattered pale grey scales, scarcely revealing streaks and resembling more, in extreme specimens, those of *P. rapae*, L. I have described and figured it in *Rhop. Pal.* under the name of *pseudorapae*, from a Beyrout, in Syria, series, which I possess. (Pl. xxxii., figs. 23 and 24.)

Grade VII*a* is the most suitable heading I can think of to classify a variation, which is evidently successive to Grade VI., but on a different line from the one I have just described as Grade VII. It is here that the variation of the species seems to bifurcate into two collateral branches, as it seems to do, although less distinctly, at the other end of the series. In unsuitable surroundings the organic balance of the species gives the impression of becoming unstable, so that it has to modify itself and establish new centres of oscillation of its individual variations by a selection of the individuals more suited to the various localities and just able to survive in them. Instead we can quite well

conceive the other grades, apart from these extreme ones, as all having the same hereditary tendencies and the races as produced simply by the effect of environment on the development of each individual, although experimental breeding of *bryoniae*, of *Rumicia phlaeas*, and other species, have shown that some characters have a tendency to persist in one or two generations, notwithstanding altered surroundings. Grade VII*a* I call the interesting race from North Africa, which I have named *maura* in *Rhop. Pal.* It shows no signs of being frail, like *pseudorapae*. Its features consist in a combination of characters of the first generation with characters of the second, such as I have never seen in Europe even in single individuals. The upperside in characteristic specimens of both sexes is absolutely that of the second generation of southern Europe; the underside however is similar to that of the *vulgaris* individuals with the thinnest nervural streaks: they are sharply outlined and in no way shaded and partly obliterated, as in *pseudorapae*. Some males have the apical crescent above broken up into streaks, as in some *vulgaris*, but a very large discal spot distinguishes them from any European specimen of this generation. Some females have more basal shading and nervural streaks above than my "type" figured on pl. lix. I possess specimens from La Calle (Alger), collected in February. As *vulgaris* is also found in Algeria, there remains to make out how these two perfectly distinct forms, and presumably races, stand to each other in Africa. It is quite remarkable that this should be the only case in which the first generation shows signs of transition to the following; as a rule, they are sharply distinct or (in the north of Europe) it is the second generation which approaches the first. Evidently the very special climatic conditions of northern Africa are the cause of this former phenomenon. Some individuals of the Syrian *pseudorapae* (see my fig. 24) recall *maura* by the shape of the wings and upperside markings pointing to summer characteristics.

Grades in the extent of the dark pattern, taken on the whole, and races of *P. napi*, L., in Europe, detectable in the second and third generation:—

These generations do not produce such striking individual variations as the first, so that much fewer forms have been named and races have scarcely been noted. A comparison of series from the various regions shows, on the contrary, that geographical variation is quite considerable, as well as distinctive features between these two broods in each locality, so that it is well worth working them out accurately. The incredibly indiscriminate use which has been made of the name of *napaeae*, Esper, as I shall presently point out, is no doubt partly responsible for the neglect of this interesting group of forms, because collectors and authors set their minds at ease by applying it to the one that each of them chanced to find in his region; in every local list we invariably find *napaeae* and nothing more interesting than this.

In a general way the features of these generations, as compared with the first, may be said to consist in a broadening of the wings, more convex outer margin, and in a tendency to obliteration of the nervural pattern, which, as a rule, is, in most cases, except the northern ones, entirely absent on the upperside, and in an increase of the true or transverse pattern. The latter does not consist so much in an increase of its extent, as in its becoming of a darker tinge and acquiring sharper

outlines, so that it stands out more boldly. In the male it has more extent in that the spot on disc of forewing is invariably present and often larger and in that a little streak, or a series of tiny dots, homologous to this spot, often becomes very distinct next to the costa, just within the apical crescent; the corresponding streak on hindwing also becomes prominent in both sexes, and in the female a spot sometimes appears between the third median and the first cubital nervure, homologous to the anterior spot of forewing.

Whilst in the first generation the nervural streaks on the underside of hindwing vary comparatively little in extent, in the two following this part of the pattern acquires primary importance and affords some of the leading features of geographical variation. In those races in which the second and the third generation differing less from the first on account of the extent of their pattern, still strongly resembling that of the latter, there is an interesting phenomenon to observe of variation along two collateral lines. It is evidently connected with the phenomenon I have dealt with in my introductory remarks to the grades of the first brood, which in the Arctic and more particularly in the Alpine forms may exhibit an intensive dark pattern on upperside of some females and a very limited one on their underside. The generation we are now dealing with develops this feature to a high degree individually, and it becomes also so constant in some regions as to constitute an important feature of the race. We thus have one line of variation in which the streaks of underside keep about as extensive as in the first generation, whilst the upperside pattern becomes more and more characteristic of the two other generations by losing the nervural one and developing the true pattern, and another line of variation in which the underside streaks tend to obliteration, whilst the upperside ones keep quite broad, especially on the outer part of the wing, and even the ground colour may preserve its *bryoniae*-like bright yellow colour. The existence of these two lines constitutes a difficulty when one sets to work to establish the various grades of extent of the pattern, because by the upperside some races should stand at the head of the series, whereas by the underside they should be classified further down. What one wants is a classification which will show as nearly as possible the relationship of the various races, and not an artificial one based only on one or on a few characters, chosen according to our fancy, such as used to be the fashion in old days. If we follow this rule, and we take into account both sexes and both surfaces of wings, we find that the races of *napi* fall into a very natural order, and that it is only a minority of individuals which seem to be out of place by some characters, due chiefly to the dimorphic tendency I have described in the first brood of *bryoniae*, *arctica*, and *interjecta*. This tendency, so conspicuous in the first grades, is carried on through all the others, and we thus always find individuals with an upperside pattern exceptionally extensive for the grade and as compared with that of the underside.

Grade I. is so very similar to the first generation of some races, and more precisely to *umoris*, Vrty., from the marshes of Tuscany and from the Alps, that one could not make out it was a second generation, except by knowing when and where it was collected. I take as typical of this grade and name **linnaei**, a series collected at Norrweken, in Central Sweden, from July 25th to the beginning of August. I

presume this is very near the extreme northern limit at which a second brood is produced. Compared with its own first brood differences do exist: for instance, the male constantly has a large apical crescent and a spot on disc, whereas these are usually absent in the first; the underside streaks are greenish-gray, whereas they are much darker and sharper in the first: one male of my series has the slightly broader wings and more convex outer margin, characteristic of summer broods; this, no doubt, is the race which produces the yellow form *sulphurea*, Schöyen, described from the extremely rare male, but more frequent in the female sex. Its first brood seems to answer the designation of race *arctica trans. ad napi*, Vrty.-L., but I have not enough material at hand to make certain of it.

Grade I*a* conveys, to my mind, as well as possible, the relationship of the following little group of races to the others. The latter constitute, more or less, one series of grades along the same line of variation, and their differential characters consist in the extent of the pattern, and are thus purely quantitative on an average, but the races in question in this paragraph are puzzling as to their position, because they could not be placed either before or after Grade I. By both surfaces of the male sex and of most females, as well, and by the underside of all the females, they would most positively fall into Grade III., but a considerable percentage of females exhibit on upperside a remarkably greater extent of pattern than is normally found even in Grade I., and a bright yellow ground colour, which is very clearly the equivalent of form *bryoniae*, O., of the first generation. Here, as in that case, the *bryoniae*-like individuals and those of the form standing opposite to it, by its white ground-colour and by its limited dark pattern, constitute two groups pointing to dimorphism, whilst intermediate forms are quite scarce. In the case of the first brood, however, the dark streaks of underside are, as a rule, proportionately as extensive as those of upperside in the *bryoniae* forms, and these fall in, quite naturally, as the culminating grades in the extent of the pattern. In the cases of the second and third brood, on the contrary, the *bryoniae* features decidedly give an impression of abnormality, such as of atavism of some female individuals, making its appearance in races which would otherwise have a very natural position in Grade III., and would, in fact, be identical with the races I will describe in that paragraph. That is why I consider the races I am dealing with in this paragraph as a collateral variation to the main line, or in other words, as a sort of dimorphism amongst races. The doubt I have is whether it should not be called grade III*a*, but the analogy to *bryoniae* and the considerable average extent of dark pattern in the female sex on upperside, owing to the *bryoniae*-like forms, have decided me to call it grade I*a*, because it must evidently be more closely connected with the first generation than are the races described as grade III.

Race *flavescens*, Wagner, *Verh. zool.-bot. Ges.*, liii., p. 174, pl. I., fig. 1 (1903), is, I think, the name which should designate the one of Mödling, near Vienna, whose first generation I have discussed under the name of *interjecta*, Röber. The name of *flavescens* is the oldest given to any individual form from that locality, and designates the one which constitutes the characteristic of that race in the second generation. I have figured it in *Rhop. Pal.*, pl. xxxii., figs. 46 and 47;

its characteristics are the broad nervural streaks on upperside, which begin on the outer half and extend to the entire wing-neuration in extreme examples; form *meta*, Wagner, with the same extent of dark pattern, but with ground-colour white, is figured by Röber in Seitz's *Gross-Schmett.*, pl. 21. Judging by the large series of this beautiful race sent by C. Höfer, *meta* is scarce, and so is the other transitional form *sulphurea*, Schöyen, as figured by Röber, with the ground-colour bright yellow, but with dark nervural pattern nearly abolished. The males and the white females differ in no way from *subnapaeae*, Vrty., as noted above. My series was collected from the end of June to the end of July, so that it seems as if a third generation should exist. One of the specimens I have figured is from Frankonia, so that it would appear this race should be found over a wide area in Austria and Germany.

Race *neobryoniae*, Shelj.=*bryonides*, Vrty., *Rhop. Pal.*, p. 333, pl. lii., figs. 18-23 (1911), is the most conspicuous *napi* I have seen from any part of the world by its gigantic size, ranging from 40 up to an expanse of 55 mm. in male, and from 40 to 48 in the female by the presence of bright yellow females and by the boldness of the dark pattern; the nervural streaks do not reach the extent they have in extreme specimens of *flarescens* and *meta* from Mödling, but thinner streaks often reach the base of the wing; what is characteristic here is the extent of the true or transverse pattern, and especially the enormous discal spots, nothing of the sort existing in other races; evidently this is due to the phenomenon I have pointed out in the *bryoniae* of the first brood from the Alps, but in the latter the greater extent of nervural pattern shows off less the true pattern. I have described *bryonides* from the Baths of Valdieri, m. 1375, in the Piedmontese Maritime Alps, and Turati and I have discussed it at length in the *Bull. Soc. Ent. Ital.*, xlii., p. 199 (1911). At that time, however, we had not yet detected the important fact that in that locality not two, but three broods are produced yearly: one in June, one from July 10th to 31st, and one from August 10th onwards. Extraordinarily quick a succession as this may seem, there is no question about it, because not only was it clearly to be seen in nature, but I have myself bred the third from ova laid by a female of second brood. Besides, if one separates specimens according to these three periods of emergence one finds they exhibit perfectly distinctive features in most males and in all the females. In my earlier descriptions of *bryonides* I stated that it was the second generation of *bryoniae*; this is not correct; all the specimens I have figured in *Rhop. Pal.* and all those characteristic of it belong to the third generation; the second is considerably smaller, has a much less extensive pattern, and never produces the yellow form of the females; I will deal with it in the paragraph on grade V. and point out it is Esper's true *napaeae*. As in the other races of *napi*, with three broods, and, in fact, in the *Rhopalocera* in general, the second brood is the largest, this inversion of size is quite remarkable; the only explanation which occurs to me is that the second generation feeds so early in the season that the *Cruciferae* at that altitude are still quite small and tender and afford poor nourishment, whereas the third brood, both in the wild and in the orchards, get in August large plants, with firm tissues and abundance of the flowers and pods the larvæ are so fond of, thus

reaching its gigantic size. I should call *bryonides* those races of *bryoniae* which produce this third generation; it remains to be seen whether the features described by me are peculiar to the Western Alps, or are distributed more broadly. Strangely enough the variations of *napi* in these mountains, so well known to entomologists, remain to be discovered. Stauder, *l.c.*, p. 142, says that Sheljnzhko, in the *Iris* for 1913, p. 20, has re-named my *bryonides neobryoniae*, because he had already used the former name in the *Rev. Russe d' Entom.*, ix., p. 384 (March, 1910), for some other form.

Grade II. may be described on broad lines as still having, like grade I., the underside similar to that of first brood, but exhibiting on upperside characters distinctly showing it belongs to a summer one. The underside differs very little from that of a southern spring generation, such as *rulgaris*, Vrty., except that the ground-colour is usually of a bright canary yellow; from its own first brood *septentrionalis* it differs in that the streaks are thinner and bright green or greyish green, instead of dark olive green; they are, notwithstanding, always bold and sharp in outline and reach the outer margin on all the nervures. On upperside the apical crescent of the male and its discal spot are quite summer-like in tone of colour and shape; in the female the crescent is not so broad and continuous as in the following grades and the neuration is always thinly dusted with grey on all its extent and bears sharp black streaks at the terminal end of all the nervures of forewing; in some individuals all these streaks may be quite pronounced and this, of course, is more frequent in localities where the race approaches grade I. I take as my "typical" series the one I have received from L. Dupont, collected at the Pont-de-l'Arche (Eure) in Northern France, during the whole of July. My specimens from the south of England correspond to them perfectly, just as the English first generation *septentrionalis* extends to the Eure. I propose for this second generation of race *septentrionalis*, Vrty., the name of **praenapaeae** to recall the name which is usually used for it, but indicate that it does not exhibit to their full extent the features of Esper's true *napaeae*.

Grade III. is the first which stands clear of all the features of the first generation: on underside the nervural streaks of hindwing become pale, shaded in outline and fade away towards the outermargin; in the females their extremities are in fact often quite obliterated; the ground colour of these wings is never bright canary yellow, but very pale yellow, or ochreous, or white. On upperside of male the true pattern is a little more extensive and sharper, that of the female exhibits a more compact and extensive triangle at apex; in this sex the nervural pattern is usually quite obliterated on the basal half of the wings and also as far as the margin on the second cubital and on the anal nervures, only thin streaks remaining at the end of the other nervures; of course, there are exceptions, more or less frequent, according to localities. This race seems to have a vast distribution from Central France eastwards; it probably is the commonest in Central Europe generally. It extends as far north as the Oise and the series I select as "typical" was collected by D. Lucas at Compiègne, in that Department, during the end of June and in July, evidently in a locality drier and warmer than the Pont-de-l'Arche, although it is slightly further north. I name it **subnapaeae**, mihi.

Race *leovigilda*, Frühstorfer, *Intern. Ent. Zeit. Guben*, iii., p. 88 (July, 1909), is distinguished from the preceding chiefly by its very large size; the dark pattern is on an average deeper in tone and more pronounced than in the smaller *subnapaeae*, because the discal spots tend to be rather large in both sexes and the fore one of female is often connected to the outermargin by two thick streaks. The types were collected in Savoy at an altitude of 500 m., from the end of June to the beginning of July. Its author records it from the Salève, at m. 800, near Geneva, and from Eclépens, near Lausanne, whence I possess specimens. It probably has a comparatively limited subalpine range.

Grade IV. is well characterised by an interesting feature: the combination in many individuals of the minimum extent of nervural pattern with the maximum extent of true or transverse pattern. The former is not only entirely abolished, as a rule, on the upperside, as in grade III., but it is also reduced on underside in most cases to the basal part of the wing in the male (Rocci has named this character *deficiens*, as an individual form) and simply to one or two short streaks in the female, whilst in extreme examples of both sexes it is entirely absent. The true pattern, on the contrary, tends to develop on the upperside into deep black and extensive markings, with sharp outlines, standing out boldly on the pure white ground-colour; some females have black streaks at the terminal end of all the nervures of both fore- and hind-wing on the upperside. These, I presume, are part of the true pattern, originated from internervular centres, which blend across the nervure, because they are evidently homologous to similar streaks found in *Pieris*, such as *canidia*, Spar., which never produce any nervural pattern. The culminating form of this grade is the one which Röber, in Seitz's *Gross-schmett.*, has named *dubiosa*, actually describing it as a variety of *P. rapae*, L., and expressing doubts as to whether it is not a distinct species; the entire lack of nervural pattern on both surfaces is evidently what led him wrong; the extensive markings of the true pattern on the upperside gives it a strong resemblance to *P. krueperi*, Stdgr., and this struck also Röber; he, no doubt, had seen only males. The corresponding form in the female sex seems to be the one I have figured in *Rhopal. Pal.*, pl. XXXII., fig. 17, from a specimen from Le Tarf in Algeria. Röber gives Andalusia and Asia Minor as habitat. It is very likely that in these regions *dubiosa* is frequently met with and may predominate in certain localities rising to the rank of race. In Italy one meets with it now and then as an extreme individual form, but, like form *nitida*, Vrty., of *P. daplidice*, L., to which it is in some ways equivalent, it is never as abundant as in the regions mentioned above. The male from Vallombrosa, m. 1,000, in Tuscany, which I have figured on pl. XXXII., fig. 14, is very similar to Röber's figure and also to my fig. 13, from the Tuscan coast, resembles it, but I possess specimens still more exactly like it. My figs. 12 and 18 of male and 16 and 19 of female give a fair idea of the more usual aspect of the smaller race found in Central Italy and which I propose naming **micromeridionalis**, mihi. I possess series collected at Forte dei Marmi on the coast, at Vallombrosa, at Piteglio, m. 700, in the Pistoiese Apennines, on the Prato Fiorito, m. 900, near Lucca, and at Bolognola, m. 1,200, in the Sibillini

Mts. (Piceno). The mountain series all bear dates varying from July 20th to August 10th, except a few of the rest of August and beginning of September; the Forte dei Marmi ones are more abundant in September. Querci and I have not been able to establish if this is the only summer generation of these localities, as it is very likely in dry surroundings, or whether it is followed by a third at Forte dei Marmi and possibly even in the mountains, very late in the season. Querci remembers having seen large numbers of *napi* at Bolognola late in September. In Florence and on the hills around it, up to 600 m., there is distinctly a second emergence in June and a third one from middle of September to October. The former is of a much larger size and more robust build than the race just described, whereas the third is smaller and frailer, as we shall see in the next grade. To that large second generation no doubt belongs *meridionalis*, Rühl, *Pal. Grossschmett.*, p. 714 (1895), described as follows: "Large, lightly coloured specimens; underside of hindwings nearly unicolorous; nervures scarcely darkened. Flies in Central Italy." In *Rhop. Pal.* I wrongly used the name for the individual form of all sizes with no streaks on the underside. In the dry neighbourhood of Florence *meridionalis* has markings very limited in extent, as a rule, and usually also greyish rather than black (see *Rhop. Pal.*, pl. XXXII., fig. 11). as they are, instead, in the third generation. A series collected in the Mainarde Mts. (prov. of Caserta) has much more extensive and perfectly black markings. The second generation of Istria and Dalmatia, described and figured by Stauder in his *Weitere Beiträge* seems to be quite similar to this last, whilst the third generation has a still more intensely black pattern, but is otherwise quite large and like the second; I name it **stauderi,** mihi, from his fig. 7 and 8 of Pl. I.

Grade V. has the nervural streaks of the underside about similar to grade IV., but on upperside the true pattern is very much reduced in extent, as compared with this grade. The apical crescent tends to be more broken up by white in each internervular space; the spots are quite small in both sexes. My fig. 15 on pl. xxxii. of *Rhop. Pal.*, gives an excellent idea of it. I take as typical of this grade and name **tenuemaculosa,** mihi, the third generation of race *meridionalis* from Florence; a perfectly similar one was found in the Mainarde Mts. These consist invariably of small and frail individuals, which have evidently suffered from the summer drought and scanty food; the butterflies emerge considerably later than the third generation of the other *Pieridae*, after a very long period (end of June to middle of September), during which no *napi* are on the wing. We have seen this is not the case in race *micromeridionalis*, which emerges in July and August. Amongst the latter I have often found *tenuemaculosa* as an individual form. Rostagno, in his *Rhop. Faunae Romanae*, p. 66, has named *barraudi* a few dwarf specimens collected very late in the season, which he took to be a fourth generation, but this certainly does not exist. The gray and very limited spots above were due to his specimens being weaklings, and the nervular streaks on underside to a phenomenon I have observed in several localities: the early individuals of the third brood often have no streaks, whereas the latest ones often have very pronounced ones, and females may even exhibit extensive nervural streaks on upperside, recalling the spring brood (form **tarda,** mihi).

Race *napaeae*, Esper: It is to this grade that Esper's true *napaeae* seems to belong. The first point to clear up is to what race should his name be applied. I think we can come to a very definite conclusion: to the second generation of the Alpine race *bryoniae*, O. Esper stated his types had been collected in August in the Alpenthal above Geneva, together with *callidice*. The latter can only have been found at the beginning of August, and in a locality where it is extremely unlikely *napi* could produce more than two broods. What is more, my male specimens of the second brood from the Baths of Valdieri, where we have seen the first is *bryoniae* and the third is *bryonides*, I found agree most perfectly in every detail with Esper's figure; on upperside the markings are less bold than in *bryonides*, the apical crescent tends to break between the nervures, or has at least a dentate outline, whereas it is more or less straight in *bryonides*. What is very striking and nearly surprising at the Baths of Valdieri is the very small size of all the females, as compared with that of males; in the third brood *bryonides* this is not the case; evidently the female sex, requiring more food than the male, suffers more from the scantiness of it in the early part of the season. The very reduced extent of both nervural and true pattern markings is also most striking in the females, on both surfaces, and the contrast with *bryonides* is again considerable. It is this character, as well as the small size of the female, which obliges one to place the Valdieri *napaeae* in grade V., because this sex thus agrees perfectly with *tenuemaculosa*. The male, instead, differs from that of the latter by its larger size and by the streaks on the underside, which nearly invariably reach the outer-margin, although they are always very pale and shaded in outline; this sex thus corresponds perfectly also in this respect with Esper's figure. It remains to be established definitely whether the females of the *callidice* localities nearest to Geneva are really similar to my Valdieri specimens, or whether they approach more those of race *leorigilda*, which is the one of lower altitudes in that region; in this case Esper's race *napaeae* might have to be classified in grade III., as the underside of the male would require, and the Valdieri second generation would remain in this one, with the designation of *napaeae* trans. ad. *tenuemaculosa*.

The following grade, to my knowledge, does not exist in Europe as a race, but weaklings of *tenuemaculosa* belong to it universally.

Grade VI. consists in small and often extremely small desert forms, with all the markings reduced to a minimum extent and no basal dark shading on the wings above in most individuals, a character which in this species is very rare.

Race **persis**, mihi, I suggest naming the very interesting form from Persia, described by me in *Ithop. Pal.*, p. 166, and figured on pl. xlix., figs. 3 to 5, in which the apical patch has an unusual shape, more quadrangular than in any other *napi*, and the spots on disc are small, but sharp in outline, quite recalling *P. rapae*, L., of summer broods. It is, no doubt, the second generation of a race similar to *pseudorapae*, Vrty., of Syria. The actual specimens I have, or I have seen, from Beyrout, obviously belonging to the second generation of *pseudorapae*, are not like these Persian ones, but are still smaller and frailer, with the markings similar to those of *tenuemaculosa* in shape, but so pale and reduced in extent as to be on the verge of obliteration. I have

figured a female in *Rhop. Pal.*, pl. xxxii., fig. 20, under the name of *minima*, Vrty., which I mention at p. 143. I used the same name at p. 154 for tiny individuals of *P. manni*, Mayer, but these fall under that of *nana*, Vrty., p. 166, and the name *minima*, first used for the definite summer Beyrout generation of *napi*, should stand for the latter.

Summarising the conclusions of the above remarks, I find that the seasonal and geographical variations of *P. napi*, L., in Europe, as far as they are known to me, work out as follows :—

Race *concolor*, Röber : Single generation at very high altitudes in the Alps and chiefly in the Eastern Alps.

Race *bryoniae*, O. : Single generation at very high altitudes in the Alps.

Race *napaeae*, Esper : I. gen. *bryoniae*, O. ; II. gen. *napaeae*, Esp. Described from high altitudes in the region of Geneva.

Race *neobryoniae*, Shelj. (=*bryonides*, Vrty.) : I. gen. *bryoniae*, O. ; II. gen. *napaeae*, Esp. (or *napaeae* trans. ad *tenuemaculosa*, Esp.-Vrty.) ; III. gen. *neobryoniae*, Shelj. : Described from the Baths of Valdieri, m. 1375, in the Piedmontese Maritime Alps.

Race *caucasica*, Vrty. : I. gen. *caucasica*, Vrty. ; other gen. unknown : Described from the Kouban, in N.W. Caucasus.

Race *arctica*, Vrty. : Single generation. Described from Saltdalen, in Northern Norway.

Race *linnaei*, Vrty. : I. gen. *arctica* trans. ad *napi*, Vrty.-L. ; II. gen. *linnaei*, Vrty. : Described from Norrwegen, in Central Sweden.

Race *flavescens*, Wagner : I. gen. *interjecta*, Röber ; II. gen. *flavescens*, Wagner : Described from Mödling, near Vienna.

Race *napi*, L. : I. gen. *napi*, L. ; II. gen. unknown to me : Southern Sweden.

Race *britannica*, Vrty. : I. gen. *britannica*, Vrty. ; II. gen. unknown to me : Described from South of Ireland ; I possess it also from the north coast of Scotland.

Race *septentrionalis*, Vrty. : I. gen. *septentrionalis*, Vrty. ; II. gen. *praenapaeae*, Vrty : Described from Westcliff-on-Sea and Epping Forest, in England ; spreads to Northern France.

Race *subnapaeae*, Vrty. ; I. gen. *septentrionalis*, Vrty., or *umoris*, Vrty. ; II. gen. *subnapaeae* ; III. gen. may exist, but unknown to me : Described from Compiègne in Northern France, is broadly widespread in Central Europe.

Race *leorigilda*, Frhst. : I. gen. *septentrionalis*, Vrty., or *umoris*, Vrty. ; II. gen. *leorigilda*, Frhst. ; III. gen. unknown to me : Described from Savoy, m. 500, Geneva and Lausanne, is, presumably, purely a Sub-alpine race.

Race *umoris*, Vrty. : I. gen. *umoris*, Vrty. ; II. gen. *micromeridionalis*, Vrty. ; III. gen. *micromeridionalis*, Vrty. : Described from Forte dei Marmi, in swampy localities on Tuscan coast.

Race *standeri*, Vrty. : I. gen. *vulgaris*, Vrty. ; II. gen. *meridionalis*, Rühl. ; III. gen. *standeri*, Vrty : Described from Istria and Dalmatia.

Race *meridionalis*, Rühl : I. gen. *vulgaris*, Vrty. ; II. gen. *meridionalis*, Rühl. ; III. gen. *tenuemaculosa*, Vrty. : Described from "Central Italy" ; I possess it from Florence and from Atina, m. 500, in Mainarde Mts. (Caserta).

Race *micromeridionalis*, Vrty.; I. gen. *vulgaris*, Vrty; II. gen. *micromeridionalis*, Vrty.; III. gen. doubtful. I possess it from Vallombrosa, m. 1,000 (prov. of Florence), from Piteglio, m. 700 (Pistoia), from Mt. Prato Fiorito, m. 900 (Lucca), and from Bolognola, m. 1,200, in the Sibillini Mts. (Piceno).

Race *dubiosa*, Röb.: Will probably be established as distinct from Southern Spain.

(To be continued.)

NOTES ON COLLECTING, etc.

Butterflies in Notts and a Gynandromorph.—My brother and I have devoted some time this May and June to *Euchloe cardamines*, but could not turn up any striking variety, though one male had white streaks running into the orange patch.

On June 10th we found a new locality, to us, in the county for *Polyommatus icarus*, and among the females a large proportion showing more or less of blue, a few being very fine. We also saw and captured *Colias croceus* (*edusa*) in good condition, which is surely a very early date for this district; it must be an immigrant.

We visited the same ground on June 16th and 17th, but were unlucky in the weather, as there was a strong wind and practically no sun. Still we managed to bag a nice series of the *P. icarus*.

On the 18th—an afternoon which is apt to be more or less devoted to "reflection"—my brother, who has passed his three score years and ten, dragged me out for a ten miles tramp to have another look at the same spot, but by the time we reached the ground the sun was overcast and nothing was flying. By diligently searching the grass heads—a back-breaking job—we managed to take about forty, and among them a magnificent gynandromorph, left wings ♂, right wings ♀, both upper and underside, and in beautiful condition. The right wings are dark, shot with blue, and with well marked orange spots on the forewing and less strongly marked on the hindwing.

We also took a female with right hindwing partly bleached, both upper and underside.—Douglas H. Pearson (F.E.S.), Chilwell, Notts.

C. alchymista in Shropshire.—I took here on June 20th a specimen of *Catephia alchymista* at light, on a hedgerow in the corner of a hayfield, at Cleobury Mortimer.—Commander G. C. Woodward.

A Staphylinid Beetle attacked by an Ant.—Sitting in my garden at Claygate, on June 17th, 1922, I noticed a large red ant moving across the lawn, carrying in front of him what appeared to me, at first sight, to be a small piece of stick, but on closer investigation the latter proved to be a medium sized Staphylinid, which the ant had got hold of by the lower abdominal segments in such a way that the "Staph" was held in an upright position. It was evidently carrying the same to its nest. The beetle, which was about twice the size of the ant, was still alive, but had evidently given up the struggle. I captured the ant and released its prey, which promptly made tracks for safety.—S. C. Leman (F.E.S.)

CURRENT NOTES AND SHORT NOTICES.

At a recent meeting of the South London Society a letter was read from the representatives of the late Mr. Lachlan-Gibb, stating that a

sum of £200 had been bequeathed by that gentleman to the funds of the Society, "as an appreciation of a life's pleasant and instructive fellowship with their members."

The *Entomological News* for June reminds us that "a specimen unaccompanied by any data as to its habitat, its time of occurrence, its relation to its surroundings, has a certain value, but from any other view-point such a naked object is useless." All of the most interesting sides of entomology, of biology, are based upon the observations made in connection with the living thing and its surroundings, and the more completely these are recorded in connection with the specimen the better." This was brought home to us recently very strongly when a collection of a life-time with thousands of butterflies and moths came into our possession, not one of which had a label of any kind. They were absolutely useless, although many were local species there was not the slightest indication of locality even.

SOCIETIES.

The Entomological Society of London.

March 15th, 1922.—New Fellows.—The following were elected Fellows of the Society:—Messrs. Reginald Charles Treberne, Entomological Branch, Department of Agriculture, Ottawa, Canada: T. G. Sloane, Moorilla, Young, New South Wales, Australia; William Monod Crawford, B.A., Orissa, Marlborough Park, Belfast; Leonard Charles Bushby, 11, Park Grove, Bromley, Kent; Arthur Morel Massee, "Park Place," The Common, Sevenoaks, Kent; Linnaeus Greening, "Fairlight," Grappenhall, Cheshire; John Wilson Moore, 151, Middleton Hall Road, Kings Norton, Birmingham; John Edmund Eastwood, Wade Court, Havant, Hants; Dr. Francis Arthur, M.R.C.S., L.R.C.P., 395, Bethnal Green Road, E.2; and Dr. H. Silvester Evans, M.R.C.S., L.R.C.P., Lautoka, Fiji.

Exhibits.—Mr. W. H. Tams exhibited a selection of insects, chiefly Lepidoptera, taken on the Mount Everest expedition.

Mr. O. E. Janson exhibited a new species of *Euchroea* and a female of the rare Saturniid moth, *Argema mittrei*, from Madagascar.

Dr. C. J. Gahan exhibited an example of the Indian Phasmid *Carausius morosus*, in which homoeotic regeneration had taken place, an amputated antenna having been replaced by a tarsus.

Professor E. B. Poulton, F.R.S., who illustrated his remarks with lantern slides, read some notes by Mr. A. H. Hamm, on the occurrence of *Syntomaspis druparum* in hawthorn seeds in birds' droppings, and some notes by Dr. R. C. L. Perkins, on the procryptic resting attitude of *Polygonia c-album*. He also exhibited some Chalcids bred by Mr. J. Collins from beetles in dog biscuits and plum branches.

Dr. S. A. Neave read a letter from Mr. W. J. Harding recording the capture of *Polygonia c-album* at Holcombe, in Devonshire, and some discussion took place as to the distribution and recent spread of this butterfly in the south of England.

April 5th.—New Fellows.—The following were elected Fellows of the Society:—Messrs. William George Clutten, 136, Coal Clough Lane, Burnley; Edmund James Pearce, The Lodge, Corpus Christi College,

Cambridge; George Evelyn Hutchinson, Aysthorpe, Newton Road, Cambridge; Charles Herbert Lankester, Cartago, Costa Rica; Arthur D. R. Bacchus, 29, Abbotsford Road, Redland, Bristol; and Captain Douglas S. Wilkinson, Kennington Vicarage, Ashford, Kent.

Exhibits.—Lord Rothschild exhibited a group of mimetic Lepidoptera and Hymenoptera from South America.

Mr. W. G. Sheldon exhibited, on behalf of Mr. T. Greer, a series of *Epinephele jurtina*, and of *Pieris napi*, from Co. Tyrone.

Mr. A. W. Pickard-Cambridge exhibited Zeller's types of a number of moths, mainly Crambids from Egypt and Palestine.

Mr. W. F. H. Rosenberg exhibited an example of *Colaenis telesiphe* race *tithraustes* from Ecuador, in which the band of the hindwing is white as in the typical form.

Mr. G. T. Bethune-Baker exhibited a series of *Heodes phlaeas*, and a specimen of *Zygaena transalpina* ab. *elongata* from Florence.

Dr. G. A. K. Marshall, on behalf of Mr. B. P. Uvarov, exhibited some remarkable mimetic long-horned grasshoppers with their Cicindelid models.

Dr. K. Jordan, F.E.S., exhibited a pair of the Agaristid moth, *Aegocera mahdi*, the male of which has a stridulatory organ; also a series of *Liphyra brassolis*.

Dr. S. A. Neave gave an account of the fauna of Mt. Mlanje, Nyasaland, and illustrated his remarks with lantern slides, and with an exhibition of some typical insects from that locality.

The South London Entomological Society.

January 12*th*.—Exhibits.—Mr. A. A. W. Buckstone exhibited *Heliophobus hispidus*, the dark form from Torquay and the lighter form from Dorset, and a very dark aberration of *Ortholitha plumbaria*.

Mr. Withycombe, larvæ of *Taeniorhynchus richardi* (Dip.) attached by siphons to roots of *Typha angustifolia* from Epping, with illustrative photographs.

Mr. Hy. J. Turner, for Mr. Thomas Greer, Tyrone, the following aberrations recently taken by him. *Euchloë cardamines* (1) ♂ ab. *marginata*; (2) ♂ dark streaks on the orange blotches; (3) ♂ very small; (4) ♂ usually large; (5) ♀ ab. *radiata*; (6) ♀ with orange streaks above and below. *Melitaea aurinia* ♀ dull obscure coloration. *Parargе megera*, (1) ♂ with apical ocellus reduced to a small dot; (2) ♂ with double apical ocellus. *Polyommatus icarus* (1) Gynandromorph R. ♂ L. ♀; (2) ♂ with faint red marginal blotches upper side hind margin hind wings, underside ab. *icarinus*; (3) with marginal red blotches extended to form a band.

Mr. Goodman, *Coenonympha tiphon*, typical and race *philoxenus* from Britain and race *isis* from the Dauphiné.

January 26*th*, 1922.—Annual Meeting.—Mr. Stanley Edwards, F.L.S., Vice-President in the chair. The Report of the Council, Statement of the Treasurer, and Balance Sheet were received and adopted. The Officers and Council for the ensuing year were declared elected.

The President being unwell, his Annual Address was read by Mr. Riley. It was entitled "Will o' the Wisp" and dealt historically and biologically with fireflies.

The new President, Mr. E. J. Bunnett, then took the chair, and votes of thanks were passed to the retiring Officers and Council.

Major C. E. Lyles, 6, Hyde Park Mansions, and Mr. J. H. Adkin, Whitecliff Road, Purley, were elected members.

Mr. C. Cranfurd exhibited an *Aglais urticae* with a curious deficiency of colour in two streaks on the hind-margin of the hind-wings; the scaling was perfect.

February 9th.—NEW MEMBER.—Miss Alice K. Lock, 77, Grove Hill Road, S.E., was elected a member.

SECOND BROOD OF B. SELENE.—Mr. R. Adkin exhibited a second brood series of *Brenthis selene* from Abbot's Wood, Sussex, at end of July and in August.

RACIAL SERIES OF B. SELENE.—Mr. A. A. W. Buckstone, a large form of the same species, racial in the Isle of Arran, and a series of a small race from Headly; and an aberrant form of *Taeniocampa incerta*, resembling both *L. munda* and *L. gracilis*.

THE VERY LOCAL H. SPONSA IN KENT.—Mr. H. W. Andrews, the Anthomyiid (Dip.), *Hylephila sponsa*, said to be rare, but common in Kent, and species of local *Limnophora*.

A. GALEODES FROM CAPE TOWN.—Mr. H. Moore, a large species of *Galeodes* from Cape Town, of a genus usually placed between the spiders and the mites, it attacks small birds, lizards, etc., and is venomous.

ABERRATIONS OF B. CORYLI.—Mr. Blenkarn, *Cryptocephalus coryli* from Mickleham, with a spot on each elytra, and the racial form of *Philodecta laticollis* from Killarney, December, 1921.

ABERRATIONS OF BRITISH LEPIDOPTERA.—Mr. Frohawk, *Aglais urticae*, suffused very considerably; *Pieris napi*, ♂ asymmetrical central wing spot, R. almost missing, L. unusually large; *Argynnis paphia*, ♂ central markings much suffused; *Euchloë cardamines*, ♂ and ♀ with discal spots in hindwings; *P. brassicae*, a series of *nigronotata* with well developed discal spot; also a fine pencil sketch of a hybrid pheasant and grouse.

THE DODDER OF THE GORSE.—Mr. Enefer, *Cuscuta epithymum*, the dodder of the gorse, an anastomose specimen of oak, and a section of the mistletoe on apple.

February 23rd.—NEW MEMBER.—Mr. Cheeseman, 30, Clayton Road, S.E., was elected a member.

LANTERN SLIDES EXHIBITED.—An Exhibition of Lantern Slides by members.

Mr. Hugh Main, slides illustrating the latest results of colour photography, a series of slides illustrating the life-history of the field-cricket and of the wolf spider *Lycosa*.

Mr. Frisby, slides showing the Serotine Bat, nests of water-fowl, and British orchids in situ.

The President, slides of the liverwort showing remarkable proliferous growth, of "fairy flies," and of the tracheae of a beetle.

Mr. Syms, slides of the ova of the more local species of British butterflies.

Mr. Tonge, slides of the ova of a number of British Geometers.

Mr. Staniland, slides of the galling of the wild crab by the woolly aphis, *Eriosoma lanigera*, and of the Syrphid fly (*Syrphus vitripennis*).

Mr. Withycombe, a curious fungus growth from a dead ant, a nest of *Osmia rufa* in a door lock, the egg-mass of *Empusa pauperata*, the life-history of a *Coniopteryx*, etc.

March 9th.—New Members.—Mr. G. C. Champion, A.L.S., F.E.S., was elected an Honorary Member. Mr. L. C. Bushby, of Bromley, and Mr. A. M. Massee, of Sevenoaks, were elected members.

Lecture.—Captain J. Ramsbottom, F.L.S., gave a Lecture on "Symbiosis of Fungi with the Fertilisation of Orchids," illustrated with lantern slides and diagrams.

March 23rd.—Decease of a Member.—The death of Mr. Lachlan Gibb, F.E.S., a life-member, was announced.

Exhibits.—Mr. Goodman exhibited an aberration of *Argynnis aglaia* with the discal blotches much increased in area and united to form an irregular band.

Mr. Grosvenor, Dr. Chapman's bred series of *Callophrys avis*.

Mr. Turner, the remarkable silver Satyrid, *Argyrophorus argenteus*, from Chili.

April 13th.—Exhibits.—Mr. A. A. W. Buckstone exhibited a series of *Brenthis euphrosyne*, all strongly marked, taken on high ground at Horsley, compared with others taken at a much lower elevation in the valley. Also a specimen from Oxshott with xanthic markings, and ab. *obscura* of *Cleoceris viminalis* from Yorks.

Mr. Enefer, beetles attacking lentils from Egypt.

Mr. Withycombe, the results of pine-beating at Bagshot, including *Panolis piniperda*, larvæ of *Ellopia prosapiaria*, *Chrysopa vulgaris* and *C. prasina* with its prey *Chermes laricis*.

April 27th.—New Members.—Mr. A. D. Hobson of Highgate, Mr. W. Rait Smith, F.E.S., of Bickley and A. G. West of W. Dulwich were elected members.

Lecture.—Mr. E. E. Green, F.E.S., gave a Lecture on "British *Coccidae*" with blackboard sketches and numerous coloured figures of species and their depredations.

Exhibits.—Mr. Grosvenor exhibited a collection of the species and forms of the genus *Endrosa* (*Setina*.) from the collection of Dr. Chapman to be deposited in the British Museum.

Mr. Step, a living Salamander (*Salamandra maculosa*) which he and his son had found under a heap of stones by the roadside near Boulogne.

May 11th.—New Member.—Mr. C. B. Leechman, of Purley, was elected a member.

Exhibits.—Mr. H. Main exhibited *Thais polyxena* bred, from Hyéres, and some wingless sand-beetles, *Pimelia angulata*, from Egypt.

Mr. E. Step, a large gall on *Populus alba* from France, with small Diptera (*Cecidomyia* sp.) which had emerged, and much smaller Hymenopterons inquilines. He also showed larvae of the lichen feeding Geometer, *Cleora lichenaria*.

Mr. H. Moore, Lepidoptera from N. Zealand, including *Vanessa gonerilla*, *Chrysophanus salustius*, etc.

Mr. R. Adkin, exhibited the "Brown-tail" and "Gold-tail" moths, and discussed their names, pointing out that the former should be called *Nygmia phaeorrhoea* and the latter *Leucoma chrysorrhaea*.

Mr. Staniland, the beetle *Melanophila acuminata*, from Suffolk.

Mr. Blair, for Mr. Dods, the "stick-insect," *Carausius morosus*, of an unusual red-brown colour.

Mr. Turner, the Brazilian Longicorn *Phoenicocerus dejeani*, which has the antennae furnished with extraordinary long lamellæ.

Lancashire and Cheshire Entomological Society.

January 16th, 1922.—New Member.—Mr. H. O. Wells, Inchiquin, Lynwood Avenue, Epsom, was elected a member of the Society.

The Soirée.—Mr. Wm. Mansbridge reported favourable progress of the Joint Committee of Scientific Societies in Liverpool towards arranging an Associated Soirée, and the general closer co-operation of the Scientific Societies in the district.

Report of Recorder of Lepidoptera for 1920 and 1921.—Mr. Mansbridge then read his report as Recorder of Lepidoptera for the years 1920 and 1921. He mentioned that besides many interesting records, five species had been added to the Lancashire and Cheshire list in 1920, and five in 1921. These included one species new to Britain, *viz.*, *Blastobasis lignea*, Wlsm., and its variety *adustella*, Wlsm. Most of the additions had been made by the members who study Micro-lepidoptera, and this was considered to be a very encouraging feature of the Society's work.

Exhibits.—Mr. H. B. Prince exhibited a box of insects which he had bred from a number of larvæ caught in paper traps at Hightown, they included *Noctua triangulum*, *N. ditrapezium*, *N. baja*, *Phragmatobia fuliginosa*, *Leucania litharyyrea*, *Taeniocampa gothica*, and *Triphaena comes*. This is the first record of *N. ditrapezium* in Lancashire.

February 20th.—Flashlight Photography and Nature.—The Society met to hear a lecture by Mr. Oswald J. Wilkinson of Lymm upon the above subject. Mr. Wilkinson has made a special study of Nature Photography at night by means of flashlight, and last year his series of lantern slides of insect life gained the medal of the Royal Photographic Society. In his entertaining address, the lecturer showed how the student who had little daytime leisure for camera work could obtain better results at night by mean of flashlight, and at the same time gather a series of records of nocturnal habits of insects and other creatures of great value to science. There is a vast field of research in this direction, for as yet only the fringe has been touched, and the speed of the exposure, about 1-8,000th of a second, makes the operator almost independent of the movements of the subject. The slides showing the change of the caterpillar of the "Painted Lady"

butterfly, for instance, proved this unmistakably; during the process of getting rid of its old skin the caterpillar is in a state of rapid oscillation, but the photographs were as clear and definite as if the insect had been at rest: the succession of pictures showed the different stages of this metamorphosis from the first spinning up of the larva, to the fully developed chrysalis; some 10 days later the butterfly breaks out of the chrysalis and one slide showed it just after emergence.

Mr. Wilkinson's photographs dealt with a large number of subjects as spiders, butterflies and moths, beetles as well as studies of flowers with their insect visitors; many were in natural colours by the Paget process and the whole exhibition fully justified the statements of the lecturer regarding the scope for this branch of photography.

Exhibits.—Mr. P. G. Nagle made an interesting exhibit of local Lepidoptera from Chester and district, which included the following:—*Celastrina argiolus*, *Polygonia c-album*, *Colias hyale*, together with *Amphipyra pyramidea*, *Mamestra glauca*, *Calymnia affinis*, *Tiliacea citrago* and *Asteroscopus sphinx*.

OBITUARY.

The Hon. Victor A. H. Huia Onslow.

Mr. Onslow died at Cambridge on June 27th, at the early age of 32. He was born in New Zealand, in 1890, when his father, the late Earl of Onslow, was Governor-General of that colony. Debarred from following the active life he had chosen through paralysis of the lower limbs by a diving accident while on a holiday in the Tyrol, in 1911, he settled at Cambridge and devoted himself to research work. He had already shown a strong bent for science, and with extraordinary courage he settled down to make the best use of the limited powers he had. The Mendelian investigations were particularly attractive to him, and many were the papers he contributed to scientific journals on the subject. Of great interest to Entomologists is his work on the Inheritance of Colour in the Lepidoptera, and last year he contributed a long paper on the Causation of Colour in the Wings of Lepidoptera to the *Proceedings of the Royal Society*. To the *Journal of Genetics* he contributed a series of papers on the yellow forms of *Abraxas grossulariata*, on Melanism in *Boarmia* species, in *Hemerophila abruptaria*, in *A. grossulariata* ab. *carlegata*, and in *Diaphora mendica* var. *rusticata*. In the complex cases in which intermediates occur he demonstrated by means of an ingenious device, the "tintometer," that several factors were involved, and that true Mendelian segregation occurred He also published an important paper in the *Philosophical Transactions of the Royal Society* in 1921, "On a Periodic Structure in many Insect Scales and the Cause of their Iridescent Colours." Few entomologists had the pleasure of knowing Mr. Onslow personally, but all must admire him for the courageous determination of character which enabled him to turn what seemed a maimed existence to usefulness for mankind, and regret that such a valuable life has ended so prematurely. —E.A.C.

Subscriptions for Vol. XXXIV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 **[This subscription includes all numbers published from January 15th to December 15th, 1922.]**

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Desiderata.—Cratægata, Sambucaria, condition immaterial. *Duplicates.*—Dominula, mendica, and numerous common species.—*E. A. Cockayne, 65, Westbourne Terrace, W.2.*

Desiderata.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—*W. G. Pether,* "*Thelma,*" 4, *Willow Bridge Road, London, N. 1.*

Duplicates.—Aglaia, Adippe, *Io, T. quercus, Coridon vars., *Fuliginosa (Reading), *B. quercus ♀, Tiliæ, Menthastri, *Linariata, Aurantiaria, Leucophæaria vars. Paniscus. *Desiderata.*—Pupæ of Dictæoides; Imagines of typhon, palpina, camelina (dark), Curtula, Pyra, and numerous others; Ova of Hispidaria.—*Harold B. Williams, 112a, Bensham Manor Road, Thornton Heath, Surrey.*

Duplicates.—Sybilla, Paphia, Io (2), Selene, Lucina (2), Ocellatus, Illustraria (autumn) Nastata, Roboraria ♂, Prunaria (4) ♂, Tipuliformis. *Desiderata.*—Castreusis ♂, Cucullina, Cribrum, Cinerea, Ravida, Ashworthii, Notata, Obfuscaria, Smaragdaria and others, also vars. and local forms.—*Harold E. Winser, Kent House, Cranleigh.*

Desiderata.—Volumes of *Ent. Mo. Mag.* for 1920 and 1921, *Entomologist*, 1918, 1920 and 1921, second-hand. State price.—*Hy. J. Turner, 98, Drakefell Road, New Cross, S.E. 14.*

Duplicates.—Cinxia, Bellargus, Coridon, H. Comma, Lineola, Galathea, Moneta, Nupta, and many others. *Desiderata.*—Blandina, Irish Icarus, Carmelita, Cuculla. Gonostigma, Ashworthii, Templi, Australis, Undulata, Smaragdaria, Testacea.—*W. Gifford Nash, Clavering House, Bedford.*

Duplicates.—*Atalanta, Sylvanus, *Urticæ, Phlæas, *Moneta, *Pisi, *T. cratægi, *Lucipara, *Filipendulæ, etc. *Desiderata.*—Paniscus, Actæon, Anachoreta, Tincta, Asteris, Absinthii, Notha, Socia, Festucæ, Rubi, Unangulata, Munitata, etc.—*Wm. Foddy, 39, York Street, Rugby.*

Duplicates.—Cinerea ♀, fine forms, grey, brown and blackish, Maritima and vars. Immorata and other East Sussex species.

Desiderata.—Pupæ. Luteago (Barrettii), Caesia, Albimacula, Alpina, Xanthomista, Sparganii, Dissoluta (Arundineta), Graphalii. Also imagines of extreme forms Noctuæ in fine condition only.—*A. J. Wightman, 35, Morris Road, Lewes.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. 1922, October 4th and 18th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. July 29th, Field Meeting at Eastbourne. Leader, R. Adkin, F.E.S.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E.3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

All MS. and editorial matter should be sent and all proofs returned to HY. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

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The Entomologist's Record

AND

Journal of Variation

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New British Cecidomyiidae. 4.

By RICHARD S. BAGNALL, F.R.S.E., F.L.S., F.E.S., and J. W. HESLOP HARRISON, D.Sc., F.R.S.E.

(*Continued from vol. xxxiv., p. 66.*)

Many of the following records are largely due to our now having access to further continental literature, in particular to the valuable contributions of Rübsaamen published during the progress of the war and, therefore, not then available to British Zoologists. Many species affecting common plants are so extraordinarily local and isolated that only the most determined and constant research will yield success; the species from elder, beech, and *Ranunculus acris* recorded here are cases in point.

Oligotrophus schmidti, Rübs.

On *Juniperus*; a small obscure gall.

DURHAM, Chester-le-Street, Langdon Beck.

NORTHUMBERLAND, Blanchland, Eglingham.

Phegomyia fagicolus, K.

On *Fagus*. Houard, 1158. Leaf discoloured, hypertrophied and folded between the secondary veins; each fold containing two or three red larvae.

SCOTLAND, Crieff, on one tree only, September, 1921.

Psectrosoma tamaricis, Stefani.

On *Tamarix gallica*; young twig swelling, with large cavity.

DEVON, Torquay district, twice, including an example extraordinarily like the one figured in Houard.

SUSSEX, Bexhill, December 30th, 1921, two examples, in each case causing a bend in the young twig. Recorded in Houard from Sicily and Portugal.

Rhopalomyia cristae-galli, Karsch.

On *Rhinanthus crista-galli*; flower distinctly deformed, faintly pilose; larvae gregarious, white.

YORKS., near Moorsholm, July, 1922.

DURHAM, Widdy Bank Fell, near Langdon Beck, August, 1922.

Macrolabis holosteae, Rübs., 1917.

On *Stellaria holostea*; terminal gall; larvae creamy-yellow.

NORTHUMBERLAND, Stocksfield, June, 1922.

Macrolabis sp.

Leaves of *Hypochaeris radicata*; larvae white (? *M. hieracii*).

NORTHUMBERLAND, Seaton Sluice, August, 1921.

Geodiplosis ranunculi, K.

A shining red larva, living in the roots and lower part of radical leaves of *Ranunculus acris*.

NORTHUMBERLAND, Stocksfield, Hexham, July, 1922, rare.

Profeltiella ranunculi, K.

An amber-yellow larva, accompanying the above is probably

referable to this species. Kieffer describes it as predaceous upon *Cecidiplosis ranunculi*.

Northumberland, Stocksfield, July, 1922, rare.

Octodiplosis glyceriae, Rübs., 1895.

Reddish larvae, paler anteriorly, in leaf bases of *Glyceria aquatica*.
Durham, Billingham and Ryton.

Rhabdophaga exsiccans, Rübs.

On *Salix pentandra*; a clavate twig-gall.
Durham, Langdon Beck, Waldridge Fell.
Yorkshire, near Moorsholm.

Rhabdophaga gemmicola, K.

Bud gall on *Salix aurita*.
Scotland, Birnam.
Durham, Gibside, Hunstanworth.
Northumberland, Riding Mill, Hexham.

Rhabdophaga ramicola, Rübs.

A twig swelling on *Salix purpurea*.
Northumberland, Stocksfield.
Westmorland, Appleby.
Lancashire, Ainsdale.

Genus *Jaapiella*, Rübs., 1915.

Of the species of *Perrisia* already recorded by us *alpina*, F. Loew, *cirsicola*, Rübs., *compositarum*, K. (?), *dittrichi*, Rübs., *floriperda*, F. Loew., *genistamtorquens*, K., *genisticola*, F. Loew., *inflatae*, Rübs., *laticola*, Rübs., *parvula*, Liebel, *praticola*, K., (?) *rubicundula*, Rübs., *scabiosae*, K., *schmidti*, Rübs., *vaccinivorum*, K. (*vaccinii*, Rübs.) and *veronicae*, Vall., fall into this genus.

Jaapiella inflatae, Rübs.

B. and H. in *Ent. Rec.*, xxxiii., p. 154.

The larvae are white and not red as stated, the red larvae being those of the host species *Jaapiella floriperda*.

Jaapiella knautiae, Rübs., 1917.

On *Knautia arvensis*; deformation of terminal leaves enclosing gregarious white larvae.
Durham, near Winlaton (old record); Vigo.
Northumberland, near Stocksfield.

Jaapiella sarothamni, Rübs., 1917.

On *Cytisus scoparius*; flower undeveloped and not opening, containing pale red larvae.
Durham, Gibside. Northumberland, Stocksfield.

Perrisia berberidis, K.

On *Berberis*.

Northumberland. Hexham and Corbridge.
Scotland, Melrose district.
We have known this species for some time but were under the impression that it was already known for Britain.

Perrisia cardamnicola, Rübs., 1915.

Bright red larvae feeding gregariously on *Cardamine pratensis* are referable to this species. Gall and larvae strikingly distinct from those of *Perrisia cardaminis*, Winn.
Durham, Burnhill, June, 1922.

Perrisia dryophila, Rübs., 1917.

Light reddish larvae in galls of *Arnoldia* and *Contarinia quercina*; apparently not uncommon where the host-galls occur.

Perrisia jaapiana, Rübs., 1914.

(Not *P. jaapiana*, Rübs., 1917, from *Spiraea ulmaria*).
This is B. and H. 158, a leaf-pod gall on *Melilotus lupulina*.

Perrisia fusca, Rübs. and *P. oxyacanthae*, Rübs.

In unopened flowers of *Crataegus*, the former with yellow to orange larvae and the latter with red (usually brick-red) larvae—much later than *Contarinia anthobia* and therefore liable to be overlooked.
Both apparently widely distributed.

Perrisia filipendulae, Kieffer (*non* Swanton).

Spiraea filipendula; red larvae in closed flowers.
Yorks., in a garden at Aislaby, near Whitby.

Perrisia rossi, Rübs., 1914.

This is apparently B. and H. No. 405.

Perrisia squamosa, Tavares.

B. and H. No. 379 in part; the form with whitish larvae; usually solitary. We find acorn-cups also affected by pale salmon larvae feeding in groups of three or four.

Perrisia trotteri, Tavares.

On *Cytisus scoparius*; gall in end of twig like that of *Janetiella tuberculi*, but larger and containing a red larva.
Durham, near Lanchester and Lintz Green.
Devon, near Sidmouth.
Recorded by Houard from Portugal.

Perrisia rallisumbrosae, K.

On *Cytisus scoparius*; leaflets folded in form of a pod, thickened and discoloured, containing a few red larvae. Houard, 3431.
Scotland, Crieff, rare, September, 1921.
Recorded by Houard from Italy.

Perrisia hedickei, Rübs.

On *Pimpinella saxifraga*; affecting the leaves and the bases thereof

DURHAM, Penshaw Hill and Bishopton, quite commonly. Already recorded by us without name.

Schizomyia nigripes, F. Loew.

On *Sambucus nigra*; flower enlarged, virescent, slightly elongated and remaining closed. Larvae gregarious, yellow to pale orange-yellow.

NORTHUMBERLAND, Stocksfield, Fallowfield, July, 1922. In spite of persistent search in very many English counties this Cecidomyiid escaped observation until the date named and thus emphasises the patience necessary in the study of Cecidology.

Asphondylia lathyri, Rübs.

On *Lathyrus pratensis*; single, yellow to orange-yellow larva in pod, causing a swelling.

NORTHUMBERLAND, Tughall, near Chathill; near Hexham also. Young examples, July, 1922; Hartley, August.

Tricholaba trifolii, Rübs. (1917, B. & H. 210).

There may be two species, the one (B. & H. 210) containing a single white larva and the other an inquiline of *Perrisia trifolii* with one or more larvae, ranging from white to whitish-yellow and, according to Rübsaamen, to pale orange-red. If distinct then *T. trifolii* occurs with us as well as our B. & H. 210.

Tricholaba similis, Rübs., 1917.

Yellowish-white to pale orange-red larvae in the pod galls of *Perrisia viciae*, possibly a variety of *T. trifolii*.

DURHAM, Fatfield, Birtley.

YORKS., Saltersgate.

Contarinia asperulae, K.

On *Asperula odorata*; terminal leaves, shortened and broadened and somewhat concave enclosing orange-red larvae.

DURHAM, Gibside, July, 1922. Two examples, one empty and the other with larvae of which two were apparently parasitized.

Contarinia geicola, Rübs., 1917.

White larvae in crinkled leaves of *Geum urbanum*.

NORTHUMBERLAND, Stocksfield, July, 1922.

Contarinia jaapi, Rübs., 1914.

On *Lathyrus pratensis*; stipules considerably enlarged containing largish agglomeration of buds; larvae gregarious, yellowish-white to pale flesh-colour.

YORKS., Scarborough, Great Ayton, June, 1922. One example contained about 50 larvae.

Clinodiplosis urticae, K.

This is the inquiline of *Perrisia urticae* and already recorded by us (*Ent. Rec.*, xxxiv., p. 62).

Clinodiplosis sorbicola, Rübs., 1917.

Pale creamy-yellow larvae in twisted leaves with *Contarinia sorbi*, June.

WESTMORLAND, Witherslack.

YORKSHIRE, Saltersgate and Sutton Bank.

Stenodiplosis geniculatus, Reut.

Pale red larvae in seeds of *Alopecurus geniculatus*.

DURHAM, Lintz Green, July, 1922.

YORKS., near Moorsholm, July, 1922.

This species is known from Finland and appears to be very distinct from *Oligotrophus alopecuri*, which we have now noted on both *Alopecurus pratensis* and *A. myosuroides* (*agrestis*).

Cecidomyidarum sp.

Orange-red larvae in *Aphis* on Bramble.

NORTHUMBERLAND, Stocksfield, July, 1922.

Cecidomyidarum sp.

Red larva on lower side of Raspberry (*Rubus idaeus*) leaves, crinkling the leaf and causing torsion of the veins especially basally and near the mid-rib, giving the appearance of *Eriophyiid* damage.

DURHAM, Birtley, June, 1922.

Cecidomyidarum sp.

Honey-yellow larvae predaceous upon above.

DURHAM, Birtley, June, 1922.

Cecidomyidarum sp.

On *Galium aparine*, Houard, 5307.

NORTHUMBERLAND, Stocksfield.

Cecidomyidarum sp.

Red larvae in brown terminal shoot of *Stellaria holostea*, possibly an inquiline.

NORTHUMBERLAND, Stocksfield, July 1922, once only, but probably late in the season. Several species cause a gall of this nature, of which we know *Perrisia silvicola* with white larvae, and *Macrolabis holostear* with creamy-yellow larvae.

Cecidomyidarum sp.

Leaves of *Alchemilla vulgaris* more or less deformed, slightly crumpled, or in some cases crinkled with torsion of veins. Larvae white tending to pale flesh-tint in the larger examples, feeding on the underside of the leaf.

NORTHUMBERLAND, Stocksfield, July, 1922.

Cecidomyidarum sp.

On *Hypericum pulchrum*, flower remaining closed, small and slightly thickened. Larvae gregarious, glassy-white with end pinkish

owing to ingested stamens. Seemingly normal flowers may contain a single larva.

NORTHUMBERLAND, Stocksfield, July, 1922.

DURHAM, Waldridge, August, 1922.

Cecidomyidarum, sp.

On *Sambucus nigra*; flower strongly swollen and enlarged, with tissues slightly thickened, containing a single flattish yellow larva (? *Asphondylia* sp.).

NORTHUMBERLAND, Stocksfield, July, 1922. Very local, but plentiful where it occurred.

Cecidomyidarum sp.

On *Ranunculus repens*: similar gall to that caused by *Perrisia ranunculi* but containing numerous yellow to orange-yellow larvae.

YORKS., Scarborough, June, 1922.

Cecidomyidarum sp.

On Maple (*Acer campestre*); Houard, 4027.

Small sharply defined depression about 1mm. in diameter on the lower surface of the leaf (containing a broad white larva) with a surrounding zone of discoloration affecting both surfaces.

YORKS., plentiful in hedgesides at Spital Beck on the York to Malton Road, June, 1922.

Cecidomyidarum sp.

On *Campanula*: inquiline in galls of *Perrisia trachelii* with pale yellowish-orange larvae.

NORTHUMBERLAND, sandhills at Seaton Sluice, August, 1921, where the host-species (with its brick-red larvae) is plentiful.

Cecidomyidarum sp.

In galls of *Perrisia veronicae*; with white larvae predaceous on the larvae of that species.

YORKS., common near Great Ayton. SCOTLAND, Kelso.

(To be continued.)

Races and Seasonal Polymorphism of the Grypocera and Rhopalocera of Peninsular Italy.

By ROGER VERITY, M.D., and ORAZIO QUERCI.

INTRODUCTORY REMARKS BY R. VERITY.

Researches on the Lepidoptera have progressed remarkably in connection with our knowledge of geographical and seasonal variation. New races are continually being discovered in the various localities, more or less definitely characterised, and these races are seen to constitute groups proper to certain regions or to certain kinds of surroundings. One thus perceives the instance of zones with features due, not only to the presence of species peculiar to each, as it has long been known, but also to the aspect of those common to more than one zone. Peninsular Italy stands out very prominently as a well-defined zone, better defined, in fact, than is usually the case, on account, no doubt,

of its being surrounded on three sides by the sea and separated northwardly from the continent by a barrier of high mountains, which mark a most distinct change of climate from the damper one of the basin of the Po, with luxurious vegetation, to the much drier one, south of their water-parting, with a very different and comparatively much poorer flora. I shall come back to this subject later, when dealing with the different European zones. What I wish to say here is, that this is one of the reasons for which I have decided to publish this Catalogue separately from the rest of Italy. It is not an artificial division, but a very natural one. Another reason is that I am able to avail myself of the data obtained by Querci in the last forty years and of my own observations in Tuscany, where I live, which make this region much better known than any other from the special standpoint of this paper. During the last ten years I have published a considerable number of these observations, but unfortunately they are very much scattered in this and other Journals and Transactions. Our object here is to collect them and classify them, together with those of Oberthür, Frühstorfer, Turati, Rostagno, Rocci, and others, who have dealt with races found in Peninsular Italy. We have left out all that refers to purely individual variations, which have no, or little, connection with surroundings or seasons. The interest of local catalogues and observations consists in pointing out the peculiarities of the regions they deal with, as compared with others. When one compares adequately extensive series of specimens from different regions, one finds that on the average, if not in all the individuals, certain characteristics stand out clearly as peculiar to each and leave no doubt as to their existence, even if they are not striking at first sight, whereas much more conspicuous individual variations are usually found to be common to all or most of the series and are of no interest from the geographical point of view. This distinction is of primary importance, but it can only be made with adequate materials to work upon. The habit of preserving in collections an extremely small number of specimens, which prevailed until the beginning of this century, caused the utter ignorance we were in as to variation in connection with distribution. A few of the most striking varieties had been observed and named. Collectors eagerly sought for them and were satisfied when they secured a specimen and they had mentioned them in local lists. Thus collections and literature always grew within limited boundaries, established by previous authors. Innovations would only be introduced by a few entomologists who were more daring and were credited with such superior knowledge as to make them very nearly infallible. Otto Staudinger reigned supreme among them. It is interesting to look back on this curious phenomenon, which nowadays seems incredible. It was evidently the result in our small entomological field of action of the mentality of humanity in general; a lack of initiative in the mass of mankind, which used to let itself be guided entirely, in all its actions, by past experience and by a few sharper and more fortunate individuals, as if it feared to take a step without their consent. Entomological literature is full of errors due to this mentality: species and varieties were always conscientiously referred to those already known and named, whereas in many cases they were quite distinct and unknown and should have been described. One sees that many authors have

undergone considerable mental strain to fit existing descriptions and figures to the specimens they had before them, but they evidently could not admit they had discovered a novelty. As a consequence one finds a wearisome uniformity in the literature of last century, the same informations and the same names of "varieties" and "aberrations," as all variations used to be called from the subspecies to the monstrosity, are found repeated over and over again in all the texts and in the lists of every sort of region; the most usual variations, which are to be met with anywhere, and which for this very reason were better known and had received names, were those which local writers invariably quoted, whereas variations peculiar to their surroundings were not mentioned, because they could not place them in the established classifications and they thus gave them no importance. This is also another consequence of the way of collecting mentioned above: an individual variation is clearly discernible even in a single characteristic specimen, and if it happened to be one of those which had struck the fancy of a writer of the past, so that it had received a name amongst hundreds just as interesting, or even more so, which had been neglected, the local entomologist carefully noted it. Geographical variations were only taken into account in the past when they were particularly prominent and constant. Unfortunately even in these cases the literature of last century is overflowing with incorrect statements and gross blunders, because such characters had been described too vaguely ("larger," "smaller," "pattern more extensive," "markings reduced"), with reference to a "type of the species," which nobody knew, so that each collector conceived it according to his own fancy: some took as typical any specimen received from abroad and especially those sent from Germany by Staudinger's firm, under the specific name; others trusted to the figures of the text-book they had at hand and which were most misleading because their authors never stated, as a rule, the locality of the specimens used for the figure they gave under the specific name. All this is most distressing and it is disheartening to think that our present efforts will, no doubt, produce the same impression on future generations! The complexity of nature is such that it seems to make fun of our attempts to master it. Our only consolation is that it too proceeds, step by step, from the simple to the complex, so that the human brain, which is its most beautiful achievement, must follow Mother Nature and build up its knowledge stone by stone, while every man must remember that, though he may rise he still is very far from the summit, that none will ever reach. To try and clear up the entomological literature of the past and set it on firmer ground, so as to put a stop to the increase of confusion, is not an easy task. We must work our way back to the first origin of each name, establish it strictly, according to the law of priority, read up original descriptions carefully and thus establish definitely the typical race and form, as a starting point for new descriptions. It is with this view that Querci and I have undertaken the laborious task of looking up these descriptions in connection with the names mentioned in the following Catalogue, and we have thought it useful to note in each case the locality of the typical specimens, for future reference.

Tutt was the first man who seriously undertook to look up the entire literature of the species he dealt with, notably some of the

British ones; we all deeply regret that death cut short, in 1911, the task he had begun in 1905. Also Charles Oberthür is one of the pioneers of the modern method of working out variation, in a work to which he gave the very appropriate name of "*Études de Lépidoptérologie Comparée*," adopting it as the title of a long series of magnificent volumes. He has been one of the first to look up original descriptions in many doubtful cases. Unfortunately, however, he sometimes neglected the right of priority and used the name to which a good figure or a good description allowed him to refer more exactly, in preference to the name first published. This view may or may not be accepted, but, anyhow, it does not diminish the importance and value of this splendid work, which leaves one in amazement, when one considers the short period of time in which it has been written. In some instances one regrets that its author should not have made use more fully of the enormous materials he has collected, by working out geographical variation more thoroughly. One often finds evidence that he had made some interesting observation in this sense, but he drops it, without defining it, and fixes it too rarely by a name, making it a point not to follow "l'école de Frühstorfer," as he puts it. Notwithstanding, his descriptions of variation on broad lines and of the distribution of those races which he does consider, constitute a clearer and more complete study of many subjects than any author has as yet produced.

The writings of the late H. Frühstorfer stand quite opposite to those of Oberthür, unfortunately also by the form in which they are published! He has followed the method of describing and naming, with no hesitation, every race which differed from those already known. It is several years since I came to the conclusion that this is decidedly the right method and that it gives excellent results. I cannot enter into a discussion of this long debated question here, but I must state my view. Facts clearly show anyone who devotes a little attention to this subject that it is the most natural development of the study of variation and that the results already achieved are of the greatest interest. The chief objection made to it, that it is a hopeless task, with no end or aim, is already obviously seen to have been an entirely mistaken anticipation. The geographical variations of most European species have been found to be very limited and to follow one simple line. Those which in reality vary to a disconcerting extent can be counted on one's finger-tips and it is only a question of energy and time to work them out; of this sort are *Plebeius argus*, L., *Pieris napi*, L., *Parnassius apollo*, L., and *P. mnemosyne*, L., *Melanargia galathea*, L., *Satyrus statilinus*, Hufn., *Melitaea didyma*, Esp., etc. What was quite wrong in Frühstorfer, was the way he published a great many utterly insufficient descriptions, not taking the trouble to compare his new race with those already known, which stood nearest to it, so as to establish well its position amongst them and so as to convey a clear idea of it. He often gives one the impression of having said to himself: "By stating the locality I make sure of the priority of my name. Why trouble any more about it? Let those who want to know what it looks like procure specimens from there." This habit of leaving the work to others, and the toilsome task of having to look up Frühstorfer's few words of description scattered in innumerable journals, with the danger of one of them, which had escaped one's

notice, sinking into synonymy a name one had well earned by a careful study of that same race, has turned most entomologists against this author, and it has put in a wrong light a line of research, which in itself is excellent and most promising. I must add, however, that Frühstorfer admitted I was right, when I made these remarks to him during a call I paid him in Geneva, and that lately he has published some monographs, with a summary of his works on some *Erebiae* and *Melitaeae*, which is just what is needed.

Another line of research has been opened by Chapman and Reverdin, with the study of the *genitalia*, which has already yielded most important results by revealing the existence of unsuspected species, even in regions and in groups of Lepidoptera, which were thought to have been thoroughly worked out. It is now becoming clear, however, that the results of this method of establishing and distinguishing species have been at first overrated and that one cannot rely on it as a touch-stone to cut short any debated question. These organs have been shown to vary both individually and geographically, within the limits of some species, just as much as any other characteristic, and that in many cases conclusions can only be drawn by comparing the averages. Sometimes they have directed the attention of entomologists to the existence of other specific features, which had escaped their notice, but there have been cases in which the *genitalia* appeared quite alike when there existed evidences of other sorts that two species were before one, and I believe one will often meet with the opposite case of different looking *genitalia* in the various races of a single species; for instance, I cannot believe that *Z. romeo*, Dup., is a distinct species from *Zygaena scabiosae*, Schiff., as suggested by Burgieff, or that the Italian *transalpina*, Esp., includes three or four species, as maintained by Rothschild and Jordan; the differences they have detected can, I think, be explained by the general structure of these races, some of which have slender abdomens and others stouter ones; this would naturally modify also the aspect of the last abdominal segments. It is all a question of establishing what differences are specific in the various genera before drawing conclusions in particular cases. Notwithstanding these difficulties, the method, when properly and judiciously handled, will certainly yield most important data. This brief review of the developments of the study of variation in the Lepidoptera is, I think, sufficient to show how necessary it is to make a new start in the form of local lists and to work up again even the regions which were thought to be tolerably well known. In connection with Italy this has of late been begun partially by several authors, besides ourselves, and, as far as Peninsular Italy is concerned, it seems as if we had reached a fairly complete knowledge already.

(*To be continued.*)

Notes on Entomology in France and Italy, July-August, 1921.

By Lt. E. B. ASHBY, F.E.S., Memb. Soc. ent. de France.

Leaving London on Friday, July 22nd, I reached Melun the following morning (*via* Paris), and walked from there to Barbizon in the Forest of Fontainebleau.

The Forest was very dried up through the long continuance of

the drought, but I noted the following insects (besides a number of commoner ones): *Satyrus hermione*, *Callimorpha hera*, *Zygaena filipendulae* (a small form), the grasshopper *Chorthippus parallelus*, and the Dipteron *Eristalis arbustorum*, all of which I secured together with a fine male of the moth *Lasiocampa quercus*, which dashed straight into my net, as I tried to secure it, and the Hymenoptera *Cerceris labiata* and *Ammophila sabulosa*, also the Dipteron *Conops flavipes*.

Leaving Paris the night of July 23rd I reached Chambéry early next morning and devoted the day to the motor tour of the Grande Chartreuse, from Chambéry by Les Eschelles and St. Laurent du Pont to the Convent, and back to Chambéry *via* Grenoble; an exceedingly pleasant and interesting day's trip. Above the Grande Chartreuse I found *Erebia ligea* in profusion and very fresh, and also the grasshopper *Stauroderus scalaris*, though not much else of any account, but I only had a comparatively short time to do any collecting. One or two specimens of the dragon-fly, *Aeschna grandis*, were flying over the small pond between the Convent and the Chapel of S. Bruno higher up. Leaving Chambéry on July 25th I reached Susa in Piedmont *via* Modane and Bussoleno the same afternoon, and on the 26th I set off early to walk from Susa to the village of Meana and beyond towards the much higher slopes on which the little village of Santa Maria della Losa is situated. Thanks to Mr. Tutt's and to Mr. Rowland Brown's "Notes on Susa" in the *Entomologist's Record* of past years, I was soon on good ground, and on that day I netted the following insects, *Papilio machaon*, *P. podalirius*, *Pieris manni*, *Polyommatus meleager*, males, and females ab. *stereni*, *S. hermione*, and the moths *C. hera* and *Diacrisia sanio* (*russula*).

Returning to Susa for déjeuner, I went out again at 5 p.m. along the right bank of the River Dora Riparia down stream, which flows through the town, and found the beetles, *Aromia moschata* (in abundance), and *Hammaticherus heros* (one), in a hedge of willows; together with a number of the Hymenoptera *Polistes gallica* and *Vespa crabro*, as well as a few of the butterflies *Eugonia polychloros* and *Pyrameis atalanta*, which were mostly settled amidst the foliage in the same spot, in the hollows and angles of the boughs.

July 27th to August 1st.—I stayed on at Susa during this period and collected again on the road past the village of Meana leading up to the village of Santa Maria della Losa in great heat; also on the Mont Cenis Road, as well as on a more productive offshoot of this road, leading towards Chiamonte, high up above the River Dora Riparia, left bank. I found the road from Susa to Bussoleno not worth repeating from the collecting point of view and it is very shadeless. I have little to add to the accounts of collecting at Susa by Mr. Tutt and Mr. Rowland-Brown in past numbers of *The Entomologist's Record*.

I only got one specimen of *Libythea celtis*, quite perfect, on July 28th, above Meana, on a large piece of rock abutting on the main road towards Santa Maria della Losa, though I saw one or two specimens which I failed to capture, as they were settled on the beginning of the road towards Chiamonte on a shaded hilly zigzag very shortly after leaving the Mont Cenis Road, just before passing under the first vine trellis. *Polygonia egea* swarmed everywhere near Susa, generally in very good condition, especially on walls around vineyards in the environs of the city.

The fine Roman arch of Caesar Augustus at Susa is well worth seeing as well as the other Roman walls and remains adjacent. The hotels at Susa are still poor, but the "Albergo del Sole," at which I stayed, although not too clean, is respectable, and fairly reasonable in price, with good food well served. During my stay at Susa I thought I saw one specimen of *Neptis lucilla*, on the road towards Chiamonte, flying among beech trees, but I could not be certain. In addition to the above-mentioned series, the following is a list of the various insects I observed during my stay at Susa, *viz.*:

Rhopalocera.—*Colias croceus* (*edusa*), *Melitaea didyma*, *M. athalia*, *M. phoebe* (very fine), *Satyrus cordula*, *Hipparchia semele* (the fine form noted by Tutt), *Epinephele lycaon*, *Erebia eurgale*, *E. aethiops* (very fresh), *Scolitantides orion* (females only, towards Chiamonte), *Aricia medon*, *Polyommatus icarus*, *P. escheri*, *Agriades coridon* and *Heodes alciphron* (including a very fine pale brownish female.

Heterocera.—*Lymantria dispar*, *Zygaena ephialtes* var. *coronillae*, *Z. transalpina*, *Z. lonicerae*, and a fine full-fed larva of *Saturnia pyri* brought to me from a garden near, and which obligingly spun up at once and produced a fine moth in May, 1922.

Coleoptera.—*Silpha obscura*, *Strangalia maculata*, *Telephorus fulva*, *Cryptocephalus aureolus*, and *Cetonia metallica*.

Hymenoptera.—*Scolia hirta*, *Sphex maxillosus* (abundant), *Ammophila viatica* (also abundant), and *Vespa crabro*.

Orthoptera.—*Locusta cantans*, *Acryptera fusca*, *Stauroderus scalaris*, *Decticus verrucivorus*, *Oedipoda miniata*, and *O. caerulescens*.

Diptera.—*Asilus inconstans* (male and female *in cop.*), and *Echinomyia feror*.

The above list is of course by no means exhaustive, and the great heat during my visit prevented me from extending it. A day at Bardonnechia on July 29th, the first station in Italy after passing through the Mont Cenis Tunnel, although looking most attractive from the train was really fruitless, and I got nothing much there beyond *Parnassius apollo*, *Polyommatus damon*, a few of the common mountain species, and the Hymenopteron *Ammophila viatica*.

Leaving Susa on August 1st I reached Aosta *via* Turin, and spent a morning exploring this interesting old Roman city with its Roman Theatre and Gateways, and the Cathedral of St. John with a fine western façade. I reached Pré-St.-Didier on August 2nd by motor, and spent the latter part of the afternoon on the hillsides opposite the Hotel Univers, where I stayed comfortably until August 8th. I found the following insects fairly abundant on the slopes. *Pieris manni*, *M. phoebe*, *E. lycaon*, *P. damon*, *Erynnis laraterae*, and the beetles *Mylabris floralis* and *M. variabilis*, with the bee *Bombus pratorum*. The grasshopper, *Caloptenus italicus*, was very abundant, and I afterwards found it abundant in many places around Pré-St.-Didier.

August 3rd.—To-day I walked up to La Thuile on the Petit St. Bernard road and back. I was glad to get two specimens of *Dryas pandora* just above Pré-St.-Didier, at the commencement of the walk, several fine specimens of *M. phoebe* and *B. amathusia*, with one finely marked variety of *A. aglaia*, but I got little at La Thuile except a few specimens of *P. damon*, and *Erebia pronoë*, and one good specimen of *Lorcia alciphron* var. *gordius*. Butterflies, including *P. apollo*, were swarming in suitable places but were nearly all worn except *Limenitis*

camilla, which was sometimes very fresh. I also took the beetle *Pachyta quadrimaculata*, and at La Thuile one specimen of the bee *Bombus distinguendus*. Edelweiss grows commonly round La Thuile, but it is not easy to find the first specimen, its dirty grey-white colour harmonising so well with the rocky ground on which it occurs.

August 4th.—To-day I climbed to the top of Mt. Grammont behind Pré-St.-Didier, which is 9,059 ft. high and very steep. The view of the whole Alpine expanse from the summit was glorious, but the higher part of the mountain was practically denuded of insect life. *P. apollo* was numerous but getting worn. I also got the Ichneumon *Amblyteles fusorius*, fairly high up, and the moths *Cleogene lutearia*, *Scotosia dubitata*, *Boarmia repandata*, *B. rhomboidaria* (*gemmaria*), *Plusia iota*, *Gnophos myrtillata*, *Lygris populata*, etc., in returning through the pine woods above Pré-St.-Didier, also the dragon-fly *Sympetrum striolatum*. In the same woods I also took specimens of the Hymenoptera *Halictus sexcinctus* and *Ammophila sabulosa*. This evening I took at light in the Hotel Univers the moth *Cosmia paleacea*.

August 5th.—To-day, walking up the right bank of the river Dora Baltea under the Grammont towards Dollens, I caught a fine specimen of *Dryas paphia* ab. ♀ *valesina*, but little else out of the ordinary except the Ichneumon *Amblyteles fusorius*. *C. croceus* (*edusa*) and *C. hyale* were common. Near Courmayeur I got the grasshoppers *Podisma frigidum* and *Locusta viridissima*, and was glad to turn in for a well-earned meal at the Hotel Unione at Courmayeur, where I found my old friend the proprietor, Signor Cav. Ruffier, very well.

August 6th.—To-day I motored to the Col of the Petit St. Bernard, where there is a fine Alpine garden close to the Hospice, and walked back after déjeuner at the Hospice, which was crowded with tourists, as far as La Balme below La Thuile, about 20 kilometres. There was very little insect life on the higher parts of the Pass, but *Brenthis pales*, rather worn, were common near the lake below the Hospice, and lower down *Erebia tyndarus* were frequent. I got the grasshoppers *Podisma pedestre*, *Chrysochraon brachypterus*, and *Anonconotus alpinus* (male and female), on the higher slopes of the Pass, all new to me. Between La Thuille and La Balme I picked up on the dusty road a fine larva of the moth *Deilephila galii*, which very soon after pupated. It produced a fine moth in June, 1922.

August 8th.—*L. camilla*, *M. phoebe*, and *Issoria lathonia* were common to-day on the roadsides between Pré-St.-Didier and La Thuile, but little else were worth taking. Nearly every insect was so worn and over, and the flowers were all finished this parched year. Mont Blanc also might almost this year be styled "Monte Bruno" instead of "Monte Bianco," from the large masses of rock quite clear from snow. It is too late this season for the High Alps, and on the recommendation of the nephew of Doctor Festa of Turin Museum, whom I fortunately met at Pré-St.-Didier to-day, I decided to leave and to go down to Nus, in the sub-Alps between Aosta and Ivrea, which he told me was well watered and worth trying. He also gave me a specimen of the Bee *Eumenes unguiculus*, taken at Pré-St.-Didier.

August 9th.—I was very glad I took my Italian friend's advice. This small village of Nus, with a railway station and the (only) Hotel Bordon, is quite close to the pretty Val di Barthelemi, which I com-

menced to ascend this morning. It is an excellent collecting ground, perhaps the best I have as yet found in Northern Italy, and has the great advantage of being so sheltered on either side by high cliffs that it is frequently possible to get out of the hot sun when it is full on this defile from early morning up till 2 or 3 p.m. This valley is well watered, a stream rushing down its full length from the direction of the village of San Barthelemi, several kilometres above. To-day I found insects very plentiful and in good condition, though I well believe that June and July would have been better months as regards quantity and variety. Flowers were here abundant still, so different from the burnt up districts of Pré-St. Didier and Courmayeur this year. I took 2 *Argynnis pandora* in excellent condition a little way up the valley, and *P. podalirius*, *P. machaon*, *C. croceus*, *L. camilla*, *P. maera* and *P. megera* were very abundant. I saw one *C. croceus* var. *helice*, but it was not quite perfect. *C. hera* was simply swarming on the blossoms of *Eupatorium*. The entrance to this small valley is about 10 minutes from the little Hotel Bordon in the village, which hotel, though very unpretentious, is clean and respectable, and the simple meals are politely served, though a naturalist who travels with his wife would probably prefer to stay at Aosta and make the very short journey to Nus and back by train.

I stayed at Nus until August 14th, and during this week I added the following insects to my captures, *viz.*, *Lampides boeticus* (one perfect), *Bithys quercus* (common), *Ruralis betulae*, the latter large and in excellent condition but not very abundant, *Rumicia phlaeas* var. *eleus*, *C. hyale*, and *D. paphia*, female var. *valesina* (the prevailing form of the female here), *E. lycaon* (abundant), and *S. statilinus* (very abundant and very fresh). In the lower part of this valley I also took three very fine and fresh female specimens of *Chrysophanus hippothoe*.

On August 12th I mounted up through this valley to the smaller village of San Barthelemi, a four hours' walk up hill, finding *A. pandora* nearly all the way, in some places plentiful and generally very fresh in both sexes; also *Heodes virgaureae* in both sexes but worn in the higher altitudes, and a few *E. aethiops*. After déjeuner at the make-shift of a hotel in the tiny village, it started to rain, rain, rain, ending in a considerable fall of snow on the mountains close by. I therefore descended on account of the cold, having left my coat at Nus, and as all hope of collecting up there on the snow-clad ground for a day or two, was dissipated, the entomological treasures of this altitude could not be ascertained.

As usual in the Alps I did not find dragon-flies on this long walk at all numerous, but in the lower part of the Valley of San Barthelemi near Nus, I have frequently seen and captured *Cordulegaster annulatus* in good condition, and one species of *Aeschna* that I could not catch.

In addition to the species mentioned above I took the following insects in this valley during my stay at Nus:—

Rhopalocera.—*Pieris manni*, *P. daplidice*, *M. didyma*, *P. meleager*, *Celastrina argiolus*, *P. icarus*, *E. tavaterae* and *P. c-album*.

Heterocera.—*Phlogophora meticulosa*.

Coleoptera.—*Lamia textor*, *Clytus verbasci* and *Chrysomela menthastri*.

Neuroptera.—*Chrysopa vittata*.

Hymenoptera.—*Sphecodes gibbus*, *Odynerus limotus*, *Allantus* sp. and *Amoenus gravenhorstii* = *cingulatum*, *Scolia hirta* and *Eumenes unguiculus*.

RHYNCHOTA.—*Carpocoris nigricornis* and *Graphosoma lineata*.

ORTHOPTERA.—*Locusta* (*Phasgonura*) *cantans* and *Mantis religiosa* larva.

DIPTERA.—*Ocyptera bicolor*, *Echinomyia grossa* and *Anthrax fenestrata*.

I left Nus for Turin on August 15th and was fortunate in finding the city cooler on arrival owing to the fact of a recent heavy thunderstorm. Early on the morning of August 16th I took the steam tramway from beside the central station to Mirafiore, a halt on the way to Stupinigi: crossing the bridge over the river Sangone, a few minutes walk in the direction of Stupinigi, I turned sharp to the right and walked through a part of Stupinigi Wood.

There I found insects in general far less abundant than they were in this excellent collecting ground during the summer of 1919, but I noted the following in fair abundance, males and females of *P. agon*, males and females of *Everes argiades*, and a grey skipper *Hesperia fritillum* with the moths *Lithosia complana*, *Bryophila perla*, *Larentia sordidata* and *Plusia iota*.

Coming to the broad river bed of the River Sangone, I found *Loweia dorilis* abundant in places across the stream which was very low and easy to cross. Further on, just below some old cottages, in places where dock is abundant amidst and near a small pond or two almost hidden by the ever present Acacias, is the *C. dispar* var. *rutilus* ground around Turin, and just as I was too late in finding the spot in September, 1919, so I was too early to-day to get the species in abundance, my only reward after four hours persistent tramping round the ground being one perfect male, the only one seen, and one very fresh female, damaged in emerging, which I therefore left. The first week in September is the date to get both sexes fresh here and abundantly in the second brood. A few specimens of *M. didyma*, *Brenthis selene*, and *E. laraterae*, and the first and only specimen of *Syntarucus telicanus* which I have ever seen and taken, were the only other butterflies, but before leaving the bed of the Sangone river, I searched the two small branch streams for dragonflies and was glad to take a male and female of *Orthetrum brunneum*, a specimen of *Ischnura elegans*, single specimens of *Platycnemis pennipes*, *Lestes barbara*, and of *Sympetrum meridionale*, and of the summer form of *Libellula depressa*. I found the males and females of *Calopteryx splendens*, a fine form, abundant, and I secured three specimens of *Lindenia* (*Onychogomphus*) *forcipatus*. I also took specimens of the Orthoptera, *Podisma pedestre*, *Homorocoryphus nitidulus*, and *Xiphidium fuscum*, and the Hymenopteron *Crionocnemus fuscus*.

Returning to Turin after lunch I took the tram out to the River Stura, where I had often collected in the summer of 1919. Here again I found insect life much less abundant than in that year, and whereas I had found the dragon-fly *Libellula pedemontana* along the backwaters and streams flowing into the River Stura so very abundant in 1919 at this time, to-day these were comparatively scarce, but I secured a few males and females amongst the reeds on which they settle frequently, in excellent condition, this pretty dragon-fly being particularly easy to capture. I also took on the same ground a specimen of the Ichneumon *Amblyteles sputator* and the beetle *Trichius fasciatus*. I left Turin on August 17th, reaching London on the

evening of August 18th, after a very interesting trip in an adverse collecting season.

CURRENT NOTES AND SHORT NOTICES.

We regret to announce the death of Dr. Sharp, F.R.S., who for many years has compiled and edited the Insecta portion of the *Zoological Record*. He had passed the chair of the Entomological Society, and was one of the two "Special Life Members."

Another fellow of the Entomological Society has also passed away in Hamilton Druce, F.Z.S., whose special study was the *Lycaenidae*, For some time past he had been in bad health.

We are pleased to welcome a new venture in *L'Amateur de Papillon*, five numbers of which lie before us. It is an admirable little magazine published in Paris under the editorship of M. Léon Lhomme, an ardent devotee of the study of French Lepidoptera. We understand from the prospectus that it will appear eight times a year, each number will contain 16 pages with illustrations, and the contents will deal with the Lepidoptera alone, not omitting the Microlepidoptera, will contain much faunistic matter as to localities, and will afford aid to those whose opportunities of making progress in their studies are limited; all the matter will be concerned with the Lepidoptera of France. The subscription is seventeen francs, and we would suggest to those who spend their annual holidays in the "pleasant land of France" that they subscribe to this modest periodical.

From the editorial of *L'Amateur de Papillons* we quote an apt phrase or two. "Est-ce qu'il y a des oeuvres vraiment parfaites? Mieux vaut faire une oeuvre imparfaite que ne rien faire. Agir, c'est vivre, tandis que rester inactif et ne rien produire, c'est déja être mort."

From the same editorial we quote an admirable summary of the pleasure and benefit some of us gain in our practical study of entomology apart from the scientific side: "Après une longue semaine d'un labeur incessant, absorbant, comme on aime, le dimanche venu, gagner la forêt voisine, égarer ses pas dans les allées herbues et fleuries, fréquentées par nos insects prédilection, ou arpenter les champs en friche que la main de l'homme ne retourne pas de quelque temps, laissant les plantes sauvages se développer à leur aise. On y retrouve un calme réparateur, on y respire un air revivifiant, on y éprouve le bienêtre recherché et, par les heureuses captures qu'on a pu faire, on sent encore s'augmenter le plaisir de sa journée de repos."

The May number of the *Canadian Entomologist* has only just reached us. The contents deal largely with injurious insects:—Beetles injurious to sunflowers in Manitoba, the devastation of young pine trees by the beetle *Ips pini*, a study of the Tarsonemid mites of N. America, with several illustrations and biological details, new *Syrphidae* (Dip.) to Canada, miscellaneous notes on Coleoptera, and synonymic notes on *Catocala* by McDunnough.

M. Chas. Cabeau describes a new aberration of *Dryas paphia* in the July number of the *Revue Mensuelle* (Namuroise), ab. *♂ joannis*, captured in June near Torgny. Above, the forewings are entirely black except (1) a basal area of the typical ground colour, (2) a median

costal spot of the same, (3) the normal apical colour, (4) the marginal area next the apex powdered with black and crossed by black nervures; the lower wings have the basal area normal, the median area black, the external area normal but crossed by strong black nervures. Below, the forewings have the markings united, and the hindwings largely silvered, with shining green central and sub-abdominal areas.

The *London Naturalist* for 1921 has recently been issued. It is largely (60 pages out of 90) taken up with an extremely interesting and enlightening article by Dr. E. A. Cockayne on "Structural Abnormalities in Lepidoptera," an attempt to collect and group such aberrations as have been recorded in British and foreign periodicals. The grouping is stated to be only provisional since our knowledge of causes is so slight. However the large number of headings is an undoubted advantage as it suggests to the ordinary lepidopterist what to look for, *i.e.*, various kinds of scale defects, errors of metamorphosis. There is one plate, referring to this article. The remainder is largely taken up with Ornithology. The late Arthur Bacot was an active member of the Society from its commencement and also of its forerunner the old City of London Society, hence there is a particularly interesting obituary by one with especial knowledge of him.

Some of the books from the library of the late H. Rowland-Brown have passed to the shelves of the Entomological Society of London, and among them are four volumes of a collection of separata dealing with the local lepidopterous fauna of France, a set which the Fellows will no doubt find of great use for refence when premeditating their holiday collecting tours.

Iris for May contains fifteen plates with figures of the "Typen der Gattung *Agrotis* der Collection Staudinger." There are altogether 356 figures of these, all of the Palaearctic Fauna.

The *Annales de la Soc. Ent. Belgique* pt. II. contains "New Plecoptera," part 4, by Prof. F. Klapalek, and "Neotropical ants of the genus *Camponotus*," by F. Lautschi.

On July 31st was published parts 1 and 2 (1922) of the *Trans. Ent. Society of London*, nearly 300 pages and eleven plates. It contains New South African *Pyralidae*, by A. J. T. Janse; Exotic *Tipulidae*, by Prof. P. Alexander; S. American Micro-lepidoptera, by Edw. Meyrick; Notes on Orthoptera in the British Museum, by B. P. Uvarov; Two new British *Hydroptila*, by Martin E. Mosely; New Neotropical *Curculionidae*, by Guy A. K. Marshall; Intersexual forms of *Plebeius aegon*, by E. A. Cockayne; Butterflies on the Nile, by H. Mace and G. A. K. Marshall; Types of *Carabidae* in the Stettin Museum, by H. E. Andrews; Mallophaga of Spitzbergen, by Jas. Waterston; The genus *Lathropoda*, by H. Eltringham; Deceptive Resemblance in Long-horned Grasshoppers, by B. P. Uvarov. What a pity it is we do not get any portion of the most interesting Proceedings until, it may be, more than a year after the date of the meetings.

During last winter Lieut.-Col. H. D. Peile exhibited a case of most interesting butterflies taken by himself in Mesopotamia, and containing some new and remarkable forms from this outlying portion of the Palaearctic area. Full notes and descriptions of these have now been published in the *Jr. Bombay Nat. Hist. Soc.*, December, 1921, and March, 1922, with an excellent coloured plate of the new forms. The author writes, "In character the butterfly fauna of Mesopotamia, like

the flora which of course largely determines it, is much more English than that of the fauna of, say, the south of France, and the fact that a large proportion of the forms are either the same as, or nearly akin to English species, at once strikes the collector; *machaon*, for instance, is the only Papilio found below the highlands; and other examples of English forms are *rapae*, *daplidice*, *croceus*, *pamphilus*, and *atalanta*: besides the more widespread *astrarche=medon*, *megera*, *icarus*, and *flava=thaumas*; and of course the ubiquitous *cardui*."

The *Annales Soc. Ent. de France* for 1921 have been recently completed. Most of the papers deal with Coleoptera and Diptera. Only one each is devoted to Lepidoptera and Odonata. There are six plates and 356 pages of letterpress. The *Bulletin* (Proceedings) for the same year occupies another 308 pages.

SOCIETIES.

The Entomological Society of London.

May 3rd.—Decease of two Fellows.—The President announced the death of Mr. A. W. Bacot, of York Cottage, York Hill, Loughton, Essex, and of Mr. Gilbert Storey, of the Department of Agriculture, Cairo, Egypt, and a vote of condolence was passed to their relatives.

New Fellows.—The following were elected Fellows of the Society: Mr. C. L. Collenette, c/o Messrs. Barker and Co., Singapore; and Mr. Michael G. L. Perkins, 4, Dean's Yard, Westminster Abbey, S.W. 1., and Trinity College, Cambridge.

Portraits of Eminent Fellows.—The Treasurer called attention to additions to the collection of portraits in the meeting room, and especially to a beautiful pencil drawing, from a photograph, of the late Dr. Longstaff.

Exhibits.—Mr. W. G. Sheldon exhibited a series of *Pararge roxelana* from Herculesbad, and *P. climene* from Sarepta.

Professor E. B. Poulton, F.R.S., read some notes on the life-history of *Catochrysops phasma*, and on the life-history of a Bethylid of the genus *Cephalonomia*, Westw., observed at Oxford by Mr. A. H. Hamm, and illustrated some of his remarks with lantern slides; he also read some interesting notes on the habits of the Driver-ant, *Dorylus nigricans*, Illig., in Tanganyika Territory.

Mr. C. L. Withycombe exhibited larvae and an adult of *Osmylus chrysops* with some enlarged figures of them, and also some larvae of the mosquito *Taeniorhynchus richardi* taken in Epping Forest.

Papers.—"The *Mallophaga* of the Oxford University Expedition to Spitzbergen," by Dr. J. Waterston, B.D., D.Sc.; "The *Dasytinae* of South Africa," by Mr. G. C. Champion, F.Z.S., A.L.S.; "A monograph of the genus *Catochrysops*," by Mr. G. T. Bethune-Baker, F.L.S.; and "The Species of the genus *Larinopoda*," by Dr. H. Eltringham, M.A., D.Sc., F.Z.S.

June 7th.—Decease of a Fellow.—The President announced the death of Mr. H. Rowland-Brown, M.A., formerly Secretary of the Society, and a vote of condolence with his relatives was passed.

New Member of Council.—He also announced that Mr. H. Willoughby Ellis, F.Z.S., had been co-opted on the Council in the place of the late Mr. Rowland-Brown.

NEW FELLOWS.—The following were elected Fellows of the Society: Messrs. B. A. R. Gater, B.A., F.R.M.S., 13, Arundel Mansions, Kelvedon Road, S.W. 6; Lionel Lacey, Churchfield, Rodborough, Stroud, Glos.; Herbert Mace, Faircotes, Harlow, Essex; William H. Jackson, 14, Woodcote Valley Road, Purley; and Miss A. B. Flower, Eastbury, Surrey Road, Bournemouth West.

EXHIBITS.—Professor Poulton made some remarks on transformational deceptive resemblance in insects arising out of the exhibits of long-horned grasshoppers made by Dr. Marshall on behalf of Dr. Uvarov at the previous meeting.

Professor Poulton also exhibited an example of *Coccinella septempunctata* as the prey of an Asilid, *Laphria flava*. He called attention to some recent observations on the "false head" of *Lycaenidae* in relation to the attacks of enemies; he also gave numerous interesting particulars of the bionomics, geographical races and affinities of the remarkable African butterfly, *Pseudopontia paradoxa*.

Dr. Dixey who illustrated his remarks with a lantern slide, discussed the venation of this butterfly. He expressed the opinion that it is more closely associated to the *Pierinae* than to any other subfamily, and that there are probably two geographical races of it distinguished by the venation.

Dr. Neave made some remarks on the habits and distribution of this species, and of *Leptosia medusa*, and *Leuceronia pharis*, butterflies that are associated with it in some parts of Africa.

Mr. G. Talbot, on behalf of Mr. J. J. Joicey, brought for exhibition some new and rare Lepidoptera from Africa, New Guinea, and the Dutch East Indies.

PAPERS.—"Transformative deceptive resemblance in long-horned Grasshoppers," by Dr. B. P. Uvarov; "*Elateridae* of the Seychelles Expedition," by M. Fleutiaux, communicated by Dr. H. Scott.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.

May 25th.—Mr. Step exhibited an abnormal blossom of the cowslip found by Dr. Cockayne at Ranmore, with an eight-lobed calyx partly corolla-form; the beetles *Necrophorus respillo* and *Silpha thoracica* from a dead toad at Ockham, and on behalf of Mr. Coppeard an extreme fasciated stem of the buttercup 2 inches across.

Mr. Withycombe, the asparagus beetle, *Crioceris asparagi* now common at Enfield.

Mr. Enefer, some indelible ink he had made from the petals of *Iris germanicus*.

Mr. R. Adkin read a paper, "The Lepidopterous Enemies of Man."

June 8th.—Mr. Edwards, fossil shark's teeth, *Oxyrhina*, from Walton, Suffolk.

Mr. Step, a *Vespa germanica* ♀, which had hibernated in a chimney and was so misleadingly black as to suggest the imposition of the name "*Vespa carbonaria*, sp. nov."

Mr. Enefer, an *Acronicta alni* of which he had found three larvae at Penzance in August, 1921.

Mr. Withycombe, a Neuropteron, the rare *Chrysopa dorsalis*, bred from a pine-feeding larva taken at Oxshott in 1921.

Mr. Step said that the *Cleora lichenaria* larvae he had shown at a

previous meeting had extended their feeding two or three weeks beyond the normal time and were found to be ichneumoned, except one which had developed to an imago in the normal period.

Mr. Coulson reported the capture of *Phryxus livornica* at Merton, Surrey, on May 15th.

Mr. Preston, butterflies from Macedonia.

Mr. Bunnett, ova, larvae and imagines of *Melasoma populi* (Col.) from Oxshott, where it was very common just now.

Various reports were made of the occurrence of *Colias croceus* (*edusa*) on the N. Downs, etc.

June 22*nd*.—Mr. Step exhibited, on behalf of Mr. Turner, from Freshwater, I. of Wight, flowers of *Orchis incarnata* and of the Buckbean (*Menyanthes trifoliata*) both abundant in the marshes and said that he reported *Iris pseudacorus* and *I. foetidissima* were flowering and abundant, but that insects were remarkably scarce.

Mr. Staniland, *Pterognathus gigas* and *Archon centaurus* (Col.) from the Gold Coast.

Mr. Withycombe, the Neuroptera (1) *Osmylus chrysops* alive with its larva; (2) *Sialis lutaria* and a living larva; (3) *Ithone fusca* from Australia and a preserved larva; (4) *Psychopsis leonina* from Africa and a preserved larva from Australia; (5) *Stenosmylus excisus* from New Zealand; he also gave notes on their life-histories.

Mr. Buckhurst, *Hesperia malvae* ab. *taras* from Effingham.

Mr. Enefer, a shoot of sycamore and a root of ash deformed by the attacks of gall-flies.

Mr. Goodman, aberrations of (1) *Parnassius apollo* much approaching *P. delius*, from St. Martin Vésubie; (2) *P. delius* with sparser markings than usual; (3) A *Parnassius* with characters intermediate between *delius* and *apollo* suggestive of a natural hybrid.

Mr. Syms, a larva of *Ruralis betulae* and a larva of *Anthophagus racra* (Col.) in its cell for pupation.

July 13*th*.—Major Stuart Maples, Monkswood, Huntingdon, and Messrs. H. Candler, Broad Eves, Ashtead, and E. B. Watson, Winthorpe Grange, Newark, were elected members.

Mr. R. Adkin, two specimens of a dark grey form of *Grammesia trigrammica* (*trilinea*) from Abbots Wood, where the species had been unusually common at sugar.

Mr. Buckstone, living larvae and pupae of *Pyrameis cardui*, the ground-colour of the pupae varying from pale grey to blackish.

Miss A. K. Loch, a uniformly pale yellow aberration of *Brenthis euphrosyne* with quite normal spotting, from Worth, Sussex.

Mr. H. Main, several items brought by him from the S. of France. (1) Larvae of the ant-lion, *Palpares libelluloides*; (2) The Tenebrionid beetle, *Pimelia gallica*; (3)Cases of the large Psychid, *Acanthopsyche atra* (*opacella*) with young larvae; (4) the spider, *Lycosa narbonensis*, discussed by Fabre; (5) the spider, *Clotho durandi*, found under stones; (6) the Myriapod, *Scutigera araneoides* said to be poisonous; (7) Larvae of the butterfly *Thais rumina*.

Mr. Cheeseman, living larvae of *Attacus cynthia* and *Samia cecropia*, two large silk-spinning moths.

Mr. Enefer, the larch weevil *Liparus* (*Molytes*) *germanus* from Farningham, Kent.

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MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. 1922, October 4th and 18th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. September 23rd Field Meeting for Larvae-beating and Fungus hunting at Ockham Common. September 28th, Paper "Natural History of St. Kilda," Rev. J. Waterston, B.A., B.Sc. October 12th, Lantern evening.—*Hon. Sec.*, StanleyEdwards, 15, St. German's Place, Blackheath, S.E.3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

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Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

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AND

Journal of Variation

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CONTENTS.

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Communications have been received or have been promised from Messrs. Hy. J. Turner, H. Donisthorpe, Dr. Verity, J. H. Durrant, G. T. Bethune-Baker, Alfred Sich, W. Daws, the late Dr. T. A. Chapman, R. S. Bagnall, J. W. H. Harrison, W. J. Kaye, Dr. E. A. Cockayne, C. R. N. Burrows, H. Baker-Sly, Command, J. C. Woodward, the late A. J. Fison, with Reports of Societies and Reviews.

The Larvae of Euclidia glyphica, L., and E. mi, Cl.

By E. A. COCKAYNE, D.M., F.R.C.P., F.E.S.

In an attempt to identify a larva, which I found at Folkestone in 1899 and at first attributed to *glyphica*, I was unable to find any description of a British species with which it agreed and thought it must be the larva of some rare immigrant. My first surmise was right. But my search has revealed such an amazing number of incorrect descriptions and figures in both British and continental works that I have ventured to send the following notes and quotations. They demonstrate a series of errors, which in the case of such common insects must be almost without a parallel.

The larvae of our two species of *Euclidia* are very similar in colour and markings, the most obvious difference in this respect being that, in *glyphica* there is a fairly large oblong chocolate-coloured spot situated on the pale mid-ventral surface of the 8th segment and a much smaller one on the 7th, whereas in *mi* these are wanting. It is the number of prolegs which has given rise to all the trouble. *E. mi* has only three pairs, those proper to the 7th and 8th segments being entirely absent. *E. glyphica* has four pairs, those proper to the 7th segment being absent and those on the 8th reduced to about half the size of the others. Thus *mi* is twelve footed, and *glyphica* is fourteen footed.

Humphreys and Westwood in *British Moths and their Transformations*, 1851, say of the genus *Euclidia*, "Mr. Stephens, indeed, described them as sixteen footed, which Mr. Curtis attempted to correct, by stating that they possess fourteen feet, ingeniously throwing a leaf over that portion of his figure of the larva, which would have shown his own error." This little gibe would have been more justifiable if these authors had given a correct description themselves. Unfortunately they call the larva twelve footed and Humphreys repeats the mistake in his *British Moths*. The figure of *glyphica* in Curtis' *British Entomology*, is a masterpiece. The prolegs on the 9th and 10th segments are clearly shown, but a little leaf of trifolium prevents one from seeing whether there are any on the 7th or 8th.

The letterpress, too, is worded with skilful ambiguity. In small print Curtis says "the larvae of *Euclidia* have but fourteen feet, not sixteen as stated by Mr. Stephens." In some general remarks in large print lower down on the same page he says the larvae are "semi-loopers, cylindric, naked, with 6 pectoral, 4 abdominal and 2 anal feet." The first is correct if applied to *glyphica*, the second to *mi*, but neither applies to the genus as a whole. In his special description of *mi* he states definitely and correctly that there are 4 abdominal feet, but in that of *glyphica* he gives no number. In Stainton's *Manual* and in his *British Butterflies and Moths* both species are said to have 12 legs, and Wilson in his *Larvae of the British Lepidoptera* quotes the *Manual* in the case of *glyphica* without giving a figure. Newman, in his *Illustrated Natural History of British Moths*, says "the larva of *glyphica* is figured by Hübner and there are but two pairs of ventral claspers (on the 9th and 10th segments)." Meyrick, *Handbook of British Lepidoptera*, gives in his definition of *Euclidia*, "Larva slender without prolegs on 7 and 8." Buckler, *Larvae of British Butterflies and Moths*, copies Porritt's description correctly from

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the *Ent. Mo. Mag.*, 1881, xvii., p. 210, stating that there are no prolegs on the 7th, 8th, 11th and 12th segments in the larva *glyphica*, and in figure, a dorso-lateral view, the prolegs are not visible. In the case of *mi* Buckler's figures are beautiful and the description is correct.

South figures the larva of *mi* correctly, but contents himself with saying that that of *glyphica* is very similar. Tutt, in his *British Moths*, avoids all mention of the legs of both species.

The Continental authors are almost as confusing. Hübner's figure of *glyphica*, in his *Geschichte Europäischer Schmetterlinge Raupen*, is a good one, except that the first pair of prolegs is left out. Herrich-Schäffer in his description makes the same blunder. Hofmann, in the *Europäischen Schmetterling's Raupen*, 1874, figures the larva of *glyphica* with five pairs of prolegs, making it sixteen footed, and gives no number in his meagre description. In the 1893 edition he gives a new lateral view of the larva with only three pairs of legs, but in the text he is right, making *mi* twelve footed and *glyphica* fourteen footed. In the 1910 (Spuler) edition the same figure appears with the addition of a small pair of prolegs on the 8th segment, to make the figure agree with the text. Lampert, *Gross-Schmetterlinge und Raupen Mitteleuropas*, 1906, makes no mistake in his description, but his figure shows the larva of *glyphica* like that of *mi*, with the first two pairs of prolegs absent.

Kirby, in his *European Butterflies and Moths*, 1882, appears to have been the first to describe both larvae correctly. Seitz gives the name *Gonospileia*, Hbn., to the genus, but says that the first and second pairs of prolegs are aborted. He divides the genus into two sections based on a difference in the tibial spines. *Mi* falls into the first, *glyphica* into the second section.

Hampson attaches greater importance to this difference in the tibial spines, and places *mi* in the genus *Euclidimera*, and *glyphica* in *Gonospileia*.

This appears to me more correct, because apart from the larval difference the genitalia of these two species are widely different, as Pierce has shown in his *Genitalia of the Noctuidae*, and as I have confirmed by my own preparations. The harpes in *glyphica* are extremely asymmetrical, whereas those of *mi* are almost symmetrical. Even with Hampson's separation neither *Euclidimera* nor *Gonospileia* are homogeneous, as I hope to prove in a second paper.

The New Forest in the rain.

By RUSSELL E. JAMES, F.E.S.

It is now many years since I last visited the New Forest, and the fact that my son had never been there in the "butterfly" time prompted me to arrange a short holiday in early July. The cold wet weather began about the date we fixed to start, and during our stay with the exception of one or two very short spells it rained continuously. In spite of this handicap we worked away steadily and in the end came out with very good results, although needless to say, it proved less of a "butterfly" holiday than we had anticipated.

We left Waterloo mid-day on the 2nd and had arranged to spend the first few days at a village just over the Dorset border from Fordingbridge, where in 1910 I had found *Triphaena subsequa* in

some numbers. This species was our particular quarry, but the first night proved we were a week too early.

We soon had a taste of the weather we were in for, as while putting on treacle in a wood near the village, rain began which continued heavily all the evening. A fair number of moths turned up, but only one *T. subsequa*—just out. Other species of interest were *T. fimbria*, *Craniophora ligustri*, *Rhodophaea suavella*, in some numbers, *Dipterygia scabriuscula* (*pinastri*), *Xylophasia hepatica*, *Noctua festiva*, in great variety, and many common things. It was too wet for dusking and little was taken except some *Xanthorhoë rivata*, *Asthena luteata*, and a larva or two of *Cucullia verbasci*, off a clump of mulleins.

Next morning the rain continued steadily up till lunch time, when the sky broke and we had the one really sunny afternoon of our visit We mounted bicycles to try the Verwood locality for *Emydia cribrum*, which was still plentiful at this date in 1910. On the way we had our minds set at rest as to whether the large fritillaries would be out yet, by netting two beautiful *Argynnis cydippe* (*adippe*) at a sunny corner of the road. To our great disappointment we found the whole of the old *cribrum* ground destroyed by fire: we tramped round all the outskirts and neighbouring heather, but found no trace. Can some of the Ringwood collectors tell us whether it has survived in this particular locality? The only insect on the heath in any numbers was *Plebeius aegon*, the males of which positively swarmed.

In the evening we cycled to a high chalk down, which is a far better ground for *T. subsequa* than the woods, but although moths swarmed on treacle they were still more backward. For example, *Xylophasia hepatica* which was very worn the previous night, was here in lovely condition. *Toxocampa pastinum* also occurs in numbers on this ground, but unfortunately was not yet out, and the evening was therefore a double disappointment. The outstanding moth at treacle after the very common ones was *Xylophasia sublustris*, in lovely condition and one or two on every tree. *Mamestra dentina* was very common and variable also, neither of these species being even represented in the wood. But beyond these there was very little of interest except a few *Agrotis corticea* which always rather surprises me when I come across it away from the coast. One or two *Ellopia prosapiaria* (*fasciaria*) and *Mesoleuca albicillata* were taken on tree-trunks and at dusk, and single specimens each of *Myelophila cribrum* and *Platyptilia ochrodactyla* completed the bag—altogether a disappointing day.

Tuesday, 4th.—More and heavier rain. It continued in such a downpour that it was after tea-time before there was a chance of doing anything, when we cycled off to another wood, where I had beaten *Notodonta chaonia* larvae on a former occasion. Two hours' beating produced a fair number of *Polyploca ridens*, *Amphidasis strataria*, *Eupithecia abbreviata*, *Ennomos angularia*, a late *Psilura monacha*, a pupa of *E. erosaria*, two full grown *N. chaonia*, a half grown *N. trepida* and other uncertain Geometer larvae. Among the larvae a large number of *Rhodophaea suavella* (imagines) came into the umbrellas, and a nice female *Phorodesma pustulata* which unfortunately was missed.

On the way back more *C. verbasci* larvae were found. This being our last night before moving on, we decided to try the wood once more and were rewarded with another fine *T. subsequa*. *R. suavella* was

abundant, and *C. ligustri* and *D. scabriuscula* again turned up, besides *Aplecta herbida* and *Erastria fuscula*—the two latter perfectly fresh. A nice confluent var. of *Agrotis exclamationis* was picked out. Far more things flew at dusk and a nice little fresh series of *Scotosia vetulata* was netted round a large buckthorn and *Phibalapteryx tersata* was not uncommon round clematis. Others seen commonly were *Ligdia adustata* and *Melanthia ocellata*—both worn—and a few nice *Acidalia imitaria* and a couple of *Aphomia sociella* were netted casually.

Tempted by an appearance of dryness on the morning of the 5th, we decided to have another turn at larva beating before leaving for the New Forest. After forty minutes, however, down came the rain, but not before we had added another *N. trepida*, four *N. chaonia*, more *P. ridens*, many "Thorns" and *A. strataria*, and another *P. monacha*. We continued for a time in the rain and got thoroughly soaked. The rain stopped during lunch, so we threw our wet things into the bottom of the open cart, and started on the fourteen mile drive in our remaining dry suits.

While the horse was being harnessed we found *Pyralis farinalis* in immense numbers on the stable walls, and in such lovely condition that we boxed a fresh series each.

The rain and wind re-started after the first half-mile, and long before we reached our destination—a cottage in the far north of the Forest and right off the beaten track—we were wetter by far than we had been in the morning. We arrived with nothing dry in our bags except socks and shirts, so in these, plus the least wet of the trousers, we sat before a large fire until something else dried. This was the only night of our holiday that we stayed in. We went to bed early and awoke in the morning to the same sound of driving rain, but after breakfast donned mackintoshes and sallied forth. It was cold and cheerless in the extreme, but we started beating oaks and soon had larvae of *P. ridens* and *N. chaonia* again, and a couple of small *N. trepida*. A large one fell soon afterwards, unfortunately smashed, and before the morning was out we added four more large *N. trepida* from one tree, three *N. chaonia* and a number of *P. ridens*, *Amphidasis strataria*, *Ennomos angularia*, *Eupithecia abbreviata*, a few *Ennomos erosaria* and *Cidaria psitticata*, and some others. *A. strataria* was nearly full grown and quite common, often two or three falling into the umbrella together. Not many moths were seen, but *Boarmia roboraria* was common and in splendid condition, both on oak and pine trunks. These were all of the normal pale form and we took a fine long series. The only other moth at all common was *Triaena psi* which was dotted about on the tree trunks. *Ellopia prosapiaria* (*fasciaria*) occurred very occasionally and was badly worn. Even in the rain we found that *Dryas paphia* was out, as they were occasionally found at rest on, or walked out of the bracken, and *Limenitis sibilla* was twice taken in the same way. The afternoon was fairly dry and more of the same larvae were beaten, while a half-gleam of watery sun, for not more than five minutes, showed that the butterflies were in numbers and only wanting the least encouragement to fly.

For these few minutes male *D. paphia* sat with opened wings on the bracken in considerable numbers, and although only three females were seen one was a fine var. *valesina*. *Limenitis sibilla* was scarcer

but in these few minutes half-a-dozen were netted. Then down came the rain again, and we went home to tea. In the evening we treacled in the enclosure, but moths were not plentiful. The only thing we took that is not quite common was *Aplecta herbida*. We saw no *Noctua festiva* here but *N. brunnea* replaced it. At dusk there was little on the wing, but *Acidalia aversata*, *Phorodesma pustulata* (*bajularia*) and worn *Larentia pectinitaria*. Of *P. pustulata* we took some nice fresh specimens. *Boarmia repandata* flew commonly to the light whilst going round treacle, but no var. *conversaria* among them.

The next morning, the 7th, looked better and we hurried over breakfast to get off before the inevitable rain came. We hoped really to see some butterflies at last and were not disappointed, but the sun never got fully out, and we had at least two hours solid rain from 12 to 2 p.m. My boy looked upon this rain as a special providence; it was while standing under a small hawthorn for shelter, in the middle of an oak plantation, that he found a very large female *Stauropus fagi* at rest on the stem. Although it had evidently flown, it was in very fair condition. During the two spells of half sunlight *D. paphia* swarmed in such numbers as I have never seen before. They scarcely flew, but sat open-winged on the brackens and brambles. Males outnumbered the females by at least twenty to one, and as among these females we took twenty-two var. *valesina*, the number of males can be imagined. No striking varieties were taken, but four of the pale-spotted males occurred, and one with xanthic hindwings. Among the females was one with central spots slightly coalescing and several var. *valesina* were so pale as to be almost intermediate. Nearly all were in first rate condition and evidently var. *valesina* must swarm when the females are fully out. *L. sibilla* was common, but nothing compared with *D. paphia*; I have seen them as common at Holmsley, but never anything in the southern part of the Forest to equal *D. paphia* in numbers. *L. sibilla* gets worn very quickly, and many were seen quite fresh, but with torn wings. Still there were more than enough quite perfect, although, I am sorry to say no varieties. More *Boarmia roboraria* were taken during the rain, and although no larvae-beating was done, four *N. chaonia* and a *N. trepida* were taken ascending tree-trunks, after presumably being dislodged by the wind and rain. After tea we dug a few pupae of *Agriopis aprilina* from oak on the Common near our cottage, and as the woods had been unsuccesful last night we decided to try the Common also for treacle. It was much the same, however, only the commonest species turning up. At dusk over the heather we took *Nola cucullatella* and some female *Acidalia subsericeata*, which I thought in the half-light were *A. straminata*. A closer view however speedily proved their identity, to my disappointment. *Agrotis strigula* and *Pempelia palumbella* in numbers, also occurred.

Saturday, the 8th, we had planned for a cycle ride across the Forest to the *Zygaena meliloti* ground, and in spite of the threatening outlook we started. We got one mile before the rain began, but decided to push on in the hope of its clearing. Instead of clearing it increased steadily and although we searched over the ground in our endeavour to find a stray specimen at rest, as a type for my boy, there was nothing doing. As we returned, the sky at last cleared and the

sun came out, but the wind was now almost a gale and nothing was tempted to fly. We looked in at Matley Bog and I have rarely seen anything so wet. We thrashed alder steadily in the hope of *Macaria alternata* but only produced *Cabera pusaria* and *Acidalia aversata*. In fact the only decent insect boxed before evening was *Acidalia trigeminata* off a fence in Lyndhurst. Having been blown quite dry before we got back, we thought with the high wind there might be a chance in the wood, so we tried it again. While putting on treacle, the rain re-started heavily and continued all night. Nothing flew at dusk, so we occupied our time searching tree trunks and low oak branches with lanterns, for larvae dislodged by the storm. By this means we obtained more *N. trepida*, *N. chaonia* and *P. ridens*, and one *Panolis piniperda* on oak evidently blown from a neighbouring pine. Treacle had the same miserable result—only a few common moths—so we went to bed hoping for a better day to-morrow.

This, our last full day, proved worse than ever, and nothing could be done but beating and trunk-searching. This was uncomfortable enough in the rain and the sodden undergrowth, but we persisted and considerably added to our bag of *N. trepida*, etc. A quite fresh *Hylophila prasinana* was a surprise for the time of year, and we also took a late female *Gnophria rubricollis* off a bracken frond, which gave a nice batch of ova. We decided not to treacle at night, but the rain having at last stopped we went out on to the Common and dug a few more *A. aprilina* and beat a few more larvae. A specimen of *Nephopteryx spissicella* was beaten out and the only *Rhodophaea suarella* we had seen in the Forest. A pupa of *Eugonia polychloros* was found on a barn near a sallow tree, but a long search produced no more. We then went home to pack so as to dispatch our luggage early to Fordingbridge and give ourselves as long a morning as possible should the day prove fine.

At last we got a morning with some blue sky visible and no wind, so we took lunch with us, saw our bags off in the cart and cycled to Fordingbridge for an afternoon train. The sun never came well out, but it was warm and still, and butterflies were in even greater numbers than on the 7th; twenty var. *ralesina* were taken in an hour or two, although the females of *D. paphia* were still in a very small minority. Three more white-spotted males occurred, all badly damaged, and a female with a patch of *ralesina* colouring in the centre of the right hind-wing, but with more extreme varieties we had no luck. We could not get a day, however, without rain, and down it came again before one o'clock. This finished the butterflies as we had to leave at two, but happily we got a dry ride over the moors to Fordingbridge. Our last capture was a fine *B. roboraria* on a tree just outside the enclosure—No! not the last—as in Fordingbridge we found a colony of *Cucullia* larvae on *Verbascum nigrum* which we fondly hope may be *C. lychnitis*—time will show, as I am always doubtful about these larvae.

A striking feature among the New Forest butterflies was the absence of *Argynnis aglaia* and *A. cydippe* (*adippe*)—none of the former and only one of the latter. They may have been present on the open ground outside the enclosure, but the wind was so high all the time that they certainly did not fly. One other species new to me as a New Forest insect was *Catocala nupta*, a larva of which was found when searching for *E. polychloros* pupae. I thought at first it was a dark *C. sponsa*, but soon recognised its true identity.

So ended a very wet week, but we felt we had risen superior to circumstances, and indeed had taken many things—especially in the larvae line—that we might have missed had the weather been fine and all our time devoted to butterflies.

The Lepidoptera of the Smaller Channel Islands.

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

I have just returned from a month's (August) ramble in the different Channel Islands. Although most of the time was spent in Jersey and Guernsey, which are already quite well known, visits to Alderney, Sark and Herm proved that these smaller islands are well supplied with butterflies, while of the moths *Callimorpha quadripunctaria* (*hera*) is to be found everywhere. The three smaller islands are so very much less in area than their two larger sister isles, that it is instructive to have the areas compared. Jersey, 29.000 acres; Guernsey, 14,000; Alderney, 2,000; Sark, 1,200; Herm, 200.

Alderney is a bleak wind-swept island and I was pleasantly surprised to find *C. hera* soon after landing, flying on the highest part of the island. I saw one only, but that proved that the insect was a resident, for I cannot imagine *C. hera* flying across from France. The flights are always short but rapid, and 10 to 15 mile flights must be out of the question. Of the butterflies noted there were only seven for certain, *Rumicia phlaeas* being doubtful. Those actually observed were *Colias croceus* (*edusa*), *Pararge megera*, *Pyrameis atalanta*, *Vanessa io*, *Pieris brassicae*, *Pieris rapae* and *Polyommatus icarus*. I am unable to find any records from Alderney, but I believe I have read of *Melitaea cinxia* being taken there as well as in Sark and in Guernsey.

Although Sark is not much more than half the size of Alderney its contour is very different, and there are delightful sheltered valleys, where lepidoptera are found in abundance. While Alderney scarcely has a tree, Sark is well wooded. It is about 22 miles from the coast of France and 9 miles from Guernsey. Probably quite a considerable list of butterflies and moths could be worked up by a resident collector. What I observed on August 25th were the following: *Callimorpha hera*, several; *Zygaena trifolii*, worn and going over; *Hipocrita jacobaeae*, larvae; *Abraxas grossulariata*, several flying; *Acidalia straminata*, one; *Colias croceus* (*edusa*); *Pararge megera*, very common; *Satyrus semele*, abundant; *Vanessa io*, common; *P. atalanta*, *Epinephele tithonus*, abundant; *Epinephele jurtina*, *Pieris brassicae*, *Pieris rapae*, *Rumicia phlaeas*, *Polyommatus icarus*, and *Cyaniris argiolus*. On a *Centaurea* head I noted the large green rose-chafer beetle, *Cetonia aurata*.

In the small island of Herm the occurrence of even the eight observed species is rather remarkable when one considers the amount of inbreeding that must have taken place down through the ages. *C. croceus* and *P. atalanta* would be reinforced with immigrants, but the remainder are probably entirely segregated. The remaining five species seen were: *Pararge megera*, *Satyrus semele*, *Epinephele tithonus*, *E. jurtina*, *Polyommatus icarus*, and *Pieris rapae*. Of the moths as usual *Callimorpha hera* was present, but only one was seen. No one would expect any specialised forms in such small islands especially as neither Jersey nor Guernsey produce any special local

forms. Jersey has certainly four species not found in England at all, these are *Lampides boeticus*, *Leucania l-album*, *Agrotis crassa*, *Eubolia peribolata*, while *Argynnis lathonia*, only a rare migrant to the South of England, is a regular resident in the island. *Eubolia peribolata* occurs in Guernsey and Sark as well as in Jersey and might even yet be found in England.

[A. W. Luff in *Trans. Guernsey Soc. N.H.* sums up the results of many years observations by himself and others on the insects of the Sarnian Isles. Of Rhopalocera he gives Herm 17 species; Alderney 25 species; but he does not give *C. croceus* and *P. brassicae*, both of which Mr. Kaye reports: Jethou 8 species, and Guernsey 31 species. Sark is omitted.—Hy.J.T.]

Some Notes on Swiss butterflies.

[Supplementary to the *Butterflies of Switzerland*, by Rev. Geo. Wheeler, M.A., F.E.S.]

By the late MR. A. J. FISON.

(Arranged and communicated by MISS L. M. FISON.)

I. SOME LOCALITIES IN THE ENGADINE.

THE ALBULA.—*Melitaea asteria*, July and August. *Erebia gorge* var. *triopes*, not rare, July and August. *Erebia manto* var. *pyrrhula*, July and August, high above pine region over the Pass.

BERGEL, *i.e.*, VAL BREGAGLIA, S.E. of Sils Maria.—*Chrysophanus alciphron*, June and July: abundant at end of June, on sorrel. *Epinephele jurtina* var. *hispulla*. *Satyrus circe*, mid-June to August. *Satyrus briseis*, July-August. *Epinephele lycaon*.

BERNHARDIN.—*Erebia eriphyle* (4,000-5,000 ft.), mid July.

COIRE.—*Colias palaeno* ab. ♀ *werdandi*, on Alps, June-July. *Melitaea asteria*, July-August, at 6-8,000 ft.

DAVOS.—*Colias palaeno* ab. ♀ *werdandi*, mid June-July.

FLIMS.—*Brenthis thore*, mid May-July. *Erebia gorge* var. *triopes*, July and August.

FLIMSERSTEIN.—*Erebia eriphyle*, mid July (4-5,000 ft.).

GRISONS.—*Erebia epiphron* var. *valesiana* ab. *nelamus*, June-July.

GÜRGALETSCH, S. OF COIRE.—*Erebia medusa* var. *hippomedusa*, May-June. *Erebia manto* var. *pyrrhula*, Parpan, July-August.

HINTERRHEINTHAL.—*Erebia eriphyle*, July (4-5,000 ft.).

KALFEUSTERTHAL, or CALFEUSER THAL (W. of Coire—N. of Flims).—*Brenthis thore*, mid May-July.

MALOJA.—*Melitaea maturna* var. *wolfensbergeri*, June.

PAS DE SUZE.—*Melitaea trivia* var. *fascelis*, July-August, on Mullein.

PONTRESINA.—*Melitaea maturna* var. *wolfensbergeri*. *Chrysophanus hippothoë* var. *eurybia*, July.

PRÄTIGAU.—*Erebia melampus* var. *sudetica*, rust blotches very large, July-August.

VAL ROSEGG (S. of Pontresina).—*Melitaea maturna* var. *wolfensbergeri*, June.

STELVIO.—*Erebia nerine* var *stelviana*, on rocky slopes, July-August. *Erebia alecto* var. *glacialis* ab. *pluto*, and type (rare). *Erebia gorge* var. *triopes*.

ST. MORITZ.—*Colias palaeno* ab. ♀ *werdandi*, mid June-July. *Chrysophanus hippothoë* var. *eurybia*, July-August. *Polyommatus*

donzelii, July-August. *Brenthis pales* var. *arsilache*, July-August, at Stätzer Lake.

Tarasp.—*Lycaena amanda*, mid July-August (in rushes). *Erebia medusa* var. *hippomedusa*, May-June. *Polyommatus meleager*, June, near Kurhaus.

Tessin.—*Gonepteryx cleopatra*, April-May and August. *Chrysophanus alciphron* var. *gordius*, June-July.

Trafoi on Stelvio.—*Chrysophanus alciphron* var. *gordius*, always there. *Lycaena amanda*, June-August. *Polyommatus donzelii*, June-August.

Upper Engadine.—*Erebia gorge* ab. *tripes*.

Val Muranza (extreme E. centre of Suisse).—*Erebia nerine* var. *stelriana*, July-August, on rocky slopes.

Wassenstein (Albula Pass, near top).—*Colias palaeno* ab. ♀ *werdandi*, mid June-July.

Zernetz.—*Erebia nerine* var. *stelriana* (3 miles above Zernetz).

Races and Seasonal Polymorphism of the Grypocera and of the Rhopalocera of Peninsular Italy.

By ROGER VERITY, M.D., and ORAZIO QUERCI.

(*Continued from page 158.*)

If one gives a comprehensive glance to those species which have a comparatively limited area of distribution and to the broader groups of races of those which are widespread, one distinctly detects the existence of several European zones characterised by their Lepidoptera; it must, of course, be understood they usually blend into each other in transitional regions, because here, as in most cases, *natura non facit saltum*. I will briefly attempt to draw a sketch of these zones, so as to establish the position of the one we are dealing with. I leave out Russia, which still needs being worked out more thoroughly. The examples I quote are all drawn from the *Grypocera* and from the *Rhopalocera*, but it must be borne in mind that the *Heterocera* afford a considerably greater number and amply confirm the same conclusions.

I. *Arctic* zone, including Northern Scandinavia and Finland: Characterised by its very limited number of species, by never producing more than one generation yearly, by several peculiar species and races, only resembling the Alpine ones of very high altitudes.

II. Zone of *Northern Europe*, as far south as Central England and Central Scandinavia: Characterised by two generations of the trigenerate species, the second being, however, often very partial; no peculiar species; races transitional between preceding and following.

III. Zone of *Northern Central Europe*, including the South of England and of Scandinavia, the extreme North of France, Belgium, Holland, Denmark, and the extreme north of Germany: Two generations constantly produced, and a third in favourable years in a few trigenerates; species distinctly more numerous than in zone II; races distinctly northern, usually small, frail, and pale, in those species which do not spread further north than this zone, but distinctly more robust and brighter than in preceding zones in the species which do reach them; a marked feature is the greater individual variability and the tendency to produce more extensive dark markings, in many species,

than in the following zone, culminating in melanic aberrations; *England* is particularly notable in these respects, owing to insularity, and might be considered a subzone also because it lacks several species.

IV. Zone of *Central Europe*, including the eastern part of Central France, Germany, Switzerland, and Austria; It produces several species quite peculiar to it in Europe. The great *Alpine* mass in the southern part of this zone may be said to constitute a peculiar subzone, which blends with that of Central Europe to the north of its waterparting and with that of Northern Italy to the south of it. These two zones are also found to encroach on one another, in the sense that the races of several species resemble southern ones in certain regions of the Central Europe zone, such as that of the Lake of Geneva and the Valais, whilst, on the contrary, races quite similar to those of the zone of Central Europe spread along the range of the Apennines, at high altitudes, far down into the zone of Peninsular Italy; there are also entire species which in Central Europe are found also in the plains, but only at these high altitudes in the peninsula of Italy.

The particular configuration of Southern Europe, divided into three vast peninsulas, and some large islands, is obviously the cause of this part of Europe having to be dealt with as four distinct zones, because their Lepidoptera differ most markedly, although they exhibit many points in common when compared to Central Europe.

V. *Iberic* zone: This zone is decidedly connected with Palaearctic Africa in many ways, and stands apart from the rest of Europe on this account; they have many species in common, which are peculiar to them, and the races of other species are quite similar, or are transitional in the Iberic peninsula; besides this, one finds that many European species produce in this zone their largest and most gaudy races, and that some produce several races within its limits, making it an extremely interesting region. What I propose calling the *Franco-iberic* subzone of transition consists in those two curious strips of France, which stand at a right angle to each other, and of which one extends from the Pyrenees, along the western coast, and the other eastwardly, along the southern coast, as far as the Maritime Alps. In both one finds a mixture of some Iberic species*, and of very southern-looking races, with others more like those of Central Europe. The first strip mentioned reaches a most unexpected latitude, and contrasts with the rest of Central Europe. No doubt the explanation of this, and of the curious angle the two strips form, rests entirely on the direction of the isothermic winter lines, with which they may be seen to coincide exactly. The maritime climate in both cases and the Gulf Stream along the western coast, are evidently their cause.

VI. The *Italic*: This zone comprises three very distinct subzones: the *Northern-Italic*, the *Peninsular-Italic*, and the *African-Italic*. Within the second of these another little subzone is detectable: the *Calabrian*. The *Northern-Italic* subzone has very definite boundaries, because it

* The Rhopalocera afford the following in the Southern portion: *T. ballus*, *C. avis*, *N. esculi* (Hb.) Obth., *L. roboris*, *C. lorquinii*, *G. melanops*, *T. rumina*, *P. feisthamelii*, *P. pasiphaë*, *M. lachesis*, *M. syllius*, *S. fidia*, which all stop short before or at the Maritime Alps; *Agriades hispana*, H.S., – *aragonensis*, Gerh., which stretches out into a long arm along Liguria, as far as Northern Tuscany; *M. dejone*, which extends locally in the subalpine zone, as far east as South Tyrol; *C. dorus*, which reappears locally in Central Italy.

exactly consists in the totality of the Po Basin; the waterpartings of such mountain masses as the Alps to the north and west, and the Apennines to the south, mark so sharply the limits of very different climates, both northward and southward, that one is in no way surprised at finding perfectly characterised and peculiar races in this region. The climate is intermediate between that of Central Europe and that found from Liguria and Tuscany downwards, and so are the races of its Lepidoptera, which develop in incomparably damper surroundings than those of the rest of Italy, and feed on a luxuriant green vegetation, which does not get dried up during July and August. So great is their resemblance to those of Central Europe that one might very reasonably doubt whether the Po Basin should not be considered a subzone of the latter, rather than be joined to the rest of Italy. The extent to which the Po Basin is occupied by the Alps, with their numerous peculiar species and races, would be another strong reason not to split the Alpine subzone. It is quite true that strictly Alpine species of very high altitudes are, as a rule, similar on both sides of the waterparting (except rare cases, like that of *E. alecto*, Hb., on the Stelvio), but, on the other hand, there are two reasons which make me conclude that the Po Basin should be separated from Central Europe: one is that several species, characteristic of the latter zone, stop short exactly at the waterparting of the Alps (so that they are found, for instance, in North Tyrol, up to the Brenner Pass, and not in South Tyrol), or only just cross it in a few localities (such are *C. palaemon*, *C. amphidamas*, *L. arcas*, *S. prumi*, *C. chrysotheme*, *C. myrmidone*, *C. hera*, *E. arete*, *H. arethusa*, *M. maturna*, *M. parthenie* (as distinguished from *M. varia*), *A. levana*, *P. l-album*, *E. xanthomelas*; very probably *A. iris* and *L. populi* have an extremely limited distribution in a few Alpine valleys, and should be included here too, but, curiously enough, one finds them recorded as far south as Central Italy by old writers); the other reason is that nearly all the species, which spread in both regions, produce in the Po Basin different races from those of Central Europe, though distinctly less so than they are from the races of Peninsular Italy. Anyhow, this question can only be settled when the races of the Northern Italic zone are more thoroughly known. On its south side, as already mentioned, the chain of the Apennines draws a sharp line between this transitional zone and that of *Peninsular Italy*, with its distinctly southern characteristics. Liguria belongs to the latter, and the great majority of its species and races do not seem to differ in the least, as was to be expected, from those of Central and Southern Italy. We will not deal with Liguria in this catalogue because we are not sufficiently acquainted with it.

The features of the truly Italic races of the *Peninsular* subzone are obviously due to the marked change of climate, clearly shown by the isothermic winter lines, and of the flora, which strikes one as soon as one has crossed the passes, or in the railway, one comes out of the tunnels of the Apennines, between Piedmont and Liguria, or between Emilia and Tuscany—one enters the region of the olive. Springs are so scarce that all the streams are torrents, and when the water supplied by the winter and spring rains has dried up, the ground becomes baked; a few storms are in most years all that can be expected from June to September and, in some years and regions, from May till October. As I have pointed out in my paper on "*The various modes of emergence*,

etc." this drought produces in Tuscany a "pause" of about twenty days in the emergence of all Lepidoptera; it is the first step towards those special climatic conditions which culminate in the North African ones, where the summer "pause" becomes considerably longer than the winter one. These climatic conditions in most of the widespread species produce the same race from Tuscany to Calabria, or two parallel races: one in the mountains, identical with, or more similar to, those of Northern Italy and Central Europe, and one in the plains; sometimes there is a third in particularly damp localities, such as marshes, or certain slopes on the north side of mountains, or certain spots on the sea-shore, or deep narrow valleys; this last race, too, comes nearer those of Central Europe by the extent of its dark markings. Several species, however, change aspect in Calabria and resemble, there, much more the races of Northern Italy than their near neighbours of the rest of the peninsula, in their larger size, than they do the latter, by their more saturated colouring, and by the greater extent of dark patterns. This phenomenon is so distinct that Calabria stands out as a small subzone by itself, and we shall see also that the distribution of species contributes to confirm it. Another noteworthy exception to the uniform distribution of races in the whole of Peninsular Italy is afforded by some of those species which in this region are only found at high altitudes, namely, by *P. apollo* and by the *Erebiae*; these in Tuscany produce a race peculiar to the peninsula, whilst further south, in Umbria, in the Marche and in the Abruzzi, they revert to larger and darker forms, much more similar to the Alpine races. I must point out, furthermore, that there also exist several species, which are totally absent from Tuscany and which make their appearance again to the south of it in colonies, thus isolated by great distances from the zones where most of them are more widespread and characteristic: *L. boetica*, *H. alveus*, *H. foulquieri*, *H. serratulae*, *H. morpheus*, *H. thersamon*, *H. dolus*, *P. tithonus* (=*eros*), *A. eumedon*, *J. jolas*, *L. arcas*, *S. spini*, *A. euphenoides*, *P. ergane*, *C. iphis*, *C. typhon*, *C. dorus*, *M. japygia*, *S. cordula*, *L. celtis*, *M. triria*, *M. aurinia*, *B. pales*, *D. pandora*. In both cases I think the cause rests in the geological structure of the Apennines, which is of a Tertiary nature as far down as the depression between the valley of the Tiber and that of the Metauro, and Jurassic beyond it, and in the existence, south of Tuscany, of large mountain-masses, resembling the Alps more than does any part of the chain within Tuscany itself. The features of the characteristic Italic races consist in small size, frail structure, colours bright, but light (not saturated), dark pattern reduced in extent. Species which descend to the plains and hills produce these features to their highest degree here, and extreme races are found in the driest, hottest localities, and especially in the generation whose larvae have fed up during the summer months (the second of the bigenerates and the third of the trigenerates). Apart from those afforded by Calabria, as noted above in several species, one meets with few exceptions in the rest of the Peninsula of races distinguished on the contrary by large size and saturated colouring: *H. alciphron* in race *mirabilis*, Vrty., very local, *L. arion* (culminating in Liguria), the second generation of most *Pieridi*, *E. ligea*, *E. dryas*, *S. fagi* [*hermione*] (both in sub-species *fagi* and in *major*), *S. circe*, *S. statilinus* in race *rostagnoi*, Vrty., on the coast of the Campania, *M. pseudo-athalia* in race *maxima*, Trti., in the Isle of Elba, *L. circularis* in race *herculeana*,

Stichel, in the Mainarde Mts., are the only ones I know of larger than the average size of the species, and which are not surpassed by races of other zones of Europe. A remarkably small list as compared to the numerous gigantic races of the Iberic and of the Balkanic zones!

As regards species, the Italic zone in general, and the Peninsular subzone in particular, do not afford any peculiar characteristics, except one species, *M. arge*, Sulz., proper to the latter, and *M. pherusa*, B., proper to Sicily, if it be specifically distinct from *M. syllius*, Hbst. No doubt this is partly due to the very central position of Italy in southern Europe, which favours the spreading of species to and from it, but, on the other hand, there must also exist some cause which is decidedly unfavourable to certain species, because there are a few which are found both east and west of it, and which are absent from our Italic zone; these are: *Z. lysimon*, *H. admetus*, *P. sephyrus*, *L. duponcheli*, the genus *Zegris*, *P. eleanor* (except an isolated colony at the far end of Calabria, and those individuals which pass the frontier in the Maritime Alps), *E. melas*, *H. hippolyte*, *H. arethusa*. Most of the species of Peninsular Italy are those which are distributed over the greater part of Europe and, in fact, of the Palaearctic region, but there are a few which spread locally as far south as the plains and hills of the Po Basin and yet do not enter the Peninsular zone: *C. oedipus*, *A. hyperanthus*, *P. achine*, *N. lucilla*, and *B. selene*; *L. alcon* and *E. aethiops* only just overrun its boundary. The following, found in the peninsula, are, instead, proper to the Mediterranean region: *E. boetica*, Rbr., *H. malroides*, *G. lefebvrei* and *G. nostrodamus*, *A. escheri*, *G. cleopatra*, *P. manni*, *P. alexanor*, *H. lupinus*, *P. ida*, *C. jasius*. A few are distributed towards the west of Italy: *H. armoricanus*, *A. hispana*, *A. euphenoides*, *C. dorus*, *E. neoridas*. *H. armoricanus* has a very extensive distribution outside Italy, as well as within it; the four others give one the impression of having spread to Italy from the west. *P. ergane*, *A. damone*, *T. hypermnestra*, *P. alexanor*, are, instead, widespread towards the east, and seem to have reached Italy from that direction. It is said that, before 1808, *Danais chrysippus*, L., used to exist at Naples, but that it was extinguished there by that exceptionally cold winter.

The *Calabrian* subzone, from the point of view of species, is notable by the presence of *P. alexanor*, as already mentioned, and of *A. damone* —at its furthest end. The latter is otherwise only found, in Italy, on the opposite side of the straits of Messina, on the Etna. What is also a striking characteristic is the total absence of the genus *Erebia*, which ends in the Abruzzi, although there are, here, several species, and the Calabrian mountains seem well suited to some of them, although they have been reached, as have those of Sicily, by both the *Parnassius* of Peninsular Italy. The absence of *Agriades*, except *thersites*, both in Calabria and in Sicily, is noteworthy too, and the existence of *thetis* in Africa makes it all the more surprising.

The *African-Italian* subzone, as may well be called the island of Sicily, affords a very distinct entomological fauna, both as regards species and races. In connection with species the disappearance of a considerable number of those found in the Peninsula must first be noted, and amongst these of all *Erebia* and *Agriades*, as in Calabria. This impoverishment is partly compensated by the existence of species which Sicily has in common with the African zone, but the *Grypocera* and *Rhopalocera* only afford three; *Melitaea aetheria*, *Urbicola*

pallida, Stdgr. (which has been shown to be cospecific with the African *bennuncas*, Obth., and distinct from *comma*, L.), and *Tarucus theophrastus*, found only once by Ragusa. I have already mentioned that a colony of the eastern *Anthocharis damone* exists on both sides of the straits of Messina, and *Powellia orbifer* is another eastern species found in Sicily. One species is peculiar to this subzone, namely *Melanargia pherusa*. Races, in many species, contrast remarkably with those of the Peninsular zone and, curiously enough, considering the aridity of Sicily, they usually do so by their larger size, more robust build and gaudy colouring. The following are the exceptional ones, being particularly small and frail in Sicily: *E. alceae*, *E. althaeae*, *L. boeticus*, *H. alciphron*, *C. minima*, *C. rubi*, *T. hypermnestra*, *E. cardamines*, *P. apollo*, *P. ida*, *M. didyma*, *P. atalanta*. The race *meridionalis*, Stdgr., of *didyma*, Sicily has in common with Greece, and it contrasts with the gigantic *patycosana*, Trti., of the Calabrian coast, and even with *neeraeformis*, Vrty., of its mountains. Also *P. mnemosyne* approaches the oriental races in features. The large *rhamnusia* race of *H. lupinus*, Costa, is proper to Sicily. *S. statilinus* produces the gigantic *rostagnoi* described from the Campania coast. Several races are perfectly similar to one of the African ones, or transitional to them: *P. icarus*, *P. machaon*, *E. jurtina*, *M. galathea*, *H. semele*, *H. briseis*. Finally, some belong to races so generally distributed around the Mediterranean, besides northern Africa, that the astonishing thing is they should not be produced in Peninsular Italy: *R. phlaeas* race *aestiva*, Z., *C. rubi* race *ferrida*, Stdgr., *C. pamphilus* race *lyllus*, Esp. groups of races, *P. aegeria* subspecies *aegeria*, L., *D. paphia* race *anargyra*, Stdgr., etc.

VII. Zone of *Corsica* and *Sardinia* and *Elban* subzone of transition: The former is so well known that I need waste no words in recalling the peculiar species and the marked races it produces, which makes it one of the most highly characterised zones, notwithstanding its limited area. It is said, that with the Elban Island and other smaller islands near the coast of Tuscany, it consists of remainders of the great Tyrrhenian continent, and that the species proper to it are a few examples of its fauna and flora which have survived. In Elba, however, only two of these species still exist: *C. corinna* and *H. neomiris*. The four others (*P. hospiton*, *E. nuraj*, *A. elisa*, and *A. ichnusa*) are missing, and so is *E. bellezina*, which spreads to the N., S., and W., but which does not exist to the E. in Italy. *E. belemia* is said by Turati to have been discovered lately in Sardinia, but there still is a doubt about it. The races of Corsica and Sardinia are most striking in a few species, such as *P. sao*, *Pyronia tithonus*, etc., but not in Elba. The very distinct *aristaeus* of *H. semele*, on the contrary, does extend to the latter. Most races are identical with some of those which spread from the Iberic zone to Africa and to Sicily, so that they differ very much from the races of Peninsular Italy, in a way which is rather unexpected, considering it is the nearest continent. Of these those of *R. phlaeas* and of *D. paphia* exist also at Elba; the ones of *A. medon* and of *E. jurtina* are in it transitional to the Tuscan races; the remainder are quite identical with latter. Elba also possesses a few species not found in Corsica and Sardinia, such as *E. ausonia*, *M. athalia*, *M. didyma*, etc.

VIII. The *Balkanic* zone produces a large number of species and races, not otherwise found in Europe, so that it is a most distinct one.

This is due to its close connection with Asia Minor, which it resembles in many ways. It undoubtedly affords several subzones, which will have to be made out, but it still needs much work, and, anyhow, it would be out of keeping with the object of this paper to enter into a description of it.

(To be continued.)

NOTES ON COLLECTING, etc.

An Aberration of E. glyphica.—On June 18th at Horsley I captured a specimen of *Euclidia glyphica*, L., with the normal yellow of the hindwings replaced by cream colour. The majority of the upper layer of scales are unpigmented and rolled up.

I do not know of any other record of this kind of scale defect in *glyphica*, but a long list of examples in other species is given in my paper published in the *Trans. Lond. N.H. Soc.*, 1921, pp. 53-64. —E. A. Cockayne (M.D., F.E.S.).

Catocala nupta var.—On Monday, September 4th, I took a variety of *Catocala nupta*. The forewings are normal in colour and markings. The underwings are of a dark chocolate-brown colour, where in the type it is brick-red. The black markings on the hindwings are as in type as regards size and shape, but the edges are slightly shot with dark purple. I saw this specimen near Coggeshall in Essex resting on the wall of a house. Its size is normal.—Thomas B. Daltry, Madeley, Stevenage, Herts.

A Rare Spider.—In a marshy field near Rye, Sussex, I found on September 2nd, 1922, a female specimen of the handsome spider *Argiope bruennichi*, Scop. The web was spun between reeds, amongst a bed of yellow wild flowers. The spider had just caught an immature grasshopper. Mr. S. Hirst, who kindly identified the specimen, writes:—

"This spider is fairly widely distributed in Europe, and in France it occurs as far North as Paris. So far as I am aware the species has not been found before in this country."—Frank Slade, F.Z.S., 3, Market Street, Rye, Sussex. *September 11th*, 1922.

Abundance of Euchloë cardamines in East Tyrone, 1922; a record in gynandromorphs!—This species was out in wonderful numbers during the only fine spell of weather that we have had so far this season; ab. *marginata*, turning up again and I was pleased to get two examples of ab. *dispila*, Raynor.

On May 27th I had the great luck to capture the two gynandromorphous specimens described below; the first being netted at 3.30 p.m. (S.T.) and the second at about 5.30, in localities a quarter of a mile apart.

(1) ♀; upperside left forewing with a broad stripe of the ♂ colour, extending from discoidal into the apical blotch. Underside left forewing with a large orange patch from discoidal to apical blotch, covering two thirds of the wing in this area; right forewing with three orange streaks from discoidal to outer margin; sub-costal veins broadly streaked with yellow.

(2) ♀ ; var. *caudotostieta*, Williams. Upperside right forewing with irregular orange streaks from the discoidal to outer margin, another broader stripe just below, extending to apical blotch ; hindwings with well marked discal spots. Underside left forewing has three parallel stripes of orange, the first above discoidal, the second below, and the third near the anal angle ; right forewing has a triangular blotch of orange extending from and enclosing the discoidal to apical patch ; sub-costal area dusted with yellow.—THOMAS GREER, Curglasson, Stewartstown. *September 15th*, 1922.

MOSQUITOES.—The Mosquito Investigation Committee of the South-Eastern Union are urging workers to make observations on the following lines.

1. Do *Anopheles* larvae require a meal of animal matter before pupating ?

2. If so, which species require it ?

3. During which instar do larvae take this meal if at all ?

4. Has any observer succeeded in getting *Anopheles plumbeus* to pair in captivity ?

5. If so, did the eggs subsequently laid hatch as usual or how long was the hatching delayed.

6. Are the eggs of any species ever laid on the damp marginal mud or on the water ? Which species do which ?

7. Whether dancing in the air of *A. plumbeus* has been observed ? If so, the sex, or sexes, of the participants, the height above the ground, and the nature of the observed movements. In the case of swarms being observed, whether other swarms containing insects of opposite sex were also observed and at what distance ?

8. Manner of capture, subsequent movements of the pair, and position in copulation, and its duration.

9. The duration of life of the male after it has mated and the time elapsing before oviposition in the case of females, are additional points of interest to which attention is drawn of those able to keep and feed captured insects.

10. A record of the time elapsing between the first meal of blood and oviposition will add to the value of observations.

11. As there is a lack of positive knowledge based upon direct observations in the case of most species of mosquito as to whether aerial dances are a necessary prelude to mating ; observations throwing light upon this point are particularly desired.

12. The swarming of midges is far more commonly observed, and similar observations upon this point in the case of mosquitoes will be welcomed, as likely to afford comparative data.

13. Records should state—

(*a*) Date, time of day, state of weather, direction and force of wind, and if after or before sunset.

(*b*) Place, under trees, or round bushes, buildings, above lighter or darker patches of ground, or in buildings, wells, etc.

(*c*) Nature of trees, bushes, or ground, *i.e.*, grass, gravel, etc.

PAPILIO ALEXANOR—TWO YEARS IN PUPA.—While at Digne in July, 1920, I took a number of larvae of *Papilio alexanor*, all of which fed

up well and pupated in due course. All of the pupae produced butterflies in the summer of 1921 with the exception of two which I thought must be dead. I left the two pupae *in situ* in the breeding cage, however, and to my surprise perfect butterflies emerged—one on July 1st, 1922, and one on July 25th, 1922. I certainly did not expect that a southern insect like *P. aleranor* would be capable of passing two winters in the pupal stage.—J. A. Simes (F.E.S.).

CURRENT NOTES AND SHORT NOTICES.

We are informed that a new part of *Genera Insectorum* has just appeared: *Carposinidae*, by E. Meyrick. At the end of the year a thick volume will be issued on the *Oecophoridae* by the same author.

We are getting the parts of *Seitz Macrolepidoptera of the World* (Exotic section) quite regularly, about four parts per month, direct from the present publishers, Messrs. Kernen, of Stuttgart. Each part contains eight pages and two plates, or sixteen pages and one plate, and the price is 2s. per part. By the time this is published we understand that parts 254-261, English edition, will be in the hands of the subscribers. Volume V., American Rhopalocera, has reached the *Hesperiidae*, and Vol. IX., Indo-Malay Rhopalocera, has also reached the end of the Lycaenids. These two volumes will be completed very shortly, and Vol. VI., the American Bombyces, etc., is in progress. The publishers have notified us privately that the translation of Volumes X., Indo-Malay Bombyces, etc., and Volume XIII., African Rhopalocera, is being so rapidly pushed forward that in a few weeks they too will be appearing alongside the parts of the other volumes. As there seems no possibility of getting the completion in any other way than direct from the German publishers, we recommend our readers to complete their sets to date before any part goes out of print; as have the parts of Volume I., Palaearctic Rhopalocera.

SOCIETIES.

The South London Entomological Society.

July 27th.—Mr. H. Main exhibited the natterjack-toad from the South of France.

Mr. Step, the insects he took on the occasion of the Field Meeting at Netley Heath, July 15th, including *Strangalia armata* (Col.), *Volucella pellucens* (Dip.), etc. He also showed the Southern Smooth Snake and the Wall Lizard sent from the Pyrenees by Mr. O. R. Goodman, and gave notes.

Mr. Adkin, a short series of *Cupido minimus* from Eastbourne, where it was abundant and generally large in size with blue dusting, in May last.

Mr. T. H. L. Grosvenor, *Zygaena anthyllidis*, *Z. transalpina* and *Z. scabiosae* sent from the Pyrenees by Mr. O. R. Goodman.

Mr. F. B. Carr, larvae of *Nemoria viridata* from Witherslack and of *Bapta temerata* from Horsley.

Mr. Barnett, a series of *Brenthis euphrosyne* from S. Devon, and *Ematurga atomaria* taken as late as June 22nd.

Mr. Hy. J. Turner, the race *alexandrina* of *Melitaea aurinia* with other races for comparison. There was an abundance of light yellow markings on the fore-wings.

Mr. Bell, larvae of *Cerura bifida* and *C. furcula*, he stated that the ova were laid on the under sides of the leaves not as the books stated on the upper. Also he showed larvae of *Notodonta ziczac*. All were from ova found near Hatfield in June.

August 10th.—Mr. D. W. Seth-Smith, 34, Elsworthy Road, was elected a member.

Mr. R. Adkin exhibited a series of *Arctia villica* reared from larvae picked up on Eastbourne Parade. They were common this year whereas larvae of *A. caja* were unusually scarce.

Mr. Tonge, a bred specimen of *Melenydris salicata* from Langridge Fell.

Mr. Prideaux, aberrations of *Rumicia phlaeas* from Kent, and a remarkable aberration of *Mesoleuca albicillata* bred from Brasted.

Major Gillet, a unique black-banded form of *Agrotis corticea*, a very light ♂ and a dark ♀ of *A. cinerea*, and aberrations of *A. exclamationis*, all taken in his light-trap.

Mr. Bunnett, larva and imago of *Ledra aurita* (Hem.), and the cicada *Centrotus cornutus*, from Box Hill, with the scarce beetle *Agrilus sinuatus*, and *Rhinomacer attelaboides*.

Dr. Robertson, Lepidoptera taken by him at Grindelwald in July. *Pieris napi* var. *bryoniae*, *Albulina pheretes*, *Acidalia immorata*, *Zygaena achilleae*, *Crambus myellus*, etc.

Mr. Hy. J. Turner, species of the S. American genus *Automeris* mostly sent by his friend and fellow member Mr. Lindeman, and read notes on the distribution and characteristics.

Messrs. Tonge, Ham and Carr reported the abundance of *A. villica* larvae, the scarcity of *A. caja* and the occurrence of *P. c-album* near and in Oxford, and fresh *C. croceus*, respectively.

OBITUARY.

Dr. David Sharp, M.B., C.M. (Edinb.), F.R.S., etc.

Born 15th October, 1840. Died 27th August, 1922.

The death of David Sharp leaves a gap in the ranks of British entomologists that will be difficult to fill.

Sharp was born at Torchester, Northamptonshire, but his family moved to Stoney Stratford when he was an infant, and his early boyhood was spent at that place. About 1851 he came to London with his family, where he resided till 1864. He was educated at St. John's Foundation School, Kilburn, and when he left there he worked in his father's business in London for a short time. But David soon concluded that a commercial life was not congenial, and so in 1862 he began to study medicine at St. Bartholomew's. In 1864 he entered the University of Edinburgh and graduated in 1866. He then returned to London and worked for a short time under the Sharp's family doctor. In 1867 he proceeded to Scotland, where he took up his residence at Thornhill, Dumfries, in charge of a patient. In 1875 he

was married to Jessie Margaret Murdoch, at Eccles, Dumfrieshire, who survives him. There were seven children—five daughters and two sons; one of his sons joined up during the War and died in England; his other children still survive. In 1884 he returned to England and took up his residence at Southampton, where he remained till 1888, when he moved to Wilmington, near Dartford, Kent. In 1889 he moved to Cambridge, and 1890 accepted the position as Curator in Entomology at the Cambridge University, which he held till March, 1909. In 1909 he gave up his residence at Cambridge and retired to Brockenhurst, in the New Forest, where he had built a house opening on to the forest which he loved so well. It is here that he died, and in the churchyard of the little parish church, which has associations with the ninth century and Domesday book, he lies buried in a spot that overlooks the forest.

David's family life was of the happiest, especially with his mother, whose widowhood was brightened by his constant attention.

As Sharp left no autobiographical notes it is not possible to follow the influences which moulded his character and directed his life's work. His father was a man of strong personality, which he inherited; he also inherited a wonderfully judicious mind and a cautious but sound judgment. As a young man he met Herbert Spencer under his father's roof, and he was greatly attracted both by the writing and personality of this philosopher. His love of fundamental principles as guides to actions and beliefs were evidently gathered from this source.

Like many another entomologist, he was first attracted to the study of insects through the beauty of butterflies. Before he took up the study of medicine a room at the top of the house in London was converted into a butterfly farm, and here, with the assistance of one of his sisters, he bred butterflies and moths. The exact date he deserted Lepidoptera for Coleoptera is difficult to fix, and it was most probably gradual. When in Brighton, in May, 1861, he bought a small note book, and for a number of years he noted all his catches and localities. On February 5th, 1863, he possessed 662 species of named British Coleoptera, and on March 31st, 1865, he had 1984.

The turning point of his life was in 1867, when he accepted the charge of a patient at Thornhill, for this gave him time and opportunity to devote himself to entomological work which he never could have done had he started upon a general practice. It was during this period that he brought out his *Revision of the Homalota* (1869), and did most of the work on the *Dyticidae*, which was published.

In January, 1876, he offered himself as a candidate to the Town Council of the City of Glasgow for the post of Curator of the City Industrial Museum. It is perhaps as well for the science of entomology that he did not procure the position. Upon his return to England he decided to abandon the medical profession and devote himself entirely to entomology. In the following year (1885) he became associated with the *Zoological Record* as Recorder of Insects, and this position he held until a short time before his death, the editing of the 1920 volume being his last work. The thirty years as Editor of this work made his name a household word to all zoologists. The work entailed as Recorder of Insects and as Editor was great, and to most men of Science a great deal of it would be uncongenial, but Sharp took it as a duty, and zoologists owe him their gratitude.

The number of papers published by Sharp are too numerous to mention here. His two volumes of *Insecta* in the Cambridge Natural History, is the work by which he is best known to the average entomologist. This is one of the few text books of entomology in the English language, which it is a pleasure to read from a point of view of literature.

Sharp was greatly interested in island life. He worked considerably on New Zealand Coleoptera, and his interest in that country was such that he eventually allowed his entire entomological library to go to the Cawthorn Institute, Nelson, believing that it would be of greater use to science out there than in England.

The Rev. T. Blackburn was one of Sharp's earliest entomological friends. The exact date of this friendship is uncertain, but in August, 1865, they were exchanging specimens. Upon the Rev. T. Blackburn going out to Hawaii, Sharp's attention was turned to those islands. Blackburn's collection of the Hawaiian insects were worked out by various specialists, the Coleoptera being worked by himself and Sharp. These collections demonstrated the peculiar precinctive fauna of the Hawaiian Islands and aroused the interest of zoologists, which led to the formation of the Sandwich Island Committee. Professor Alfred Newton was the first Chairman, and Sharp the Secretary and Editor of the publication. Sharp's judgment of men was shown in his choice of Dr. R. C. L. Perkins for the field investigations, and it would have been difficult to have chosen a more fitting man. The results of the years devoted to this work are great, these islands being to-day more thoroughly worked than any similar group within the tropics. It also stands as a monument of the value of systematic work to economics. During the last eighteen years the sugar industry of the islands has been rescued from destruction by the introduction of parasites to control certain insect pests. It is estimated that an average of some eight million dollars per annum has been saved by this work. One of the chief reasons why the economic entomologists have attained this success is because the insect fauna of the islands was so thoroughly known. When a small leafhopper was found destroying the sugar-cane it was at once recognised as an introduced insect and not a native; when parasites were introduced it was known if hyperparasites were present or not to attack them; the biological complex which surrounded these introduced insects could be calculated with some certainty. Without the labours of Sharp, Blackburn, and Perkins, along with various other systematists, the economic entomologists would have had to work in the dark. Sharp used to remark that he was an extravagant entomologist, as he was not an economic one, but few economic entomologists can claim greater economic results for their work than Sharp can for his years devoted to the "Fauna Hawaiiensis."

Sharp joined the Entomological Society of London in 1862, he served as Secretary in 1867, President in 1887-8, Vice-President 1889, 1891-2, 1896, 1902-3. He was elected a special life Fellow in 1921. At the time of his death he was, with one exception, the senior Fellow, there being one other dating from 1861.

In 1890 he was elected to the Royal Society. He was also an honorary member of a number of foreign entomological societies.—F.M.

Subscriptions for Vol. XXXIV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1922.]

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Desiderata.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—*W. G. Pether*, "*Thelma*," 4, *Willow Bridge Road, London, N. 1.*

Duplicates.—Aglaia, Adippe, *Io, T. quercus, Coridon vars., *Fuliginosa (Reading), *B. quercus ♀, Tiliæ, Menthastri, *Linariata, Aurantiaria, Leucophæaria vars. Paniscus. *Desiderata.*—Pupæ of Dictæoides; Imagines of typhon, palpina, camelina (dark), Curtula, Pyra, and numerous others; Ova of Hispidaria.—*Harold B. Williams, 112a, Bensham Manor Road, Thornton Heath, Surrey.*

Duplicates.—Sybilla, Paphia, Io (2), Selene, Lucina (2), Ocellatus, Illustraria (autumn) Nastata, Roboraria ♂, Prunaria (4) ♂, Tipuliformis. *Desiderata.*—Castreusis ♂, Cucullina, Cribrum, Cinerea, Ravida, Ashworthii, Notata, Obfuscaria, Smaragdaria and others, also vars. and local forms.—*Harold E. Winser, Kent House, Cranleigh.*

Duplicates.—Cinxia, Bellargus, Coridon, H. Comma, Lineola, Galathea, Moneta, Nupta, and many others. *Desiderata.*—Blandina, Irish Icarus, Carmelita, Cuculla. Gonostigma, Ashworthii, Templi, Australis, Undulata, Smaragdaria, Testacea.—*W. Gifford Nash, Clavering House, Bedford.*

Duplicates.—*Atalanta, Sylvanus, *Urticæ, Phlæas, *Moneta, *Pisi, *T. cratægi, *Lucipara, *Filipendulæ, etc. *Desiderata.*—Paniscus, Actæon, Anachoreta, Tincta, Asteris, Absinthii, Notha, Socia, Festucæ, Rubi, Unangulata, Munitata, etc.—*Wm. Foddy, 39, York Street, Rugby.*

Duplicates.—Cinerea ♀, fine forms, grey, brown and blackish, Maritima and vars. Immorata and other East Sussex species.

Desiderata.—Pupæ. Luteago (Barrettii), Caesia, Albimacula, Alpina, Xanthomista, Sparganii, Dissoluta (Arundineta), Graphalii. Also imagines of extreme forms Noctuæ in fine condition only.—*A. J. Wightman, 35, Morris Road, Lewes.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. 1922, October 18th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. —*Hon. Sec.*, StanleyEdwards, 15, St. German's Place, Blackheath, S.E.3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

All MS. and editorial matter should be sent and all proofs returned to HY. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

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The Entomologist's Record

AND

Journal of Variation

CONTENTS.

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Communications have been received or have been promised from Messrs. Hy. J. Turner, H. Donisthorpe, Dr. Verity, J. H. Durrant, G. T. Bethune-Baker, Alfred Sich, W. Daws, the late Dr. T. A. Chapman, R. S. Bagnall, J. W. H. Harrison, W. J. Kaye, Dr. E. A. Cockayne, C. R. N. Burrows, H. Baker-Sly, Command, J. C. Woodward, the late A. J. Fison, with Reports of Societies and Reviews.

Notes on a few species of Diptera bred from the larval stage.

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

1. DIPTERA BRED FROM A SMALL PIECE OF FUNGUS.—On July 31st last, when collecting Coleoptera in fungi at Barkham, I noticed some Dipterous larvae in a fungus—*Armillaria mellea*—growing on a willow tree. They were similar in shape to some larvae I had taken in a fungus at Otford, in September, 1921 (and from which I bred *Platypeza modesta*, Zett.), only instead of being white they were of a pinkish colour with dark bands. A few white larvae also occurred. A little of the fungus was taken home and placed on damp sand in a small glass bowl covered with muslin. Very shortly a number of *Mycetophila fungorum*, Dg., hatched out, and these were followed by a dozen *Drosophila* sp.? (not yet identified). Early in September a few *Phaonia scutellaris*, a fly with a yellow abdomen, appeared. This species I am informed would be predaceous on some of the other Dipterous larvae. Towards the middle of September a few *Fannia manicata*, Mg., emerged, the adult form of the white larvae.

Finally, at the end of September, a number of a handsome black velvet fly with red eyes, the ♂ of *Platypeza fasciata*, Mg., put in an appearance, and at the beginning of October some six or eight of its grey ♀ ♀ hatched out. This last species is the imago of the banded larva mentioned above.

2. DIPTERA BRED FROM LARVAE TAKEN IN THE BURROWS OF TOMICUS SEXDENTATUS.—When capturing *Tomicus sexdentatus* in the Forest of Dean, in August last, a number of Dipterous larvae (large and small) were observed in the burrows of the beetle. These were collected into a small tin filled with frass and refuse from the burrows, and bits of Scots fir bark. From time to time the following species of Diptera have hatched out. *Phania laeta*, Flr., the largest of the species bred out, is probably parasitic on the larvae and pupae of the *Tomicus*; *Louchaea deutschi*, Zett., the habits of which are unknown; *Sciara* sp., in some numbers. Dr. Munroe, in his paper on the Genus *Hylastes*, Er. [*Proc. R. Phy. Soc. Edinb.*, **20** (1918)], writes—"the larvae of Sciarid flies are the chief inhabitants of the galleries of *H. palliatus*"; and on October last *Medeterus tristis*, Zett. (probably a predaceous species).

I am indebted to Mr. Edwards, of the British Museum, for the names of these flies.

Notes on collecting in June, July, and August in Shropshire.

By Commander J. C. WOODWARD.

The following are a few notes on collecting this summer in Shropshire, within a few miles of Cleobury Mortimer.

Until the middle of June the weather was warm and sunny, but afterwards turned cold, the nights especially, with rain nearly every day. From June 6th until about the 15th, most of the usual species were on the wing, but not in such profusion as in most years, but after this Lepidoptera became scarce, on account of the cold sunless weather. At the beginning of June *Pieris rapae* was common; *Euchloë cardamines* was observed, though it was anything but common, as it is in most years; *Vanessa io*, one or two worn specimens: *Brenthis euphrosyne*, common, but getting worn about June 8th; *B. selene*, very common

and in good condition about June 10th; *Pararge aegeria*, only seemed to occur sparingly this year; *Epinephele jurtina*, most abundant towards the end of June; *Aphantopus hyperantus*, very common in its usual localities, but later than most years, I did not take it till well on in July; *Coenonympha pamphilus*, very common at the beginning of June; *Bithys quercus*, one specimen end of August, not seen here before; *Callophrys rubi*, common in its usual haunts at the beginning of the month; *Polyommatus icarus*, most abundant and in splendid condition at the beginning of June; *Hesperia malvae*, not so common as usual; *Nisoniades tages*, also not so abundant as in most years; *Augiades sylvanus*, observed a few specimens during the middle of June, but this also was not so abundant as usual. During the end of June, and all July and August the weather was atrocious, rain on most days, and cloudy when not raining, and very cold at night.

The second broods were all late this year. I found a large number of broods of the larvae of *V. io*, all very small, well on in July, and did not see any of the perfect insects until the end of August: the same applied to *Pyrameis atalanta*, *Pieris napi*, and *P. brassicae*, which did not appear till well on in August, and then only sparingly.

I captured a *Colias croceus* (*edusa*) on August 21st, a species I have not seen here before, and I also observed, but I did not capture, one *C. hyale*, another stranger to these parts. *Polygonia c-album* occurred quite frequently this year, but I did not observe it till well on in August. *Aglais urticae* was only out in small numbers, at the end of August. *Dryas paphia*, uncommon this year, I only noted two specimens. *Pararge megera*, very few about, 2nd of August.

P. icarus did not appear again till the end of August, and then only sparingly. I suppose the majority of the larvae had been killed by the cold and wet. *Adopaea flava* (*thaumas*) was occasionally observed from August 21st onward. One *Pyrameis cardui* was observed at the end of June, and another on August 21st.

As to the Heterocera, most of the species that occur commonly here most years, seemed to be entirely absent this year. *Theretra porcellus* was about at the beginning of June, but in very small numbers. *Hemaris tityus* (*bombyliformis*) was fairly common, but not nearly so common as usual. I took one specimen of *Thyatira batis*, a species I have not hitherto observed here. *Orgyia antiqua*, found one larva, middle of August, but no more. *Lasiocampa quercus*, one larva, which did not spin up till August 25th, and one ♀ on August 23rd, which only laid five eggs before it died. *Cilix glaucata*, generally quite a frequent species here, I observed only two specimens. I found one larva of *Pygaera pigra* on August 21st. I took one specimen of *Diaphora mendica* flying in the daytime in a wood, and one specimen of *Triaena psi* on a tree trunk, whilst fishing. *Bryophila glandifera*, on the roof of a fowl house, June 20th. *Agrotis exclamationis*, very common in hayfields at the beginning of June. *Triphaena comes* (*orbona*), August 21st. *T. pronuba*, very common at the beginning of August at the flowers of lime. I should have mentioned that I found the larvae of *Macrothylacia rubi* on August 21st, fairly commonly. *Charaeas graminis*, common about August 27th. *Agriopis aprilina* pupae very common at the foot of oak trees in August. *Mania maura*, August 15th. *Leucania pallens* and *L. comma*, very common during the end of July. *L. conigera*, common, end of July. *Grammesia trigrammica*, very common in hay fields, June.

Calymnia trapezina, two specimens, August 20th. *Plastenis retusa*, two specimens, July 15th. Larvae of *Cucullia verbasci* were very common down by the river, feeding on figwort, during July. *Heliaca tenebrata*, only occasionally this summer, beginning of June, usually common here. I took a specimen of *Plusia moneta*, a species I have never taken here before. *P. chrysitis*, very sparingly this year in July, usually a very abundant moth here. *P. gamma*, this usually very plentiful insect was quite scarce this year. *Euclidia mi* and *E. glyphica* occurred more commonly than usual this year. The capture of the season was *Catephia alchymista*, which I caught flying along a hedge, at the corner of a hayfield, a perfect specimen. *Botys fuscalis* and *Hypena proboscidalis* were common in July.

The Geometrids observed were, *Geometra papilionaria* and *Acidalia aversata*, exceedingly common; *Timandra amata*, common in June; *Ptychopoda dimidiata*, *Ephyra punctaria*, *E. linearia*, and *Ortholitha limitata*, common in most grass fields during August; *Cidaria pyraliata*, common at the end of June; *C. fulvata*, June; *C. corylata*, this moth does not appear to be common in this part of Salop, as I have not taken it here before; *Lygris suffumata* and *Amoebe viridaria*, this latter species was very late this year, fresh specimens being taken right through till the end of August; *Xanthorhoë montanata*, as usual very common; *X. ductuata* and *Malenydris didymata*, exceedingly common during July; *Eulype hastata*, in June; *Mesoleuca bicolorata*, August; *Perizoma affinitata*, common; *P. flavofasciata* (*decolorata*); *P. albulata*, one specimen occurred at the beginning of September, an unusually late date; *Camptogramma bilineata*, as common as usual in June and July; *Hydriomena furcata*, common; *H. impluviata*; *Eucnoeca obliterata*, one specimen occurring at the end of July, a late date; and *Asthena luteata*, one specimen also occurring at the end of July, again a late arrival. None of the *Eupithecia* were observed at all.

The *Boarmiinae* were very scarce this year. *Abraxas sylvata*, generally of frequent occurrence, was not seen at all, and even *A. grossulariata* was not observed, a species generally swarming here; *Cabera pusaria*, common in August; *C. exanthemata*; *Metrocampa margaritaria*, even of this usually abundant moth only a few specimens were seen; *Selenia bilunaria*, July; *Hygrochroa syringaria*, July; *Gonodontis bidentata*; *Crapteryx sambucaria*, August; *Opisthograptis luteolata*, very common all the summer; *Venilia maculata*, June; *Boarmia gemmaria*, common, July; *B. repandata*, even this usually very common moth only occurred sparingly; *Ematurga atomaria*, June, common; *Thamnonoma vanaria*, July; *Lozogramma petraria*, June.

Among the *Zygaenidae*, *Z. filipendulae* was exceedingly abundant in the hayfields at the end of June, but *Adscita statices* did not occur in its usual localities.

I took one ♀ of *Zeuzera pyrina*, another species I have never previously taken here. *Hepialus humuli* was very abundant this year, also *H. lupulina*, which simply swarmed over low herbage in the twilight during June.

This season has easily been the worst I have ever known in this part of the country, even the commonest species being either entirely absent or very scarce. Although I had more time at my disposal for collecting than usual, I only observed about one-third of the species I should have seen in an ordinary year.

Some Notes on Swiss butterflies.

[Supplementary to the *Butterflies of Switzerland*, by Rev. Geo. Wheeler, M.A., F.E.S.]

By the late MR. A. J. FISON.

(Arranged and communicated by Miss L. M. Fison.)

"The works of the Lord are great, sought out of all them that have pleasure in therein."—*Psalm*, cxi. 2.

II.

Hesperia malvae, L., ab. *taras*, Brgstr.—Avençon Gorge (N. side and bottom), 29.iv. and 5.v.09.

Heteropterus morpheus, Pallas.—(4) at Reazzino, near Locarno, 10.vii.03.

Chrysophanus virgaureae, L.—Jura. Salvan (7) 9.vii. Saasthal, ♀, 15.viii. Pontresina, vii.

C. virgaureae var. *zermattensis*, Fallou.—Evolena, Zinal, Gadmenthal. Best at Huteck, near Saas. ♀s of Val Bregaglia and Pontresina are very near *zermattensis*. Small ♂s from Rosegg Glacier are intermediate.

Chrysophanus hippothoë, L.—1 on Les Pleiades, 3.vi.14 (L.M.F). Mt. Caux, Glion, 20.vii.86 & 90, before hay cut.

C. hippothoë var. *eurybia*, Ochs.—Fexthal, 8.viii.01. Ravoire and Bovine, near Martigny, and Mt. Chemi. Tuilbière Marsh, 11.vi.92.

C. alciphron, Rott.—Saas Fée, near glacier. Bergell.

C. alciphron var. *gordius*, Sulzer.—Brusio, 17.vi.01. Salvan. Above Sembrancher, 9.vii.14 (L.M.F.).

C. dorilis, Hufn.—Charpigny, v. and vi. Brigue, viii.90.

C. dorilis var. *subalpina*, Spr.—Evolena. Fénestral Bridge, 4.viii.10.

Small form from Leysin—also below Trois Torrents, on old road near Chapel.

C. phlaeas, L.—Simplon, 24.vii.10. Pont de Pierre Sonzier: Naters Charpigny (1), 5.ix.88.

C. phlaeas ab. *eleus*, Fabr.—Val d'Anniviers, up to 3,000 ft. Naters.

C. amphidamus, Esp.—Caux (18), 24.vi.03; (26), 30.v.04; (18), 4.vi.03. Tramelan Gorge, 30.vi.03 and 17.vi.05.

Lycaena arcas, Rott.—Gstaad and Lauenen, 18.vii.07.

L. euphemus, Hb.—(14) beyond (W. of) Ilarsaz Bridge, 1.viii.06.

L. alcon, Fabr.—S. of Aigle Golf Links, 20.vii.06. Weesen Marsh, 15.vii.03.

L. arion, L.—Very fine, W. of end of Rockfall bed at Arth-Goldau, 16-22.vi.04.

L. iolas, Ochs.—19.vi.06, Sierre, 200 yds. E. of stand, vii., 3 ♀s; 1 ♀ W. side of arm of lake. Took the 4 ♀s and 2 ♂s and released them at Charpigny.

L. amanda, Schneider.—(4015) W. end of St. Triphon Rock, 15.vi.09. Sion (10) 20-21.v.04. (1) at Visp, 15.vi. 19 (L.M.F.). (1) near the Pontet stream below Charpigny, 25.vi.14 (L.M.F.).

Cupido sebrus, Bdv.—Abundant Huemoz, Auliens, Glutiere, vi.14. Charpigny, 5.vi.07 (5), v.-vi., 13-14 (L.M.F.); also a few end vii.22 (L.M.F.).

Nomiades semiargus, Rott.—Leuk, 29.iv.04 (2).

N. semiargus var. *montana*, Ney.—Morteratsch glacier. Glion, vii. and viii.

N. cyllarus, Rott.—Gryonne Meadows, v.14. Charpigny, v.14 (L.M.F.).

N. cyllarus ab. *lugens*, Caradja.—Pont de Pierre Sonzier (2). Charpigny, 10.v.05.

N. cyllarus ab. *subtus-radiata*, Obth.—Charpigny, v.14 (L.M.F.).

Polyommatus eumedon, Esp.—Pierre-à-voir, Les Plans, 16.vi.90. Caux, 10.vi.

P. donzelii, Bsdv.—Jaman, 25.vi.90. Turtmannthal, 18.viii.90. Binnenthal, end vii. and beg. viii.05. Languard Falls.

P. damon, Schiff.—Beyond Lavey. One year hundreds at Charpigny. (Charpigny, 14.vii.22, few.) Huémoz, 14.vii.13, abundant. Champéry, 1.viii.22. Massonger, 3.viii.22 (L.M.F.).

P. meleager, Esp.—Follaterre de Fully. Sion to Vex by high road.

P. hylas, Esp.—Charpigny, v.

P. escheri, Hb.—Alvaneu Bad. Fully or Saillon, 7.vi.01. On hill of Supy close to Ormonaz, v., abundant.

P. alexis, Hb., ab. ♀ *coerulescens*, Hb.—Martigny, v. com. Mt. Bré, 04.

P. eros, Ochs.—Mauvoisin, 12-19.viii.91. Faulhorn, 1.viii.14 (L.M.F.).

P. orbitulus, Brunner.—Lac de Fully and above to S.W., 18.vii.91. St. Luc, 16.viii.88. Rosswald above Bérisal, 26.vii.90. Pontresina Täschthal, 8.vii.95, abundant. Faulhorn 1.viii.14 (L.M.F.).

P. astrarche, Brgstr., var. *calida*, Bellier. Mt. Bré, 28.v.03.

P. astrarche vera.—Kippel, 9.viii.90 (2). Follaterre, 29.v. Lövschen Thal, 9.viii.90.

P. pheretes, Hb.—Faulhorn, 1.viii.14 (L.M.F.). Little Scheidegg, 3.viii.22. Savolaire, 20.vi.93. St. Luc (6,000 ft.), mid viii.88. Dischmathal, 2.vii.01. Little Scheidegg and above.

P. pheretes ab. ♀ *coeruleopunctata*, Wh.—Albula Pass, 21.viii.01. L. Scheidegg.

P. pheretes ab. *maloyensis*, Rühl.—Zermatt.

P. baton, Brgstr.—En Chemin. Almagel Valley, 6.vii.94. 2 below Sommet des Vignes, ♂ ♀, 12.vii.14 (L.M.F.).

P. orion, Pallas.—On 20.v.11 I saw a fine *orion* on Gemmi Path. At Charpigny, I introduced it in 1909 from W. of Martigny. Charpigny, 2.vi.14 (L.M.F.).

P. orion var. *nigra*, Gerhard.—S. of les Marécottes.

P. optilete, Knock.—Les Plans. Täschthal, 8.vii.95. Témely, 2.vii.00.

P. optilete var. *cyparissus*, Hb.—Zermatt, 1897. Near Einsiedeln. Type from Fenestral, 17.viii.10.

Plebeius (*Rusticus*) *argus*, L.—Large at Mendrisio and Lugano: Sierre; many near Losone by Locarno. v. Zermatt, Bergün. 2nd Simplon Refuge. I have 2 aberrations with narrow black borders, Vernayaz, 12.vi.14. Above Lourtier, 9.vii.14 (L.M.F.).

P. argyrognomon, Brgstr.—Branson Canal (9), 6.ix.05. Zermatt. Brigue.

Round Geneva the type form is replaced by a variety in which yellow spots un.s. are pronounced, and in ♀ appear on up. side in one or both wings, which are also darker (up. s) and have heavy black margins.

Valley of Versoix river near Geneva, and at foot of Salève near Crevin.

Erebia argiades, Pallas.—(18) Mendrisio, 15.viii.02. Lugano, nr. station, 14.viii.02.

Cyaniris argiolus, L.—Charpigny, iv. and v. Gryonne; Brusio, 13-17.vi.01.

Lampides boeticus, L.—(2) Charpigny, 18.ix.05.

L. telicanus, Lang.—(3) ½ mile W. of Stampa, 17-28.viii.01. Morgins to Monthey, 1894, by inn. Stresa.

Zephyrus quercus, L.—Charpigny, vii. St. Triphon Marsh, vii.13. Below Sommet des Vignes, 13.vii.11.

Z. betulae, L.—Charpigny, 20.ix.06. Revereulaz, 22.ix.06. St. Léonard, 28.ix.86. Veytaux, Follaterre. Naters (2), 21.viii.90.

Thecla w-album, Knoch.—Glion to Les Avants, 11.viii.95. Charpigny, vi., on privet. Naters, 20.viii.90. Château D'Oex, Church Path (1), 14.vii.08.

T. ilicis, Esp.—Charpigny, 12-30.vi.11.

T. spini, Schiff.—Charpigny, 15.vi.08. 1.vii.22 abundant (L.M.F.).

T. pruni, L.—Charpigny (1), 4.vi.08. Bex.

T. acaciae, Fabr.—Charpigny on Shumach. 26.vi.04. Lots 100 yards W. of Eclépens Station on elder flowers (4-5 ft. high), 30.vi.-8.vii.05.

Nemeobius lucina, L.—Charpigny, Gryonne, v. Caux, vi.

Papilio machaon, L., ab. *burdigalensis*.—Erimantet. Vallorbe.

Parnassius apollo, L.—I have one of 53mm. Fine ♀s at Sion in June. Chasseral up to 4955 ft. Rarely up to tree line as at Schwartzee. Zermatt, and foot of Fex glacier—*apollo* and *delius* vars. descending from 2nd Refuge to Im Grundt. At Charpigny, 15.v.11, a fine *apollo* was flying. I introduced it from Salvan in 1910. Charpigny, 2.vii.14 and 26.vii.22 (L.M.F.). Finhaut, vi.13. Lac Champex, v.14. Grindelwald, viii.14 and viii.20. Val de Bagnes, vii.14. St. Triphon Marsh (1), 3.vii.22. Champéry, 31.vii.22. Barmaz, 4.viii.22 (L.M.F.).

P. apollo var. *pseudonomion*, Christ.—Le Pont, 7.vii.02.

P. apollo ab. *ruta*, Tutt.—Zermatt, 18.vi.14 (L.M.F.).

P. apollo ab. *neradensis*, Obtr.—Martigny, 13.vii.14. Charpigny, 29.vii.22 (L.M.F.). Faido and Lavorgo, 9-10.vii.03 (3).

P. delius, Esp.—Chamrion Hut above Mauvoisin, 15.vii.91. Täschthal, 8.vii.95. Ernaney, 13.viii.09. ♀ Salanfe Road, above Salvan (old), 3.ix.10. Marsh by Meleise, 21.vii.11. Lac Lioson, Vallée de Nant, 8.viii.06. S. of Palette by pond, 2.vii.00. Champéry, 29.vii.08. Abundant in stream above Barmaz, 4.viii.22, fresh ♂ and ♀ (L.M.F.). Fluelathal entrance, 27.vi.01. Lac de Fully, 15 viii.87. Bonaveau, 8.viii.22. Les Crosets, 21.viii.22.

P. delius ab. *inornata*, Wh.—Heuthal, 6.viii.04.

P. delius ab. ♀ *hardwickii*.—Champéry, 29.vi.08. Rosegg Glacier, 9.viii.00. Langthal, 5.viii.00.

P. delius ab. ♀ *nigrescens*, Wh.—Marsh below Path to Piz Languard, 10.vii.01. In Sertig Valley near Davos, several rare vars. of *delius*.

P. mnemosyne, L.—N.E. of Lake Tannay, 23.vi.85. Rosswald, Brigue, 26.vii.90 (old). Faulenthal, 17.vi.95. Illgraben, 30.v.97. St. Triphon Marsh, vi.13 (L.M.F.). Sous Alesse (2), 3.v.90. Thalalpsee, vi. and vii. Illgraben, 25.v.04.

P. mnemosyne ab. *nubilosa*, Christoph.—Most are so in Binn Valley.

Pieris rapae, L., var. *metra*, Steph.—Charpigny, v.14.

P. rapae ab. *leucotera*, Stefanelli.—Charpigny, v.14.

P. rapae ab. *mannii*, Mayer.—Mt. Bré, 16.iv.02 [a species.—H.J.T.].

P. brassicae, L.—Spring brood fine from Platten ; waters, 14.vii.90 and Brigue.

P. napi, L., var ♀ *bryoniae*.—Jaman, 25.vi.90 (lots). The Dôle, 23.vi.87.

Pontia callidice, Esp.—Portailles de Fully, 18.vii.91. Col de Gueulaz, vii. viii. and ix. Flying above Riffelalp up to summit of Gornergrat, over 2,000 ft. of snowfield, 17.vi.14 (L.M.F.). Allesse, 15.viii.87. Van, 11.viii.88. Fluela Hospice, 27.vi.01.

P. daplidice, L.—St. Triphon and Charpigny, 6.vii.22, also Gryonne Meadows, 22.vii.22 (L.M.F.). St. Nicklaus.

P. daplidice var. *bellidice*, Ochs.—Sion, 28.iv.-3.v.

Anthocharis simplonia, Fr.—Lac Champex, 8.vi.93. Vérossaz, 4.v.93. Winkelmatten, 18-20 and 22.vi.14, some v. small (L.M.F.), also at Les Rives of Champery, 31.vii.22, and Barmaz, 4.viii.22, singly. Gryon, 6.vi.05. Vernayaz, 3.v.06.

A. simplonia var. *flaridior*, Wh.—Charpigny, 25.v.07. Charpigny, v.13 (L.M.F.). Gryonne, v.14 (L.M.F.).

Leptosia sinapis, L., ab. *lathyri*, Hb.—Replaced type 1903 even in S. Alps.

L. sinapis ab. *subgrisea*.—Sion, 21.iv.04.

Colias phicomone, Esp.—St. Luc (above), 16.viii.88. Salanfe, 11.viii.88. Col de Soud, 15.vii.14. Faulhorn, 1.viii.14. Barmaz, 4.viii.22 (L.M.F.).

C. palaeno, L.—Stockhorn, Binn, 8-15.viii.05, ♀ s. v. good. S. of Celerina and Cresta (1), Isérables, 21.vii.85. Salanfe, 11.viii.88. Bel Alp, 14.vii.90. Wessel, 30.vii.90. Very large at Tramelan. Faulhorn, 1.viii.14. (L.M.F.). Toubière de Traconne, N.W. of Ste. Croix.

C. palaeno ab. ♀ *herrichi*, Stgr.—Obergestelnalp. Bel Alp. Engelberg. Davos, Coire. Weissenstein.

C. hyale, L., ab. *apicata*, Tutt.— ♀ Le Pontet, Charpigny (L.M.F.).

C. edusa, F.—In great numbers. Airolo, St. Gothard, 8.viii.92.

Races and Seasonal Polymorphism of the Grypocera and of the Rhopalocera of Peninsular Italy.

By ROGER VERITY, M.D., and ORAZIO QUERCI.

INTRODUCTORY REMARKS BY R. VERITY.

(*Continued from page 183.*)

These notes will, I hope, go some way towards showing what a fascinating study geographical variation is, and what interesting observations can be made by a comparison of races, when they have been properly defined. The list, to follow, of the races of Peninsular Italy, is a proof that they are anything but indefinite and unlimited in number, as it was, till quite lately, supposed. It is perfectly clear that each species rarely produces more than one or two races in each of the zones I have mentioned, and that, on the contrary, the same one extends very often to more than one zone, so that the aim of reaching a tolerably complete knowledge of these races is anything but a hopeless undertaking. The more the zones have been worked out the more

interesting comparative remarks will become. I think that one can safely say most races have already been described and named in all the zones, except, perhaps, the Balkanic one. What is now required is that in each zone someone should collect the notes, published chiefly by Oberthür, Frühstorfer, Seitz, and myself in several books and journals, and give one a synthetic account of them by comparing them, filling gaps, and establishing roughly the distribution of the various races, as far as it can be made out now. The List to follow has been drawn out by Querci and myself with this object in view.

This being the first attempt of its kind, we were confronted with special difficulties, on account of the utter ignorance we were in, ten years ago, when we started work, as to the number of yearly generations and of their distinctive features in the south of Europe, even of the commonest and most widespread species. As a considerable number vary very little even in the different zones, and I have already pointed out these features in some of my papers, I should hope a good deal of work will be saved to others. Another tedious task we have had to accomplish, has been that of going over most of the literature of the past, to make out how the old names were to be applied to the generations and races newly separated from each other. This too, I venture to think, is a considerable amount of labour not to be gone back upon. The new races, which will be discovered locally, should henceforth be described by a comparison with those, already known, which stand nearest to them. I have shown in many instances that the variations of most species consist simply in grades along one main line, sometimes with a few minor collateral branches. New races will, in consequence, need no lengthy descriptions. It will often simply be a case of stating where they fall in connection with the others. As I have already stated, I believe in Western Europe the number of races to be discovered is small as compared with those already described. They will be found chiefly in the limited number of species which vary a great deal, both individually and geographically. In these cases the only way of establishing the new races well is to compare them with series of specimens from the locality, whence their nearest allies were described. I have often discovered, in my own experience, that descriptions and one or two figures are hopeless in particular cases of this sort, and that they lead one, too often, wrong. What is wanted is collaboration amongst entomologists, and a race suspected to be new should be sent for comparison with the "typical" series of those it resembles most, or specimens procured from the locality of the latter. This I have usually found to be quite feasible, and I can say, with great satisfaction, that the goodwill of entomologists to help each other is remarkable. As I am dealing with this argument, I must mention that, according to my view, one should abstain from describing individual forms singly, because these descriptions get lost in the mass of literature, and fancy names given to them are getting overwhelming in number. The only way of developing this subject in a practical form, and of obtaining interesting results and observations from it, is to set to work systematically on large series of specimens of the entire species, or even of the genus, including those races which produce the most extreme extent of pattern, and those which produce its extreme reduction. As all forms, whether they are produced by normal variation

and are usual, or whether they are aberrations, only met with accidentally, must be some grade of a series of forms leading up to it from the average, and going beyond it to more extreme ones, we must contrive some way of designating these series, and then of designating each form as a grade of it by a comparative number. Tutt used compound names as a first attempt, but this is a cumbersome method, when several characters are combined in one specimen. I believe the Linnean fancy name will have to be restricted to species, races, and generations, infinitely less numerous, and that individual forms will have to be designated by some sort of formula drawn from letters and figures, indicating the various parts of the wing pattern, and conveying at once to one's mind the position of that individual form in the totality of variation of the species or genus. I have worked at this problem considerably, and some day I hope to publish some results. Contrary to my expectation, however, I have found that the laborious task of making out characters by the statistical method does not lead, in practice, to any useful result in fixing races; the standards, best characterised, are so obvious by simply comparing adequate series of specimens, collected at random, that no elaborate method is necessary to prove their existence, and for the present I see no object for long calculations on intermediate and transitional ones. Statistical data, however, give interesting results in other ways, and it is an excellent training for the eye in the analysis of characters, besides being conducive to the drawing out of descriptions in a methodical and rational way.

In these various studies I have found it of great help to use series of specimens set in glass mounts in the way I have described at length in the *Bull. Soc. Entom. de France*, 1917, p. 312, which enables one to compare a large number at a glance, and on either surface. I have thus detected many characters that would probably have escaped my notice among the thousands of specimens mounted for me by Querci and his family, and which I now in many cases preserve as a "typical" series.

Last, but not least, what has been fundamental in my contributions to the study of variation has consisted in my having been able to avail myself of the enormous amount of material collected each year by the Quercis in Peninsular Italy (about 25,000 specimens yearly), and of large series received by him from all sorts of regions, not to speak of his observations and his forty years experience in the field.

I must end up these introductory remarks by a few words of explanation of the classification adopted in the List which follows. I very much appreciate the efforts made of late by several, and chiefly by British entomologists, to substitute a more rational and homogeneous classification for the very rough and incongruous ones in use during the last century. It is an extremely difficult task, and it still requires much work, but my impression is we are on the right track. First of all, it was quite the right thing to adopt the general principle of dealing with the simplest groups and to gradually rise to the more complex and highly specialised. I have followed this order, like Tutt, Wheeler and others, in the large Divisions or Sections, and I have, besides, endeavoured to apply it to the smaller groups more thoroughly than they seem to have done, if I am not mistaken. I need scarcely say that the classification along a single line, which one is compelled to

follow in writing, is so artificial that it cannot come anywhere near showing the actual relationships. The more one studies variation, the more one sees that it always works out into what can best be pictured materially by the spherical shape. In limited groups, such as the *Grypocera* and *Rhopalocera* afford, we also must conclude that all the minor groups now in existence are terminal and collateral lines on very nearly the same plane of the sphere, and that we rarely meet with any which carry us back to slightly deeper planes; still this is always comparative, and should only be borne in mind as a warning against childish attempts to construct fantastic phylogenetic trees of descent. Even in the groups which seem comparatively the lowest and most ancient by many characters, one always runs up against some character clearly showing close analogy to the apparently highest and most distinct groups, and vice versa. It would seem that characters develop entirely independently of each other. Let me simply mention the *Grypocera*-like cocoon of the *Parnassius*. In practice, we can only set to work by describing first those forms of each group which by the average of their characters give one the impression of being the simplest and lowest, and gradually passing to the highest; then we must take up the next group and deal with it in the same way. This method, of course, has the inconvenience of bringing together the highest forms of one group and the lowest of the next, so that one jumps back abruptly from the former to the latter, while the lowest forms of the two groups, may really come much nearer each other than the order followed shows, but, notwithstanding, it is always a better plan than the confusion which would ensue if, tempted by some striking resemblance, one broke the rule, in some cases, and one inverted the order, as has been done by some authors.

I have readily adopted also the comparatively recent tendency to split up many of the extensive genera of the past into a number of smaller ones, because I fully recognise that they consist in many cases of a lot of species clumsily brought together on the strength of most superficial characters, or even of resemblances, which were only apparent, so that they often comprised species standing further apart from each other than were others placed in different genera. The modern attempts are now aiming at more rational and homogeneous groupings. The arguments brought against it by the numerous entomologists who are only acquainted with Europe, is that very soon there will be a genus for each species, but anybody, who has a knowledge of the fauna of the other parts of the world, is fully aware that each European species is, in most cases, the representative of a large group. The very fact that they are found together, or in localities not far distant, within such a comparatively limited area as Europe, is a reason for suspecting they stand far apart from each other, and they may belong to different genera. As a matter of fact one can take it as a general rule that *the more similar to one another are the general areas of distribution of two species, the further apart the latter stand to each other specifically.* For the same reason *the poorer in species of Lepidoptera a region is, the further apart those stand from each other.* Exceptions are only met with in the cases of very particular surroundings, to which certain genera are especially suited, for one then finds more species of these genera than would have been anticipated by this rule (such are the *Oneidi* or the *Colidi* in arctic or alpine localities, or the *Satyridi* in

very hot and dry ones). All this is due to the fact that in each group, be it broad, like Divisions, or more restricted, like Genera, one finds, on the one hand, a tendency to produce *a small number* of genera or of species, as the case may be, *which develop a high degree of adaptability to all sorts of surroundings* (amongst the Rhopalocera *Pyrameis cardui*, L., surpasses all others by its world-wide distribution and its very limited variability), and, on the other hand, *a comparatively large number, more or less highly specialised, so that each is adapted to particular conditions.* The first are produced by a tendency in evolution to perfect "functional" elasticity, the latter, on the contrary, it is to be supposed, by "structural" differences. In other words, the first seem to be a development along the line of the catabolic male sex, which reacts to surroundings with a great display of vital force to resist unfavourable conditions, the second seem to be a development along the line of the anabolic female organism, which saves up vital energy, when in permanent conditions, by creating an organic balance so suited to the latter as to require the least possible exertion in all the functions of life. Of course, the more unsuitable to Lepidoptera the conditions of a locality are, the greater selection will have to take place. That is why the Asiatic species, which have spread as far as the comparatively poor European region, are, as a rule, a selection of representatives of very distinct groups.

Another necessity which has been felt in the recent revisions of classification is that of an evaluation of the different degrees of relationship between species. It has been realised that all the groups, which were called "genera," were far from being equivalent. This evaluation, of course, can only be made roughly, and one cannot grasp all its shadings, but one clearly detects the existence of two grades between the Family and the Genus of old authors; they have been called Subfamily and Tribe. The tribes often consist in old genera, which have been found to be too distinct and broad, as compared to most other genera, and which have in some cases been divided into smaller ones equivalent to the latter. A more homogeneous distribution of species has thus been attained. In a few cases, notably in the *Lycaenidi* and *Theclidi*, which include an unusually large number of genera, the latter are found to fall naturally into groups, which cannot be disregarded, although they are not distinct enough to be considered tribes, as Tutt thought them. In our List I will call them "Groups." In the same way a grade of relationship less than the genus is detectable between "groups of species"; the *Parnassius* afford an example in the Palaearctic region; these grades will, however, need a revision of their comparative values to attain uniformity in all the tribes. Let me mention that in the classification of the *Lycaenidi* tribe I have taken as a base the late Dr. Chapman's conclusions, drawn from the study of the genitalia. Two years ago he very kindly corresponded with me about this subject, and it was he who informed me that Tutt had created his genera simply by rule of thumb. Going into the subject more carefully, Chapman had found that the grouping of species and the order suggested by Tutt required rectification in several cases, which he pointed out to me. Readers must thus not be surprised at some innovations, as were, for instance, the Editors of this Journal, when they observed in a footnote to one of my papers (1920, p. 144), that *hylas*, Esp., and *escheri*, Hüb., were usually known as *Polyommatus*, whereas I called them *Agriades*.

For definitions of the subdivisions of species, as used by us, I refer those who wish to know them to my introduction to *Rhopalocera Palaearctica*, simply stating here that, since I wrote it, experience has gone a long way towards convincing me that species are most positive entities, with very definite limits, with which all the other categories we use, to express relationship and classify variations, are not to be compared. I still believe that in vast regions, such as the Palaearctic there exist in some localities subspecies and races connecting groups, which are decidedly distinct species in localities very distant from these, but what I have found is that intermediate individuals never exist, when two species fly together in the same region, however suggestive their features may be. For instance, the individuals I took to be transitional between *Pieris rapae* and *manni*, and I called *mannides*, have turned out to be simply southern forms of *rapae*, found also where *manni* does not exist.

An interesting additional species to the following List is the fossil *Doritites bosniaskii*, Rebel, discovered in the Pisan Mountains, in Tuscany, and preserved in the Vienna Museum. It has been figured and discussed by Emilio Turati in his paper on the Variations of *Parnassius apollo* race *pumilus*, Stichel (*Atti Soc. Ital. Scienze Nat.*, lvii., p. 29), where he also gives his view that the genus *Parnassius* must have originated in Europe, and that *pumilus* is one of the most ancient forms and a direct offshoot of *D. bosniaskii*. I fear I cannot share this opinion. The remarkable resemblance of this fossil to *P. delphius* race *hunza*, only found on a few mountains in the Himalaya, at enormous altitudes, where scarcely any of the Lepidoptera of our times can exist, as also the fossil neuration and pouch, identical with those of the living genus *Luehdorfia* of the far East, show, it seems to me, that *hunza* is one of the most ancient types, and that *Doritites* belongs, presumably, to a collateral and intermediate branch between the *Parnassiidi* and the *Thaiidi*, already notably progressed, however, as compared with a hypothetical ancestor of these two tribes. I should consider *apollo* the most recent and highly specialised *Parnassius*, which is gradually replacing *nomion* since an epoch posterior to the formation of the Behring Straits, so that it has not passed over into America, like the latter and like *delius*: instead, it has spread broadly all over Europe, because it is the most suited to our epoch, and it even succeeds, on this account, in holding its ground on the unfavourable Aspromonte, notwithstanding that it is reduced there to the miserable dwarf *pumilus*.

(To be continued.)

SCIENTIFIC NOTES AND OBSERVATIONS.

Somatic Mutations.—The following asymmetrical specimens of Lepidoptera are probably somatic mutations and ought to have been included in my list published in this volume of the *Ent. Record*, pp. 105-111.

Arctia caia, L.—Male. M. Durenne has kindly drawn my attention to an example with the left forewing typical, but with the right dark brown except for a zigzag white line almost parallel to the termen, a small white basal blotch and three very small white spots. The hindwings also are asymmetrical. (*Rev. Soc. Ent. Namuroise*,

1902., p. 57. fig.). I think symmetrical aberrations of *caia* are known with forewings like the right one in this specimen, and it is very like *A. hebe.* var. *lugens*, Schultz (*Berl. Ent. Zeitschr.*, 1888, XXXII., Taf. VII., fig. 6.).

Arctia hebe, L.—Male. Both wings on the right side uniformly dark brown, the left forewing with the basal part brown and the outer part with the usual brown and white markings, the left hindwing pink with a row of brown spots. (Millière. *Iconographie et description de chenilles et lépidoptères Inedits.* Pl. LIII., p. 19.)

A. hebe.—Both wings on the left side typical, those on the right smaller, uniformly brown and semi-transparent in appearance. The text states that it is a female, but the figure appears to represent a male. (*Berl. Ent. Zeitschr.*, 1888, XXXII., Taf. VII. fig. 7.) I have not seen a completely brown specimen, but var. *mocrens*, Oberth., has brown hindwings and a great increase of brown in the forewings, and has the sides of the abdomen pink like both these asymmetrical specimens. (*Études. Lep. Comp.*, 1912, VI., p. 318.)

Angerona prunaria, L.—Male. Right side ab. *corylaria*, Thnbg. (*sordiata*, Fuessl.), left side ab. *pickettaria*, Prout. Bred by C. P. Pickett from a cross between Essex and Raindene specimens (*Trans. City of London Ent. and N.H. Soc.*, 1905, XV., p. 14).—E. A. Cockayne.

NOTES ON COLLECTING, etc.

Colias croceus (edusa) in Sussex.—*Colias croceus* (*edusa*) was somewhat abundant here and in the neighbourhood during the month of August. Neither ab. *helice* nor *C. hyale* was seen.—Joseph Anderson, Chichester.

Celastrina argiolus.—First appearance of Spring and Autumn broods at Chichester.—*Celastrina argiolus* was first noticed on May 7th, when it was flying in the garden with *Gonepteryx rhamni* and *Pieris brassicae*. The first seen of the autumnal emergence was on October 5th. The temperature on both occasions was very mild.—Joseph Anderson, Chichester.

A trip to the New Forest in End September.—On September 23rd I took a run down to the New Forest, making Cadnam my head-quarters. On the Saturday evening I started work sugaring my favourite ride with but poor results; there was a misty rain all the time. On Sunday I went beating for larvae, but only got very few, and nothing of note. In the evening the luck at sugar was not much better than the previous night, it being clear and rather cold. Monday evening was much better, the ground being baited and the air warm, and inclined to rain, which however held off till after midnight. I came back with over 30 specimens that I wanted. Tuesday evening also was excellent, in spite of heavy showers all the afternoon and a particularly heavy downpour whilst I was sugaring my trees. The result of my four days trip. was as follows:—*Sarrothripus revayana* (*undulanus*) 1, *Ennomos erosaria* 1, *Semiothisa liturata* 1, *Chlorodysta* (*Cidaria*) *siderata* 3, *Agrotis saucia* 9, *Noctua castanea* race *neglecta* 4, *Amathes litura* 1 var., *Scopelosoma satellitia* ab. *brunnea* 3, *Xanthia fulvago*

(*cerago*) ab. *flavescens* 1, *Epunda nigra* 2, *Agriopis aprilina* 2, *Hadena protea* var. 3, *Xylina ornithopus* (*rhizolitha*) 20, *Xylina socia* (*petrificata*) 17, *Catocala sponsa* 2 (worn). Besides the above *Amphipyra pyramidea* and *A. litura* were very abundant and in good condition. *H. protea* was swarming, and I could have taken many more *X. ornithopus* (*rhizolitha*) but thought my captures sufficient. Except for a few common things, such as *Orrhodia vaccinii*, *Amathes lychnidis* (*pistacina*), *A. circellaris* (*ferruginea*), etc., there was nothing else worth noting. With regard to larvae, one *Macrothylacia rubi*, one *Cossus ligniperda*, several unknown Geometers, Noctuae, etc., and one *Notodonta dromedarius*, were all my bag.—H. Baker-Sly (F.E.S.), "Kingston," Edenbridge, Kent.

COLEOPTERA.

Some Casual Notes on Coleoptera in 1922.—In spite of the wet summer, or indeed want of summer, we have experienced this year, I have managed on the whole to do very well with Coleoptera, adding over twenty species new to my collection. These notes, however, do not deal with the additions, nor with the rarer captures I have made, but refer to certain species met with casually during the year, which are either new country records or of interest for some other reasons.

Scydmaenus powerі, Fowler.—A specimen of this rare little beetle was taken in a sandy hollow near Beaulieu Road Station on May 15th last. This is a new county record. Dr. Power originally took it at Wimbledon, Surrey; Birdbrook, Essex; and Seaton, Devon. As far as I am aware it has only been taken since at Bradfield, Berks; and Perranporth, Cornwall. I have verified my example with the specimens in the Power Collection at the British Museum.

Heledona agaricola, F., occurred in its usual fungus at Balmer Lawn, May 5th, and Rhinefield Walk, May 10th. This beetle has not been recorded from the New Forest before.

Nebria iberica, Oliv., was taken under moss on a wooden bridge at Pond Head, May 16th. All other specimens of *Nebria* found in the Forest in sand-pits, etc., proved to be *N. brevicollis*. Another example occurred under chips, etc., at Westerham on October 18th. This species was introduced into the British list by me in April, 1922 [*Ent. Mo. Mag.* **58** 92 (1922)]. As far as I know it has now been taken in the British Isles at Borrowdale, Connemara, Westerham, New Forest, and Morthoe.

Grammoptera holomelina, Pool, was abundant on hawthorn blossoms in a lane near Wimbledon Common on May 26th. This species has evidently been extending its range of late years, and Mr. Bedwell informs me he has also taken it in several places in Surrey.

Eryx ater, F.—I captured a specimen of this beetle in the hollow of an apple tree in an old orchard at Hartlebury on June 19th. This is its first record for the county of Worcester.

Diphyllus lunatus, F.—This species was found in its usual black fungus, *Daldinia concentrica*, on a dead ash tree at Wroxham, Norfolk, on August 19th. It is also a county record.

Cryptices quisquilius, L., was taken in the sand-pits at Freckenham, the only other inland record in Britain known to me is Tubney, near Oxford. From these same pits I have previously recorded the following

coast species—*Harpalus picipennis*, *H. serripes*, *Philopedon geminatus*, *Microzoum tibiale*, and *Broscus cephalotes*, see *Ent. Rec.* **32** 153, 199 (1920).

Triarthron märkeli, Schmt.—A specimen was taken by evening sweeping at Barton Mills on September 5th, in the locality where I took *Anisotoma pallens* and *A. cinnamomea* previously, neither of which turned up on this occasion. This is its first record for Suffolk. I have now taken *Triarthron* in the New Forest, at Wellington College, Crowthorne, Woodhay, Barton Mills, and on September 22nd at Woking.

Olophrum nicholsoni, Donis.—A specimen of this beetle was swept up at Barton Mills, Suffolk, on September 5th. This is the first time as far as I know that this beetle has ever been taken anywhere outside Wicken Fen.

Blaps mucronata, Latr.—I found a specimen under a stone at the foot of the Under Cliff at Ventnor, on September 9th. This seems a very curious locality for a beetle which is generally found in cellars. It is true I sometimes take it on pavements at Putney, but then there are houses quite near. The spot at Ventnor was far away from any houses.

Lebia chlorocephala var. *chrysocephala*, Mots.—Swept up from young broom trees at Woking, September 22nd. There seem to be very few records of this race, though probably widely distributed. Mr. Harwood tells me he used to take it near Colchester also associated with broom. —Horace Donisthorpe.

CURRENT NOTES AND SHORT NOTICES.

It is seldom indeed that a man lives to see his work appreciated during his lifetime, though a few fortunate individuals have seen their own obituary notices. But it is still rarer that a biography of a living man appears, produced as a labour of love by his disciples. This has been the good fortune of the eminent Spanish Entomologist, Don Ignacie Bolivar y Urrutia, Director of the Royal Natural History Museum of Spain, Hon.F.E.S. It is in the form of a well produced book of 151 pages, which is at the same time a history of the progress of Natural History in Spain during the past half century, and the growth of the Museum and Natural History Society, which are so intimately connected with the name of Bolivar. The frontispiece is an excellent portrait of this doyen of Orthopterists, survivor of the generation of Brunner von Wattenwyl, de Saussure and other famous names: there are half a dozen photographs of views of the Natural History Museum of Madrid, a chronological bibliography of Bolivar's writings from 1872 to 1921, and finally there is a reproduction of the autographs of the subscribers to the work, which includes the names of many entomologists of all lands. The book has been prepared by one of the best known of his disciples, Don Manuel Cazurro. Bolivar is a first-rate all round naturalist, but it is as an orthopterist that he is pre-eminent. The Iberian Peninsula has the richest and most striking Orthoptera-Fauna of any part of Europe, and it is thanks to him that it is at the same time one of the best known. Long may he be spared to his innumerable colleagues and friends.—M.B.

The first meeting of the Entomological Club since the war took

place on Friday, October 27th, Mr. H. Donisthorpe being the host. The guests were R. Adkin, member of the Club, E. C. Bedwell, H. J. Carter (Australia), Dr. Cockayne, J. H. Durrant, H. Willoughby Ellis, W. J. Kaye, G. C. Leman, Dr. G. K. Marshall, Rev. F. D. Morice, H. E. Page, N. D. Riley, and Hy. J. Turner. Mrs. Donisthorpe welcomed the visitors in the reception room, where tea and coffee were served during the conversazione before supper. Much admiration was expressed for the wonderful and admirably arranged collection of ant-guests made by Mr. Donisthorpe.

On Thursday, November 23rd, the South London Entomological Society will hold its Annual Special Exhibition of Varieties, when it is hoped that another fine "gathering of the clan" will take place. The Society cordially invites friends and visitors, who will be doubly welcome if they bring an exhibit. Nearly two hundred members and friends were present on the last occasion, and it is hoped that there will be an equally successful meeting on this occasion.

We hear that Messrs. Watkins and Doncaster, Naturalists, of 36, Strand, have a large number of back numbers of *Seitz*, and even a few copies of the *Palaearctic Butterflies* (English edition) for sale.

At the Annual Congress of the South-Eastern Union of Scientific Societies, held at Southampton in June last, a Zoological Section was formed, Prof. E. B. Poulton, F.R.S., being unanimously elected President. It was agreed to include in the work of the section the Compilation of a List of all works, papers, articles, etc., dealing with the local fauna of the area comprised in the South-Eastern Union. The affiliated Societies are asked to co-operate by sending in titles of such. When a sufficient amount of material has been accumulated the Council of the Union will be asked to publish this Bibliography in the *South-Eastern Naturalist*, together with a summary showing the areas which remain to be investigated in any order by individual workers of the affiliated Societies of those areas. Mr. Hy. J. Turner, 98, Drakefell Road, is acting as Secretary for the time being.

The Entomological Society of Hampshire is undertaking the task of compiling a *Hampshire County List of Lepidoptera*, and are asking that all lepidopterists, whether in or outside the county, who can help, will do so by sending in their lists, especially of the Microlepidoptera, to the President, Mr. W. Fassnidge, 47, Tennyson Road, Southampton. We trust that our readers will respond freely to this appeal. Work of this sort is a step in the advancement of knowledge, a help to all future students of our science.

The Jubilee Supper of the South London Entomological Society was a very successful event. Some seventy members and their friends sat down to an excellent repast at the Holborn Restaurant, on Thursday, October 19th, with Mr. R. Adkin, F.E.S., in the chair. After a short account of the foundation and history of the Society by the chairman, the meeting had the pleasure of hearing a few words from the only surviving original member, Mr. G. C. Champion, A.L.S. The musical side of the meeting was afforded by a former member, Mr. Percy Richards.

We regret to record the death of Arthur Horne, F.E.S., a well-known collector of Aberdeen, whose series of aberrations of British Lepidoptera is probably one of the most notable, and has few rivals. It is reported that the collection will come up to Stevens' sale rooms.

SOCIETIES.

The Entomological Society of London.

October 4th, 1922.—Obituary.—The deaths of the following Fellows were announced, and a vote of condolence with their relatives was passed:—Dr. David Sharp, F.R.S., one of the special Life Fellows of the Society, Mr. Hamilton H. Druce, Mr. Arthur Horne, Mr. Frank M. Littler, and Mr. G. O. Sloper.

The Collection of Portraits.—The Treasurer made a statement as to four new portraits that had recently been hung in the Meeting Room, and a portrait of the late Dr. Sharp presented by Mr. W. J. Lucas, for addition to the collection, was gratefully accepted.

Election of Fellows.—The following were elected Fellows of the Society:—Messrs. Guy Babault, 10, Rue Camille-Perier, Chaton, Seine-et-Oise, France, and Albert E. Waight, Brunleigh, Kent Bank Road, Grange-over-Sands.

Exhibits.—Mr. W. G. Sheldon exhibited some moths from the Farn Collection including the rare type form of *Sarrothripus revayana*, Scop., as well as ab. *ramosana*, Hb., and ab. *degenerana*, Hb.; also *Acrobasis tumidana*, Schiff., and *A. zelleri*, Rag.

Professor Poulton, F.R.S., exhibited and made remarks on the position of the wings when at rest of living example of *Polygonia c-album*.

Mr. Arthur Dicksee exhibited some rare butterflies from Ecuador.

Dr. F. A. Dixey, F.R.S., commented on some recent observations he had made on the scent of butterflies, chiefly Pierines.

Mr. H. Donisthorpe exhibited specimens of *Aulonium ruficorne*, Ol., and *Hypophloeus fraxini*, Kug., two beetles new to the British list taken in the Forest of Dean.

October 18th.—New Fellows.—The following were elected:—Messrs. S. Stuart Light, Redcot, Linton Road, Hastings; G. H. E. Hopkins, Downing College, Cambridge; V. G. L. van Someren, C.M. 25, Nairobi, Kenya Colony.

Exhibitions.—Mr. Donisthorpe exhibited a series of both sexes of *Leptura rubra*, taken in Norfolk.

Dr. K. Jordan, F.R.S., exhibited some Notodontid Moths, the males of which have a remarkable organ on the side of the abdomen, the function of which seems to be to transmit scent from the abdomen to the hairy hind tibia and hindwing.

Professor E. B. Poulton read a communication from Dr. R. C. L. Perkins, F.R.S., on seasonal changes in the colours of the female of *Agriades thetis* (*bellargus*), and exhibited specimens of the males *Papilio dardanus*, from Kibwezi, Kenya Colony, in which the colouring of the hindwing was of the western pattern. He also exhibited a living and healthy larva of *Abraxas grossulariata*, the only survivor of a fifth inbred generation that had been sleeved out on *Prunus pissardii* as long ago as July 21st, 1921.

Papers.—The following papers were read:—On Schmit-Goebl's Types of *Carabidae*, by Mr. H. E. Andrewes. On the Larva and Pupa of *Sabatinca*, by Dr. R. J. Tillyard. On Endomychiid Coleoptera, by Mr. G. J. Arrow. On the Biology of some British Neuroptera, by Mr. C. L. Withycombe. On the Rhopalocera of the 1921 Mt. Everest Expedition, by Mr. H. D. Riley.

The South London Entomological Society.

August 24*th*.—Mr. Barnett exhibited series of two forms of the female of *Brenthis selene* from S. Devon.

Mr. Withycombe, the larva of *Limacodes testudo*, beaten from oak at Oxshott, with the Hemipteron *Acanthosoma interstinctum*.

Mr. Sims, examples of the large earwig, *Labidura riparia*, and referred to its burrowing habits. He had seen a fly carried in the forceps.

Mr. Main, the spider *Clotho durandi*, found under stones in S. France, with photographs of the structure of its snare, and read Fabre's remarks on the species.

Mr. Turner, exotic species of "whites," *Pieridae*, to show the extreme development of brilliant coloration, with total, or almost total, suppression of the white coloration on both surfaces.

Mr. Robert Adkin, pupae of *Papilio machaon*, three spun up on a carrot-leaf, on the glass of the food-bottle, and on a dark stick amid the food, respectively, were pale yellow-greenish. Seven spun up on dark sticks leaning against the cage away from the food-plant were putty-colored with broad black stripes along the sides, and wing cases black, giving them a very dark appearance.

September 14*th*, 1922.—The President in the chair.

Exhibition of Orders other than Lepidoptera.—Mr. R. Adkin, exhibited a large female of *Sirex gigas* from Eastbourne, 70mm. in expanse.

Mr. W. J. Lucas, Orthoptera: a brown form of *Mantis religiosa* from Spain, 1911. Neuroptera: specimens of *Palpares libelluloides* from Sierra de Carboneva and Algeciras, Spain, 1911-12; *Nemoptera bipennis* from S. de Carboneva, *N. coa* from Corinth, and *N. sinuata* from Macedonia and Syria. Hymenoptera: two specimens of the rare *Methoca ichneumonides* taken by himself in the New Forest, one on August 27th of this year.

Mr. H. W. Andrews, the Diptera: *Dioctria oelandica*, found after many years search near Farningham, Kent; *Catabomba pyrastri*, a ♀ var. *unicolor* from Shoreham, Kent; *Urophora cardui*, bred from thistle galls and its hymenopterous parasites, also from Shoreham.

Mr. H. J. Turner, the curious "flue-brush" beetle, *Rhina barbirostris* (*Curculionidae*), from Brazil.

Mr. F. J. Coulson, var. *infuscata* of *Xylophasia monoglypha*, August 22nd, at Wimbledon Common, and a blackish speckled form of *Boarmia gemmaria* bred from ova from St. Leonards-on-Sea, with normal forms, and var. *perfumaria* from Wandsworth.

Mr. C. L. Withycombe, Orthoptera: *Empusa egena* and *Oedipoda germanica* from S. France; *Psophus stridulus* from the Pyrenees; and a Mantid from the Straits Settlements with short prothorax and ill-developed forelegs.

Mr. Enefer, Coleoptera: *Clerus apiarius*, *Strangalia quadrifasciata*, both on cow-parsley; *Liparus germanus* and a Longicorn, both on pine logs; and a living *Carabus auratus*, all from Mürren, Switzerland. He also showed a yellow crab-spider, a wolf-spider (*Lycosa*), and the orb-spider (*Epeira fasciata*) from Clarens, L. of Geneva, and read notes on the last-named species.

Mr. H. Main, the wolf-spider, *Lycosa picta*, sent to him by Mr. Bristowe from Oxshott, and described the habits of the young.

Mr. Cheeseman, a striated *Polyommatus icarus*.

Mr. B. S. Williams, Coleoptera from Harpenden, *Panagaeus bipustulatus*, *Cassida hemisphaerica*, *Stilicus subtilis*, *Megarthrus denticollis*, *Antherophagus nigricornis*, and *A. pallens*, with *Quedius othiniensis* and *Aleochara spadicea* from moles' nests.

Mr. G. E. Frisby, Hymenoptera: *Ammophila luffii*, from St. Ouen's Bay, Jersey, with *A. hirsuta* and *Bembex rostrata*; and the two British *Sapyga*, *S. 5-punctata* and the rare *S. clavicornis*, from Wrotham.

Mr. Stanton, Coleoptera of economic importance: *Bruchus rufimanus* and *B. affinis*, with notes on their occurrence, habits, specific identity, etc.; *B. obtectus*, its origin and habits; *Anthonomus cinctus*, first recorded as British in 1921, a pest of pears abroad.

Mr. Stanley Blenkarn, Coleoptera: (1) British species of *Bembidium*, (2) larger ground-beetles, (3) many species of water-beetles, (4) British *Chrysomelidae*.

Mr. Tonge, living larvae of *Sphinx ligustri*, showing wide variation in the size and intensity of colour of the oblique stripes on the sides.

The Society, the Ashdown Collection of British *Chrysomelidae* and *Odonata*.

September 28th.—The President in the chair.

Mr. Sperring exhibited specimens of the dark Lincolnshire race of *Brenthis euphrosyne*, and on behalf of Mr. Coppeard a dark suffused aberration of the same species, an *Aphantopus hyperantus* with a partial double row of eyespots on the right hindwing, an *Epinephele iurtina* with additional spots on the forewing, and another partly xanthic.

Capt. Crocker, aberrations of *Agriades coridon* from Royston, ab. *obsoleta*, ab. *striata*, ab. *roystonensis*, ab. *semisyngrapha* extended and approaching ab. *syngrapha*, females streaked with ♂ colour, brown suffused females, ab. *marginalis* ♂ ♀, ab. *caerulea*, asymmetrical specimens, etc.

Capt. N. D. Riley, for Mr. Hirst, Fabre's Banded *Epeira* (*Argiope bruennichi*), new to the British fauna, from Rye, Sussex, and the Gorse Red Spider, *Tetranychus lintearius*, from Devonshire.

Mr. B. S. Williams, species of Pentatomids from Harpenden district, including *Podops inuncta*, *Sehirus bicolor*, etc.

Mr. Coulson, an abnormal cocoon of *Saturnia pavonia* in the shape of a dish, and aberrations of *Coenonympha pamphilus*.

Mr. Mera, living larvae of *Colias croceus* (*edusa*) from ova laid by a female taken during the Field Meeting at Eastbourne, and a series of *Triphaena fimbria* bred from Epping Forest, generally dark in coloration compared with an old (1880) light specimen from Ipswich, typical of the then obtained specimens.

Mr. Enefer, *Callimorpha quadripunctaria* (*hera*) from Clarens, Switzerland, and *Erebia pronoë* from Mürren in August.

REVIEWS AND NOTICES OF BOOKS.

The Genitalia of the Group Tortricidae of the Lepidoptera of the British Islands.—By F. N. Pierce, F.E.S., and Rev. J. W.

Metcalfe, M.A., F.E.S. Oundle, Northants, 1292, 25 s.—This long expected volume has at length been published. We congratulate the authors, Mr. F. N. Pierce and the Rev. J. W. Metcalfe, on the work they have done, and entomologists generally should feel that they owe them a deep debt of gratitude for taking upon themselves the expenses of publication with such a meagre promise of support. Eighty subscribers only is apalling, and 22 of that 80, booksellers and institutions. The Entomological Society, with more than 700 members, only has 31 subscribers, and further, the South London Entomological Society, with the bulk of its 180 members workers on the Lepidopterous fauna, has only nine subscribers, of whom eight are fellows of the Entomological Society, leaving only one additional subscriber. This apathy, this absence of a desire to acquire knowledge, this failure to help the skilled worker seems most unaccountable. One would think that every lover of insects would use his utmost endeavour to get a working library together consonant with his needs or his resources, if only as a saving of time in the acquirement of knowledge. No; the average collector cares nought for books. The sale of the valuable entomological library of our late, esteemed colleague, Dr. T. A. Chapman, in the past spring, was a record of such a state of mind. Possibly more entomologists on that occasion had an opportunity of viewing the books than had ever happened before, as on the previous day there was the largest assemblage ever known in the sale room, where they were on view, attending the disposal of the Farn collection of Lepidoptera. It is scarcely credible, but not a half a dozen of those then present came again the next day to the sale of the books.

As the result of their special investigation the authors put forward a classification "based on the structure of the male and female Genitalia" entirely. The nine large groups are arrived at in accordance with the structure of the signum in the female. The genera are in numerous cases rearranged and renamed, and Mr. Pierce recognises the aid he has received in the nomenclature from our colleague Mr. J. H. Durrant. Seven new species have been added to the British list during their investigations, and the authors have pointed out that in the following five pairs of species they can find no difference from a genitalic point of view. *Argyroplace carbonana* and *A. nigricostana*; *Argyrotoxa schalleriana* and *A. perplexana*; *Celypa striana* and *C. purpurana*; *Spilonota ocellana* and *S. lariciana*; *Rhopobata naevana* and *R. geminana*. They may or may not be separate species in each pair. We notice an act of self denial extremely praiseworthy, but most unusual we think in the present age, and that is the refraining from adding names to the newly arranged genera, for which the classification of the authors affords numerous opportunities.

The general get up of the volume is quite good. Handy size, clear good type, figures well drawn of both sexes, which is very essential in this group. There are about 100 pages of concise descriptions and 34 plates, containing figures of each species. We are promised a further volume "at no distant date," giving an account of the genitalia of the *Tineidae*. May the intending subscribers to the present volume come forward and help in defraying the expenses of publishing this valuable pioneer work in our knowledge of the structure of *Tortricidae*, and thus give cheering encouragement to our authors to "keep going."—H.J.T.

Subscriptions for Vol. XXXIV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 **[This subscription includes all numbers published from January 15th to December 15th, 1922.]**

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MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. 1922, November 15th, December 6th. Annual Meeting, 1923, January 17th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. November 23rd, the Annual Exhibition.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E.3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

All MS. and editorial matter should be sent and all proofs returned to HY. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

Lists of DUPLICATES and DESIDERATA should be sent direct to Mr. H. E. Page, Bertrose, Gellatly Road, New Cross, S.E. 14

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The Entomologist's Record AND Journal of Variation

EDITED BY

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CONTENTS.

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Communications have been received or have been promised from Messrs. Hy. J. Turner, H. Donisthorpe, Dr. Verity, J. H. Durrant, G. T. Bethune-Baker, Alfred Sich, the late Dr. T. A. Chapman, R. S. Bagnall, J. W. H. Harrison, Dr. E. A. Cockayne, C. R. N. Burrows, the late A. J. Fison, with Reports of Societies and Reviews.

On the Geographical and Seasonal Variations of Pararge megera, L.

By ROGER VERITY, M.D.

This species had for the last few years baffled my attempts to define its geographical and seasonal variations, although I felt that definite characteristics of races and generations did exist. They are, however, so subtle and so overshadowed by the very much more striking individual variations, which occur in all localities and at all seasons, that for a long time I could not grasp them. Oberthür seems to have had the same impression, because in his *Études de Lép. Comp.*, III., p. 364, he mentions several geographical variations, but he concludes that races cannot be separated distinctly, except in the case of *tigelius*. I went on collecting series from all sorts of regions, although I found considerable difficulty, because correspondents do not realise that the most widespread and abundant species are the most interesting in the study of variation, and they seem to think they are not worth procuring. I think I have at last detected the lines of variation produced by surroundings. They are subtle, as I say, but, as they exist, this is no reason for neglecting them more than characters, which are striking at first sight, and which any untrained eye can perceive. In most cases they are not absolute and constant, individual exceptions occurring, but the percentage of the latter is sufficiently small to be considered as such, and for the existence of a general rule to be established just as much as in most other species, in which it is more easily seen.

A greater or lesser degree of variation along the following lines distinguishes the summer generations from the first one in all regions, slight as it may be at times; the same variation takes place in the summer generations, as one proceeds from colder and damper surroundings to warmer and drier ones, and finally it is also found in the first generation, when one passes from the remainder of Europe to its South-Eastern portion: the wings become narrower and more pointed at apex; the androconial scales are seen microscopically to become more slender at their further end; the fulvous colour above becomes warmer in tone and brighter; the upperside dark markings become less extensive in general and the basal patch of the hindwings gets invaded by fulvous and, in consequence, lighter in tone, whilst the pale shaded band which precedes the ocellated spots tends to obliteration; on the underside of the hindwings spaces of the clear ground colour appear, especially round the ocellated spots and along the dark streaks, and they break up the diffused scaling into bands and patches, so that these and the streaks stand out boldly, and give a more variegated appearance to the entire wing, increased by the fact that the streaks become darker and sharper (especially the lunules between the ocelli and the margin); these spaces increase in extent, as the diffused scaling withdraws, till the latter disappears entirely; the ocellated spots, however, remarkably enough, tend to become larger, especially on account of the two streaks, which encircle them, becoming broader and of the inner one becoming more distinct. It must be noted that other individual variations found in all localities and seasons are distinctly greater in the female sex, but that the variations described above, which characterise the average of series from different regions and seasons, are on the contrary more marked and distinct in the male. The main line of variation of the species consists decidedly in that afforded by the

underside of the hindwings, where the features are found which chiefly and more constantly differentiate the second or the second and third generations from the first, and which characterise also more constantly the primary races of the broader regions, apart from the secondary localised ones I will mention further on. The upperside characters usually follow them, in a general way, but in no way necessarily, and, on the contrary, there are cases, in which the opposite extremes of the variations of the two surfaces are found combined together; for instance, in *tigelius*, first generation, the underside is very much darkened by a thick dusting, whilst the upperside exhibits the very least extent of dark pattern produced by *megera*: in *emilyssa* the reverse occurs, and an underside of the lightest description is associated with heavy black markings on the upperside. The features of the upper surface are much more erratic; in every series one finds an extent of individual variation, which, especially in the female sex, often covers nearly the totality of that afforded by the species. It also gives rise to an interesting phenomenon, not observed so markedly, to my knowledge, in any other species, *i.e.*, to a production of very localised secondary races, distinguished by a single character, which becomes prevalent in a limited area, whilst as a rule it is only one of the many individual variations met with occasionally. I think in some cases one would not be far wrong in calling this phenomenon ABERRANT RACES, because they consist in an unusual proportion between the individual forms, created by the great increase and prevalence of one form out of many, just as in individual aberrations the usual proportion between the markings and the colours of the wing is altered and one of them invades an unusual extent of wing-surface. I will mention these races presently. With regard to the general seasonal and geographical variations of *megera*, one can note first of all that, amongst the widespread European species, it is one of the least variable. Altitude does not seem to affect it and in each region one meets with the same race from the mountain tops to the sea shore. Latitude, too, seems to have a limited effect on it. As far as I have been able to make out in my present state of knowledge, the first generation is identical from Scotland to Spain and even the very special climate of Palaearctic Africa only produces, as we shall see, a slight difference of tone on the underside, and this not in all cases. It reminds one of the similar lack of variation in the first generation of *Pamicia phlaeas*, in which, also, Africa alone produces a washed-out appearance of the underside in race *cyrenaica*, Turati. What, on the contrary, affects *megera* most distinctly in all its generations are certain regions. In Corsica and Sardinia it acquires such peculiar features that one would not be surprised if it proved to be a distinct species. In Sicily, the Balkans and Asia Minor its underside features stand exactly opposite to those of the rest of Europe in the scale of variation of *megera*, and in Peninsular Italy forms more or less intermediate are quite constant. One wonders what special cause there can be in the S.E. for a marked change of aspect in the generation, which is scarcely affected by the difference between the Scotch and the African climate! It suggests that heredity comes into play and that the four lines of variation I will presently mention constitute four "phylogenetic" races, whereas the races which only differ from each other by belonging to successive grades along these lines are purely "ontogenetic," as in

the case of *Rumicia phlaeas*, L., which I have dealt with in the *Ent. Rec.*, xxxii., p. 7.

Having thus cast a glance on the variations of *megera* in a general way, let us see what races are detectable and what features their generations exhibit. I find that in the case of this species, as in those of others described by me in this Journal, the most natural, and, at the same time, the most practical, classification consists in following the main line of variation I have described above, as afforded by the features of the underside of the wings, and in dividing it conveniently in the number of grades suggested by the races and generations, as they fall into groups. Here, however, it must be noted that other characteristics associate with the fundamental ones and create four parallel lines of variation; these run through the various grades, so that each of the latter consists in various forms, most of which are characteristic of a race and a generation. I will endeavour to show this clearly in a tabular form at the end of this paper.

Grade I: Linneus gives "Austria and Denmark" as the habitats of the species, so that the nymotypical race is the one which spreads, as far as I can ascertain, to the whole of Northern and Central Europe. We shall see that F. J. Ball has described and named the second generation of Central Europe, thus restricting the Linnean name to the first. The latter can be described as the darkest amongst the usual forms of the species, on account of the extent of the pattern on both surfaces; the fulvous colour is paler, more yellowish and duller than in the other grades; the underside of hindwings is distinctly yellowish. The upperside markings seem to vary in extent according to localities. All the German authors mention particularly *mediolugens*, Fuchs, *Jhrb. Nassau*, 1892, p. 87, from Nassau on the Middle Rhine, and Seitz says it is predominant at Bergstrasse in some places: it thus is quite a local race. It is described as having all the pattern of the upperside increased in extent and especially the androconial band of the male one-third broader than usual and the transverse streak of the forewing in the female also much broader. If the underside of the hindwing is darker too, this would constitute a grade standing before this one, of nymotypical *megera* but I find no record of the aspect of that surface, so that I take it to be purely a variation of the upperside; this is far more likely, on account of its much greater variability. The form standing opposite to the last described, by a strong reduction in the extent of the upperside markings, so that those of the forewing are in the female as thin as they usually are on the underside, is *alticola*, Vrty. (*Bull. Soc. Ent. Ital.*, xlii., p. 269, 1911). I described it from specimens collected by myself at the Baths of Valdieri, m. 1375, in the Maritime Alps, as the mountain race of *megera*. This, I fear, is not correct: *alticola* is found as an extreme individual form in most races, and especially in particularly hot and dry localities, but it seems to be the result of any sort of unsuitable condition which the individual has undergone. As altitude is, apparently, the chief hindrance to the development of this otherwise nearly ubiquitous species, it is very likely *alticola* is more frequent at the highest altitudes it reaches, according to regions, but I have found no evidence that it is prevalent anywhere.

Race INFRAPALLENS, mihi: As I have already mentioned, the African

climate does modify to a slight degree even the underside of the generation of the species in question, which emerges there during the autumn and the winter. Some individuals are quite similar to nymotypical *megera*, but others afford features I have not seen in any European individual: they consist in a warmer, more reddish tone of the yellow ground colour of the hindwings and in a duller and paler tinge both of the diffused scaling and of the streaks and eye-spots; the former is often very thick and uniform; the two latter are of the same tone, so that they do not stand out at all; the eye-spots are also distinctly smaller than usual. To what extent this form is produced and whether it is prevalent or not in certain localities I have not been able to ascertain. It seems well suited to afford protection on reddish sandy soils. The extent of the black markings on the upperside is considerably more variable in Africa than in most regions, because one finds quite usually both forms as dark as nymotypical *megera* and others approaching *alticola* and, thus, similar on that surface to *praeaustralis* and *australis*.

The well known *tigelius*, Bonelli (*Mem. R. Soc. Scienze di Torino*, xxx., pl. 1., fig. 2), peculiar to Corsica and Sardinia, does not follow the main line of variation exactly and must be considered as a particularly distinct collateral branch, which certainly is more distinct from all the other races taken as a whole than the latter differ from each other. For this reason, and because no individual of any other race could be mixed up with *tigelius* or vice versa, as I will point out further on, one feels that *tigelius* is at least a subspecies as compared with *megera*, if it be not proved in future that they are actually two species, like *Aglais urticae*, L., and *ichnusa*, Bell. (see *Ent. Rec.*, xxxi., p. 199), according to my views. In its first generation the underside features vary individually to a marked extent and occasionally do not differ much from nymotypical *megera*: a characteristic form is produced, however, quite commonly (transitional ones prevail), in which the basal half of the hindwings, as far as the furthest of the two central streaks, is covered with thick blackish scaling, whereas the outer half is very sparingly dusted with them, the eye-spots standing out on a space of clear ground-colour; this, of course, is equivalent to the obliteration of the band which precedes the eye-spots on the upperside; this obliteration is the most prominent and better known characteristic of *tigelius*; the underside can thus be described as belonging to grade I. and similar to nymotypical *megera* in its basal half and to grade IV. similar to *australis*, or transitions to it, in its further half; also the tinge of the ground-colour is less yellow than in *megera*, particularly on the outer part of the wing. It is interesting to note that in the same islands one finds the race *lyllus*, Esp., of *Coenonympha pamphilus*, L., which, in its first generation *lyllides*, Vrty., is distinguished from its other races by that very same division of the underside of hindwings into a dark basal and a lighter outer zone. Other characteristics of *tigelius* are that it is considerably smaller than any other *megera* and that the upperside markings are reduced in extent to a degree not met with even as an individual variation in other regions; we shall see that the summer generations carry this reduction still further; another noteworthy feature, which denotes a tendency to vary along a peculiar line, different from the main one of the species, is the large size of the apical eye-spot of forewing and the

rather large size of the two placed between the third median and the second cubital nervures of the hindwings, whilst, on the contrary, the remaining eyespots all tend to become very small and are, in the summer generations, often entirely obliterated. I will shortly point out that nymotypical *tigelius* (it should have been spelt with double *l*) is the summer one, and mention the differences between it and the spring generation, which I propose calling TIGELLINA, mihi ("types" from Lanusei and Ogliastro, in my collection).

Grade II: It was F. J. Ball who first pointed out (*Annales Soc. Entom. de Belgique*, lviii., p. 177 (1914), that there exists a difference between the two generations of *megera* of Central Europe. He named the second one *filipluma*, from Belgian specimens, because it differs microscopically from the first by having a thinner distal end to the androconial scales: the only character, visible to the naked eye, he detected is that the broad fulvous space of the forewing, which contains the apical eye-spot, is not split up into five separate spaces by streaks on the nervures, as it is in the first generation. In the specimens I have at hand I might say this feature I do not see, but, its existence may, of course, depend on localities and years. I find, on the other hand, perfectly constant characteristics on the underside of the hindwing. To describe them it would be sufficient to say simply that they are one grade away from nymotypical spring *megera* along the main line of variation of the species, as described above, but to be clearer I will briefly mention them again: the diffused scaling is not as uniform, on account of narrow spaces which appear along the streaks and round the eye-spots, splitting it up into bands and patches; the streaks and the circles round the eye-spots are darker and stand out more; the pre-marginal lunules, especially, become darker along their outer outline, becoming as dark as the streaks, instead of being of the same tone as the diffused scaling; the circles round the eye-spots are slightly broader on the average; all this gives the wing a more variegated appearance and gives one the impression of a dark complex pattern standing out on a light ground colour. It must be understood, however, that, though I find these features are always detectable, even in the most northern regions, it needs a little attention to see them in the races of Northern and Central Europe. As one proceeds southwards they become more striking, and one then meets with extreme individuals which recall the more southern races. At the same time one also observes a gradual decrease in the average extent of the dark markings on the upperside in the summer generation, or generations, whereas the spring generation remains as a rule unaltered, except in the Italian zone; seasonal dimorphism thus becomes more prominent. As might have been expected, the darkest summer generation is the one I have named *caledonia*, in the *Bull. Soc. Ent. de France*, 1911, p. 314, pl. i., fig. 12, from a series collected on the northern coast of Scotland, in August. It is noteworthy that in this race, notwithstanding the high latitude, the summer characteristics of the underside are constantly quite marked.

The summer generations of race *tigelius* differ from the first in exactly the same way as do, from each other, those of the Continent, by the upperside reduced extent of the black markings, which are extremely thin, and even partly obliterated on the outer part of the

wing in some individuals of both sexes, by the brighter and warmer tinge of the fulvous, and by the underside characters. The features which distinguish this race from the continental ones in the first generation, exist also in the summer ones, so that one is justified in calling them Grade II of the same line of variation. The diffused scaling on the underside of the hindwing is as reduced in extent on the further half of the wing as in Grades III and IV, but on the basal half it is as intensive and dark, and the markings, on the whole, are as thick as in the northern *iliplauma*, so that one must classify the summer generations in this grade, just as their first falls in with the first of race *megera*, in Grade I. Having looked up Bonelli's original description and figures, I have found that he stated his "types" had been collected during July "in the plains of Sardinia." His figures are good, and show unmistakably the characteristics of the summer generations on both surfaces, quite resembling the specimens I have myself found on the 2nd of September, 1910, near the house and tomb of Garibaldi, in the little island of Caprera, off the north coast of Sardinia. Kirby, in his catalogue, expresses the doubt that Hübner's name of *paramegaera* might have the right of priority over that of *tigelius*, Bon. This does not seem to be the case. Bonelli read his paper before the *R. Academia di Scienze* of Turin on March 7th, 1824, so that his name dates from that day, although it was only printed in vol. xxx. of the *Memorie* of 1826. According to Fernald's researches on the dates of publication of Hübner's plates, plates 162 to 195 were published from 1823 to 1833, so that it is extremely unlikely that plate 170, with *paramegaera*, should have appeared before March, 1824. Curiously enough Hübner's three figures all look suspiciously identical with Bonelli's three, and as if copied from them!

As I have already mentioned, in the Italic zone the first generation of *megera*, which varies so little in the rest of Europe, does change aspect. It is shifted along the main line of variation to grades usually proper to the summer generations; in consequence the seasonal dimorphism, which becomes so much more marked in other parts of southern Europe than it is in the north, again is diminished in the Italic zone. I propose the name of PRAEAUSTRALIS, mihi, for the first generation of Peninsular Italy, which apparently does not vary in the least from Northern Tuscany to the Coast Range of Calabria, and from the tops of the Apennines to the sea-shore. I select a series from Florence, as "typical," collected in the Pian di Mugnone, from March 30th (emergence usually begins in Florence about the 10th) to May 18th. Its most characteristic feature is that on an average the underside of the hindwings exactly corresponds to that of the summer generation of northern Europe in the extent and the intensity of the diffused scaling, in the sharpness of the streaks, of the premarginal lunules, and of the circles round eye-spots; it differs from it in having only the slightest suspicion of yellow left in the tinge of ground-colour, which tends more to silvery-white. On the upper surface the fulvous is warmer and the black markings are usually decidedly reduced in extent; the basal black patch is more suffused with fulvous, the marginal band is narrower, etc.

(To be completed).

Some Notes on Swiss butterflies.

[Supplementary to the *Butterflies of Switzerland*, by Rev. Geo. Wheeler, M.A., F.E.S.]

By the late MR. A. J. FISON.

(Arranged and communicated by Miss L. M. FISON.)

"The works of the Lord are great, sought out of all them that have pleasure therein."—*Psalm*, cxi. 2.

(*Continued from page 195.*)

Dryas paphia, L., ab. ♀ *calesina*, Esp.—Brigue; Stalden, 15.viii.90. Sépey Road e. July. Bad Fideris, 7.vii.04; Mendrisoo, 15.viii.02; Flims; Bergell; Im Grund, abundant, 20.viii.09.

D. pandora, Schiff.—Charpigny, 23.ix.05 (1).

Argynnis aglaia, L.—A very dark aberration on Col de Pillon, 31.vii.08; Lac d'Arnon near Gsteig, 30.vii.08.

A. adippe, L., var. *cleodoxa*, Ochs.—Monte Bré; nr. Gondo; Le Prese; (6) Lavorgo, 9.vii.03; Zermatt; Visp; Stalden; Forêt d'Aletsch.

A. niobe, L.—Col de Pillon, 31.vii.08.

Issoria lathonia, L.—In great numbers Leuk-Varen, 29.iv.04.

I. lathonia ab. *valdensis*, Esp.—1 got near Roche or Champéry abt. 1892; Bex.

Brenthis euphrosyne, L.—Salvatore, 22.v.03, very yellow on under-s. like *cleodoxa*; Dent de Vaulion, 5.vi.88; Les Plans, 16.vi.90; Eclépens, 20.v.90.

Brenthis selene, Schiff.—S.W. of Villeneuve, 1.vi.00 and on 12th; Simplon Kulm, 21.vii.02; Dischmathal, 2.vii.01; Meientbal, 3.viii.03.

B. selene ab. ♀ *marphisa*, Hbst.—Binn, on N. lower forest ridge; Stockhorn on tiny pasture (lots), 10.viii.05.

B. thore, Hb.—(1) Faido, 13.vii.03; N. of Thalalpsee, 16-18.vii.03, (38) in 04; 23.vi.87; Wasen; Bad Alveneu, 2.vii.06.

B. daphne, Schiff.—Ravoir de Martigny, 26.v.03.

B. ino, Rott.—Les Pleiades, 7.vii.90; S. of Grum Alp, 21.vii.01; Tourtemagne; Sion; Evolena; St. Luc; Leukerbad; Dent du Midi, 6.vii.23 (L.M.F.); Gryon in hollow to N. where Taveyanaz Path begins.

B. amathusia, Esp.—N. of Glion; Bains d'Alliaz, 7.vii.90; Lac Champex, viii.13; Grindelwald, viii.14; Dent du Midi, 21.vii.22; Les Pleiades, 21.vii.91; Gryonne Valley, 5.vii.11; Champéry, 31.vii.22; Barmaz, 4.viii.22 (L.M.F.).

B. dia, L.—Naters, 21.viii.90; Charpigny, v.: a nice aberration with upper wings suffused with black, Charpigny, v.13 (L.M.F.).

B. pales, Schiff.—Van, 11.viii.88; Simplon, 24.vii.90; Simplon Hospice, 24.vii.90; Faulhorn, 1.viii.11; Col de Soud, vii.14; Little Scheidegg, viii.20; Zermatt, vi.14; Barmaz, 4.viii.22.

B. pales var. *isis*, Hb.—Rossinières; Arolla; Champex; Hotel de Lenz; Val Rosegg, 30.vii.04.

B. pales var. *arsilache*, Esp.—Lac Lioson, 1-20.viii.05, abundant; edge of woods S. of Samaden and Celerina, on *Arnica* flowers (9); 23-25.viii.04 (v. worn), Statzer See; Anniviers; Hotel de Lenz; La Forclaz down to 3,000 ft. A very fine aberration is found in the Heuthal in which the yellow and black of the wings has run all together. It is not uncommon there.

Melitaea cynthia, Hb.—Loëche; Fully, 18.vii.91; Triftalp; Saas,

2.vii.94 : Eggishorn Hotel, 16.vii.94 : Bernina Pass (W. of), 18.vii.01 : S. of Diavolezza and below it, 19.viii.01 ; Riffelalp Restaurant ; Binnenthal, 1 hour below the Albrun Pass (E. of path), 20-22.vi.05 ; above and beyond Imfeld, 26.viii.05 : and S. of Pubenhorn, 30.vi.05 ; Faulhorn, 1.viii.14 (L.M.F.) ; Mont Blanc to Pilatus.

M. maturna, L., var. *wolfensbergeri*, Frey.—Grumalp : Le Prese, 13.vii.01.

M. aurinia, Rott.—(52) Gryon, 27.v.04 ; Éclépens, 20.viii.90 : Châbles Rouges, v.

M. aurinia var. *merope*, Prunner.—Zermatt ; Latscher Kulm, 2 hrs. from Bergün, and at Lake Palpuogna, half way to Albula : Lac Pully ; Portailles, 18.vii.91.

M. didyma, Ochs.—(21) Below Tourbillon Hill to N. at Sion, 18.v.04 ; A dark brown var. a very fiery orange, N. of Tourbillon, at Sion, 18.v.04.

M. didyma var. *alpina*, Stgr.—♀ (1) Charpigny, 23.viii.88, also 5.vii.22 (L.M.F.).

M. deione var. *berisalensis*, Favre.—Savièse-Bisse Lentine (N. of Sion), 10.vi.05 (12) ; Ormona (12), 10.vi.05 and (13) 11.vi.08.

M. aurelia, Nickerl.—Olon Granges, 16.v.04 ; Illgraben, 25.v.04 ; Gandria, 16.v.03.

M. aurelia var. ♀ *rhoetica*, Frey.—Tarasp ; Evolena ; Bel Alp.

M. parthenie, Brkh.—Leukerbad ; Lugano ; ab. at Les Écovets (S. side), 19.ix.85.

M. athalia, Rott., ab. *navarina*, Sélys.—(1) Val Solda, 26.v.03.

Approaching ab. *aphaea*, Hb.— From S. edge les Écovets to Ollon, 15.ix.85.

M. dictynna, Esp.—Temcley, 2.viii.10, light colour.

Araschnia levana, L.—1904 at Thalapsee and Murgthal (36) from 23.vi.-2.vii. (♂ ♀) ; 1 on road to Thalalpsee, 18 & 24.vi.02, and in Murgthal on 25th (on Ragwort or *Vincetoxicum*).

A. levana var. *prorsa*, L.—Murgthal, on sage (10 and 11), 2-3.viii.04, and (2) 3.ix.04 ; (1) 8.vii.08 at one mile N.E. of Yverdon by Lake.

Vanessa antiopa, L.—Saw 36 (old), Martigny to Saxon, 29.iv.87 ; Lots at Charpigny, v.88, also vi.22 (L.M.F.).

Aglais urticae, L., var. *H. turcica*, Stgr.—St. Niklaus.

Limenitis populi, L.—Earlier at Granges than at Rossinières ; S. of Yvonand (6) 19-23.vi.05 and (4) 22-26.vi.06 ; equal numbers of ab. *tremulae*, Esp., and of ♀s, Grindelwald ; intermediate form at Charpigny, 20-24.vi.07 (4) ; Bad Alvaneu, 2.vii.06 (4) ; the form N. of the Alps approaches this more than the type ; below Col de Jaman towards Montbovon very good ; Ste. Croix. They settle on dead snails ; on hot days they rest at noon.

Neptis lucilla, Fabr.—Val Misox (entrance), near Bellinzona.

Apatura ilia, Schiff.—Piz Alun ; Ragatz (1,860 ft.) (6) on 18.vii.04.

A. ilia var. *clytie*, Schiff.—Locarno (2) ; Le Pontel sous Charpigny, 10.vii.86.

"Purple Emperors" ♂ often came down on to moist roads about 10 a.m., but ♀s at 4 p.m. All carrion attracts them, as the paunch of a sheep. (2) in wood N. of La Tête, Charpigny, 3.vii.11 ; St. Triphon Marsh, 3.vii.22.

A. iris, L.—Glion (road to Les Avants abundant) ; The Signal Road (by the Signal Chalet) near Blonay ; Bex, 19.viii.85 ; Frénières (1), 1.viii.90.

Libythea celtis, Laicharting.—Foot of Monte Bré, near Gandria (5) v. old, 16.vi.02.

Pararge hiera, Fabr.—Above Les Monts nr. Bex, 6.vi.93; E. of Caux, 18-24.vi.03; Ravoir de Martigny, 31.v.07 (3); Les Plans, 16.vi.90; Crête de Guéroz, 5.vi.89.

P. achine, Scopoli.—Very fine on land between St. Triphon Quarry and Aigle: Gryonne meadows, 26.vii.14 and 19.vii.22; near Choëx, going over, 22.vii.22 (L.M.F.); Arth-Goldau, 16-21.vi.04 (6 and 8): Charpigny, 24-30.vi.90.

Satyrus circe, Fabr.—On hill over La Sarraz tunnels; in 1906 at Éclépens, 21.vi.-10.vii.07, took 10 but none at Éclépens in 1905; (1) up Chamonix Road at Martigny; Gignard S. of Attelens, abundant in 1901; Chamby, 1902; at Ste. Croix in the Covatonnaz Gorge; gets scarce in Switzerland.

Satyrus statilinus, Hüfn., var. *allionia*, Fabr.—Leuk, 4.ix.00; nr. Naters, 21.viii.90.

S. cordula, Fabr.—Wengern Alp; St. Maurice, 29.vi.14 (L.M.F.); Dent du Midi, nr. Choëx, 4.vii.22 (L.M.F.).

S. cordula ab. ♀ *paca*, Hb.—Village of Lavey 1 m. up; Charpigny, 22.vii.22 (L.M.F.); La Bâtiaz, 13.vii.14.

Enodia dryas, Scopoli.—Charpigny, 4.viii.

Hipparchia briseis, L.—Éclépens, 31.vii.06-15.viii.06; Dombresson nr. Neuchatel, viii.; near Naters.

Epinephele jurtina, L., var. *hispulla*, Hb.—3.viii.03, N.W. of Champéry; N. of Brigue, 30.vii.90; Charpigny; on Jura where butterflies are more like southern than alpine forms.

NOTES ON COLLECTING, etc.

The Lepidoptera of the smaller Channel Islands.—In the October number of the *Record* Mr. W. J. Kaye gives lists of butterflies in the Channel Isles. I myself spent most of August in Guernsey, going to Sark and Herm for one day each. To Mr. Kaye's list I can add the following species.

Sark: *Pieris napi*, *Eugonia polychloros*, *Aglais urticae*, *Pyrameis cardui*, *Argynnis aglaia*, *Coenonympha pamphilus*, and *Plebeius aegon* (*argus*). All other butterflies in Mr. Kaye's list, with the exception of *Celastrina argiolus*, were also taken.

Herm: All Mr. Kaye's eight species and *Pieris brassicae*, *Pieris napi*, *Gonepteryx rhamni*, *Aglais urticae*, *Pyrameis cardui*, *Coenonympha pamphilus*, *Rumicia phlaeas*, and *Plebeius aegon* (*argus*). Thus on one day all the 13 Herm species but one were taken!—E. Bolton King, Balliol College, Oxford. *November 12th.*

Some Moths taken at Tremezzo.—At last my wanderings led me into a pleasant place. We arrived at Tremezzo, on the Lake of Como, in the middle of April last. This townlet is the capital of the fertile district known locally as the Tremezzina. In May and June it is a land of flowers, though hardly any of them indigenous. To see the indigenous flora one must get up the hill sides where conditions are too rocky or too steep to allow of cultivation. The Spring was very backward and Lepidoptera were late in appearing. April 23rd, I saw half a dozen *Xanthorhoë* (*Melanippe*) *fluctuata*, and noticed that they were

all darker and more richly marked than our Middlesex specimens. A few days later two *Leucania albipuncta* were seen, and *Adela tibulella* was not rare about veronica blossoms. Early in May the webs of *Hyponomeuta plumbellus* were seen on spindle. Though there were ants on the bushes they did not enter the larval webs. Ants were almost everywhere. Scarcely a tree trunk or bush was without them. I think they must destroy numbers of young larvae, as caterpillars were very scarce, except Coleophorids and Psychids. I saw larvae of the latter on tree trunks among ants. Whenever an ant touched a larva the latter promptly brought the edge of its case down on to the bark, thus protecting itself, and the ant then took no further notice of it. The leaves of the trees and bushes showed scarcely any signs of larval attack, but blight was now and then to be noticed. This was probably useful to the numerous ants. The snail-like cases of *Crinopteryx familiella* were not uncommon on *Cistus*, and I noticed six species of the genus *Coleophora*. Cases of *C. limosipennella* on elm in a hedge; a dark brown species, caught on the wing, with a broad white subdorsal stripe and white antennae, the basal third thickened with scales, and another kind, also on the wing, with ochreous stripes. The fourth species seen was common in the larval state, mining the leaves of *Silene nutans*. The case was straight and pale in colour. I bred a few moths which were blackish fuscous in colour with several narrow whitish stripes. On the last mentioned plant I saw a large, straight, flattish case, evidently belonging to another species. Above Bellagio, on the opposite side of the lake, I found cases on *Astragalus* sp.? These were formed of whitish mined portions of the leaves and were laterally compressed. The forewings of the resulting imagines were pale ochreous with two silvery white stripes. There was on the way to Cadenabbia a small electric light, which was very attractive to Lepidoptera. I always looked up when passing it. I saw *Lycia* (*Biston*) *hirtaria* and other Geometers resting on the grey wall just above the light. On May 14th I looked up as usual and saw two huge *Saturnia pyri*. This species was seen again later. A few weeks afterwards a specimen of *Saturnia cynthia* was brought to me alive, but dilapidated. It was said to have been taken in the garden. If so, then the species may have acclimatised itself in the place in the same way as it has done in certain districts round Paris. July 1st, a fresh specimen of *Odonestis pruni* flew in to the light. It is said to be rare, and it was the only one seen. The first of the Deltoidina and Pyralidina seen was our familiar *Hypena rostralis*, and then *Pyralis farinalis*. On June 1st, a *Crambus* flew into the room and next morning it proved to be a fresh specimen of the mountain species *C. myellus*. The next day *Mecyna polygonalis* was found entangled in an old spider web. It was alive and not much damaged. On June 13th, I saw the first *Crambus craterellus*. Strangely this was the most common species of the genus round Tremezzo. It haunted the herbage in the gorges behind the town. In the same places the pretty *Eurrhypis cognata* was not rare, but the Tortricina were not abundant. At Bellagio I noticed *Hemimene alpinana* and *Pichrorampha petiverella* about *Achillea*. In July I noticed mines of *Bedellia sommulentella* in convolvulus, and those of *Nepticula plagicolella* in sloe.

The usual Rhopalocera were late in appearing, and *Pieris brassicae* was by far the most abundant species. As the species inhabiting

North Italy are well known, and as nothing of special note occurred, I will not dilate on the butterflies, more especially as it is many years since I studied this group, which has now become more than ever a subject of special investigation. My son went partly up one of the mountains and brought back *Syntomis phegea* and reports of several Zygaenids, so no doubt the upper slopes would be well worth working. —Alfred Sich. *November*, 1922.

Lepidoptera attacked by Birds.—On August 19th I was given a specimen of the Convolvulus Hawk Moth (*Agrius convolvuli*) which had been picked up on the bank of the river at Wroxham. It was evidently a freshly emerged specimen and in fine condition, with the exception that the lower half of the abdomen had been pecked off, probably by a bird of some kind. On September 4th I found a pupa of the small Copper butterfly (*Rumicia phlaeas*) at New Fen, near Waterbeach. This I took home, and the perfect insect emerged in about a week's time. As the small Copper occurs in my garden I decided to let it go, and put it out of my study window on to the creeper. Next day I observed the four wings of the butterfly on the leads. I generally put bread for birds there; it is therefore most probable that the insect had been eaten by a bird and its wings allowed to fall on the leads.—Horace Donisthorpe.

A White-bodied Pieris rapae from Japan.—A form of *Pieris rapae*, in which the abdomen is entirely covered with white has long been known from Syria under the name of var. *leucosoma*, Schawerda. From no other part of the world has a similar form of this well known and common butterfly been described, so far as I am aware. It was therefore with much interest that I came across an aberrant specimen of *Pieris rapae* with white abdomen in a lot of butterflies sent to me some time ago by Mr. S. Satake, of Tokyo, Japan. A brief diagnosis follows:—

Pieris rapae ab. *albiventris*, nov. aber.

Belongs to subsp. *crucivora*, Boisd., and is about the same size as the typical form of that subspecies, differing as follows:—The apical black mark on the upperside of forewing larger at least by one-third, the shape more nearly approaching an equilateral triangle than a scalene triangle; no trace of the dark suffusion on the underside of hindwings; abdomen entirely white, as in var. *leucosoma*, Schawerda. Much larger in size and by far the more strongly marked than var. *leucosoma*.

Length of body, $\frac{3}{4}$ inch; expanse of wings, $2\frac{1}{8}$ inches.

Holotype, ♂, Narita, near Tokyo, Japan, July 20th, 1917 (Mr. S. Satake). Type in my own collection.—Waro Nakahara, Ph.D.

COLEOPTERA.

Leptura rubra, L., in Norfolk.—On August 6th, 1918, Mr. H. J. Thouless captured a male of *Leptura rubra* on the wing at Horsford, in Norfolk. Each year since he has taken a small number of specimens in this locality, on and in stumps of Scots pine. This year he was kind enough to tell me that he had again found the species, and I determined to go to Norfolk and try for it. On August 18th I visited Horsford and obtained a short series of the beetle, on the stumps and

by digging into them. The latter method proved very hard work, as the stumps were very firm, and, moreover, it was evident that nearly all the beetles had emerged for the year. August 19th was spent at Horning and Wroxham with Mr. Thouless. The weather, which was dull on the 18th, having improved and become very hot, I visited Horsford again on the 20th, Mr. Thouless this time accompanying me in the morning. It turned out to be a most beautiful day, and the beetle was observed in great profusion all over a large area where Scots pine had been cut during the war. Females of the beetle were more plentiful than the males. It is no exaggeration to say that *Leptura rubra* had been present (or was present in the larval stages) in every stump, however long ago it had been cut down, over the whole area. I personally have no doubt whatever that this beautiful Longicorn beetle has been present in this district for many years, and that when Mr. Thouless first took it here it was no "chance specimen" nor "recent introduction." Of course the cutting down of so many Scots pine during the war gave the beetle a splendid chance to increase, so many suitable stumps for breeding in being left; and it has evidently availed itself of them to the utmost.—HORACE DONISTHORPE.

CURRENT NOTES AND SHORT NOTICES.

A correspondent writes us, "It seems to me regrettable that no one has seen their way to replace the cork of insect boxes with a layer of the india-rubber now sold in the shops, as it readily allows of the insertion of all kinds of pins, and when working on the more delicate Diptera it is ten to one the pin if inserted in cork lining gets provokingly bent, or deliberately snaps, with of course the end of the valuable specimen you desired to transmit to posterity. Metal pins themselves are objectionable, but nothing suitable to replace them, save possibly hardened glass, of which some mention has been made, occurs to mind. Mounting very small Diptera answers, but it renders the larger kinds unsightly. The india-rubber I may commend to notice, I always have some pieces in use."

"I can only affirm that small pins penetrate this india-rubber, now sold in the shops, with ease. Most sheets of cork are perforated with cavities or are knotty, and very many small pins have I broken when transferring minute insects to a store-box, Diptera especially. The real question seems to me to be expense, and this the trade would be best able to understand. I can only say that when lining paper conceals a hard piece of cork it is most objectionable. The surface of the india-rubber is white. It might be made whiter. The subject deserves attention."

Ugly stories come to us from Royston. We hear of sweeping for *A. coridon*, poison-bottles crammed with specimens good and bad, the hillsides dotted with small patches of those thrown out of the killing bottles and rejected, etc., etc. It is much to be hoped that these stories are extreme exaggerations, if not fabrications.

Nothing "succeeds like success" we are told. We had never known a Society double its subscription and at the same time increase its membership until the Entomological Society of London did this; and it continues to increase. We urge our readers to become Fellows in the coming year, and share in the prestige which this association of entomological workers ensures.

The South London Entomological Society held its Annual Exhibition on November 23rd. Needless to say another most successful gathering was added to the long list of previous "Annuals." Most of the well known and active workers in our study were present among the 190 who were in the room. The exhibits were perhaps somewhat more varied than last year, for in addition to the Lepidoptera, which on some occasions have been exclusively shown, there were exhibits in several other orders, as well as in botany. Visitors and country members were present from as far as the Isle of Wight, Bournemouth, and Liverpool, with many from the home counties.

The recently issued part of the *Ann. Soc. Ent. Belgique* contains "Notes on the genus *Nemopalpus* (Dipt. *Psychodidae*)," with one plate, by A. Tonner; Studies on Ants: "Influence of Temperature on the Activity of Ants," by Robert Stumper; "Notes on the genus *Asthenopus-porilla* (Ephemeroptera)," by J.-A. Lestage; etc. *The Bull. Soc. Ent. Belgique* contains a "Synonymic List of the Orthoptera and Dermaptera indigenous and accidental in Belgium," by J.-A. Lestage.

The *Rev. Mens. Soc. Ent. Namuroise* for October contains the descriptions of more new forms of the Rhopalocera found in Belgium. *Melitaea cinxia* ab. *deficiens* has the postmedian black line on the upper side of all four wings obliterated. *M. athalia* ab. *indigata* has the antimarginal black line on the forewings feebly marked, and the submarginal is absent. *M. dictynna* ab. *cacua* has the median and postmedian marks in the spaces 2 and 3 on the upperside forewings absent. *Brenthis pales* form *arsilache* ab. *interligata* has, on the upperside of the forewings, the two black spots above the inner margin united by a black streak. *B. ino* ab. *interligata* is an exactly similar aberration. *B. ino* ab. *semicadmeis* has lost the black submarginal dots on the upperside of the hindwings, but the antemarginal black spots are enlarged and of an oval shape.

A considerable portion of the *Scott. Nat.* for September-October is taken up with entomological matter. William Evans gives "Some Insect Records from the Edinburgh district in 1921," dealing with all orders, and suggests that the appearance of two *Pyrameis atalanta* in May at Balerno indicates that the species survived the winter in the locality. Ronald C. Fisher writes "Notes on the Poplar Saw-fly (*Trichiocampus viminalis*)." A. Fergusson contributes a long series of "Additions to the List of Clyde Coleoptera."

SOCIETIES.

The Entomological Society of London.

November 1st.—Election of Fellows.—The following were elected Fellows of the Society:—Messrs. A. N. Burns, Salisbury Road, Rose Bay, Sydney, New South Wales; R. T. Daubeney, B.A., Herne Vicarage, Herne, Kent; C. G. Gosh, B.A., Agricultural College, Mandalay, Burma; L. G. Higgins, M.A., F.R.C.S., Heatherside, Woking, Surrey; J. F. Marshall, M.A., Seacourt, Hayling Island; A. E. Moore, Brookside, Brent Mead Avenue, Golders Green, N.W.; A. Musgrave, Australian Museum, Sydney, New South Wales; Miss E. K. Pearce, Kempston, Bournemouth West; Messrs. E. Piazza, 4734, 46th Street, San Diego, California, U.S.A.; J. Price, 135, Corporation Street,

Stafford; Rev. W. H. Richardson, 32, Wanderers Avenue, Wolverhampton; Messrs. A. H. Ruston, Aylesbury House, Chatteris, Cambs.; F. E. Wilson, Jacana, Darling Road, East Malvern, Melbourne; and H. E. Winser, 2, Mead Road, Cranleigh, Surrey.

CORRECTITON.—Dr. H. Silvester Evans, M.R.C.S., L.R.C.P., Lomaloma, Fiji (not Lantoka).

GIFT TO THE SOCIETY.—The Treasurer announced that he had received £500 towards the Housing Fund from the Misses Chapman, on behalf of their brother, the late Dr. T. A. Chapman, F.R.S.

EXHIBITIONS.—Dr. F. A. Dixey, F.R.S., exhibited specimens and drawings of the genitalia and scent-scales of *Belenois gidica*, Godt., with those of some other species of *Belenois* for comparison.

Dr. K. Jordan, F.R.S., described the tympanal organ of *Speiredonia* and discussed the development of this organ in the *Noctuidae*. Dr. Eltringham gave some account of similar organs in *Geometridae*.

Dr. E. A. Cockayne exhibited an example of Homoeosis in *Coenonympha pamphilus*, L.

Mr. J. E. Collin exhibited an intersex of *Mydaea duplicata*.

Professor E. B. Poulton, F.R.S., exhibited on behalf of Mr. E. N. Willmer, living larvae of a Nemopterid from the Egyptian desert, and Mr. E. E. Green and Dr. Imms described the habits of a similar species from India and Ceylon.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

October 16th.—THE OPENING MEETING OF THE SESSION.—This meeting was devoted to exhibits. General reports from members pointed to the fact that it had not been a very good season for collecting. One of the most interesting features was the wide distribution of *Colias croceus* (*edusa*). Practically every member present had captured at least one specimen, and several reported having taken fairly good series. In our immediate neighbourhood it was reported from Hale, Formby, Chester, Tattenhall, Waverton, Mouldsworth, Point of Ayr, and Abergele. Var. *helice* was taken at Abergele and Chester.

Mr. B. H. Crabtree, F.E.S., exhibited a small box of varieties of *Rumicia phlaeas*, including ab. *schmidtii*.

Mr. E. P. Doudney brought a good exhibit of Witherslake insects, including *Xylocampa areola*, *Dasychira pudibunda*, *Pterostoma palpina*, *Abrostola triplasia*, *Drepana lacertinaria*, *Nemoria viridata*, *Scodiona fagaria*, *Acronicta menyanthidis*, *Ino geryon*, and *Coenonympha tiphon*: and from Bude, *Lycaena arion*.

Mr. Garner Richards showed a long series of *Polyommatus icarus* and *R. phlaeas* from Hale district (Lancs.).

Mr. A. W. Hughes showed *Eupithecia consignata* from Warmington, Northants., a series of a light form of the female of *Parargc aegeria*, and a bred series of *Malacosoma neustria*, and some *Aromia moschata* (Coleoptera) from Freshfield.

Mr. C. F. Johnson, F.E.S., brought long series of *Agriades coridon* and *A. thetis* (*bellargus*), including some beautiful varieties.

Mr. Wm. Mansbridge exhibited some fine series of *Blastobasis lignea* and its dark variety *adustella*, and also a pale variety from Grange.

Mr. C. P. Rimmer showed a series of *Abraxas grossulariata*, with some dark forms from Neston, Cheshire, and one very pale form from Abergele, N.W.

Mr. S. Gordon Smith, F.L.S., F.E.S., showed a fine collection ot varieties he had secured this year, including the following: —From Chester, *Perenophtilota fluviata*, a bred series obtained from specimen which came to light: *Agrotis puta*, series taken at light; *Dianthoecia carpophaga*, dark var. taken at light; *Agrotis exclamationis*, varied series at light; *Luperina testacea*, dark var. at light. From Delamere, *Anisopteryx aescularia*, var. with almost unicolorous forewings, at light: *Diacrisia sanio*, three, including one var. with the band on the hindwings missing; *Spilosoma lubricipeda*, var. approaching *fasciata*; *Polyploca flavicornis*, two vars. without the cross lines, one var. with the cross lines joined together, one var. with thorax and body black, one var. very pale. A specimen of *Drepana binaria*, taken at Houldsworth: *R. phlaeas*, var. with the orange red band of hindwings missing, from Waverton. From Witherslake, *Mamestra dentina*, dark var.; *Rusina tenebrosa*, very dark specimen. Series of *Pachys betularia*; *Lomaspilis marginata*, varied series taken at light. From the New Forest, two females of *Lymantria monacha*, one being a var. with whitish instead of pink body. *Asphalia diluta*, varied series. A var. of *Noctua c-nigrum* with the costal mark pinkish brown. A specimen of *Agrotis cinerea*, taken at Parc Llwydiarth. A specimen of *Xylina socia*, taken at Dolgelley, and *Selenia bilunaria*, dark form from Dolgelly. A var. of *Arctia caia*, from a Formby larva, and a var. of *Agrotis strigula*, from Moel Famman.

Mr. Robert Tait, F.E.S., exhibited *Carterocephalus palaemon*, *Hamearis lucina*, *Ematurga atomaria*, from Northants. *Limenitis sibilla Argynnis cydippe* (*adippe*), *Hemaris bombyliformis*, *Triphaena subsequa* (*orbona*), *Dipterygia pinastri*, *Aplecta herbida*, and *A. nebulosa*, including a var. with dark band on the upper wings, *Phorodesma bajularia*, *Ephyra trilinearia*, *Limacodes testudo*, etc., from the New Forest. Also a fine series of *Boarmia repandata*, bred from Penmaenmawr larvae.

The South London Entomological Society.

October 12*th*.—Exhibits.—Mr. Withycombe exhibited a queen hornet, *Vespa crabro*, caught when flying over a tram car at Walthamstow.

Mr. H. Main, recently hatched young of the slug *Arion ater*, the larvae of the glow-worm, *Lampyris lusitanica*, a wolf spider found under stones, closely allied to Fabre's *Lycosa narbonensis*, and a black scorpion abundant at Pont du Gard, S. France.

Mr. Blenkarn, the Coleoptera *Magdalis carbonaria*, from Mickleham, not hitherto taken south of Sherwood Forest, and *Rhynchites pubescens*, which was not uncommon at Westerham in June.

Mr. L. W. Newman, a painting of an aberration ♂ of *Agriades coridon* from Royston, with various streaks of ♀ coloration, and an extremely pale *Epinephele jurtina* from the Chilterns.

Lantern Slides.—Mr. H. Main, of the economy of the scorpion, of *Microdon* sp. (Dip.) a scavenger in ants' nests, of the early stages of *Cetonia aurata*.

Mr. Dods, of a series of plants.

Mr. Lucas, of points in the life-history of *Raphidia notata*, *R. maculicollis*, *Chrysopa perla*, and *Hemerobius* sp.

October 26th.—Mr. F. T. Vallins, 372, Sherrard Road, E. 12. was elected a member.

Mr. R. Adkin exhibited his series of *Diaphora mendica*, with its various local races, etc.

Messrs. O. R. and A. de B. Goodman, *Pieris rapae* sexes and *P. manni* sexes for comparison, *P. napi* of the extreme summer form *napaeae*, approaching *P. manni* in facies, and a *P. napi* with a spot near the apex strongly formed.

Miss Alice Lock, *Agrius convolvuli* and a ♀ *Colias croceus* (*edusa*) intermediate to var. *helice*, both from Sidmouth in September.

Mr. A. A. W. Buckstone, a large sample of 500 bred *Pyrameis cardui*, from Oxshott parents, pointing out aberrant specimens (1) with pale blotch in centre of forewing, (2) with blue centres to spots on hindwings, (3) with pink nervures running through the white blotch, etc.

Mr. Blair, the ant *Myrmecophila acervorum* from S. France.

Mr. Main, flour infested with the beetle, *Tribolium ferrugineum*.

Mr. Mera, a series of *D. mendica*, including a dwarf smoky female.

Mr. Enefer, the roots of the bean, pointing out the nodules which are concerned in the formation of nitrogenous compounds, and which enrich the soil for the growth of crops.

Mr. Tonge, his series of *D. mendica*.

Mr. R. Adkin called attention to his series of *D. mendica* and read a paper entitled "*Diaphora mendica* and its varieties." A short discussion took place.

OBITUARY.

Henry John Elwes, F.R.S., F.E.S., etc.

We regret to announce the death of Henry John Elwes, F.R.S., etc., which took place at Colesborne Hall on Sunday, November 26th, after a long illness. He had been failing physically for some time, when the unexpected death of his only daughter, Mrs. Trepplin, in June last, came as a great shock, from which he never recovered.

He was educated at Eton, and subsequently joined the Scots Guards, in which he became Captain. A man of unusually robust physique and great energy, it is not surprising that he had a restless spirit, and so he became a great traveller. From the age of seventeen he never remained in England a whole year, but always desired to see "fresh fields and pastures new." His first love, apart from big game hunting, was

horticulture, and his monograph on the Lilies remains to-day the most beautiful standard work on that lovely group of plants, whilst his last great work was on "The Trees of Great Britain and Ireland." On all his travels he was a very keen observer of nature and a great lover of birds and insects, in fact he was an all round field naturalist of great ability, and, as does not always happen, he was also a good systematist. A large portion of his collection of insects was given by him to the British Museum, and he himself arranged much of the Palaearctic material so far as regards the Rhopalocera. The probability is that had not the war broken out, the whole of his insects would have come to the nation, but as things turned out he sold the remainder to Mr. Joicey.

As a large landowner he took a very practical interest in farming, and was an expert on land cultivation and on stock; he was specially interested in sheep breeding, and brought together very many breeds from all over the world.

His travels covered a great part of the world, from the Rockies and the Andes on the one hand to the Himalayas and the mountains of China and Japan on the other. The one continent he never visited was Africa, and considering his great love for big game this is very remarkable, but he once told the writer that he never had any desire to visit that part of the world. His travels made him think, and made him in his many papers and monographs make deductions that were well in advance of the methods and systems of his day. His papers on the genera *Parnassius* and *Erebia* will be remembered at once, whilst his list of the Sikkim insects is a valuable piece of geographical distribution, and when he visited and collected in Formosa, and found that the insects of Formosa, and I believe the birds also, were identical in genera, and largely so in species as well, with those of Sikkim, he became very keen to institute a comparison of these areas, but he did not live to see this done. He was a member of very many Scientific Societies, and was elected a Fellow of the Royal Society in the year 1897. He was President of the Entomological Society of London for the years 1893 and 1894, having been elected a member in 1878. He was a man of a dominating personality and independent judgment, and as a consequence was a bad opponent to fight, but he was a staunch friend, and once having made a friendship he was true to the end, and could be and was as gentle on the one hand as he could be drastic on the other. It is only about a couple of months ago since the writer saw him at Colesborne, and it was indeed a sorrow to see the bent figure and the difficulty of movement, though his brain was as clear and active as ever; it was, however, charming to hear that "he could not complain, for he had had a fine and active, and varied life, and so he was content," and we said goodbye to each other knowing that we should not, in this world, meet again, but I did not think the end would come so soon.

He leaves a widow and a son, with numerous grandchildren, to whom we tender our sincere sympathy.—G.T.B-B.

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

LIST OF CONTRIBUTORS.

LIST OF ILLUSTRATIONS, &c. (Notice to Binder.)

Subscriptions for Vol. XXXV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E.14 [This subscription includes all numbers published from January 15th to December 15th, 1923.]

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Desiderata.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—*W. G. Pether*, "*Thelma*," 4, *Willow Bridge Road, London, N. 1.*

Duplicates.—Aglaia, Adippe, *Io, T. quercus, Coridon vars., *Fuliginosa (Reading), *B. quercus ♀, Tiliæ, Menthastri, *Linariata, Aurantiaria, Leucophæaria vars. Paniscus. *Desiderata.*—Pupæ of Dictæoides; Imagines of typhon, palpina, camelina (dark), Curtula, Pyra, and numerous others; Ova of Hispidaria.—*Harold B. Williams, 112a, Bensham Manor Road, Thornton Heath, Surrey.*

Duplicates.—Sybilla, Paphia, Io (2), Selene, Lucina (2), Ocellatus, Illustraria (autumn) Nastata, Roboraria ♂, Prunaria (4) ♂, Tipuliformis. *Desiderata.*—Castreusis ♂, Cucullina, Cribrum, Cinerea, Ravida, Ashworthii, Notata, Obfuscaria, Smaragdaria and others, also vars. and local forms.—*Harold E. Winser, Kent House, Cranleigh.*

Duplicates.—Cinxia, Bellargus, Coridon, H. Comma, Lineola, Galathea, Moneta, Nupta, and many others. *Desiderata.*—Blandina, Irish Icarus, Carmelita, Cuculla. Gonostigma, Ashworthii, Templi, Australis, Undulata, Smaragdaria, Testacea.—*W. Gifford Nash, Clavering House, Bedford.*

WANTED.—Specimens or coloured drawings. Foreign forms of British varieties of British Lepidoptera. OFFERED: Drawings of 2,000 varieties.—*S. L. Mosley, Tolson Memorial Museum, Huddersfield.*

Duplicates.—Cinerea ♀, fine forms, grey, brown and blackish, Maritima and vars. Immorata and other East Sussex species.

Desiderata.—Pupæ. Luteago (Barrettii), Caesia, Albimacula, Alpina, Xanthomista, Sparganii, Dissoluta (Arundineta), Graphalii. Also imagines of extreme forms Noctuæ in fine condition only.—*A. J. Wightman, 35, Morris Road, Lewes.*

CHANGE OF ADDRESSES.—*Rev. G. Wheeler, c/o Miss Swaine, Briarfield, Guildford. B. C. S. Warren, 14 Avenue de l'Eglise Anglaise, Suisse.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. Annual Meeting, 1923, January 17th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. 1923, January 11th, Paper; January 25th, Annual Meeting.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E.3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

All MS. and editorial matter should be sent and all proofs returned to HY. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

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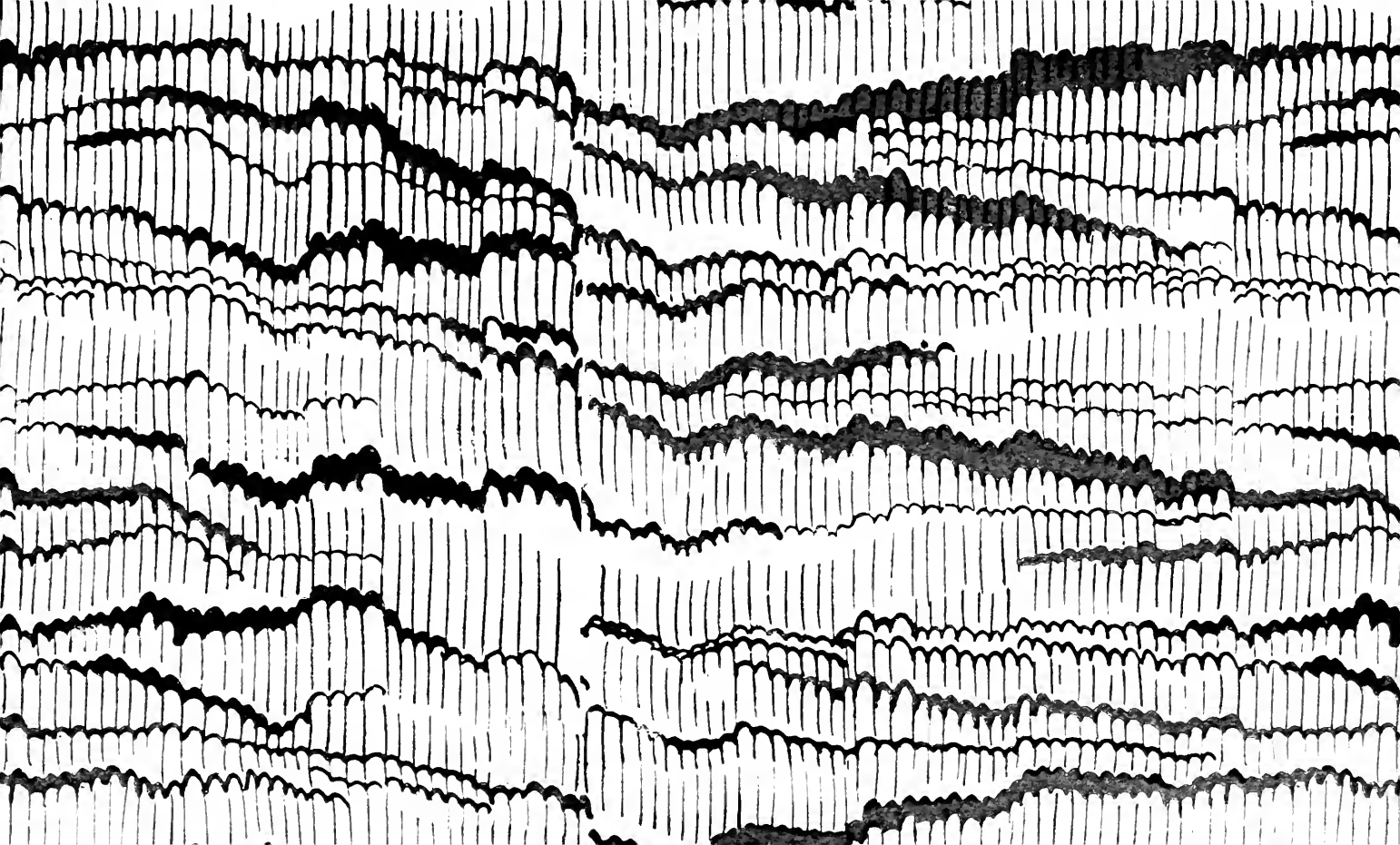

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