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THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION

EDITED BY

G. T. BETHUNE-BAKER, F.Z.S.,
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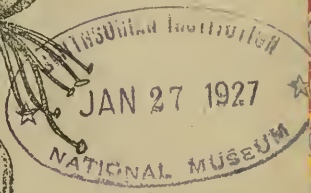
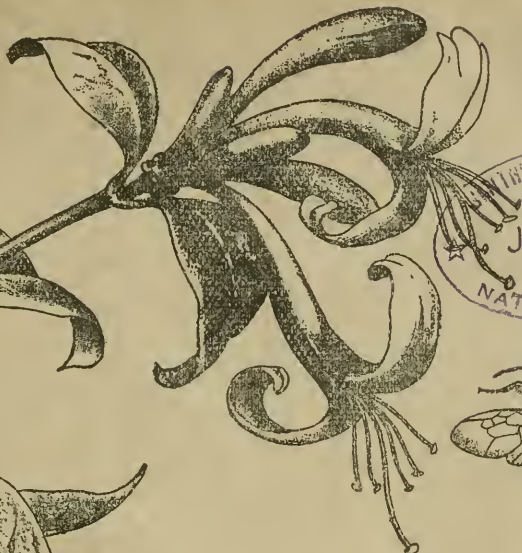
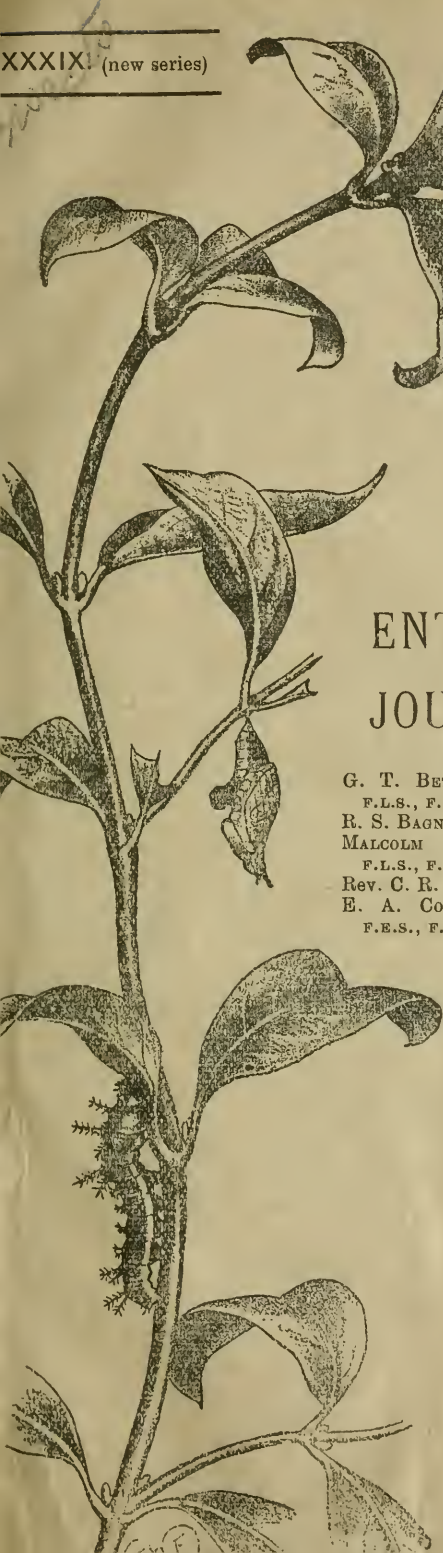
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The Entomologist's Record.

Photo, E. A. Cockayne.

Thera Hybrids.

Hybrid prouti ♂ 1-5. ♀ 6-8.

Hybrid woodi ♂ 9-18. ♀ 19-24.

The Entomologist's Record

AND

JOURNAL OF VARIATION.

VOL. XXXIX. No. 1.

JANUARY 15TH, 1927.

Hybridisation Experiments with *Thera variata*, Schiff., and *T. obeliscata*, Hb. (with Plate I. *).

By E. A. COCKAYNE, D.M., F.R.C.P., F.E.S.

In my paper in the *Record* of March, 1926, I described my attempt to hybridise these two species in the autumn of 1925 and stated my intention to try again with the spring brood. With this object I went to the New Forest at Easter and beat about 350 *Thera* larvae from Douglas fir. Some were pupating before my return, and I found it impossible to separate those with pink legs from those with green ones owing to the lack of time, and so was unable to confirm my conclusion that the colour of the legs is a safe character, by which these two species can be differentiated. From the larvae with pink legs, which appeared to be more numerous, I expected to obtain *obeliscata*, and actually did breed rather more of this species than of *variata*. I had originally intended to cross the *variata* with *obeliscata* from Oxshott, but beating there was most unsuccessful and I only got one larva.

To avoid any risk of pairing between members of the same species, I separated my pupae roughly into males and females and rejected any imago, which had been with a member of the opposite sex of its own species for however short a time. Fortunately the sorting was satisfactory and very few were wasted for this reason. On April 25th, the first specimens of each emerged and the experiment was begun. To obtain pairings I had a number of boxes and into each I put two or three males of the one species with two or three females of the other. Imagines continued to emerge until May 27th, and, although parasites had destroyed more than half the larvae, there were quite enough for my purpose. On the whole *variata* appears to be a little later than *obeliscata*. By May 6th, I had many females of the latter but only three of the former, and the last imago of all was a *variata*. In order to make sure that I had not introduced a pair of the same species in any of the boxes the insects in each were examined at least twice and a final examination was made when they died. Altogether I used 33

*Will appear in February number.—Hy. J. T.

mules and 26 females of *obeliscata* and 32 males and 21 females of *variata*, and from these I got two fertile pairings of *variata* ♂ × *obeliscata* ♀ yielding 81 eggs, and five or six fertile pairings of *obeliscata* ♂ × *variata* ♀ yielded 200 eggs, the latter being the cross I failed to obtain last autumn. The fertile eggs were all laid singly or in rows of two or three on the needles of the spruce, and pairing took place quickly or not at all. One female *obeliscata* laid a full complement of eggs within the first three days, and placed them all on the needles, suggesting that she had paired, but all the eggs were infertile. The other infertile females of both species either laid no eggs, or laid comparatively few and after some days delay, and many of the eggs were laid on the sides or bottom of the box, or on the muslin cover. The larvae from the earliest pairing of each cross began to hatch on May 22nd, and at the start thrave on spruce, but after the first and second instars they began to die. The larvae of the *variata* ♂ × *obeliscata* ♀ cross were the hardier and several rapidly outstripped the rest, but of the reciprocal cross only one larva grew with this rapidity. On June 28th I noted that on the whole the larvae of this hybrid were the larger, in spite of the fact that many of the smallest of the larvae of the other hybrid had died.

On July 15th the first imago of each hybrid emerged, but many more *variata* ♂ × *obeliscata* ♀ had pupated than *obeliscata* ♂ × *variata* ♀, and by August 1st, 22 of the former had emerged and only 8 of the latter. In the end even the bigger larvae of both hybrids began to die and I lost two or three which were pupating. On September 21st the last imago, *variata* ♂ × *obeliscata* ♀, emerged, and it was clear that the remaining larvae, which were *obeliscata* ♂ × *variata* ♀, intended to hibernate. Before the end of October they were all dead.

There is no doubt that all the imagines bred are true hybrids. I have mentioned the care taken in the pairing, and to avoid any danger of introducing larvae of either parent species I bred neither *obeliscata* nor *variata*. There was little risk of bringing in larvae on the food-plant. The spruce was gathered from places where *variata* does not occur, and it is not a usual food of *obeliscata*, but nevertheless it was always examined for possible intruders. Luckily most of the larvae grew more quickly than wild larvae of *obeliscata*, and this made my precautions almost unnecessary.

CHARACTERS OF THE HYBRID LARVAE.—In my former paper I pointed out that the larva of *variata* has green legs and that of *obeliscata* pink legs. An examination of the legs of the hybrid larvae in their last instar gave the following results:—*variata* ♂ × *obeliscata* ♀—25 pink: 10 pale pink: 1 green. *Obeliscata* ♂ × *variata* ♀—20 pink: 20 pale pink: 4 almost green: 1 green. Those which I have called almost green showed a faint tinge of pink on every segment, but to the naked eye they appeared green. The leg colour of *obeliscata* is to a great extent dominant over that of *variata* when *obeliscata* is the female parent, but when *variata* is the female parent, the influence of this species is little inferior to that of *obeliscata*.

In my previous paper I showed that most larvae of *obeliscata* had 7 setae on each side of the anal flap and some had 6, whereas in *variata* the majority had 5 and some had 6. In the case of the hybrids there was greater variation. Of 28 hybrid larvae, *variata* ♂

\times *obeliscata* ♀, six had 7 on each side, four had 7 on one side and 6 on the other, sixteen had 6 on each side, and two had 6 on one side, and five on the other. Thus ten had more setae than any *variata* I have examined, but only two had fewer than any *obeliscata*, and none had the commonest number in *variata*, 5 on each side. These larvae resembled *obeliscata* more than *variata*. Of 34 hybrid larvae, of *obeliscata* ♂ \times *variata* ♀, four had 7 setae on each side, three had 7 on one side and 6 on the other, nineteen had 6 on each side, five had 6 on one side and 5 on the other, two had 5 on each side, and one had 5 on one side and 4 on the other. Seven had more setae than I have found in any *variata*, eight had fewer than I have found in any *obeliscata*, so that in this respect neither species appeared to have a predominating influence in this cross. The number of asymmetrical examples, fifteen out of sixty-two, is rather remarkable and did not seem to be due to injury. It was noticed in some living larvae and in others it was found in the cast skin of the larva after pupation. In one asymmetrical larva of *obeliscata* ♂ \times *variata* ♀ the third and fourth setae on the right side were exactly at the same level, one just internal to the other, but in all the others the setae were spaced out fairly evenly along the edge of the anal flap.

The results obtained by examining the setae and the colour of the legs agree. The influence of *obeliscata*, when it is the female parent, is greater than that of *variata*, but, when it is the male parent, it is about equal to that of *variata*.

CHARACTERS OF THE PUPA.—I found that both parent species had pupae varying from pale green to blackish green and was unable to distinguish any difference in the markings or in the structure of the cremaster. The pupae of both hybrids showed the same range of colour variation.

CHARACTERS OF THE IMAGINES.—Hybrid *Thera woodi*, nov. hybr. *T. variata* ♂ \times *T. obeliscata* ♀, named after Mr. H Worsley-Wood.

Hybrid *Thera prouti*, nov. hybr. *T. obeliscata* ♂ \times *T. variata* ♀, named after Mr. L. B. Prout, whose paper first drew attention to the occurrence of *variata* in England.

Of hybrid *woodi*, 27 were bred, 19 males and 8 females.

Of hybrid *prouti*, 23 were bred, 17 males and 6 females.

It is a pity the different broods were not kept apart both from the point of view of the sex ratios and the colour variation, but the time required for this was greater than I could afford. The excess of males is noteworthy, and I do not think it was due to the death of female larvae. The females on the whole emerged later than the males, but the first *woodi* to emerge was a female and the last to emerge in the case of both hybrids were males. Most of the big larvae which died were, to judge by their size, males and only one was undoubtedly female. It is well known that in some hybrids the sex ratio is abnormal; in some cases there are more males than females and in others all are males.

THE MALES OF HYBRID WOODI.—These fall roughly into four groups.

(a) Four very pale; general effect very smooth and uniform. Two with much more grey than ferruginous both in median area and rest of forewing (Figs. 9 and 10); two with median area pale ferruginous and with ferruginous tint in other parts of wing: one of the latter is less uniform than the other and is paler outside the postmedian and

between the antemedian and basal patch. The shade proximal to the antemedian is faintly indicated in all: the nervures in median area are slightly darkened.

(b) Five rather uniform and lacking in pattern, but darker than the above and with a darker ferruginous median area and basal patch; in four the ground colour of the rest of the wing is much more brown than grey: one is darker than the others and has a browner median area and greyer ground colour (fig. 11): with one exception the shade proximal to the antemedian is very indistinct: nervures in median area are dark.

(c) Seven very pale: pattern variegated like the better marked *variata*, but with pale ferruginous median area and brownish tint in ground colour; postmedian not indented: shade proximal to antemedian well marked: nervures in median area darkened. In five the wing between the postmedian and subterminal from the costa to the bend in the postmedian is much whiter than the rest of the ground colour, a character of *variata* (figs. 12-16).

(d) Three with median area blackish brown: basal patch paler but with very dark edge and dark strips across it; paler lines distal to patch and on either side of median area: ground colour greyish brown. These are indistinguishable from some of the banded forms of *obeliscata* (the nymotypical form) (figs. 17 and 18.)

THE FEMALES OF HYBRID WOODI.—(a) One is pale like the males in group (a), but the ground colour is almost pure grey and the grey shades proximal to the antemedian, and the grey subterminal are very distinct and darker than the pale ferruginous median area itself. The nervures in median area are darkened. (fig. 9.)

(b) One is rather like the males in group (b) but the markings are more distinct. (fig. 22.)

(c) Four are very like the males in group (c) and one is even more prettily variegated; the outline of the postmedian lacks the loops which indent that of *variata*: the nervures in the median area are darkened. (figs. 20 and 21.)

(d) Two are banded, but not so distinctly as the males: the ground colour is a darker brown and the median area is less clearly delimited by pale lines. (figs. 23 and 24.)

MALES OF HYBRID PROUTI.—(a) Four very similar to group (a) of the reverse cross, but with brownish ground colour. (fig. 1.)

(b) Six like group (b) of *woodi*: two with very red-brown ground colour (fig. 2): three with greyer ground like the darkest *woodi*. (fig 3.)

(c) Seven a good deal darker and with one exception not so well marked as group (c) of *woodi*: one has the median area narrow and broken in the way which is so common in *juniperata*. In the figure the median area is too dark. (fig. 4.) But for the more ferruginous median area it might easily be mistaken for the uncommon brown form of *variata*.

All six females of *prouti* correspond with the males of group (c): none show much variation and resemble in pattern the obscurely marked *variata* race *britannica*; in five the ground colour is brown (figs. 6 and 7), and in one grey-brown (fig. 8.)

The two hybrids have many points in common, and their colour and pattern show characters derived from both parents. The median area almost always has the ferruginous or brown colour of *obeliscata*.

The rest of the ground colour varies; in many it is as brown or nearly as brown as in *obeliscata*, but only in two is it nearly as grey as in *variata*. In none is it as pale reddish as in the common var. *herrichi*, and in none as grey as in *variata*. In the majority the pattern is more nearly that of *obeliscata*, although in some it is more like that of *variata*. The outline of the postmedian is almost always that of *obeliscata*, and only in one is it as looped as in *variata*. The darkening of the nervures in the median area is well marked in most, and in this respect they are more like *variata*. The banded forms are almost identical with some *obeliscata*. The chief differences between the two hybrids are that *prouti* is the darker and lacks the branded and pale variegated forms.

Taking all the hybrids together, there are several specimens which would attract little or no attention in a series of *obeliscata*, but none would be mistaken for *variata*, although one at least is more like this species. The effects attributable to each parent are less easy to assess exactly in the case of the imagines than in the larvae, but here too the influence of *obeliscata* appears to be the greater especially when it is the female parent. Those most like *obeliscata* occur amongst the *woodi* and the one most like *variata* amongst the *prouti*.

Owing to its much more restricted distribution on the continent Herr Höfer thinks it probable that *obeliscata* is the more recent species, or, to be more accurate, he regards it as a species in the making, but he expresses the view that crossing it with *variata* may lead to a more definite conclusion. This has now been done, but it would have been still more interesting to have seen to what extent segregation of characters occurred in the second generation of the hybrids and whether *obeliscata* would have proved to be a true dominant. No attempt was made to do this, because I have found it impossible to keep *Thera* larvae alive through the winter, and I do not even know whether such secondary hybrids can be obtained.

In the case of hybrids the species with the greater influence on the offspring is usually regarded as the older, and if this be accepted as true, *obeliscata* must be phylogenetically older than *variata*. The result is unexpected, but I am very doubtful if the argument is sound. It seems to me more probable that the recessive is the older form. Recessive characters must be common to both species, but dominant ones may be present only in one. If they have not been lost by the species lacking them they must have been newly acquired, and indicate that the species possessing them is the younger.

Bowater describing his hybrid *Cerura furecula* ♂ × *bicuspis* ♀ says that it shows a greater resemblance to *furecula* than to *bicuspis* and gives the following quotation from Harrison. "The superior influence of the male is noted in practically all the hybrids I have reared, not only amongst the genus *Nyssia* and *Lycia*, but also in Ennomids and Larentiids likewise." The hybrid *woodi* is an exception to this rule, for both on the larvae and imagines the female parent has the superior influence.

The Ants (Formicidae), and some Myrmecophiles, of Sicily.

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

(Concluded from Vol. XXXVIII., p. 165.)

Strongylognathus destefanii, Emery.—Up to now only a single specimen (the type, a female) of this ant had been taken. I was fortunate enough to find three colonies, as well as a single ♀. On April 6th, I took a single dealated ♀, which was by itself under a stone at Taormina. On April 12th I discovered a strong mixed colony of *S. destefanii* and *Tetramorium ferox* v. *diomedaea*, at Taormina. It was situated under a stone on the hill side, but extended some distance both sides in the stony ground. I should say about 80% of the ♂♂ were *Tetramorium*. The nest was very difficult to dig up, and much time and labour failed to disclose females of either species. Another similar mixed colony was found on the other side of Taormina on April 20th. The ants were under a small stone, but extended widely in the very stony hard ground. In this nest four specimens of the beetle *Dichillus pertusus* were present. Finally on April 22nd, I found a mixed colony of the *Strongylognathus* and *Aphaenogaster semipolita*! I cannot explain this, but the fact remains, and no amount of digging produced a single *Tetramorium*.

Different forms of the genus *Strongylognathus* (of which there are four species, six subspecies, and two varieties, known) have occurred in Algeria, Tunis, Spain, France, Switzerland, Italy, Sicily, Caucasus, Urals, and Central Russia, and have always been found associating with forms of *Tetramorium caespitum*. They possess sickle-shaped jaws similar to those of the true slave-makers *Polyergus*, but have been called degenerate slave-makers, as they appear to have mostly lost the power of making slave raids. Unlike most parasitic ants the female of both host and guest live side by side in the nest. The *Tetramorium* workers bring up males, females, and workers of the *Strongylognathus*, but only rear their own workers. Wasmann suggested that these mixed colonies were founded jointly by a female of each species, but Wheeler rather thinks that the *Strongylognathus* female enters a *Tetramorium* colony after it has already been established. This latter view is perhaps borne out by the finding of solitary *Strongylognathus* females. Such a female is probably waiting near a *Tetramorium* colony, for an opportunity to enter its nest.

As the worker of *Strongylognathus destefanii* is undescribed, I have drawn up the following description of the same:—

♀ *Yellow, shining, antennae, vertex of head, and gaster a little darker (more shining) and of a brighter yellow than in S. huberi, Emery., with somewhat long erect hairs (slightly longer than in S. huberi) on head and whole body.*

HEAD: broader in comparison to its length than in *huberi*; mandibles long and strong, sharply pointed and very finely striated; clypeus and frontal area smooth and shining; rest of head almost smooth, with fairly large widely separated punctures, and with faint striae on cheeks and temples; antennae rather long, scape slender, funiculus with a rather large, well-marked, 3 jointed club.

THORAX: pronotum and mesonotum smooth and shining; sides of mesothorax and epinotum longitudinally striate; epinotum armed with two short, sharp teeth.

PETIOLE with node high; post-petiole transverse (much more so than in *huberi*) and lower than petiole, both petiole and post-petiole broader than in *huberi*; gaster apparently smooth and shining, but very finely transversely striate.

LONG 3.5-3.8mm.

Subfamily DOLICHODERINAE.

* *Bothriomyrmer adriacus* subsp. *ionia* var. *sicula*, Emery.—This form was described by Emery [*Bull. Soc. Vand. Sci. Nat.* 56 17 (1925)] in 1925 from two workers taken in Sicily (locality unknown) by de Stefani many years ago.

On April 22nd I found a large and prosperous colony under a stone at Taormina.

* *Iridomyrmer humilis*, Mayr.—On March 21st, 1926, in Palermo, I found a number of workers of this introduced species running in small single files on the pavement of a road towards the outskirts of the town. They appeared to come out of a garden, and one ♂ was observed to be carrying an Aphid. This is the first record for Sicily of this pest—the well-known “Argentine Ant”—which has been rapidly extending its range during the last twenty or thirty years and becoming cosmopolitan. In Madeira it has exterminated the local species. It has been introduced into New Orleans (where it now extends over fully 5000 square miles to the Gulf of Mexico), California, Cape Town and Basutoland. MacDougal sent it to me to name from the Canary Isles in 1924, I received it from Guernsey in 1919, and Forel records it from Central France. In Britain—Carpenter recorded its occurrence in vast numbers in Belfast in 1900, where it caused the greatest inconvenience; Waterston sent it to me to name from Edinburgh in 1912; Fryer from Enfield in 1916; Theobald from Eastbourne in 1916, (here I understand two streets are uninhabitable on account of the presence of this species): Keys from Plymouth in 1923; in 1921 Holkyard took it in a hot-house at Broadbottom, Cheshire; in 1922 Britten captured ♂ ♀ in Canary bananas at Fallowfield, Manchester; and in November 1926, I found it at Tring.

Tapinoma nigerrimum, Nyl.—This ant was abundant everywhere, nesting under stones, in bushes and rocks, and running on walls and in gardens, etc. A number of males was observed at Taormina on April 6th running on a rock, in the interstices of which the colony was situated; and males and winged females were found in a large colony nesting under a stone on April 21st. A deâlated ♀ was taken on April 6th which was walking along a dusty road. Various myrmecophiles were found with this ant—the beetles, *Stenosis brentoides* var. *sicula*, Sol., occurred in two nests at Mondello on March 17th, and again on April 22nd, at Taormina, *Drusilla memnonius*, Er., in a nest under a stone at Palermo on March 21st; and numerous examples of *Anthicus 4-guttatus*, Rossi, were running in company with workers of this ant in the Excelsior Palace Hotel garden at Taormina in March, looking so ant-like that I was frequently taken in. Young males of two spiders *Micaria* sp.?, and *Phrurolithus* sp.?, which were also very ant-like, were found at Mondello on March 17th running in company with ♂ ♀ of *T. nigerrimum*. The most interesting find however was an Aphid of the genus *Paraletus*, new to science, which Professor F. V. Theobald has named after me. On April 21st at Taormina I found a number of this new species, one winged form being present, in a nest of *T. nigerrimum* under a stone, and when disturbed the ants hastened to carry away these Plant-lice into safety. On April 24th at Mola it was found again in still greater numbers, with the same ant. Forel and other writers have stated that ants of

the genus *Tapinoma* do not keep Aphids, but this discovery proves that they do rear these insects, especially as the Genus *Paracletus* is the most truly myrmecophilous of all.

Subfamily FORMICINAE.

Plagiolepis (Plagiolepis) pygmaea, Latr.—This little species was abundant at Mondello, Taormina, etc., nesting under stones, and generally a number of queens was present in each nest.

Acantholepis frauenfeldi, Mayr.

* *Acantholepis frauenfeldi*, Mayr. var. *nigra*, Emery.—I found colonies of this variety at Taormina on April 6th, 7th, and 16th, etc., always under stones. Three or more, and on one occasion very many queens, were found in a single nest.

Acanthomyops (Donisthorpea) niger, L.

Acanthomyops (Donisthorpea) alienus, Först.

Acanthomyops (Donisthorpea) brunneus var. *nigro-brunneus*, Donis. (*alieno-brunneus*, For., of Emery's list?)—This dark form of *brunneus*, which I have named *nigro-brunneus* [*Ent. Rec.* 38 18 (1926)], was found nesting under stones, and also, as does the true *brunneus*, in trees. At Palermo on March 16th, workers were observed running at the foot of a wall in a field, and on 21st a colony was found under a stone. In the Hotel garden a colony occurred in a hollow tree, and on March 28th my old Windsor friend the ant's nest beetle, *Euryusa sinuata*, was taken running on a path in company with workers of this ant. Two more specimens of the *Euryusa* were found on April 2nd in the nest of this ant which was situated under a stone.

At Taormina colonies were observed in the wood-mould in holes in olive trees, and on Isola Bella on April 26th another was seen inhabiting a hollow olive tree.

Silvestri [*Boll. Lab. Zool. R. Scuola Agri. Portici* 6 237-38 (1912)] records the capture of two myrmecophilous beetles—*Homocusa acuminata*, Märk., and *Claviger nebrodensis*, Rag., with *A. (D.) brunneus* at S. Guglielmo, near Castelbuono. The last named beetle which, like all the species of the genus *Claviger*, is blind, and is a true guest, being fed by its hosts, and also supplying them with a sweet secretion, was first taken in Sicily by Ragusa, who recorded and described it in 1871 [*Bull. Soc. Ent. Italiana* 3 194-96 (1871)].

† *Acanthomyops (Donisthorpea) brunneus*, Latr. (Ragusa; Silvestri).

Acanthomyops (Donisthorpea) emarginatus, Latr.

Acanthomyops (Chthonolasius) flavus, F.

Formica sanguinea, Latr.

Formica fusca, L., var. *glebaria*, Nyl.—Many workers were seen running about on the rim of a fountain, and on a willow tree, etc., in the Excelsior Palace Hotel garden at Palermo in March.

Camponotus (Camponotus) ligniperdus, Latr.

Camponotus (Camponotus) ragns, Scop.

Camponotus (Tanacemyrme) sylvaticus ssp. *pilicornis* var. *sicula*, Emery. Stray soldiers and workers were taken in cart-tracks, drains, etc., and in spiders' webs in the Hotel garden at Palermo in March. At Mondello on March 17th large colonies were found under stones containing many soldiers, and workers of all sizes.

Camponotus (Tanacemyrme) aethiops, Latr.

Camponotus (Tanaemyrmex) atlantis, Forel (*pallens*, Nyl.).

* *Camponotus (Tanaemyrmex) atlantis* ssp. *nylanderi*, Emery.—This subspecies was found at Taormina, Capo S. Andrea, and Mola, nesting under stones, and in walls, etc. Workers were seen running about on leaves, and hunting high up on olive trees, etc. Soldiers were always present in the nests and gynaecoid workers were noticed in several (Taormina 14th April, etc.). Very large and brightly coloured workers (♂ ♀ not 2 2) were found in a nest at Mola on April 24th. In a nest under a large stone in a wall at Taormina (April 15th) the following myrmecophiles occurred—the Cricket *Myrmecophila ochracea*; the beetles *Coluocera formicaria*, *Oochrotus unicolor*, and *Merophysia formicaria* var. *sicula*; the Fish-Insect *Lepisma aurea*; and the little Spring-tail *Cyphodeirus albinus*. Some aphids (*Tetraneura ulmifoliae*, Baker), occurred in another colony on April 18th.

Camponotus (Myrmoscirus) rufoglaucus ssp. *micans*, Emery.—On March 16th a number of workers was taken running on a wall, and a single dealated female in a drain by the roadside on 20th at Palermo. At Mondello, on March 17th, a mixed colony of this ant and *Aphaenogaster testaceo-pilosa* var. *semipolita*, was found under a stone. At Capo S. Andrea on April 9th, a very large colony containing a dealated female, soldiers, and workers, was found.

Camponotus (Myrmentoma) gestroi, Emery.

Camponotus (Myrmentoma) lateralis, Ol.—Workers of this pretty ant were observed on walls, and running on the herbage, etc., at Taormina in April.

* *Camponotus (Myrmentoma) lateralis* ssp. *spissinodis*, Forel.—A colony of this subspecies was found under a stone at Taormina on April 21st, a number of winged females being present in the nest.

Camponotus (Myrmentoma) siceli, Mayr.

Camponotus (Colobopsis) truncatus, Spin.

At the base of a rock at Taormina, on April 26th, I found a number of the larvae of the fly, *Vermileo degeeri*, Macq., in their funnel-shaped pits which they construct, after the manner of the true "ant-lions" (*Myrmeleon*), to entrap ants.

The large grey woodlouse *Porcellionides myrmecophilus*, Stein., taken on April 21st and 24th, was taken by Budde-Lund in Dalmatia in nests of *Messor structor*, and by Dollfus in ant's nests at Lentini, Sicily.

Since the first part of this paper was published Professor F. V. Theobald has kindly named the *Aphidae* I took with ants in Sicily:—*Tycheoides albicornis*, Koch., was taken with *Aphaenogaster pallidula*, at Taormina on April 17th; *Tetraneura ulmifoliae*, Baker, (*ulmi*, L.) with *Triumvirum caespitum* ssp., *semilaeve*, at Mola on April 24th; and *Anuraphis siciliensis*, Theob. (a new species), with *Cremastogaster sordidula*, at Taormina on April 27.

Mr. E. E. Green, has also seen the white globular objects, which were being carried by *Cremastogaster luestrigyon* ♀ ♀ on April 7th, and he suggests that they might possibly be immature coccids allied to *Margarodes*.

P.S.—Mr. Green also tells me that the coccids I took in a nest of *Camponotus sylvaticus*, at Bordighera on February 18th, 1925, are *Eriococcus bahiae*, Ehrh., see *Ent. Rec.* 38, 17 (1926).

Note on Dr. Verity's Method of Nomenclature.

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

On page 121 *ante* my friend Dr. Verity refers to Boisduval as the author of *Hirsutina rippertii*. He says "If, following Courvoisier, we fix on Boisduval as the author of *rippertii* because Freyer's figure . . . is unreliable," and he then follows with the conclusion that the nymotypical race is from Digne: in doing this he, unfortunately, ignores the Code altogether, for the original author of *ripartii* is Freyer, and this being so Boisduval cannot be the author of it. It should however, after Freyer's spelling, be *ripartii*—then, I fear, I do not agree that the figure is unreliable. It is quite a good figure of that insect, the only thing is that the white of the stripe and of the irides of the ocellations is turned blackish-grey as so often happened with the old authors, and I am sorry to say with those of our day also, for in some of Oberthür's beautiful plates the white markings have already gone blackish.

The point is that no one can transfer a published name of one author to another author, as my friend purposes. *Ripartii*, Freyer, must remain (being described and figured) *ripartii*, Freyer, and cannot be listed as *rippertii*, Boisduval.

Again on the following page Dr. Verity names a form of *P. coridon rufosplendens*, calling it a *race* and he says it is "characterised by the bright warm tawny underside of the hindwings in a large percentage of individuals." I want to emphasise the statement "a large percentage," it may I suppose be 30, 40, or 50% or possibly even more, but this does not constitute a race, it is merely a very common variation.

A *race* is generally accepted as a form, that replaces in a given area, the typical form. This is by no means the case with *rufosplendens*. Referring to *P. melager*, my friend describes *superlanulata* from a single specimen; it is evidently a "sport," or unusual aberration, and most of us, at least in England, consider this constant naming of aberrations and pseudo-races, a really reprehensible practice. As long ago as 1916, Vol. XXVIII., when dealing with the varieties of *P. coridon*, Dr. Chapman winds up his paper with these words "the terrible multiplication of varietal names we suffer from, is an evil that ought in some way to be checked." The great majority of British authors entirely agree with Dr. Chapman, whilst the *Zoological Record* has decided not to list them.

It is getting more obvious as time goes on, that in this country, at least, this great multiplication of names is considered not only unnecessary, but also unscientific and I would appeal to Dr. Verity to help us to reduce the practice.

A sub-species, a race, a local form or a form! What are they?

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

The continual appearance of Dr. Verity's papers in this magazine, describing and naming what he considers new varieties, often on minute and variable differences and calling them races, when they generally are only a per centage of the species being dealt with, has for

sometime been disturbing my peace of mind on these matters and leads me now to ask for, and if possible get, a discussion on what constitutes a sub-species, or a race, or a local form.

My own opinion is that a sub-species and a race are almost synonymous, if there be a distinction, the term race is very, very, little lower in the category than sub-species.

A local form is a concept much lower in the category.

A sub-species or a race, therefore, entirely replaces what is generally regarded as the typical race in a given area.

A local form does not replace the stem, but flies in more or less abundance with it. I will cite a case in point—*A. coridon-roystonensis*, is neither a race nor a sub-species; it flies in a limited area with what we call the stem, or parent species and therefore cannot be treated as a race.

The question also arises as to what is the difference between a species and a sub-species. We call for instance *P. coridon*, a species or the parent species and we call *albicans*, from Andalusia a sub-species, but many scientists will say they are sub-species of one concept.

I have written this expressly to obtain the views of entomologists on this question, and I would ask that the matter should be seriously considered and I hope that many observers will give us their views.

Notes on Nomenclature.

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

RACE.—This term has come to be used in two ways: one as an indefinite term often applied, in general remarks at meetings and in field notes in our magazines, to a group of individuals found in some particular locality, such as a field, a slope of downs, a portion of a hill-side, with a meaning more akin to an individual brood, the offspring of one pair, or of a number of pairs closely cohabiting; the other use as marking a more or less definite grade in the conception of a species, subordinate to a subspecies. As Mr. Bethune-Baker has said, a subspecies is that which entirely replaces the species in any locality, and a local form does not replace the species but flies with it in more or less numbers. He has cited *roystonensis* as a local form, and I may add also one of the other forms flying in the same locality, *inequalis*. Both these are recurrent forms; were they only occasional forms they would both be termed aberrations. But the *coridon* occurring in the Royston area characterised by the comparative abundance of *roystonensis*, by the abundance of *inequalis*, by the great excess, in most seasons, of females over males, and by the unusual abundance of varied aberrational forms is an example of one of the best characterised races which we have in this country. Strange to say it has escaped the nomenclator so far.

VAR.—The old term *var.* (*varietas*) was used for generations to designate any and every divergence from the ordinary specific form, and became so abused in its use that at present one can only recognise it as a "term of ignorance" only indicating that the individual or individuals are not identical with the species, and affording such a limited amount of information as to grade as to be negligible. Thus our grades appear to be Species, subspecies, race, form, generation, aberration.

NOTES ON COLLECTING, etc.

AGRIUS (SPHINX) CONVOLVELLI IN GRAVESEND.—A living specimen (imago) of *A. convolvuli*, was brought to me on November 23rd last, it having flown into a window in this town. Is not this an extraordinarily late date for this insect to be on the wing?—F. T. GRANT, 37, Old Road West, Gravesend.

MOTH AND PARROT PLAGUE.—In the *Daily Mail* of November 23rd, appeared a paragraph from their Correspondent at Sydney, N.S.W., writing under date of October 22nd, reporting a plague of moths at Port Macquarie on so extensive a scale that the town was stated to have been almost black with them, but what strikes me as more curious is that simultaneously the town was visited by thousands of green parrots which the children are reported to have caught in hundreds on fences and fruit trees. This combination appears so remarkable that it may be worth recording.—G. C. LEMAN, F.E.S.

[In the *Abstract of Proceedings* of the South London Entomological Society for Jan. 9th, 1890, is the following extract of a letter bearing on the above, "Mr. F. E. Strong, writing from Melbourne on Nov. 14th last, stated that about three weeks prior to the date of his letter, Williamstown was invaded by a vast swarm of moths, which came into the houses and churches, and the sea was literally covered with their dead bodies. When these were washed up by the waves they formed a long line, over a mile in length, averaging about a foot in breadth and about four inches deep. They appeared to be all of one species. The matter had been discussed in the Melbourne papers, but without any satisfactory explanation being arrived at."—Hy.J.T.]

SUGARING IN NEW MILTON, HANTS, AUTUMN, 1926.—Results were not very good, but much better than during the summer. The following insects were taken:—6 *Agrotis segetum*, 4 *A. puta*, 10 *A. suffusa* = *zpsilon*, 9 *Noctua c-nigrum*, 7 *N. rubi*, 68 *N. xanthographa*, 6 *N. plecta*, 7 *Apamea secalis* = *didyma*, 2 *Aporophyla nigra*, 73 *Phlogophora meticalosa*, 1 *Laphygma erigua* (in fine condition), 2 *Omphaloscelis lunosa*, 7 *Amathes lychnidis*, 1 *Xanthia lutea*, 1 *N. fulvago*, and 7 *Udaria (Dysstroma) truncata*. It will be noted from the above list that many common insects are entirely missing and that many insects that are usually very common are scarce.—LIEUT. S. A. JONES, "Biskrah," New Milton, Hants.

AUTUMN NOTES FROM S. DEVON.—*Colias croceus (edusa)*; I saw only two, in mid-September. *Leucania unipuncta*: a fine male taken at sugar on the evening of August 24th. *L. ritellina*: one female at sugar, on September 21st, apparently just freshly emerged. *Laphygma (Caradrina) erigua*: This species was of very fairly regular occurrence throughout September, with an average of two or three per night. The first was seen on September 3rd. On September 10th, I took eleven *L. erigua* and the following night seven turned up. All were at sugar. In one example the two stigmata on the left forewing upper-side are united to form a yellow streak, the right side being normal. I may add that I took a specimen at light at Bournemouth on October 7th. *Heliothis peltigera*: Only two turned up at sugar, a male on

September 13th, and a female on September 20th. *H. armigera*: I was fortunate enough to take three *H. armigera* all at sugar. The first appeared on September 3rd, a male apparently in an exhausted condition as it rested quietly on the patch in a manner quite different from that of the other two. It was also much paler than the later, freshly emerged ones. I therefore concluded it had flown a considerable distance. The second was taken on September 10th, apparently freshly emerged, and the third on September 18th, also in perfect condition. *Cidaria (Orthonoma) obstipata (fluriata)*: two or three turned up at sugar on September 11th. One female laid eggs freely and at the present time (October 12th) most of the larvae have gone into the pupal stage. I also took a male at Bournemouth on October 7th. *Dianthoecia luteago* race *barrettii*: larvae and pupae were exceedingly common in certain spots, sometimes as many as six or seven from a single plant, but more usually singly.—H. B. D. KETTLEWELL, Caius College, Cambridge.

HELIOPHOBUS HISPIDUS AT BOURNEMOUTH.—In a certain small area of sand-hills near Bournemouth there was an abundance of *H. hispidus* sitting on the marram grass among the dunes. They appear to belong to a particularly large race and to have a broader white border than those I have seen from the Devonshire coast. They could also be picked up in the daytime under the gas lamps.—IBID.

LATE EMERGENCES IN 1926.—*Dianthoecia carpophaga*, commenced to emerge on June 17th, and finished July 24th. *Dianthoecia conspersa*, commenced to emerge June 26th, and finished Aug. 3rd, some pupae lying over. *Neuria saponariae*, commenced to emerge June 30th, finished July 14th, (usually well out by June 10th.). *Agrophila trabealis (sulphuralis)*, first and only emergence Aug. 2nd, remaining pupae lying over.—H. M. Edelsten, (F.E.S.), Hillside, Lindfield Sussex.

CURRENT NOTES AND SHORT NOTICES.

A meeting of the Entomological Club was held on Tuesday, November 2nd, 1926. Mr. H. Willoughby Ellis in the chair. Owing to the Chairman leaving London for Sevenoaks, Kent, his London residence was not available for the meeting which was consequently held at the Junior Carlton Club, Pall Mall, S.W.1. Members present in addition to the Chairman—Mr. Robert Adkin, Mr. H. St. J. K. Donisthorpe, Prof. E. B. Poulton, F.R.S., Mr. Jas. E. Collin, Dr. Harry Eltringham, Mr. W. J. Kaye, Lord Rothschild, F.R.S. Visitors present—Dr. K. Jordan, Mr. R. W. Lloyd, Capt. N. D. Riley, Mr. G. C. Leman, Dr. Guy A. K. Marshall, F.R.S., Mr. W. Rait-Smith, Dr. E. A. Cockayne, Mr. E. C. Bedwell, Dr. S. A. Neave, Mr. E. Ernest Green, Mr. Granville Proby. The eight members of the Club were present, this being the second occasion in the history of the Club on which the whole membership was present. The members and visitors were received in the ante-room where conversation was held. Dinner was served at 8 o'clock in the Parliamentary Library on the historic Round Table. At a late hour the party broke up after spending a most enjoyable evening.

We would like to call our readers attention to the *List of Geometers of the British Islands*, which we have published. It includes all the named varieties and synonyms up to the date of issue. Not only is it useful as a list of all such but it is also an index to the references of each species in Seitz, Meyrick and South as the most commonly used books for consultation on the British species. In addition, as the arrangement is new to our British collectors an index has been added to the List to facilitate reference.

The Derbyshire Entomological Society has recently issued a *List of the Lepidoptera of Derbyshire*, compiled by H. C. Hayward, M.A., F.E.S. It is a praiseworthy piece of work and will be of great use to all local workers and to visitors who spend a few leisure weeks in this beautiful county of dales. It is arranged on the system of Meyrick's *Handbook*, which although based on one character and therefore misleading as to general relationships, and also shirks difficult species such as *Apamea guenei*, *Scoparia basistrigalis*, etc., yet gives most useful, workable and reliable mechanical keys of species placed in the various genera. One wishes Lists like this to be of use to the beginner, who will have to use it with books like South's *Butterflies and Moths*. It has been pointed out *ad nauseum* that *minimus*, *astrarche* and *phlaeas* (sic) are in no way congeneric; neither are *argiolus* and *icarus*, nor are they *Lycæna*. One does not like to criticise hardly this most useful work on distribution and recording, but one does feel that it is only by the careful editing of local lists and the comparison with the latest determinations, that stability can be attained in our nomenclature and systematics for the coming generation of students. We want them to start, where we older ones leave off, and not where we or our forefathers began. It is our duty to the future to give the new generation a fair start and not leave them to work it all out again with consequent delay of progress.

Part 33 of the *Lepidopterorum Catalogus* has just come to hand. It lists the whole of the names which have been applied to the species in the genus *Zygaena* found in the Palaearctic Region. The author is the well-known specialist of the "Burnet" family, Dr. H. Burgeff. He lists 4 new species of his own describing and divides the 74 species into 12 subgenera, using for these last the 4 names given in Hübner's *Verz.* and adding 8 of his own names. He quotes the date of Hübner's *Verz.* as "1822?" Sherborn, Prout and Durrant have put this portion of the list as issued in 1820, basing their views on contemporary references and peculiarities of certain letters. When one turns to the varietal names, which have been used, one is appalled at the enormous number, most of them only having been used once or twice in literature. One can only hope that the future will prove that many are synonyms given by those, who rush into naming without adequate knowledge of what has already been done. *Z. purpuralis* has $2\frac{1}{2}$ pages of such, *Z. ceculans* has nearly 2 pages, *Z. achilleae* has 4 pages, *Z. meliloti* has 3 pages, *Z. filipendulae* has 8 pages, *Z. trifolii* has 3 pages, and *Z. loniceræ* has $2\frac{1}{2}$ pages. The author details all the uses of the various names. For instance the *loti* of Esper is treated as a synonym of *achilleae* with a ? and also as one of *angelicae* with a ?. Stephens *loti* is a synonym of *loniceræ*. Verty's *loti* (*Ent. Rec.*) one of *transalpina*. While Hübner's *loti* (*Samml.* 82.) is treated as a synonym of

Z. meliloti, his *loti* (Samml. 32) as a synonym of a form of *Z. transalpina* with a ?, and his *loti* (Beitr.) as one of *Z. elegans*. The amount of work put into a Catalogue of this description is amazing, and one can only say that no student of any pretention can work without such at hand always. Errors there may be, for it is humanly impossible to personally verify every reference with the original, and printers have a knack of inverting numbers, and other idiosyncrasies which are very annoying. However the part is another instalment of a most useful and admirable series, and a great credit to the originator and publisher of the *Catalogus*, Dr. Junk, of Berlin.

REVIEWS AND NOTICES OF BOOKS.

THE HETEROPTERA OF EASTERN NORTH AMERICA, with especial Reference to the Faunas of Indiana and Florida. By W. S. Blatchley, LL.D. The Nature Publishing Company, Indianapolis, pp. 1116, 12 pls. and 215 text figures.—The present work is a book for practical field-naturalists written by a past-master in the outdoor study of "other orders" of the American fauna. A quarter of a century ago the author, Mr. W. S. Blatchley, published a similarly grounded volume, *The Coleoptera of Indiana*; six years later he produced *The Weevils of N. America*; and six years ago *The Orthoptera of North-eastern America*. For more than forty years, he tells us, he has studied the Hemiptera, and to-day we have the results of his labours marshalled for the use of future students of the Order in this new work. The author claims that he has not written for the specialist, but for the tyro; he has used simple language for his characterisation of the families and genera with keys leading up to them. The species are diagnosed with clear and adequate descriptions in accord with the full and sufficient key-tables including every species in the area dealt with. To the description of each species is appended a very interesting account of the life-history, habits, habitats, distribution, food of the immature stages and often literary references culled from previous writers or from the information of his correspondents as well as from his own field experiences. Thus the identification of a species is rendered the more certain than if the description alone were furnished, and renders the volume an eminently educational book.

In the matter of illustration we confess we are greedy, for like Oliver Twist we "ask for more." There are 1253 species dealt with and these are illustrated by 12 plates and 215 figures, many of these being composite and consisting of a large number of details of structure, to aid in the morphological differentiation of the various groups and genera or in the case of very closely allied species. Wherever one opens the book, one finds evidence of the practical knowledge of a field worker aided by skill in portraying the species as it lives and as it reposed in the cabinet of the collector.

The matter is admirably arranged and properly displayed on the 1116 octavo pages, with an excellent Index by genera and a Bibliography of 23 pages with a reference to the general Catalogues of Van Duzee and of H. M. Parshley for further consultation.

The author is to be congratulated on the success of his persistent

and energetic work carried on for nearly half a century and we hope that the book will receive the support it deserves, published, as we privately understand, at the sole expense of the author, and costing in these times a not inconsiderable amount. No mean part of the appearance of the book is due to the care which the printer has shown in carrying out his technical share.—H.J.T.

NOVITATES MACROLEPIDOPTEROLÓGICAE.—A Catalogue of the Palaearctic Macrolepidoptera not contained in, or newly described since, the publication of Seitz. By Otto Bang-Haas. I Band up to 1920. Dr. Staudinger and A. Bang-Haas. Dresden-Blasewitz.—This is the first attempt of the new generation of the "Firma Staudinger" to follow in the footsteps of the famous author of the three editions of the world-known and world-used *Catalog*, and a very praiseworthy and meritorious work it is. It is an honest endeavour to list, with references, the whole of the species and varieties (in a comprehensive sense), which have been discovered and described since the issue of the various parts of Seitz encyclopaedic work. This first volume covers to the year 1920. A second section will cover 1920-1925. A further part will deal with subsequent additions. An endeavour will be made to include many described forms omitted in Seitz, such as numerous forms described by Tutt in his *British Butterflies* I-IV. and *British Noctuae*, only some of which were included in that work. Of course in a work like the present it is an easy matter to point out omissions and errors in numerical references; it is so absolutely necessary for the latter to be checked and checked again with the originals to secure correctness, a long, difficult and tedious matter almost impossible for one alone. Then, in the final proofs printers will often invert numbers and make such references absolutely hopeless. That a great advance has been made during the period from 1906 to 1920 is well shewn by the fact, that of *machaon* no less than 71 named forms have been added, to *galathea* 55 new forms, to *napi*, 53, to *trifolii* 50, to *urticae* 57, etc. The enormous number of forms added to the species of the genus *Parassius* have been so thoroughly dealt with in the *Lepidopterorum Catalogus* pars 27, recently published by Junk in Berlin, that one is referred to that work for them. The terms used by the author of each name, sub-species, race, form, generation, and ab. are used throughout, and where the grade is unknown, var. (the term of ignorance) is used. The classification is that of Seitz' work, but for ready, easy reference the species are arranged alphabetically in their own genera. The species are emphasised by Clarendon letters; the date of description and the locality of each subspecies, form and race are added. It is essential that all workers in Lepidoptera should possess this work of reference, even if only as a matter of time-saving. To go through the *Zoological Record* is a big task to the average worker with access to a good library, but to the student working away from such, it is an impossibility. The present work at the modest cost of 15s. is well worth the cost to the majority. One only complains that the whole period since 1906 could not be dealt with at once and save the handling of two or three volumes maybe, to find the species of our search. Those who subscribe for Vol. 1. are told that they will be able to obtain succeeding volumes at a reduced price.—H.J.T.

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Duplicates.—Very many in first class condition, high-set only f. i. Herminia flavicrinata, Andreas, Nych. dalmatina race andreasaria, Warnecke, about 30 species of rare Acidalias; pupae of Eupithecia illuminata or cash.—Karl Andreas, Wiesbaden, Goethestr. 23, Germany.

CHANGE OF ADDRESS.—H. Willoughby-Ellis, to Speldhurst Close, Sevenoaks, Kent.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. January 19th, Annual Meeting. February 2nd.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. January 27th, Annual Meeting. February 10th.—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., J. P. HARDIMAN, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

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All communications should be addressed to the Acting Editor, **Hy. J. TURNER**, 98, Drakefell Road, New Cross, London, S.E.14.

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The Entomologist's Record and Journal of Variation.

(Vols. I-XXXVI.)

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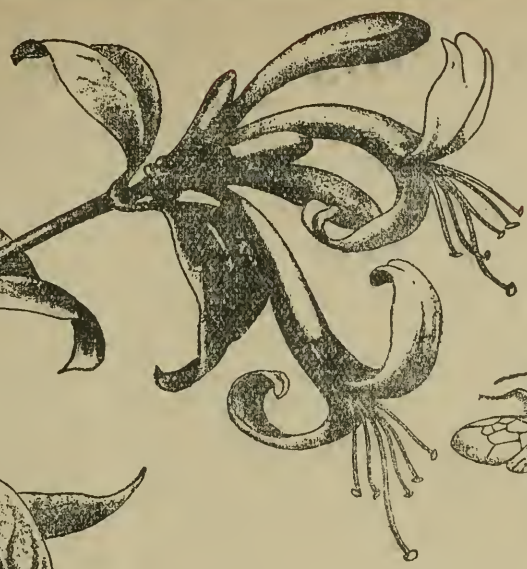
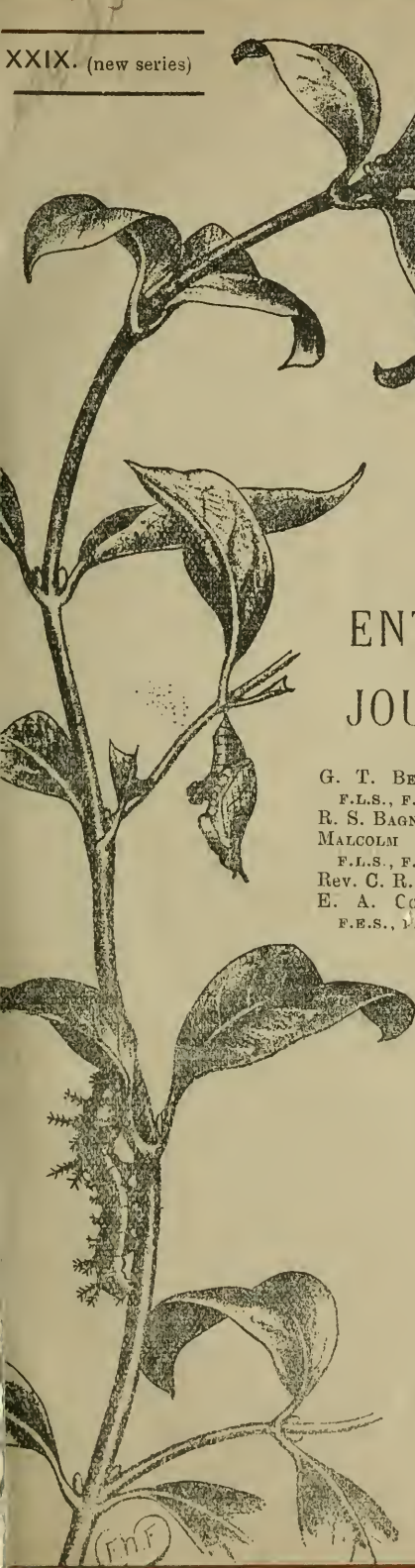
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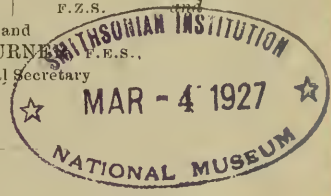
THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

EDITED BY

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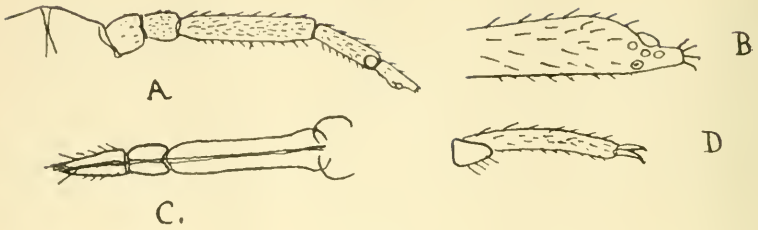
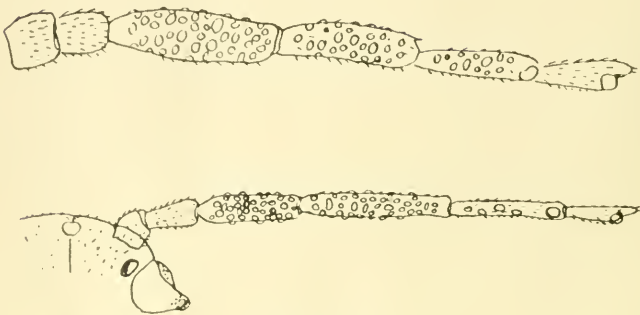


Fig. 1.



Figs. 2 & 3.

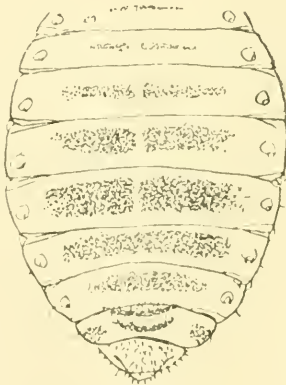


Fig. 4.

Entomologist's Record.

del. F. Theobald.

PARACLETUS DONISTHORPEI, sp. nov.

Fig. 1.—A. Head and antenna of apterous ♀ ; B. Apex of antenna ; C. Rostrum ; D. Hindtarsus. Fig. 2.—Antenna of alate ♀ of *Paracletus cimiciformis*. Fig. 3.—Head and antenna of alate ♀ *Paracletus donisthorpei*. Fig. 4.—Ornamentation of body of alate ♀ *P. donisthorpei*.

Two new Aphides from Ants' Nests. (*Plate II.*)

By FRED. V. THEOBALD, M.A., V.M.H., F.E.S.

1. *Paraclletus donisthorpei*, sp. nov.

Alate viviparous ♀. Antennae not quite half the length of the body, of 6 segments; I. a little wider but much shorter than II.; III. from $2-2\frac{1}{2}$ times length of II. with many round and oval sensoria all over it; IV. from $1\frac{1}{2}-1\frac{3}{4}$ of III., with many sensoria; V. about $\frac{3}{4}$ of IV., with four sensoria and a large apical primary one; VI. small, a little more than $\frac{1}{2}$ of V.; 'nail' very small; all the segments with minute hairs. Eyes large, with a large ocular process. Three marked stemmata. Head rounded in front, with a median line and many minute hairs. Pro-, Meso-, and Meta-notum dark, the pronotum slightly paler than others. Abdomen with dark median bars, the middle ones irregularly divided in the centre. Apex dusky. Cauda rounded. Legs long, dark, many minute hairs on tibiae. Body with minute hairs. Wings normal. Length, 3mm.; wing expanse, 7.9mm.

Apterous viviparous ♀.—Pale, minutely hairy; a small area in front of pronotum showing reticulate sculpturing: apex of rostrum dark. Eyes large, many faceted, dark. Head convex, with a median line. Body oval; segments well defined. Antennae reaching to or just past 2nd coxae, finely hirsute, hairs very short, those on segment III. are $\frac{1}{5}$ of its breadth; of 5 segments; I. and II. about equal in length; III. long, longer than IV. + V.; IV. a little more than half of III. and longer than V.; V. with very short, blunt 'nail,' which has one large and four small sensoria at its base. Rostrum reaches base of 3rd coxae, apical segment longer and narrower than the penultimate, with minute hairs. Legs moderately long, with very many short pale hairs, those on tibiae are $\frac{1}{3}\frac{2}{8}$ their breadth: 1st pair of legs a little shorter than 2nd; 2nd than 3rd. Cauda rounded and hairy. Length, 2.9 to 3mm.

LOCALITY.—Taormina, Sicily, 20.IV.26.

OBSERVATIONS.—Described from several mature apterae and one alate female, taken by Mr. H. Donisthorpe in the nests of ants, *Tapinoma nigerrima*. Two apterae show faint traces of a notch each side of antennal segment III. It differs from *Paraclletus cimiciformis*, Heyden, in the antennae of the apterous female having only five antennal segments and in the less reticulate sculpturing of the body and still more in the structure of the alate female antenna; the eyes of the apterae are also large and multifaceted. It approaches in the latter respect Mordwilko's *P. portskinskyi*, but differs in the antennae being of five segments and the shorter antennal hairs; in *portskinskyi* those on segment III. are from $\frac{1}{3}$ to $\frac{2}{5}$ its width, in *donisthorpei* they are $\frac{1}{5}$. It may be that it is only a variety of this species, which is very distinct from *cimiciformis*, the marked difference in the eyes of the apterae clearly demarking it and also the same with *donisthorpei*. Exactly what Mordwilko's *cimiciformis* is I do not know, certainly not the species of Heyden's that Del Guercio, Tullgren and myself have taken to be *cimiciformis*, for Mordwilko states that it is not sculptured and the antennal hairs are much longer. The name for this new species was first proposed by Mr. F. Laing.

FEBRUARY 15TH, 1927.

2. *Auraphis siciliensis*, sp. nov.

Apterous viviparous ♀. — Pale, with two dusky areas on the pronotum and dark median bars behind, the first between the cornicles. Body rather elongate. Antennae same colour as body, apices of segments III. and all IV., V. and VI. dark, in one all III. dark. Cornicles, cauda and anal plate dark. Eyes black and red. Legs same colour as body; femora, apices of tibiae and the tarsi darkened. Antennae not half the length of the body; segment I. a little longer than II.; III. about twice as long as IV.; IV. not quite as long as V.; base of VI. not quite equal to V.; flagellum equal to IV.+V.; all from III. to VI. imbricated, with a few short hairs. Abdomen with small rounded lateral papillae, rather darkened, very much smaller than in *ranunculi* (Kalt). The abdomen also shows six small irregular dark spots or groups of 2-3 small spots each side. There is one pair of posterior median papillae and in one specimen a single one in front of them. Cornicles about half the length of antennal segment III., cylindrical or slightly contracted at base and apex, imbricate. Cauda small, more or less hidden beneath the body, posterior border rounded; spinose, with short hairs. Anal plate narrow, spinose, with a few long hairs. Tibiae with many short hairs. Length, 1.2-1.8mm.

LOCALITY.—Taormina, Sicily, 27.IV.26.

OBSERVATIONS.—Described from three specimens taken by Mr. H. Donisthorpe in the nests of the ant, *Cremastogaster sordidula*. They resemble *Auraphis ranunculi* in regard to the rounded lateral papillae, but they are much smaller than in *ranunculi* and the body quite a different shape. From *A. heraclei*, Koch, they also differ in shape and the presence of a dark bar between the cornicles. The shape also separates it from Koch's *angelicae* and *farfarae*.

Amongst the other Aphides taken in Ants' nests by Mr Donisthorpe in Sicily were *Tetraneura ulmifoliae*, Baker, and *Tychaeoides albicornis*, Koch.

Miscellaneous Notes from Argentina. VII.

By KENNETH J. HAYWARD, F.E.S.

DESCRIPTION OF THE LARVA OF *THYREION OLIVOFUSA*, DOGNIN.—(Imagines Nos. 6373, 6375 to 7. 6379-81.) A somewhat variable larva of which the more advanced form has been taken as typical and descriptions of the variations given.

Length 28 to 30mm. Head shiny yellowish green.

Colour green, covered throughout with fine white speckling, the alimentary channel showing bluish green and internal organs showing yellowish dorsally on the 9th segment. Segmental folds yellowish. A lateral line low down of minute white spots. Dorsally on each segment a pair of setae, greyish, from tiny white tubercles, a second similar pair anteriorly more widely spaced. The posterior pair more defined on the first and second abdominal and penultimate segment.

This was by far the most usual colouring of a number examined, and was noted as specimen 1. (*Cf.* imago No. 6377.)

Specimen 2, of which three were taken had the white tubercles slightly shaded laterally with biscuit colour and a darker line of shading above the lateral line mentioned. (*Cf.* imago No. 6376.)

Specimen numbered 3, which was not uncommon, had the dark shade above the lateral line tinged with dark reddish biscuit, which colour extended above the shade centrally on each segment. The alimentary channel is more defined and a dark dash begins to appear between the forward pair of tubercles on segments 5, 6 and 12, and all the tubercles are black in place of white. (*Cf.* imago No. 6379.)

Specimens numbered 4, show a further advance in colouring. The lower lateral line is more defined and with a few definite black specks, the reddish suffusion of the upper portion of the lateral line less defined, the central patch of colour remaining as an isolated mark. The black dorsal tubercles increase in size, and the dark streak between those on the 5, 6 and 12, is more distinct. (*Cf.* imago No. 6375.)

Specimens numbered 5, of which only two were taken, probably indicate the typical colouring. The length does not vary in any of the specimens mentioned. Colouring of these specimens numbered 5 somewhat lighter green. Alimentary channel indistinct but the light yellowish colouring on the 9th segment still prominent. The lateral line well defined and with two black specks on each segment on this line. The lateral stripe above this line appearing bluish grey and consisting of a broken black line on a bluish green ground. Above this line centrally on each segment and united with line a patch of biscuit colour. A central dorsal line appearing as a series of dashes, black on segments 5, 6 and 12, and greyish black elsewhere, due to the dash being lighter in its centre than at the edges. On the 2nd and 3rd thoracic, a transverse line of four minute black spots, the tubercles mentioned above all more defined, those on the 5th, 6th, and 12th segments very prominent. (*Cf.* imago No. 6380.)

A sixth specimen was very yellowish, but this may have been due to the imminence of pupation. (*Cf.* imago No. 6381.)

These specimens were all separated with a view to noting dates of the expected changes of colour, it being naturally supposed that the coloration would alter in the order the insects are above numbered. As a matter of fact no change of colour took place in any of the specimens and all pupated between noon on December 20th, and noon on December 21st. The method of pupation was to chew up a portion of the cardboard bottom of the pill box, and with this and a dead portion of the foodplant to form a small cavity. The pupae are light chestnut in colour and somewhat elongated.

Foodplant *Martynia montevicensis*, Cham. Locally known as "Cuernos del Diable," (Devil's horns), presumably from the shape of the seed pods.

Found at Villa Ana on December 18th, 1925.

Specimens pupated as stated on December 20th. Emerged on December 29th and 30th.

Empty pupae cases sent to B.M. under number 6378.

Specimens varied from dark green to some with very little green, but it was not possible to correlate colour variation of imagines with that of larvae.

ADDITIONAL DESCRIPTIVE NOTE ON THE LARVA OF *THYREION OLIVOFUSA*, DOGN.—

Since writing my previous note on the larvae of this species, I have found more colour forms from larvae feeding on a fresh foodplant,

namely *Eupatorium hecatanthum*, (DC) Back. (*Compositae*) locally called "Tembetary."

The most distinctive of these forms is one where the larva is dark rose in colour, so exactly resembling the colour of the flower of this foodplant as to be indistinguishable from it at any distance. The larvae appear to feed on the flower heads of this plant.

In view of the diversity of colours affected by this larva, I have added below a list of the tubercles. Previously I was unable to separate these with any certainty owing to their very small size, and the lack of the necessary magnification. However by bleaching a specimen with black tubercles I am now able to give those on all segments except the last two abdominal the tubercles here being too small to deal with.

First Thoracic segment, Anterior trapezoidal, Posterior trapezoidal, a secondary pair of tubercles more narrowly spaced between the posterior trapezoidals; supraspiracular, a pair of secondary tubercles immediately over the spiracle one slightly above and larger than the other; prespiracular with a secondary tubercle, smaller, nearer the spiracle and also prespiracular, a horizontal pair of marginal tubercles.

Second thoracic segment, Anterior trapezoidal and a secondary pair of slightly smaller tubercles; a well defined supraspiracular; a smaller secondary tubercle immediately below the supraspiracular and but faintly defined, postspiracular; subspiracular low down, and marginal. The third thoracic segment identical with the second.

Abdominal segments, anterior and posterior trapezoidal, supraspiracular (well defined and immediately over the spiracle), postspiracular, (on the seventh and eighth segments this tubercle becomes subspiracular, iv.) subspiracular (very small and directly beneath spiracle), a very small lateral and faintly defined marginal. The tubercles on segment 9 and the anal segment are too small to be distinguished with the power at my disposal.

Suggestions on Nomenclature.

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

Most readers of the *Entomologist's Record*, will heartily welcome the articles on Nomenclature in the January number, by Mr. Bethune-Baker and Mr. Turner. One hopes that these articles may be taken as a sign that the Editorial Staff of the *Record* is going to make a serious effort to bring about some real reform in these matters.

In the spring of 1925, I had a conversation with Mr. Bethune-Baker on the question of subspecies, in which I ventured to express my regret that in the revision of the International Code, which had just been finished by the British National Committee, the article (No. 14) which, if accepted, will deprive names of a lower rank than a subspecies from any status in nomenclature, did not give any real definition of what was to be taken as constituting a subspecies. I pointed out that in writing my monograph of the Tribe Hesperidi, which was published last November, I had been obliged to adopt *some* definite definition of the degrees of variation, and that any author of a systematic work *must* do so, and that if only the National Committee would give them a lead in the matter, all workers would probably

follow the line they adopted. After our conversation, Mr. Bethune-Baker very kindly read over the MS. of that portion of my work dealing with this question, but at the time he could not agree with my point of view. Subsequently at one of the meetings of the Provisionary Committee on Nomenclature at the International Congress at Zürich, I proposed that article 14 of the Code should define a subspecies on the lines, which I had adopted in my monograph, but the Committee decided that there were too many difficulties in the way of doing so. It was of course, then too late for me to alter my definitions, as my work had been finished for some time. It is therefore a pleasant surprise to see now that the definitions put forward by Mr. Bethune-Baker and supported by Mr. Turner, are practically those which I had been advocating, and have employed (see *Trans. Ent. Soc.* 1926, pp. 24 and 25) with the slight difference that I restricted the use of "form" to purely seasonal forms, as distinct from races occurring simultaneously with the type.

The question raised by Mr. Bethune-Baker as to the difference between a species and a subspecies, *of course*, is too large a subject to deal with at all adequately in a brief note like the present. I would, however, just point out that Mendelism gives a suggestion that the difference is to be found in connection with Reversion.

There exist in nature, beyond all doubt (although some people maintain we cannot prove the fact), certain races, which have entirely superseded the parent form in a given locality. Some such races (*i.e.*, subspecies) have been shown by Mendelian experiments to be capable of reverting to the parents, *by the introduction* of what is called the "complementary factor," which they are assumed to have lost in the course of evolution. The factor for the parent form is therefore still latent in the subspecies, but without the artificial re-introduction of the complementary factor it cannot be developed, and reversion would be impossible.

The constitution of such a subspecies must then, as noted, contain the factor for the parent form minus the complementary factor and plus some newly evolved factor. If, in the further stages of evolution this subspecies lost the parent factor (which, as it had for generations been unable to assert itself, while other factors had been developing, would seem most likely to happen) it would then become a new species. In this new species neither the old parent factor nor its complementary factor would be inherent, it therefore could not revert naturally nor be made to do so artificially. The consideration of these facts, led me to adopt the principle of elimination of the type race, as being necessary to the subspecific standing of any race, and to assume that that standing coincided with the loss of the complementary factor; *i.e.*, the inability to revert naturally. One can therefore assume the following degrees of difference: Species; a race which cannot revert, or be made to do so by accidental means; subspecies, a race which cannot revert naturally, but can by accidental means; race (occurring with the type) a race which can revert naturally. To apply this test to a doubtful race, is obviously beyond the limits of practical possibility, at any rate in most cases, but it helps one to realise the importance of excluding any form from the rank of subspecies, if even only a very few individuals of the type can still be found among its members, for the presence of the few plainly shows that the complementary factor has not yet been completely eliminated.

Lastly, to mention another important point in Mr. Bethune-Baker's articles;— the multiplication of names. Anyone turning over the pages of Bang-Haas' new catalogue, will be appalled at the array of names listed, while not the least serious aspect of the matter is the great increase in late years of so-called "races" and "subspecies." The proposed alteration in the Code, will certainly have the effect of, so to speak, killing off aberrations and multiplying subspecies; and until some drastic control is installed on the publishing of new names this multiplication of them will never cease. Encouraged by the fact that my previous suggestions seem to have found favour in the eyes of our Editorial Staff, I would again make a suggestion: the remedy for this trouble lies in the hands of the Editors of entomological journals. If all the Editors of all English entomological periodicals or other entomological publications, would unite in refusing to publish any new name, *unless it came up to some previously accepted standard*, the desired result would be obtained. Not only this, but a further great advantage would also be obtained, namely, authors would be compelled to describe the insects they were naming in a full and accurate manner and to have a considerable *personal* knowledge of them, which strange though it may seem, is at present often not the case. There are plenty of objections which can be made to this proposal (which is of course set down here in outline) but as long as the matter is left in the hands of authors, and is controlled by nothing more than personal taste, there can be no hope of any improvement. It is however, most probable that if English entomologists adopted some such system, their example would very soon be followed in other countries.

Bang-Haas estimates that the number of names given to varieties of *Parnassius apollo* is little short of 500! and points out that there were only 14 names (counting synonyms) listed in the Staudinger-Rebel catalogue of 1901! What use can be found in such a list? Some of the names may refer to forms worthy of names, but which? Truly a case of "two grains of wheat hid in two bushels of chaff, you shall seek all day ere you find them, and" . . . the unfortunate systematic worker will fervently agree with Shakespeare as to the use of doing so.

Species, Subspecies and Race.

By P. P. GRAVES, F.E.S.

May I make some observations on Mr. Bethune-Baker's and Mr. Turner's papers on nomenclature which appeared in the last number of this journal in the hope that they may be of assistance to those who, one hopes, will ultimately legislate for the benefit of entomological (and other) systematists?

First as to a 'species.' Surely this is a collective concept, that of a group comprising a variety of differences, seasonal, aberrational, geographical and so forth, but presenting common characteristics, which separate it from another such collective group or species. Thus, when we speak of, say, the species *P. semiargus*, Rott, in general we include therein all its named variations constant and inconstant, such as *montana*, M-D., *beltis*, Frr., *helena*, Stgr., *antiochena*, Led., and

many more; when we speak in general of a very variable species such as *Papilio eurypylus*, L., we speak not merely of the first described form but of all the forms described. That is to say we refer to a collectivity of forms, which may be 'subspecies' or 'races' or what not, but include the 'typical' form, *i.e.*, the first described form with the rest. The 'typical' form is not necessarily the most primitive form, nor is it necessarily the 'parent' form. It is simply the first described form. In his second paper (*Ent. Rec.*, XXXIX. p. 11), Mr. Bethune-Baker speaks of *P. coridon*, Poda, as 'a species or the parent species' in its relation to *albicans*, but while *P. coridon* is the name we apply to a group of subspecies of which *albicans*, assuming it to be really co-specific with *coridon*, is a member, have we any evidence that the nominotypical *coridon* from Gratz, which Poda described, is the ancestor of *albicans*? It is surely just as probable that the common ancestor of *coridon coridon* and *coridon albicans* was different in appearance from either of these its descendants. If, as seems to me to be necessary, we regard a species as a group of subspecies more closely connected with one another than with other groups, then, for purposes of definition the use of trinomial nomenclature is necessary, and in the case already quoted we must use the name *P. coridon coridon* and not *P. coridon* only, when instituting any comparison between the nominotypical *coridon* of Gratz in Styria and subspecies such as *olympica*, Led., *albicans*, H.S., or *syriaca*, Tutt. I know that this is disliked by some entomologists to whom it appears a 'vain repetition,' but I personally feel that it is necessary in all cases when the 'typical' subspecies of a species is contrasted or compared with any other subspecies. I do not see why the abbreviation *P. c. coridon* should not be used in cases when the specific name is repeated sub-specifically. Such a practice would save ink.

I should personally use the term 'subspecies' to describe a marked and constant variation in both sexes, which within a given geographical area or areas entirely or almost entirely takes the place of the 'typical' form of the species. I introduce certain qualifications into this suggested definition for the following reasons. Firstly the difference between one subspecies and another must attain a certain degree. Otherwise it might be permissible (to take a purely hypothetical case) to divide such an insect as *Danaida chrysippus*, L., occurring in two Deltaic provinces of Egypt into two subspecies, because the specimens from province A taken in two seasons had on an average 21 white spots within the black margin of the left hindwing while those from Province B average 20 such spots. Again, the difference must be constant. This is an especially important consideration in hot dry regions, *e.g.*, the Mediterranean region of the Palaearctic zone, where exceptionally droughty seasons leave their mark temporarily on many species. Thus Herr Stauder in his most interesting "Faunula Ilyro-Adriatica," which has been appearing in the *Zeitschrift für Wissenschaftliche Insekten Biologie*, repeatedly draws attention to the existence of 'distress forms' (Kummerforme) as did Ribbe, on occasion, in his account of the Lepidoptera of Andalusia (*Iris*, Suppl. 1910-12). It would be as improper to give subspecific, or even racial rank, to such manifestations of the well-known results of malnutrition as it would be to announce the discovery of "*Homo sapiens* subsp. *mediterraneus* race *famelicus* new race," on the strength of investigations among a

community of Near Eastern refugees. Finally I would not insist that the 'subspecies' must entirely exclude the 'type' (typical subspecies) in a given area, because firstly, negative evidence is not absolutely conclusive and secondly, because the occurrence with the subspecies of a very small percentage of the type, while interesting as an indication of common ancestry, should not obscure the fact that a very large majority of the individuals composing the subspecies at any given time are very different from the type. To give a concrete example, some years ago I saw at Cairo a female of *M. didyma*, Esp., taken in the Eastern Desert behind Helouan, which scarcely differed at all from many German *didyma*. But so far as is known every other specimen of *M. didyma* (*sensu lato*) taken in the Desert East of Cairo and Helouan has had a facies differing greatly from that of *M. didyma didyma* but resembling that of *M. didyma deserticola*, Obth. It would be absurd to deny the Egyptian insect subspecific rank such as has been given to the Algerian desert *didyma* on the ground that one *M. didyma didyma* had occurred in Egypt.

I should apply the term 'race' to a variation in one or both sexes from a subspecies of the collective species, which variation occurs constantly with the subspecies in considerable numbers in the same area. What is a subspecies in one geographical area is at times a 'race' in another. In the former area it might be described conjecturally as a species in the making; in the latter area it might be described with more confidence as a subspecies in the making.

As regards seasonal variation it seems to me that by a seasonal form we should describe a variation which entirely, or almost entirely, takes the place of the parent subspecies or race in a particular area in a particular season, but the descendants of which always revert within that area to the form of the parent subspecies or race. The Mediterranean seasonal forms of *H. phlaeas*, L. are a good example of this. I should like to learn the opinion of more experienced entomologists as to the rank to be accorded and the name, if any, to be given to seasonal variations occurring with the parent subspecies or race constantly but not to the exclusion of the parent subspecies.

In certain cases Dr. Verity seems to me to have unduly strained the meaning of the term 'race.' Here is an instance. In parts of Italy the IIrd Gen. of *N. tages*, L., is, he states, *clarus*, Caradja. Their descendants revert to *N. tages tages*. Nevertheless Dr. Verity gives the collective *tages* of this part of Peninsular Italy the racial name *clarus*, Car. I hope to deal shortly at greater length with the seasonal variation in parts of the Near East of *Erynnis alceae*, Esp. I will only here ask entomologists their opinion as to the following point.

In Palestine, some of the 1st Gen. of *alceae* are *alceae*, the rest more or less *australis*, Zell. IIrd and IIIrd Gens. are pronounced *australis*, a specimen of what appears to be an exceptional IVth Gen. is *alceae* or very like it.

In the Constantinople region, 1st Gen. *alceae* are *alceae*, IIrd Gen. mostly *australis*, some transitions thereto and never in my experience *alceae*. The IIIrd Gen. in autumn begin by being marked *australis* but in October and at the beginning of November a few stunted specimens appear annually which make some approach to *alceae*. These may be a partial IVth Gen. though I prefer to regard them as laggards of the IIIrd Gen. Should the Palestine *alceae* be called s-sp. *australis*

because a small proportion of the *forma temp. australis* actually do have *alceae* as descendants? The Constantinople *alceae* is obviously *alceae* with s.f. *australis* as a constant variation in its IInd Gen. Is one justified in speaking of s.f. (f.temp) *australis* in one case but of s-sp. *australis* in the other? I do not see myself why *australis* should not be called a subspecies and a seasonal form *s-sp. aut f. temp.* as long as it is made clear that it is not both at once as the use of *s-sp. et f. temp.* would wrongly indicate.

Finally what is the Latin equivalent of 'race,' a Teutonic word? Should we use 'racia' and leave it at that, or 'natio' the nearest classical equivalent?

The Classification of Varieties and the application of the terms in present use.

By W. H. T. TAMS, F.R.S.

In the January number of this magazine Mr. G. T. Bethune-Baker has asked for a discussion of the terms applied to those forms which fall into the categories below the species category.

Very few Lepidopterists appear to be familiar with, even if they know of, the introduction to Rothschild and Jordan's "Revision of the Sphingidae" (*Noritates Zoologicae*, Vol. IX. Supplement, 1903), and I would urge anyone interested in morphology or geographical distribution, to make a thorough study of this introduction. For here we have laid down clearly and succinctly a fund of valuable information, which no systematist can afford to ignore.

I may perhaps be allowed to quote a portion of this introduction in order, firstly to revive general interest therein, and secondly to utilise it in the present discussion.

On page xliii the authors state:

"Since Linné applied the term *varietas* to the forms which are not specifically different, we do not see any reason against the use of this very convenient word in the same sense for all the components of a species which differ from one another. We understand, therefore, under *variety* not a particular category of the components of a species, but employ the term for all the different Members of a species indiscriminately. The different categories of varieties must receive special terms in a precise classification, and special formulae must be employed for them in a precise nomenclature.

"We distinguish three categories of varieties, namely:—

- I. *Individual variety*.—The following terms are employed by us:
- (1) *ab.* = *aberratio* for individuals which stand outside the normal range of variation.
 - (2) *f.* = *forma* in the case of di- and polymorphism. If a form occurs rarely, it may be termed *f. ab.*, in contradistinction to *f. norm.*
 - (3) ♂ *f.* or ♀ *f.*, if the respective form belongs to one sex only.
 - (4) *f. loc.* = *forma alicuius loci*, if, in the case of polymorphism, a form is restricted to one portion of the range of the respective variety or species.
- II. *Generatory variety*.—This variety is seasonal in Lepidoptera, and is designated as
- (5) *f. t.* = *forma temporæstatis*.

III. *Geographical variety or subspecies*.— This is the highest category of varieties. As the term *varietas* includes also other varieties, it cannot be employed as such for the geographical variety except in a precise nomenclature; either a specifying attribute must be added (*var. geogr.*), or an abbreviation of another term chosen (*subsp.*). But we do not see that it is at all necessary to put any such abbreviation of a term before the subspecific name. We can do without the encumbrance of the abbreviation—what we can do without is unnecessary; and what is an unnecessary encumbrance in nomenclature, common-sense compels us to drop—by

- (6) Simply mutually agreeing that a subspecies is designated by its name added to that of the species without any abbreviation before the subspecific name. This means *simplification of nomenclature, nothing else.*"

I hope those who read this will bear in mind that it was written practically a quarter of a century ago. It seems to me to be a very comprehensive set of categories, and, in the present state of my own knowledge, I cannot improve on it.

I do not study butterflies, so that anything I may say regarding the *roystonensis* question must be taken as the point of view of one who is mainly interested in the general considerations. I therefore ask: Can the above categories, without amplification, be regarded as sufficiently comprehensive for the proper grading of a variety like *roystonensis*? I may be wrong, but as I see it now, I say emphatically; Yes! The *roystonensis* variety of *coridon* is an individual variety according to the above classification, and, in my opinion, falls quite satisfactorily under the term *forma alicuius loci*. The fact that it is only found at Royston has, in my opinion, no geographical significance whatever. Whether it is a rudimentary, or vestigial, variety I am unable to say. I regard that as one of the most difficult of the problems with which we are faced. In which direction is the evolutionary process taking place, or to put it another way, is a particular form developing or vanishing?

Notes on Nomenclature.

By A. J. WIGHTMAN, F.E.S.

On page 10 of the present volume Mr. G. T. Bethune-Baker asks for a discussion on the meaning of the terms, subspecies, race, form, etc., and also raises the question as to what justifies the giving of distinctive names to insects which are merely forms of a species already named, while on the following page Mr. H. J. Turner has some notes on the same subject, which show how widely different are the interpretations these two authors place upon the term "race." If we accept the doctrine of evolution, it follows, that species are in the making, daily and hourly, and what was yesterday a race, may to-day pass the crucial moment in its evolution, which makes it a subspecies, and so on.

I doubt if any precise definition of the meaning of the terms in question will ever be acceptable to all workers using them, and in making, in the following notes, an attempt to define the difference

between form, race, subspecies, etc., I claim to give no more than the meaning, which it seems to me the terms should convey.

VARIETY.—Simply a specimen which does not agree with the type description of the species to which it belongs.

ABERRATION.—A chance non-recurrent form, which from some abnormal cause has developed markings quite outside the normal trend of the variation in the species to which it belongs. Example. The insect figured by Edward Newman on page 387 of his *British Butterflies and Moths*, as a variety of *Dianthoecia capsincola*.

FORM.—A recurrent colour, or pattern, variation from the first described form of the species (type). A form may occur rarely with the type, be equally common with the type or even replace the type in certain localities, but if a certain form is only found in a colony or group of colonies (region) and all the members of this colony, or colonies, have this special facies, then the colony becomes a race.

Example of a form, *Xanthia fulvago* form *flavescens*, Esp.

RACE.—A colony (or colonies) of an insect, the specific identity of which with a named species is not in doubt, but which from long isolation among special surroundings has developed such special characteristics, present in all members of this community to a greater, or lesser degree, as to constitute a race apart.

Example. *Acrionicta euphorbiae* race *myricae*. I cannot see that *coridon* at Royston is a race, the typical form is plentiful, it is merely a prolific spot for forms scarce elsewhere.

SUBSPECIES.—The same as race, except that some doubt may exist, as to its specific identity with the species of which it appears to be a specialised race. Subspecies usually replace some widely distributed species in a special area, as for example, *Agrotis ashworthii* which replaces the continental *A. caudelarum* in these islands.

As to the question of naming forms, I think it will be readily conceded by all, that when a species produces several distinct looking forms, such forms need distinctive names, but the giving of names to endless minor forms in very variable species, carries the system beyond the bounds of usefulness, and tends to cause a certain shyness among workers in the field of variation, towards the naming of new and distinct forms, which should be named. A hard and fast rule as to what degree of divergence from the typical form is necessary, before a name is justified, is, of course, impossible, but the matter will in the end adjust itself. Unnecessary names will be lost by reason of non-use, while those, which serve a useful purpose, will in time become as well known as those of the typical insects themselves.

Note on Varietal Nomenclature.

By GEORGE WHEELER, M.A., F.Z.S., F.E.S.

Having read the proof of the foregoing articles on this subject, I feel that there is not much more that can be usefully added, but there are just two points, more especially connected with Dr. Verity's names, to which I should like to refer. It seems to me that it would be hopeless (even for the author, still more for anyone else) to memorise the names suggested for the various generations of endless species.

Surely the expression I. Gen., II. Gen., etc., are a sufficient distinction, at any rate in the majority of cases, even if in such a case as *Araschnia levana* and *gen. II. prorsa*, a special name might be desirable. Secondly Dr. Verity's contention, that a name used for a form of one species is not available for a similar form in a nearly related species, seems to me most unreasonable. On the contrary, I consider that such a name ought automatically to be applied to all such variations, as has been done by Courvoisier for example in his paper on Lycaenid Variation. It may be remembered that I advocated this procedure in my paper read before the International Congress of Entomology at Oxford in 1912. On the other hand the name of one *species* ought never to be applied to a form of some other closely related species: e.g., such names as *Lycaena arion*, f. *alcon*, or *Colias croceus*, f. *chrysotheme* (both of which have been employed) ought never to be sanctioned.

Nomenclature.

By THOMAS GREER.

Mr. G. T. Bethune-Baker's timely protest at the endless multiplication of so-called racial and aberrational names is to be strongly commended. The definition of a race, as given by him; "a form that replaces in a given area the typical form," is clear and explicit.

How many of the legion of named races will conform with this definition? How many must sink to that of a recurrent aberration?

To quote instances at random from recent literature on the subject. In *British Noctuae and their varieties*, J. W. Tutt; Supplementary Notes by Mr. H. J. Turner, F.E.S. (*Entom. Record*, Vol. XXXVIII.)

"*Thyatira batis*, L., race *indecorata*, Barrett, n. race, Ireland";—the form *indecorata* occurs as a recurrent aberration in many parts of Ireland, but does not replace the type in any stated area.

"*Cynatophora or*, Schiff., race *gallica*, Kane"; perhaps the prefix, race, is a slip of the pen: as Kane described this form as an aberration from two examples only; one from Co. Cavan, and one from Scotland. On the other hand to be in strict keeping with this definition, why should not forms, which have been in the past designated as aberrations, be advanced to the dignity of races? such for example *Dianthoccia luteago* var. *barrettii*, Dbl.

[None of our authorities consider a form which is "recurrent" to be an aberration. Referring to *T. batis* race *indecorata*, if it recurs in many parts of Ireland, as Barrett and others say, it is not an "aberration" but a recurrent "form." And the assembly, colony, group, of Irish *batis* characterised by having, to quote Barrett, "the pink colouring of the back of the thorax and of the large spots paler or replaced by buff," "frequently," Vol. III., p.191, forms a race. A representative series, of sufficient length from various parts of Ireland placed side by side with a similar series from say S. of England would at once demonstrate the differentiation. A race cannot be illustrated by a single specimen. Of *C. or* race *gallica* Barrett distinctly says "In Ireland there is but little indication of either the pinkish or purplish tint of ground colour which is pale grey, but with very strongly accentuated stripes," and he gives six areas in which it is spread. What Kane

called ab. *gaelica* (his one specimen) has, teste Barratt, been found to be characteristic of the Irish production of this species, *i.e.*, a good proportion of those so far captured are of this form. Parallel series of sufficient size would demonstrate the differentiation as before with *batis*. A race is a grade towards a subspecies and it may be more, or less strongly characterised. There is and can be, no definite limitation. —H.J.T.]

Dr. Roger Verity and Nomenclature.

“If my work, which requires a considerable amount of time, of labour and of expense, is not appreciated and seems even to be considered by some as a sort of guilty proceeding. I certainly do not wish to inflict it on anybody. Fortunately I am comforted from such a distressing idea by the correspondence I receive continually about it, and I know some people appreciate it. My aim is to draw out as complete a picture as possible of the geographical variations of each European species, carrying on the work, which has been begun in the last twenty years by Fruhstorfer, Oberthür, Tutt, and others; and filling up gaps by new descriptions and names. I know I am making an effort from those, who wish to keep up with progress in knowledge, but I have gone through it myself to follow my predecessors. I have myself been indignant with Fruhstorfer, when he flooded us with descriptions and names, but time and facts have shewn it was not he, who was wrong, but I, in my ignorance and laziness. Gradually as I put together the necessary materials, I found he was perfectly right. Races are there, they are definite entities, not quite as sharply defined as species, but quite enough to recognise them from each other clearly and to establish the limits of their areas of distribution. That is the work we have before us.

As to the question of “names,” I fully agree with my critics (your panel of editors) that it is high time to stop naming individual forms, except when there is a special reason to do so, and especially of giving a name on the strength of a single character. I have been one of the first to propose generic names for such forms (the same name for the corresponding forms of all the species of a genus). So, I do not think, on this line I can be convicted of having given many, and those I have given to races and generations are very few indeed as compared with the enormous numbers erected for individual forms. See those given by Raynor in *Ent. Record*, 1909, to forms of *A. urticae*; and see the many of Tutt, not to speak of German authors. In Bergeff’s *Catalogue of the Zygaenae* the amount of names given to individual forms has entirely swamped and spoilt the interesting picture it might have been of geographical variation. And what about *Parnassius apollo*? When, however, it comes to races, I am sorry, but my conviction is that it is technically essential to name them, just as it has been found necessary to name species. There are a score of reasons for it, but I am sure *you* need not be told which they are. Those who do not wish to follow us in our exact analysis of Nature’s complexities can perfectly well ignore the more recent developments of Lepidopterology, but there seem to be plenty who do not mind a few names more or less and are interested in our writings.”—IN LITT.

Extracts.

RACE.—“A group of individuals having developed in the same surrounding and exhibiting certain local features simply due to their influence.”—Dr. VERITY.

SPECIES.—“All the endless research into the nature of the species has been closed to-day by the removal of the sharp limits that had been set up between species and varieties on the one hand, and species and genera on the other.” “The word has no *absolute* meaning whatever, but is only a group name, or category of classification, with a purely relative value.” “I gave an analytic proof of this in my monograph on the sponge (1872), having made a very close study of variability in this small but highly instructive group, and shown the impossibility of making any dogmatic distinction of species. According as the classifier takes his ideas of genus, species, and variety in a broader or in a narrower sense, he will find in the small group of the sponges either one genus with three species, or three genera with 238 species, or 113 genera with 591 species.”—ERNST HÆCKEL.

Nomenclature.

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

Apropos of the discussion on points of Nomenclature initiated by my valued colleague Mr. G. T. Bethune Baker, I have reviewed some of the customs which have grown up of late, induced, no doubt, by the close and enthusiastic study of natural phenomena. An expression like *Arctia caja caja* has always seemed to me cumbrous, unnecessary and absurd. *Arctia caja* designates the species and the species as it appeared to Linneus, that is, as Dr. Verity calls it, the nymotypical form. The duplication of the name does not make *caja* any more or any less *caja* than it was before. But when one reads *Arctia caja caja*, L., it is undoubtedly wrong altogether. The first *caja* is correct as *caja*, L., but the second *caja*, L., is obviously incorrect, and should have the author's name attached to it. But the whole thing is absurd. It is clear that, if in an article, other than the nymotypical form is being considered, they will be indicated by their form name, and the specific name in such conjunction would always be held to mean the nymotypical form without being bolstered up by duplication.

I take from a list of captures reported in *Iris*, p. 188, for 1926, the following:—*Euroea exclamatoris exclamatoris*, L.; *Barathra brassicæ brassicæ*, L.; *Parastictis lateritia lateritia*, Hufn.; *Polia dissimilis dissimilis*, Knoch.; *Sideridis conigera conigera*, F.; *Amphipyra tragopogonis tragopogonis*, L.; *Mormonia neonymphe neonymphe*, Esp., etc., etc., pages of it, one after the other. [“Look how scientific I am!!” saith the author, *sotto voce*.]

NOTES ON COLLECTING, etc.

EREBIA GORGE SUB-SP. RAMONDI AB. TROPES.—While examining the collection of M. Rondou at Gedre, Hautes Pyrénées, last August, I remarked that he had no ab. *tropes* amongst his series of *E. gorge* sub-sp. *ramondi*. He informed me that it had never been taken in the

Pyrénées. I told him that I had certainly taken one, if not two specimens, in July 1924. On examining my series I find I have two, both from the screens inside the Cirque de Gavarnie. One has all three apical spots very well marked and large, the largest being next the costa. The other has the costal spot very small, the other two spots being rather larger than the average spots in the short series I have from the Eastern Alps. In spite of the fact that sub. sp. *ramondi* differs so much from the *gorge* of Switzerland it is interesting to note that it follows the same line of variation.—P. HAIG-THOMAS, F.E.S., The Grange, Goring-on-Thames.

CURRENT NOTES AND SHORT NOTICES.

A meeting of the Entomological Club was held at Tring Park on Saturday November 20th, 1926, Lord Rothschild in the Chair.—Members present in addition to the Chairman.—Mr. H. St. John K. Donisthorpe, Prof. E. B. Poulton, Mr. H. Willoughby-Ellis, Mr. Jas. E. Collin, Dr. Harry Eltringham, Mr. W. J. Kaye. Visitors present—Dr. E. Hartert, Dr. K. Jordan, Capt. N. D. Riley, Dr. Waterston, Dr. Imms, Com. J. J. Walker, R.N., Mr. Arrow, Mr. Blair, Mr. Graves, Mr. H. J. Turner, Mr. W. G. Sheldon, Mr. E. Ernest Green, Mr. Edelsten, Mr. W. Rait-Smith, Dr. Herbert Smith, Major Austen.

The party met at the Tring Museum at about 11 o'clock and the magnificent collections were open for inspection and were much appreciated throughout the visit. Several long series of Lepidoptera were taken out of cabinets and especially arranged on the tables for the visitors' convenience, and many of the party inspected the portions of the collections in which they were most interested. Luncheon was served at one o'clock after which the Museum was again visited and the party dispersed at sunset after spending a most enjoyable day.—H.W.-E.

A meeting of the Entomological Club was held on December 2nd 1926 at "Caracas," Ditton Hill, Surbiton, Mr. W. J. Kaye in the Chair. The members present in addition to the Chairman were Messrs. Robert Adkin, Horace Donisthorpe, H. Willoughby-Ellis, Jas. E. Collin, and Dr. H. Eltringham. The Visitors present were, Dr. K. Jordan, Capt. N. D. Riley, Messrs. F. A. Oldaker, H. H. May, W. H. T. Tams, G. C. Leman, H. E. Andrewes, and E. Step. The meeting was called for 6 o'clock when the guests were received in the Drawing-Room by Mr. and Mrs. Kaye and light refreshments were provided. The Chairman's very interesting collections acquired by many years of personal work in Trinidad and elsewhere were on view, as were also his interesting series of British Lepidoptera. Supper was served at 8 o'clock and a very enjoyable evening was spent, the guests dispersing about 11 o'clock.—H.W.-E.

Another Catalogue of not quite so pretentious a character, but equally useful in its own sphere, is the *Catalogue of Indian Insects*, issued under the authority of the Government of India. Eleven parts have so far been published, each dealing with some one family. Of the Coleoptera, Malcolm Cameron, has dealt with the *Staphylinidae*, Kleine with the *Brenthidae*. In Lepidoptera, Bainbrigge Fletcher with the *Lasiocampidae*, the *Amatidae* (*Syntomidae*) and the *Zygaenidae* (sens.

lat.). In the Diptera, Senior White with the *Culicidae*, *Bombyliidae* and *Trypetidae*, and other specialists with their own section. No attempt is made to give every reference, but only a sufficiency to suggest further information for future workers. The arrangement is very convenient for use and each part has complete indexes of genera and species.

We understand that Frohawk's *Butterflies*, which some twelve months ago was published at £6 6s. 0d. per copy, is now being sold as a remainder at prices varying from 35s. to 2 guineas. We wonder where the author comes in when this method of business is adopted. In modern times remainders of issues have often been put on the market, but rarely if ever at so short an interval. Some of us who want new books will in future "wait and see" what happens. Those who originally subscribed must feel a bit sore.

The *Annalen* of the Natural History Museum of Vienna for 1926, contains as its chief feature the second portion of a Monograph of the *Sepsidae* (Diptera) with 9 plates, by Dr. Oswald Duda. It deals with species of the Ethiopian Region; the previous issue contained the portion dealing with the Oriental, Polynesian and Neotropic Regions.

The Zoologisch-Botanischen Gesellschaft in Vienna has recently published its *Verhandlungen*, for the two years 1924-5, consisting of Proceedings and Memoirs of 500 pages with 49 figures and a map. Among the Memoirs are a Monograph of *Orestia* (Col.) by F. Heikertinger; observations on, *Libellula* by F. Prehn., the genus *Leptogastria* (Dipt.) and the *Asilidae* by F. Hermann; and in the Proceedings considerations of race *scotica* of *Thera variata*; of the *Gnophos glaucinaria* group; of the Lepidopterous fauna of Lower Austria, of Gravosa, of the Tyrol, of N. West Sumatra, of the Dolomites, of Albarracin, of Microlepidoptera of Dalmatia and many lesser items in both Lepidoptera and Coleoptera. Dr. Rebel was in the chair for 1926.

The *Entomologisches Jahrbuch*, a Calendar for Insect-Collectors has now been issued for 35 years. The Editor is Prof. Oskar Krancher of Leipzig. Not only is there a calendar of work to be done in all orders for each month, but there are some twenty short articles by different authors, with numerous shorter hints. There is a literary supplement of the scope of new works in all orders of insects and a summary of the contents of the more important magazines. There is one plate and numerous figures. For the price, 2s. 6d., it is really very cheap, as well as being a very useful companion.

Volume XVIII, of the *Bolletino del Laboratorio di Zoologia Generale e Agraria* published at Portici (Naples), recently to hand, is in no way behind in the importance of the matter it contains and in the thorough manner in which that matter is presented. In the over 300 quarto pages there are five memoirs, two by Prof. Silvestri, one the Parasitism of an individual of *Termes gilvus* by a Dipteran, and the other describing a new genus of myrmecophilous Coleoptera; one by Sig. Grandi on the Biology and Morphology of some Hymenoptera; one by Sig. Candura on the Tineid *Sitotroga cerealella*, the pest of grain; and the fifth by Sig. Russo dealing with the *Scolytidae*. All are profusely illustrated and each paper is indexed and complete in itself. The Scuola Superiore d'Agricoltura has fully kept up its world-wide reputation for real scientific investigation.

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MEETINGS OF SOCIETIES.

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The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. February 24th, Lantern Evening. March 10th.—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., J. P. HARDIMAN, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

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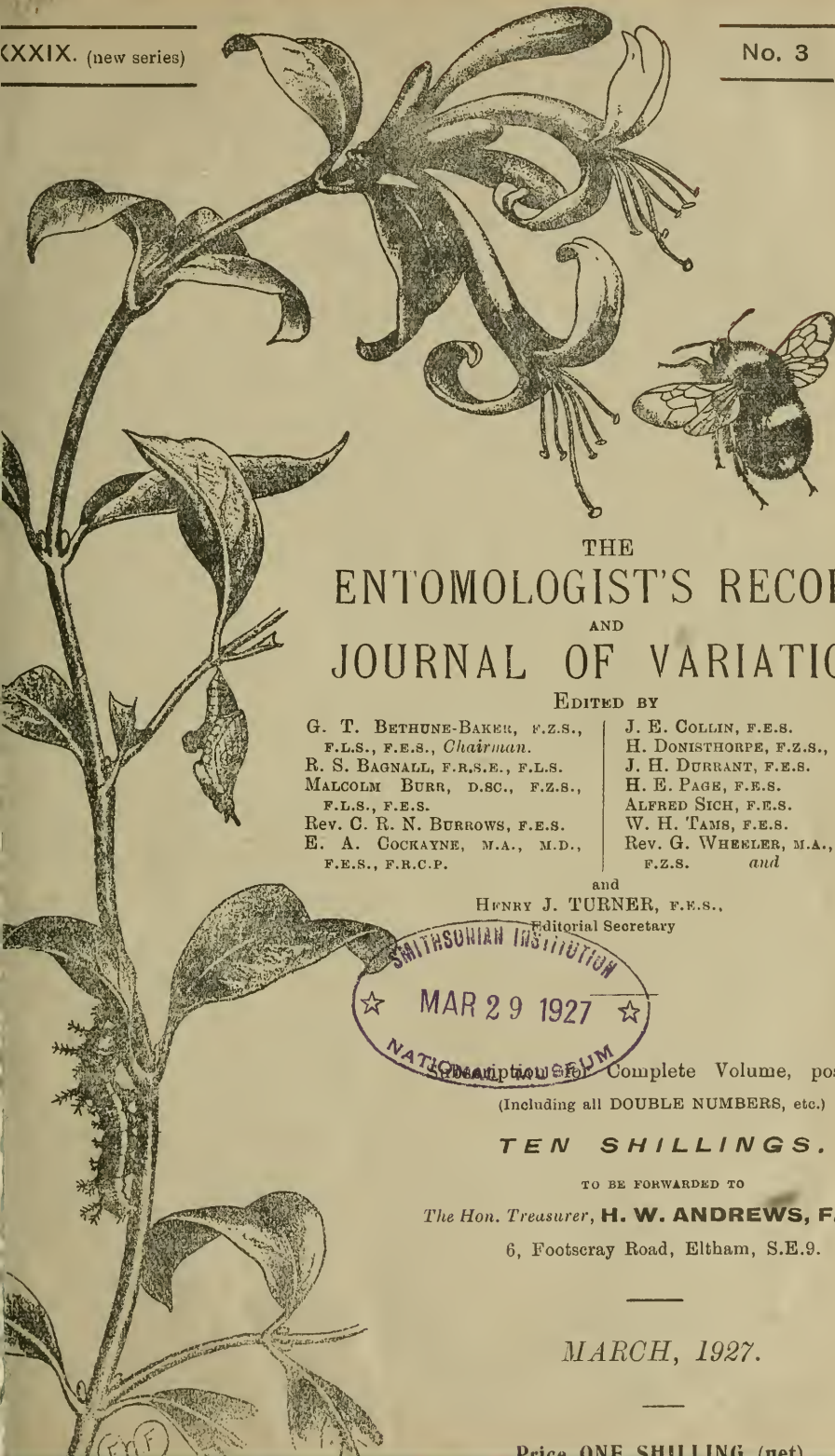
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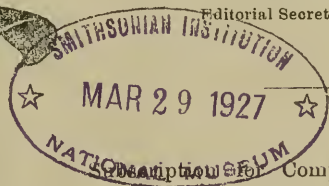
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observed at

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Some Swiss Micro-Lepidoptera.

By T. BAINBRIGGE FLETCHER, R.N., F.L.S., F.E.S., F.Z.S.

Of the numerous lepidopterists who visit Switzerland every year very few pay any attention to the smaller Moths. It seems a pity that it should be so, as so many interesting species occur and their small bulk renders it particularly easy to carry a collection when travelling. The species noted in the present paper were collected during two visits in the summers of 1925 and 1926, but this does not form a complete list of the specimens taken, as press of other work between my return to England and my departure for India has prevented the sorting and naming of the major portion of the material collected in 1926. I am very greatly indebted to Mr. E. Meyrick for his kindness in looking over and identifying my captures.

As all workers on Swiss Micro-lepidoptera must refer to *Die Schmetterlinge der Schweiz*, by K. Vorbrodt and J. Müller-Rutz (Vol. II., Berne, 1914), I have arranged the various species under the numbers given in their book.

A few notes on some localities may be useful:—Villeneuve, near Montreux; Bérisal, elevation 5,000 feet, on the Simplon Road, South slope; Grimmialp, elevation 4,000 feet, in the Diemtigen Valley, Bernese Alps; Arolla, elevation 6,500-7,000 feet, on the south side of the Rhone Valley, above Sion; Evolène, elevation 4,500 feet, below Arolla; Simplon Dorf, elevation 5,000 feet, on the Simplon Road, north slope; Chillon, near Montreux; Uetliberg, elevation a little over 2,000 feet, near Zurich; Les Avants, above Montreux (my collecting-ground was above Les Avants at nearly 4,000 feet elevation); Rochers de Naye, above Montreux, elevation about 7,000 feet; Simplon Kulm, at the summit of the Simplon Pass; Eclépens, near Cossonaye, on the railway-line between Lausanne and Berne; Blonay, above Montreux, elevation about 2,000 feet; Les Pleïades, above Vevey, elevation about 4,500 feet; Martigny, in the Rhone Valley.

1333. *Acanthopsyche atra*, L. Berisal: July 25th, 1926. Three males taken flying over the road. On the wing they looked more like small beetles than moths.
1341. *Scioptera plumistrella*, Hb. Simplon Kulm, 6,500 feet: August 2nd, 1926.
1349. *Epichnopteryx pulla*, Esp. Simplon Kulm, 6,500 feet: August 2nd, 1926.
1353. *Psychidea bombycella*, Schiff. Grimmialp: June 24th and 30th, 1925.
1358. *Fumea casta*, Pall. Montreux. Cases containing pupae were abundant on stone walls at the end of May, 1926. Males emerged from June 3rd and females from about June 15th.
1613. *Peronea cristana*, Fb. Villeneuve: June 2nd, 1926.
1622. *P. variegana*, Schiff. Montreux: September 15th and 17th, 1925.
1638. *Capua gnomana*, Cl. Berisal: July 28th, 1926.
1653. *Tortrix dunicolana*, Z. Montreux: June 18th, July 6th and 9th, 1926. Common around ivy in the evening.
1663. *Pandemis cinnamomeana*, Tr. Montreux: September 20th, MARCH 15TH, 1927

- 1925, one in the Hotel. Muller-Rutz gives June-July as the time of appearance.
1674. *Tortrix viridana*, L. One very worn specimen in the Gorge du Chandron, Montreux, on July 10th, 1926.
1677. *T. paleana*, Hb. Grimmelalp: June 27th and 30th, 1925.
1683. *Cnephasia osseana*, Scop. Arolla: August 10th and 17th, 1925.
1684. *C. argentana*, Cl. Grimmelalp: June 23rd to July 12th, 1925, common. Arolla: August 3rd to 13th, 1925, common. Berisal: August 15th and 16th, September 4th, 1926.
- 1686 (pt.). *C. chrysanthemana*, Dup. Grimmelalp; June 24th to July 8th, 1925, common.
- 1686 (pt.). *C. virgaureana*, Tr. Evolène: July 29th, 1925.
1687. *C. penziana*, Hb. Arolla; August 8th, common on trees; August 13th; August 28th (worn).
1688. *C. canescana*, Gn. Montreux: July 8th and 9th, 1926. Common on rough stone walls but difficult to see. According to Muller-Rutz, this species has only been found hitherto in the valleys of Valais.
1703. *Phalonia dœcimana*, Schiff. Grimmelalp: June 30th, 1925. Arolla, August 8th, 1925.
1712. *P. roseana*, Hw. Grimmelalp: July 1st, 1925.
1715. *P. pallidana*, Z. Grimmelalp: July 6th, 1925.
1719. *P. dubitana*, Hb. Berisal: August 3rd, 1926.
1720. *P. posterana*, Z. Simplon Dorf: July 27th, 1926. Berisal, July 20th and 21st, 1926.
1733. *Euranthis angustana*, Tr. Grimmelalp: July 7th, 8th, and 14th, 1925. Considered by Muller-Rutz as a scarce and local species.
1753. *Argyroploce corticana*, Hb. Berisal: August 23rd, 1926. This seems an unusually high elevation (5000 ft.).
1756. *A. sauciana*, Hb. Simplon Road, 6000 feet: August 9th, 1926.
1777. *A. bipunctana*, Fb. Arolla: August 10th, 1925.
1782. *A. umbrosana*, Fr. Grimmelalp: June 30th to July 14th, 1925, common.
1783. *A. lacunana*, Dup. Grimmelalp: June 23rd to July 3rd, 1925, common.
1784. *A. rivulana*, Scop. Grimmelalp: June 23rd, 1925.
1801. *Ancyliis lundana*, Fb. Grimmelalp: July 1st, 1925.
1817. *Bactra lanceolana*, Hb. Grimmelalp: June 30th, 1925.
1827. *Eucosma diniana*, Gn. Arolla: August 12th, 14th and 17th, 1925.
- ? *E. sordidana*, Hb. Beaten from alder at Berisal in some numbers at the end of August and beginning of September, 1926.
1832. *E. cruciana*, L. Arolla: August 17th, 1925, flying in numbers in the evening around *Salix* bushes; August 22nd, 1925.
1875. *E. brunnichiana*, Fröl. Grimmelalp: June 30th, 1925.
1877. *E. bimaculana*, Don. (*similana*, Hb.). Berisal: August 27th, 1926; September 4th, 1926, beaten from alder.
1889. *E. immundana*, F.R. Grimmelalp: June 25th, 1925.
1897. *E. tedella*, Cl. Grimmelalp: June 22nd to 30th, 1925, common.
1901. *E. ophthalmicana*, Hb. Montreux: September 18th, 1925, one, at light. A rarity in Switzerland according to Muller-Rutz.

1905. *Hemimene quaestionana*, Z. Grimmelalp: July 8th, 1925. Arolla: August 10th, 1925. According to Muller-Rutz, this species is only known hitherto from Eastern Switzerland.
1909. *H. ligulana*, H.S. Arolla: August 11th, 1925. An Alpine species.
1912. *H. plumbagana*, Tr. Grimmelalp: June 23rd, 1925.
1922. *Cydia pomonella*, L. Larvae common in apples at Montreux in September, 1925 and 1926.
1943. *Laspeyresia fissana*, Fröl. Chillon: June 27th, 1926.
1944. *L. discretana*, Wk. Arolla: August 10th, 1925. Apparently not common in Switzerland.
1951. *L. aurana*, Fb. Grimmelalp: July 7th and 16th, 1925, on umbelliferous flowers in the daytime.
1974. *Glyphipteryx thrasonella*, Scop. Grimmelalp: July 2nd and 4th, 1925.
1976. *G. equitella*, Scop. Abundant at Montreux throughout June, 1926, flying around stone walls on which its foodplant (*Sedum*) was growing. This little species manipulates the exterior part of its forewing with its hind-feet, to display the metallic markings.
1979. *G. fischeriella*, Z. Grimmelalp: June 29th and July 7th, 1925.
2016. *Conopia muscaeformis*, View. Berisal: July 21st, 1926. This specimen seems to agree with an example in the British Museum Collection named as *muscaeformis* by Le Cerf, and, according to Muller-Rutz, this species occurs not uncommonly in Valais. Meyrick has noted this species as "probably *astatiformis*," but this latter is not recorded from Switzerland, so far as I know.
2021. *Platyptilia gonodactyla*, Schiff. Grimmelalp: June 29th and July 1st, 1925. Arolla: August 10th to 17th, 1925, common in the evening around a small patch of a *Tussilago*, Montreux: June 10th, 1926.
2027. *Platyptilia cosmodactyla*, Hb. Berisal: August 21st, 1926, bred from a larva found feeding on flower-heads of *Geranium sylvaticum*.
2029. *Stenoptilia coprodactyla*, Z. Grimmelalp: June 23rd to July 8th, 1925, common. Arolla: August 8th to 17th, 1925, common. Berisal: August 21st, 1926. Variable in size and coloration.
2032. *S. bipunctidactyla*, Hw. Uetliberg (Zurich): July 21st, 1925. Villeneuve: September 14th, 1925.
2035. *S. pterodactyla*, L. Evolène: July 29th, 1926. Berisal: August 21st, 1926.
2050. *Oidaematophorus monodactylus*, L. Arolla: August 28th, 1925. Montreux: June 9th, 1926.
2053. *O. tephrodactylus*, Hb. Arolla: August 8th and 10th, 1925.
2059. *Alucita tetradactyla*, L. Grimmelalp: June 23rd to 30th, 1925, common. Fayaux sur Vevey (about 3,000 feet): July 13th, 1926. Berisal: August 4th to 19th, 1926, common.
2060. *A. pentadactyla*, L. Montreux: abundant in one or two places where *Convolvulus arvensis* was growing: first seen on June 9th, and common until July 5th (and probably later).
2073. *Ethmia sexpunctella*, Hb. Montreux: June 18th, 1926. Apparently a rarity in Switzerland.

2076. *E. funerella*, Fb. Les Avants: June 21st, 1926. Rare and local in Switzerland, according to Muller-Rutz.
- 2082A. *Depressaria assimilella*, Tr. Villeneuve: October 3rd, 1925. Rochers de Naye: October 7th, 1925: perhaps carried up there in the train. Only recorded before from Basel, where one female was taken in June.
2098. *D. litorella*, Hb. (*hypericella*, Tr.). Berisal: August 23rd, September 4th and 7th, 1926.
2126. *Borkhausenia pseudospetella*, Stt. Montreux: September 27th, October 2nd and 11th, 1925.
2149. *B. tinctella*, Hb. Grimmialp: June 30th, 1925.
2154. *B. stipella*, L. Grimmialp: June 30th, 1925. Arolla; August 13th, 1925.
2170. *Endrosis lacteella*, Schiff. Montreux; October 16th, 1925, September 12th, 1926.
2183. *Sophonina semicostella*, Hb. Berisal: August 11th, 1926.
2184. *S. humerella*, Schiff. Grimmialp: June 23rd, 1925.
2194. *Dichomeris limosellus*, Schläg. Villeneuve: June 2nd, 1926.
2212. *Telphusa sequax*, Hw. Grimmialp: July 2nd, 1925.
2217. *T. proximella*, Hb. Berisal: August 15th, 1926. Usually a plains species, common from April to the beginning of July.
2226. *Gelechia pinguinella*, Tr. Montreux: July 8th, 1926.
2254. *G. perpetuella*, H.S. Arolla: August 17th, 28th and 29th, 1925. Berisal: July 21st, 1926. An alpine species.
2256. *G. longicornis*, Curtis (*virgella*, Wenner). Simplon Kulm, 6,500 feet: August 2nd, 1926.
2314. *Stomopteryx vorticella*, Scop. Grimmialp: July 6th, 1925.
2335. *Aristotelia superbella*, Z. Berisal: July 23rd, 1926. Only a single specimen, from Chur, has been recorded before from Switzerland.
2357. *Tebenna (Momphe) miscella*, Schiff. Grimmialp: June 30th, 1925.
2367. *Cosmopteryx schmidiella*, Frey. Eclépens: June 22nd, 1926. A rarity in Switzerland, according to Muller-Rutz.
2399. *Coleophora ornatipennella*, Hb. Montreux: May 31st and June 1st, 1926. In hay-fields.
2403. *C. nivicostella*, Z. Grimmialp: June 22nd, 1925.
2472. *Coriscium cuculipennellum*, Hb. Montreux: September 26th, 1925, at rest on a tree-trunk in the Gorge du Chauderon.
2540. *Lithocolletis populifoliella*, Tr. Zurich: July 23rd, 1925, on a poplar-trunk.
2549. *Bucculatrix frangulella*, Goeze. Chillon: June 9th and 16th, 1926. Abundant.
2553. *B. agricomella*, Z. Grimmialp: July 1st, 1925.
2558. *Phyllocnistis suffusella*, Z. Montreux: June 10th, 1926.
2588. *Elachista subnigrella*, Dgl. Grimmialp: July 6th and 7th, 1925.
2644. *Epermenia scurella*, H.S. Grimmialp: June 23rd and 24th, 1925. Berisal: July 21st and August 3rd, 1926.
2653. *Scythis amphonyella*, H.G. Berisal: July 21st, August 14th and 15th, 1926. This is an alpine species and Berisal is apparently rather a low elevation at which to find it.
2659. *S. senescens*, Stt. Grimmialp: June 24th, 1925.
2669. *S. scopolella*, Hb. Montreux: July 10th, 1926.

2684. *Hyponomenta padella*, L. Zurich: July 23rd and 24th, 1926, at light.
2688. *H. cognatellus*, Hb. Montreux: abundant from June 5th, 1926.
2701. *Zelleria saxifragae*, Stt. Berisal: August 5th, 1926.
2708. *Argyresthia ephippella*, Fb. Chillon: September 7th, 1925. Blonay sur Montreux (2,000 ft.): September 15th, 1925.
2710. *A. semitestarella*, Curtis. Chillon: 7th September 1925.
2718. *A. sorbiella*, Tr. Evolène: July 29th, 1925.
2725. *A. dilectella*, Z. Arolla: August 1st and 13th, 1925. Apparently not a common species and not recorded previously from such an elevation. The foodplant, juniper, is common at Arolla.
2737. *Cerostoma sequella*, Cl. Grimmelalp: July 13th, 1925. Said to be scarce in Switzerland.
2754. *Plutella maculipennis*, Curtis. Montreux: July 8th, 1926.
2775. *Tinea arcella*, Fb. Berisal: August 5th, 1926.
2788. *T. pellionella*, L. Grimmelalp: July 7th, 1925.
2802. *Incurvaria flavimitrella*, Hb. Chillon: May 30th, 1926.
2811. *I. rupella*, Schiff. Grimmelalp: July 8th, 1925. Les Pleïades: June 24th, 1926.
2818. *Nemophora pilulella*, Hb. Les Pleïades: June 24th, 1926.
2821. *Nemotois metallicus*, Poda. Martigny: June 11th, 1926.
2830. *Adela croesella*, Scop. Chillon: June 2nd, 1926.
2831. *Nemotois degeerella*, L. Evolène: July 29th, 1925. Eclepens: June 22nd, 1926.
2836. *Adela rufimitrella*, Sc. Les Avants: June 12th and 21st, 1926. Locally common around flowers of (I believe) *Cardamine pratensis*.
2893. *Nepticula basalella*, H.S. (*tityrella*, Stt.). Montreux: September 13th, 1925. A single specimen, in the Hotel.
2928. *Micropteryx anreatella*, Scop. Grimmelalp: June 29th, and July 2nd, 1925. Chillon: May 30th, and June 1st, 1926. Villeneuve: June 2nd, 1926.
2929. *M. ammanella*, Hb. Chillon: June 1st, 16th, and 27th, 1926.
2931. *M. aruncella*, Scop. Grimmelalp: June 27th, 1925.
2936. *Hepialus sylvinus*, L. Berisal: August 25th, 1926, one female.
2939. *H. hectus*, L. Grimmelalp: July 13th, 1925, three males, disturbed from low vegetation in the evening.

On the variations and relationship of *Coenonympha arcania*, L., and *C. gardetta*, De Prun. = *philea*, Hüb. = *satyrion*, Esp.

By ROGER VERITY, M.D.

I must begin by pointing out the most unfortunate mistake made by the text-books of this century in bringing into general use the name of *satyrion*, Esp., of about 1805 instead of that of *philea* given to it by Hübner in 1799 (or possibly 1798, as usually believed). Oehsenheimer in 1807 used *satyrion* because *philea* had been given by Linnaeus to a South American Pierid, but the authors of last century rightly disregarded this reason, as not valid, and quoted *satyrion* as a synonym of *philea*. One cannot understand why Rühl in 1895, followed by Staudinger in the third edition of his *Catalog* of 1901, suddenly took up *satyrion* and gave *philea*, Hb., as its synonym. The only

reason I can think of is that the description only appeared in 1805, but, as I have remarked in other cases, either one must admit that Hübner's figures are sufficient to validate his names or all of these must be abolished, with disastrous results in nomenclature. To make matters worse, Staudinger made use of the same name of *philea*, but in this case according to Freyer's figures, for a different form of the insect, a less extreme grade of variation in the same direction. Rebel in his *Lepidopterenfauna der Balkanländer* (*Ann. naturhist. Hofmus.*, 1904, p. 174) remarks that the name is Hübner's and must be used according to his figure, and subsequently, in his 1910 edition of *Berge's Schmetterlingsbuch*, p. 54, he gives the new name of *epiphilea* to Freyer's form. What he does not note, however, is that *satyrion* is a synonym of *philea*, Hb. A return to this name now, after the other use made of it during a quarter of a century in a large number of text-books, through blind faith in Staudinger, would have led to considerable confusion and inconvenience. Fortunately another correction, which, if I am not mistaken, it is necessary to make to establish the nomenclature in a perfectly correct way, serves also the purpose of obviating this new source of difficulties. It is that De Prunner in his *Lepidoptera Pedemontana*, p. 74, has, in 1798, named *gardetto* an insect, which Ghiliani seems unquestionably right in referring to *philea*, Hb. De Prunner says it is not rare in the Varaita Valley in June and from his description it is quite recognisable. The date of issue of Hübner's figure is not certain, as mentioned above, but even were it 1798, a description has, *ceteris paribus*, precedence over a figure according to the accepted Rules of Nomenclature, and *gardetta* should stand instead of *philea* and *satyrion*.

To avoid further confusion it must also be noted that Godart's figures, quoted by Staudinger under *philea*, Freyer, represent, on the contrary, a very extreme form of *philea*, Hübner, and that Lang's figure of *darwiniana*, wrongly accepted as such by Staudinger himself in 1901, is totally different from Herrich Schäffer's because it is unmistakably drawn from an *epiphilea* specimen; the same may be said of Seitz's figure of *darwiniana*.

My reasons for dividing the insects we are dealing with into two groups and considering them two "exerges" of a single species will be seen by the following descriptions of the observations I have been able to make on the field. Their variations have puzzled Entomologists for over a century: at all times some have split them into two and even three species; others have united them into one. It seems to me that, as in several other similar cases, the cause of this diversity of opinions lies in the fact there exists a third sort of relationship, which is neither specific nor racial, if by the term of "race" one designates a group of individuals having developed in the same surroundings and exhibiting certain local features simply due to their influence. No effort has hitherto been made in classifying Lepidoptera to distinguish from these variations, of much more frequent occurrence, those which are due to stable hereditary causes. I have been criticised for having introduced the new term of "exerges," with, it has been said, a definition agreeing exactly with that of "subspecies." It may be so in the minds of some naturalists, but many others have used it indiscriminately for races, as defined above, and for other kinds of variations, so that it conveys nothing definite. That is why I have thought it

necessary to draw the attention of Lepidopterists to the third sort of relationship, of which *arcania* and *gardetta* are an excellent example, by a new term with this definite meaning.

Races of nymotypical exerge *arcania*, L.

This exerge consists of a very compact group of races, as compared with those of exerge *gardetta*. They strike one at once as being true races, due simply to the effects of surroundings on individual development, whereas the variations of *gardetta* are complicated by a phenomenon, which is presumably due to stable hereditary differences.

The specimens I have from Central Europe, including Geneva and Vienna, all seem to belong to exactly the same race, which differs very little also from my series from Norrwicken in Central Sweden. This is evidently the nymotypical form, as the species was first described in *Fauna Svecica*. It is slightly smaller and duller in colour than most Central Europe examples. If a name is used for the latter it must be Scopoli's *amyntas* of 1763 from Carniola or Fourcroy's *cephalus*, given in 1785 to the Parisian insect, and thus Frühstorfer's *saleriana* (*Entom., Zeitschr.*, 1910, p. 3), given to the race of Geneva, Arcine, etc., must fall as an absolute synonym. My race *tenuelimbo* of Peninsular Italy and Catalonia is rather larger and brighter; the white band-like space of underside is on an average broader and the ocelli a little larger; the name, however, was not a happy one, because the black marginal band of upperside is, on the whole, about the same as in Central Europe; its II. gen. *gracilis*, Vrtý., is remarkably small and frail. Oberthür has named (*Ét. Lép. Comp.*, IV., p. 25) *huebneri* the form of Hübner's figure 240, with a large fulvous patch in the middle of hindwing above; it is an individual form, usually very rare, but frequent in certain localities, such as Samonssy (Aisne) and Andorre (*teste* René Oberthür *in litt.* to me). Querci has found that at Orihuela (Albarracin Sierra) a similar form, but with the underside of hindwings broadly fulvous, is prevalent: race *clorinda*, Sagarra (*Bull. Inst. Catalana Hist. Nat.*, 1924, p. 199). In the Maritime Alps two giant forms are met with, both with a very broad white band on underside, but one (*balestrei*, Frhst., *l.c.*) has small ocelli and the other (*macromma*, Trti. and Vrtý.), has very large ones; they seem to exist together in some localities and to be racial in others. The Calabrian race *opposita*, Vrtý., as in the case of other species, is a near ally of those of this region. We then come to the race with the white band considerably reduced: race *insubrica*, Frey., has been noted and described for many years on account of its large size and gaudy colouring, from the Tessin, S. Tyrol and Upper Austria. There exists, however, a race which cannot bear that name, because it lacks the characteristic giant size, although it has the same intensity of colour, the narrower white band, and the same prominent ocelli and pattern. To this belongs the race of Oulx, m. 1100, in the Susa Valley, and I have collected it also at Turin and in the Carnic Alps, at S. Stefano di Cadore, m. 900, and at Cima Sappada, m. 1400. The name of *seyta*, given by De Prunner to an insect of Turin, has been attributed to *arcania*, but it seems to me his quaint description affords no positive clue, and anyhow, his statement that it flies in the autumn would restrict it to the II. gen. I take my Carnic specimens of "typical" and I name this race **parvinsubrica**. Othess from the Carso, above

Trieste, m. 300, resemble it in size and general appearance, but the basal half of underside of hindwing, instead of being grey with a bluish gloss, is tawny and in some of them the band is of a rich yellow tone, instead of white: race *tergestina*, mihi. A further grade along the same line as *parvinsubrica* is afforded by my Gôdre series of specimens from the Hautes Pyrénées; some of them are of a very dark tone on underside and also the upperside is then usually very saturated, so that they are of a warm reddish chestnut colour, instead of fulvous, on this surface: race *maesta*, mihi.

(To be continued.)

The Basses-Alps in May-June, 1926.

By Lieut. E. B. ASHBY, F.Z.S., F.E.S.

I left London early on May 16th, and arrived at Peyruis station in the afternoon of the following day. I stayed at the Hotel Barras, Les Mées, a village at a short distance from Peyruis until May 24th, in order that I might work the ground between Peyruis and St. Auban, along the right bank of the river Durance, which I found so profitable last year. When I arrived this year the Mistral, which had played such havoc with the vine and potato crop in South Provence, was still blowing, and somewhat hindered my collecting. During this week I found the following butterflies on the ground mentioned above.

Zerynthia rumina race *medesicaste*, fairly common above the station at St. Auban in first rate order, and odd specimens at different spots along the line. *Anthocharis tagis* race *bellezina* just emerging and fairly common. *Melitaea didyma*, *M. phoebe*, *M. cinxia*, *Euchloë euphenoides*, common and in fine condition. A few *Pontia daplidice* gen. I. *bellidice*, fresh. *Anthocharis crameri* (*belia*) was already going over. *Glaucopsyche cyllarus*, *Poecilia sertorius* (*sao*), and *Pararge maera*. The "burnet" moths taken were *Zygaena larandulae* a few, *Z. rhadamantus* just emerging and plentiful, *Z. achilleae* became plentiful later on, *Z. trifolii* an interesting form, and *Z. lomiceræ*. I bred magines of the last after my return home. From Digne larvae I reared a number of 5-spotted forms of what are apparently *Z. filipendulae*.

There are several small section boxes along the line between St. Auban and Peyruis stations. These are riddled with entrances to bees' nests and by careful attention I got a fine number of bees and other Hymenoptera, amongst them being bees of the genera *Anthophora* and *Chalicodoma*, with their attendant bee parasites. The Hymenopteron *Chrysis ignita* was especially noticeable on these section boxes.

Near the railway cutting between St. Auban and Peyruis stations, on the St. Auban side, there is a piece of overhanging cliff near the railway, which is also riddled with bees' nests and here I spent a considerable time with excellent results. The parasitic bees *Coelioxys vectis* and more commonly *C. quadridentata* were easily obtained. Except along the bank above the river Durance between St. Auban and Peyruis stations, I did not obtain any good results, and although I walked for some distance to the south of Les Mées village, and also to the hills west of the bridge over the river, I found both these localities comparatively unproductive at this time of the year.

May 24th.—After a week of perhaps the most trying collecting weather I have ever experienced, I left Les Mées for Digne. I spent the afternoon *en route* on the hills above the station at St. Auban, which yielded some fresh specimens of the moth *Coscinia striata*, a couple of *Anthocharis taqis*, and near St. Auban Station a couple of *Z. rufina* race *medesicaste*.

May 25th.—This afternoon and for several succeeding afternoons I collected with profit on the road leading just behind the station at Digne up to Les Courbons. At this time of the year, I found that insects in general continued later on the wing as this road gets the full afternoon glare of the sun. I found *E. euphenoides* still plentiful and fresh: several specimens of *Zygaena larandulae*; the bee *Violacea cyanusens*; the spring brood of *Polyommatus (Agriades) aragonensis*, of which males were abundant, but were going over at this date. *Zygaena achilleae* were abundant and fresh.

The morning of May 26th I spent on Mt. St. Vincent, where around the ruins of the monastery fresh *Papilio podalirius* were flying, a few *Erebia erias*, and also a few *A. crameri (belia)* were taken, but it was too late to get this last species fresh. *A. tagis* race *bellezina* was also at this date at Digne scarce and showing signs of wear on the several hills where it flies.

May 29th.—I climbed Mt. Cousson to-day ascending by its slopes that are reached by way of the grand gorge beyond the Baths. About 2½ miles up I found *Erebia erias* flying in considerable numbers, but not in any colony like *E. epistygne*. The best way of getting *erias* was to take them as they settled at the water, which crosses the path twice at some distance up. Here one could catch them easily and select the freshest specimens. The majority were in good condition. Besides these I found *Brenthis euphrosyne*, *Heodes dorilis*, and *Hamearis lucina* in good condition all nearly about the same height as I took the *E. erias*.

May 30th.—I am indebted to General Cooke for information about *Melitaea deione*, which is fresh and common at this date at the right places near Digne. It seems to be confined to the hottest gullies, where it flies up and down, rarely settling, though it seems interested in the very small plants, which struggle to keep an existence in these arid spots. The form here appears to lack the black > shaped mark near the inner margin on the upperside of the fore-wings often characteristic of the Swiss races and in this way resembling the form found at Vernet and elsewhere in the Pyrenees. I was glad to get a small series of nice fresh specimens, but I was only just in time.

May 31st.—A walk along the river bed of the Miroux brook which runs parallel with the Dourbes Road produced *Plebeius argus (aegeon)*, *Polyommatus thersites*, *G. cyllarus*, *Cupido sebrus*, *Scolitantides baton*, and *Everes argiades* race *corctas*, among other insects. In the afternoon I collected on some waste ground behind the Maison Yvan on the Dourbes Road, which produced *M. aurinia* var. *provincialis* and quite fresh specimens of *M. athalia*. Just below La Collette, I captured a perfect female of *Lycaena iolus*, at rest on a twig of *Rosa canina*, the only specimen I saw.

June 1st.—A walk along the path above the right bank of the River Bléone, from the main bridge at Digne as far as the farm St. Benoît yielded a general bag, especially the large black beetle *Molytes glabratus*,

which were fairly abundant, a fine female specimen of the clearwing *Synanthedon (Sesia) spegiformis*; and some fresh specimens of *Brenthis euphrosyne*.

During the greater part of my stay at Digne this year the weather was dull, and though I managed to bring back a thousand insects of seven orders including 100 moth larvae broom-feeders, I had to box nearly half of the imagines I took, which necessitated a great amount of searching. *Aporia crataegi* and *Pararge maera* were two of the most abundant butterflies everywhere at Digne, and were both in the finest condition.

June 4th.—I climbed the Mt. Beaumont, the approach to which I described in my notes *Ent. Rec.*, XXVIII., p. 39. Towards the summit *P. machaon* was quite common, with a sprinkling of *A. tagis*, but these were quite going over at this date. With the exception of a fine specimen of the wasp *Eumenes coarctata*, taken on the descent, I got nothing of much interest but a fresh specimen of the moth *Hemaris tityus (bombyliiformis)*, whose right pair of wings are both deformed in size; which fact however, did not in the least hinder its activity on the wing.

June 5th.—I climbed the Mt. Cousson again to-day going nearly to the summit. Unfortunately the early bright morning did not last, and the greater part of the day was very dull. A day for collecting larvae, and I found the beetles *Arima brevipennis*, Illig., and *Cebrio lepturoides*, F., abundant in both sexes, over a wide area.

(To be completed.)

On Nomenclature.

By ALFRED SICH, F.E.S.

Entomology makes rapid progress and for the last six years I have been little in touch with modern thought. However I may perhaps be allowed to give expression to some of my ideas on the subject of nomenclature. In the first place to clear the ground, it is necessary to go back geologically speaking, a few years. If it were possible to view the lepidoptera existing on this earth two or three million years ago I doubt very much whether we could recognise one single specimen as identical with any now living species. Ever since the lepidoptera first appeared, possibly in the Permian, or perhaps not till Jurassic times, they have been developing new species, new genera, new families. Some of these for various reasons became extinct no doubt, but the rest have carried on further development till the present day. Here comes an important point, which occasionally seems to be lost sight of. The lepidoptera of to-day are not at rest but still continuing their evolution. The species are either slowly dying out or gradually assuming features, which ultimately change them into new species. It follows then that among present day lepidoptera there must be some individuals which are just breaking away from a species, some which have already progressed half way towards a new species, and again others that have almost completed the whole span. As this process of development has so many and such indefinite stages it seems quite unnecessary to invent names for every rung of the ladder. In my own mind I am content with four: *species, aberratio, forma, subspecies*.

I will take the term, species, as it is generally understood. Then any specimen which differs slightly or considerably from the type of the species may be termed an aberration. This may be rare or abundant and may be considered as the first breaking away from the old species towards the new. When an aberration has become so abundant as to equal or out-number the type but still flies with and breeds with the type, I call it a form. It may then be regarded as less or more than half way towards a new species. When a form has so completely taken the place of the type of a species that the type no longer exists with it in a given locality, I call it a subspecies. It may then be considered as furthest away from the old and nearest to a new species. Thus I state my present views in a simple and very bare manner. In nature the whole question is wonderfully and fearfully complicated. I will not dilate on the subject here but will add that some species seem able to retain their ancestral garment and yet adapt themselves to changed environment, thus we have *Micropteryx* and other ancient species still with us. Some aberrations again do not seem to be attempts at new species but may be last remnants of the old species still appearing in the new species, as for instance, the ab. *helice* of *Colias croceus*. I like the term, race, but as now used it indicates what is really a subspecies. Form as above suggested means local form. Seasonal form, dimorphic and polymorphic forms are in a separate category. To my mind it requires a large amount of study in the field and possibly some experiments before we can attempt to decide the status of a lepidopteron, but there are no doubt many instances when we can come to a reasonable conclusion. It would be ridiculous to my mind for a collector to visit a locality, previously unknown to him, and then describe races and subspecies based simply on one season's experience. In the earlier days of entomology many varieties received names because the specimens so named were then considered to be good species. In later years, there arose a craze for giving names to specimens which were well known to be merely slight variations of a known species. Vanity was no doubt a great incentive to this useless action as the author of the name could add the magic *mih*i. It is useful to make an intensive study of a particular species and work out and classify all its known aberrations which in a variable species run like chains in more than one direction. To give names to every link in every chain, for example to every phase between a conspicuously spotted and a faintly spotted form, is unnecessary, inconvenient and sure to lead to confusion. In Staudinger and Rebel's *Catalog*, we find most of the varieties that are listed are given a short diagnosis to assist the reader's memory. Sometimes we also find the words *vix nominanda*. To the majority of the varietal names loosely coined during the last few years these two words surely apply.

NOTES ON COLLECTING, etc.

NOTES ON COLEOPTERA TAKEN IN 1926.—The following are the more interesting Coleoptera taken in the season just past. Unless otherwise stated all the localities mentioned are in Hampshire.

Halyzia 16-guttata, L.—was beaten in numbers from a variety of trees from April onwards, at Eastleigh and in the New Forest.
Homaloptia ruricola, F.—several on the wing on Farley Mount in

July. *Serica brunnea*, L.—Not uncommon at sugar, Baddesley, in July. *Iacm murinus*, L.—beaten from poplars on Farley Mount at the end of June. *Plater sanguinolentus*, Schr.—one taken from a pine stump on Beaulieu Heath in May. *P. elongatulus*, F.—seven specimens beaten from bushes on Farley Mount at the end of June. *P. balteatus*, L.—taken under bark on pine stumps in April and May at Chandler's Ford: one specimen taken on the wing at Beaulieu Road in May. *Corymbites quereus*, Gyll.—a single specimen was beaten from oak in the Great Covert, Baddesley, May 15th. *Campylus linearis*, L.—was in great abundance on shrubs at Baddesley at the end of May and in June. *Malachius acneus*, L.—swarmed on flowers in June, in the meadows by the R. Itchen, at Eastleigh. *Haploenemus impressus*, Marsh—a single specimen was taken in my garden at Eastleigh, May 8th. *Psilothrix nobilis*, Ill.—occurred in numbers on flowers in the quarries at Portland in August. *Drilus flarescens*, Ross.—males were common on grass stems by roadsides at Eastleigh, in May and June; and were swept in numbers from grass on St. Catherine's Hill, Winchester, in July. *Prionus coriarius*, L.—My friend Mr. B. M. Hobby gave me a fine specimen of this Longhorn taken by himself at Wordsley, Staffs, in August. *Aromia moschata*, L.—a specimen taken resting on a post at Shawford, July. *Crioceraphus polonicus*, Mots.—This species was bred from pine stumps, emerging at the end of July, Chandler's Ford. Several came to light late at night in the same month at Eastleigh, whilst a large female was picked off a tarred fence at Portland in August. *Callidium alni*, L.—was obtained by beating hazels in the Great Covert, Baddesley, on May 31st, and one was taken flying in the sunshine in a street in Eastleigh in June. *Molochus minor*, L.—A fine male of this species was beaten from dead larch twigs, at Baddesley, May 31st; in June, my friend Mr. W. Fassnidge secured several females by beating shrubs at Farley Mount. *Toxotus meridianus*, L.—was common in all the woods around Eastleigh, some of the females being practically black. Mr. A. H. Sperring sent me specimens taken in Hyden wood, near Portsmouth, June 16th. *Pachyta cerambyciformis*, Schr.—a single specimen was taken at Farley Mount in June by Mr. W. Fassnidge. *Leptura fulva*, De G.—This very local species occurs near Eastleigh, and is to be taken at flowers—thistles, yarrow and various Umbellifers are favourites—when the sun is shining. It was in good numbers in July, 1926, and was found to be breeding in posts by the railway. *Leptura livida*, F.—occurred in numbers in July at Umbellifers, Lee-on-the-Solent (Mr. B. M. Hobby). *Strangalia melanura*, L.—This species was swarming at bramble blossom on Farley Mount in June; on the 27th, when the sun was out, it would have been possible to take several hundreds of both sexes. It also occurred at Eastleigh in the same month, but very sparingly. *Grammoptera tabacicolor*, De G.—fairly common at Eastleigh in June. *G. analis*, Pz.—One specimen of this somewhat rare species was beaten from oak in the Great Covert, Baddesley, May 31st. Others may have been overlooked among the crowd of the common *G. ruficornis*, F., which continually fell into the beating tray. *Pogonocherus dentatus*, Fourc.—was beaten from oak, Baddesley, May 31st (Mr. W. Fassnidge). *Mesosa nubila*, Ol.—The first specimen of this species was beaten from a dead aspen, in the Great Covert, Baddesley, on May 8th (Mr. W. Fassnidge). On the 16th I beat another from a dead oak bough, but further beating on this and

subsequent days failed to discover others. On Oct. 23rd, in the same woods, Mr. Fassnidge and myself spent some time splitting up fallen oak boughs, and discovered several specimens resting in cells, apparently awaiting the spring before they emerged. Odd specimens were taken later on various dates in the same way, but in January (1927) Mr. Fassnidge discovered some felled oaks in Hut Wood, near Southampton, and by breaking up the partially rotten boughs secured a good series. A visit to the same trees on Jan. 9th, by Mr Fassnidge, Mr. P. Harwood and myself resulted in a bag of over a score of the beetles, and there can be no doubt that the species is a common one in this district, although considerable labour has to be expended in obtaining a series. *Leiopus nebulosus*, L.—swarmed everywhere on oaks in June and July around Eastleigh; on one occasion 5 fell into the tray at once. *Saperda populnea*, L.—was bred from galls taken in January at Baddesley, Southampton and Winchester. The species responds to forcing, and numbers emerged indoors in March. A dipterous parasite, not unlike a housefly in appearance, is commonly found to have destroyed the beetle larva, and in the wild much havoc is wrought amongst the larvae by tits. *Tetrops praeusta*, L.—a few beaten from sallows in June, Baddesley. *Stenostola ferrea*, Schr.—two specimens were beaten in the Great Covert, Baddesley, in May. *Donacia vulgaris*, Zsch.—in good numbers at a clay-pit near Brambridge, end of May and in June. *Cryptocephalus aureolus*, Suf.—swarmed on St. Catherines' Hill, Winchester, in July. Some nice red forms occurred (in 1923, in the same locality, a specimen with almost black elytra was taken). *Chrysomela didymata*, Scrib., and *C. hyperici*, Forst.—locally common around Eastleigh, June. *Cassida nobilis*, L.—was taken from dock on Netley beach, May 26th. A single specimen of *Conopalpus testaceus*, Ol., was beaten from oak, July 3rd, at Baddesley. *Ithynchites interpunctatus*, Steph.—one taken in Bishopstoke Woods, near Eastleigh, April 6th, and a second at Baddesley on May 8th. *Orthochaetes insignis*, Aub.—a single specimen on Chesil Beach, Portland, in August. *Tychius pygmaeus*, Bris.—a few were obtained from *Origianum vulgare*, L., at Portland in August, but the species seemed very scarce.—FREDK. J. KILLINGTON, F.E.S., 177, Leigh Road, Eastleigh.

COLLECTING REFERENCES.—SPAIN.—*Ent. Rec.*, XIV., p. 10; XIV., p. 70, etc.; XVI., p. 85, etc.; XVIII., p. 57, etc.; XIX. 161; *E.M.M.* XXVII., p. 233.; XXXII., p. 11.; XXXIX., p. 54; XXXIX., p. 179, etc.; XL., 7; XLIII., p. 212.; XLIV., p. 52, etc.

ANDALUSIA. *Ent. Rec.*, XXV. p. 220; *Ent.* XXXV., p. 228.

ALBARRACIN. *Ent. Rec.* XXVII., p. 173.; *Ent.* XLI., p. 4.; XLV., p. 110.; XLVI., p. 283, etc.

ALGECIRAS. *Ent.*, XLI., p. 213.

BRONCHALES. *Ent. Rec.*, XXV., p. 70.

BARCELONA. *Ent.* XXXVIII., p. 200, etc.; XLI., p. 301.

CUENCA. *Ent. Record*, XXV., p. 35.

CANTABRIANS. *Ent. Rec.*, XXVII., p. 124.

LA GRANJA. *Ent. Rec.*, XXI. 34, etc.; XXV. 33, 278; XXXIV.

66.

GIBRALTAR. *Ent. Rec.*, XXIII. 261; XXIV. 172; *Ent.* XVI. 240, 279; XL. 214, 258; *E.M.M.*, XXIV. 175, etc; XLIX. 117, etc.

GRANADA. *Ent. Rec.*, XXV. 223; *Ent.* XXII. 160, etc.

MALAGA. *Ent. Rec.*, XXIII. 262, etc.; XXV. 223.

PAJARES. *Ent. Rec.*, XXVII. 121.

PUENTE DE LOS FIERROS. *Ent. Rec.*, XXVII. 189.

RONDA. *Ent. Rec.*, XXV. 223; *Ent.* XLI. 213.

TRAGACETE. *Ent. Rec.*, XXV. 69.

GUETHERY. *Ent. Record*, XXV. 33; *Ent.* LVI. 157.

BIARRITZ. *Ent. Record*, XX. 179; XXII. 110.

PORTUGAL. *Ent. Record*, XXI. 127; *E.M.M.*, XVII. 181, etc.

VIGO. *Ent.* XXXI. 77.

CURRENT NOTES AND SHORT NOTICES.

At the invitation of the American Association of Economic Entomologists and the Entomological Society of America the Fourth International Congress of Entomology will take place at Ithaca, New York, presumably during the third week of August, 1928. A preliminary programme will be issued in the near future. —K.J.

The annual "Verrall" Supper, which is now more directly under the famous Entomological Club was held on Tuesday, January 18th, and the weather being favourable there was a very large gathering, some 140 guests being present. In the list of those present lying before us, which want of space does not allow us to print, we note a considerable number of new names. We hope that support will be given by all those who can to this admirable institution, where old friends meet once again and new friendships arise.

A circular with a preliminary programme has reached us of the 10th International Congress of Zoology which is announced to take place at Budapest, Hungary, from September 4th to 9th of the present year, under the Presidency of Dr. G. Horváth, Director of the Hungarian National Museum. The Congress had been arranged to take place in 1916, but this being impossible it had to be postponed to the present year. A cordial invitation is given to all those interested in Zoological Science to attend this Congress.

Two years ago we announced the publication of the first number of an annual report of the Hampshire Entomological Society. We have just received No. 2 of the *Transactions* of this Society, giving a short summary of their monthly doings during the past two years, and several of the papers read. Mr. E. A. C. Stowell discusses "What are Species and How do they arise"; The Rev. J. E. Tarbat, deals with "The Study of Variation"; Mr. Fassnidge gives an account of his discovery of *Synanthedon flaviventris* in Britain, as well as "Notes on the year 1925." There is also a short summary of a paper on "Two closely allied species until recently confused in *Polyommatus coridon*," by ourself. Congratulations are due to all those connected with the Society for the enthusiasm they put into their leisure-hour study, and their unity of purpose in the mutual support of the Society, the meetings of which it must be an effort to attend from distant corners of the county.

The last issued part of the *Deut. Ent. Zeit.*, the Transactions of the German Entomological Society, Berlin, contains papers on *Cerapterus* (Coleoptera *Paussidae*), *Riodinidae*=*Erycinidae* (Lep.), the

Ichneumonidae of the Dobrudscha, *Olibrus* larvae (Col.), *Aphididae* of the Philippines, *Anthophora retusa* and *A. aestivalis* (Hym.), New Neuropterous insects, the Sexual-armature in Lepidoptera, the Orthopterous Fauna of Siberia, etc., with one plate and numerous figures.

The *Zeit. für wiss. Insektenbiol.* for December contains a continuation of Stauder's valuable "Schmetter. fauna der Illyro-adriatischen Festland," a contribution to our knowledge of Tenthredinid mines, with articles on *Lathrobium* and *Rhynchites* (Col.). The supplement has articles on the *Bombyliidae* (Dip.), the *Simuliidae* (Dip.), and the palaeartic *Nemeobiinae* (Rhop.).

REVIEWS AND NOTICES OF BOOKS.

THE BRITISH ANTS, THEIR LIFE-HISTORY AND CLASSIFICATION.—By H. St. J. K. Donisthorpe, F.Z.S., etc. (Late Vice-President of the Entomological Society of London)—George Routledge and Sons, Limited, 2nd Edition, 1927.—The first edition of this work was reviewed eleven years ago in this magazine, and the remarks concluded with the words, "As a whole the work brings our knowledge of the British Ants up to a point, which leaves nothing to be added, and we can only wish for it that publicity, which Mr. Donisthorpe's treatment of his subject deserves." It has had the treatment it deserved and within ten years of its first publication an unexpected demand for its reissue has arisen. That was impossible without revision. In the ten years our knowledge had increased apace; two new species were added to the fauna and two new forms of old known species must be incorporated. New facts as to distribution in Britain it was essential to include. Wheeler in his "Social Life among the insects" and Forel in his "Le Monde Social des Fourmis" raised new points of view on the Life-history of Ants. Emery, Wasmann, Schmitz, Bondroit and others had added to our general knowledge of these Hymenoptera, so that a thorough revision was necessary if the book was to be brought up to the new high level of knowledge and usefulness. The author, one of the ablest field naturalists in the country, has kept in the foremost rank, testing, criticising, experimenting on all the newly suggested lines as they appeared from these various authors during the whole of the ten years which has elapsed, and was well fitted for the task of revision. We are told that the synonymy and bibliography have been brought up to date and all new records, both British and foreign, have been added. The Bibliography, without which no book of this class is worth obtaining, alone fills over 20 pages, and includes a list of Mr. Donisthorpe's own contributions to myrmecological science.

One of the most interesting sections deals with the phenomena under polymorphism, and its causes with the curious results attained. This phase of growth is made the more intelligible relatively, by a capital diagram. The author concludes his remarks on the habits of the ants with the summary that their "actions are guided by education, experience and memory." In a masterly way he treats of the habit of keeping "guests," summing up the records of their occurrence with each individual species. As many as nearly 70 species of inhabitants are recorded for several species. In fact many ants throughout the world seem to keep quite a "Zoological garden" on their own account, except

that many of the "guests" are apparently voluntary and the benefit is mutual. The illustrations, photographic and diagrams, are not stinted and put in wherever they are needed to aid in identification, or to illustrate structure or habitat. The get up of the book, which is reset and rearranged throughout, is very attractive, printed with paragraphs, varied type and headings, so that one never gets tired in looking up information, and comparisons can the more readily be made. It is perhaps too much to hope that the third edition may be needed in another decade, for so exhaustive has been the study of this small group that one can assume that little remains to be discovered in their economy and habits, although much may be added to our knowledge of their distribution in hitherto unworked corners even of our British Islands. Author and publishers are to be congratulated on their successful efforts, and may the circulation of the book remunerate all concerned for their meritorious work.—H.J.T.

 **BITUARY.**

George T. Porritt, F.L.S., F.E.S.

The Entomological Society of London is gradually losing from its ranks, men who, for the past fifty years or more have helped to make the Science of Entomology what it is to-day. In G. T. Porritt we lose a name familiar to all the older entomologists, as one of the most active collectors and students of the British insect fauna. In books and magazines of the "seventies" and onwards for fifty years, he was referred to or contributing articles, notes, criticisms, and many were his personal friends and correspondents both old and young. Even to us within the last two years his suggestions, criticisms and offers of aid have been freely given in that helpful, friendly spirit which he always showed. Born in 1848, he had passed the allotted threescore years and ten, and only within the last year or so, did he feel that he must give up his frequent business visits to London, on account of his somewhat failing eyesight. For many years he had been a member of the South London Entomological Society, and if the dates of his visits to London allowed, he attended the bimonthly meetings. He was connected with the *Naturalist* (Yorkshire) as joint editor at its commencement in 1875, and for many years was on the editorial staff of the *Ent. Mo. Mag.* Since 1870 he had been a Fellow of the Entomological Society of London and had served on its Council, and he was also a Fellow of the Linnean Society. Of the famous Yorkshire Naturalist's Union, he was a strong supporter from its inception in 1877, and had been its President. The Lepidopterists know him chiefly by his editorship of the Ray Society's volumes on *The Larvæ of British Butterflies and Moths*, the last five volumes of which he prepared for press after the death of the author, his friend Wm. Buckler. On the more scientific side he was much interested, wrote and read papers on Melanism, so many instances of which he met with in his home neighbourhood of Huddersfield and South-West Yorkshire. All of us, who knew him, have pleasant memories of him and we mourn his loss to ourselves as well as to Entomology.—H.J.T.

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MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. March 16th. April 6th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. March 24th. April 14th.—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., J. P. HARDIMAN, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

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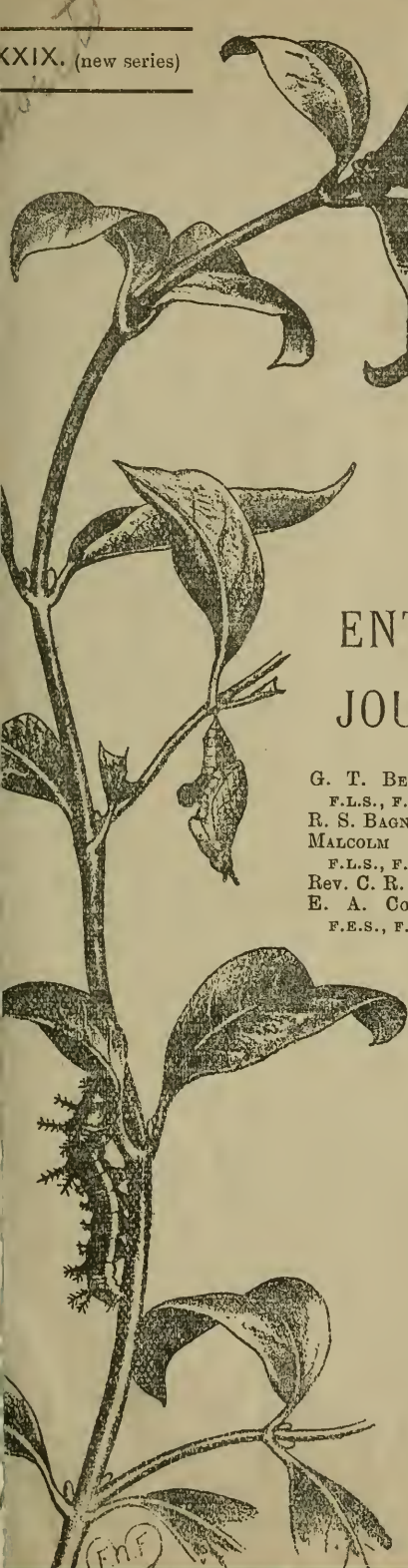
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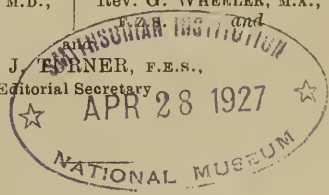
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Dr. Verity and Nomenclature.

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

I want to reply to Dr. Verity's note on nomenclature, ante p. 29 principally to correct an impression (a false impression) that has been referred to by several readers, some verbally, but also by way of reply.

Those who have followed the politics of this country and especially the foreign politics, will be well aware of the soubriquet of the late Lord Curzon in the House of Commons and in political circles generally, he was "a superior person." He himself was well acquainted with the nick-name, and it is known that at times it even had some influence, if not on his action at least in his public utterances. I must admit that when I read Dr. Verity's letter (and others felt it also) it produced in my mind the impression of a marked superiority over those who differed from him. Now I am sure this was not in Dr. Verity's mind when he wrote. I have the pleasure of his personal acquaintance and I hope of his friendship, for when I was in Florence two or three years ago, I had more than one instance of his kindness and also of his forbearance and moderation in discussion and argument. I therefore want to say that I am sure the kind doctor did not intend to assume that attitude, though those, who did not know him personally, would probably think that he did.

Turning now to Dr. Verity's letter, there are two phrases in it that call for remark, *viz.*, "I fully agree . . . that it is high time to stop naming individual forms . . . and especially on a single character," and also "When, however, it comes to races, I am sorry, but my conviction is it is technically necessary to name them." I regret much this last sentence, because, first, Dr. Verity's idea of a race is quite different from the consensus of opinion and weight of evidence here (I will deal with this later on) and secondly because he sets himself up as plaintiff and judge at the same time, and practically says I shall do as I think best, no matter what is the weight of scientific opinion on the other side. Now I say quite frankly I am glad to have Dr. Verity's theories, we move forward by theorising and experimenting, but I am not glad to have his innumerable naming of small variations; it is not helping science. Then he says he agrees it is time to stop naming individual forms, but he continues doing so. I cited a case in my note (ante p. 10) as also a case of a "race" that was not a race but a mere common variety. The gist of the matter is the fact that Dr. Verity's concept of a "race" differs from the general concept. Mr. Tams (ante p. 25) has focussed the object right down to its point. He refers to Rothschild and Jordan's *Revision of the Sphingidae* and particularly to its introduction. That book is so valuable that it is never off my table, and at the risk of repetition I will recapitulate their diagnoses of the term varieties. I would like this to sink into the minds of us all.

"We distinguish three categories of varieties.

I. Individual variety, the following terms are employed by us:

- (1) *ab.* = *aberratio* for individuals which stand outside the normal range of variation.
- (2) *f.* = *forma* in the case of di- and polymorphism. If a form occurs rarely, it may be termed, *f. ab.*, in contradistinction to *f. norm.*

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- (3) ♀ -f, or ♂ -f., if the respective form belongs to one sex only.
 (4) *f. loc.* = *forma alicuius loci*, if, in the case of polymorphism, a form is restricted to one portion of the range of the respective variety or species.

II. *Generatory variety*, this variety is seasonal in Lepidoptera and is designated as

- (5) *f.t.* = *forma tempestatis*.

III. *Geographical variety or subspecies*.—This is the highest category of varieties. As the term *varietas* includes also other varieties, it cannot be employed as such for the geographical variety except in a precise nomenclature; either a specifying attribute must be added (*var. geogr.*) or an abbreviation of another term chosen (*subsp.*). But we do not see that it is at all necessary to put any such abbreviation of a term before the subspecific name. We can do without the encumbrance of the abbreviation—what we can do without is unnecessary; and *what is an unnecessary in nomenclature, common-sense compels us to drop*—by (the italics are mine
 (6) G.T.B.B.) simply mutually agreeing that a subspecies is designated by its name added to that of the species without any abbreviation before the subspecific name. This means *simplification of nomenclature, nothing else.*"

I know of no definition of this subject as concise and as comprehensive as this, and the consensus of scientific opinion in this country and largely elsewhere also agrees with it.

It is here we part company with Dr. Verity, the word race being generally accepted as synonymous with sub-species.

Dr. Verity names any insect slightly different that has a large percentage of the slightly different form. In a case of this kind 20% to 30% is a large percentage, but it is not a race at all, it is merely a common variety, and the same would apply to a 75% abundance, though in this latter case the variety would be rapidly approaching to the status of a subspecies. In our previous volume, p 122, Dr. Verity says "It is surprising how the geographical variation of *coridon* has been neglected: it produces a number of obviously different races, when sufficiently large series are compared to *neutralise the confusion created by individual differences.*" The italics are mine, but this sentence shows my friend's idea of races and also his method of study—he admits great variation and then would eliminate that variation from his mind and apparently see only the variety he wants to name, and having eliminated the other varieties, he calls the variety a race so as to fit it in to his theory, and he goes on in the following pages to name no less than fifteen forms of *coridon* many on almost single and minute and variable differences calling them races. I have very carefully gone through his paper, with a very large series of *coridon* before me from very many localities and I have no hesitation in saying that if the locality labels were taken off it would be impossible to sort out those varieties correctly, in fact, without the labels I do not believe Dr. Verity himself could. It is this method that makes us cross swords with the learned doctor, he eliminates all that does not suit him, he tells us so as I have quoted, and then proceeds to give us what he

calls a "complete picture of geographical variation" this picture however, as he tells us, eliminates very much, if not most, of the picture's real surroundings; then he closes with saying, "Those who do not wish to follow us in our exact analysis of Nature's complexities can perfectly well ignore the more recent developments of Lepidopterology, but there seem to be plenty, who do not mind a few names more or less and are interested in our writings." I would ask Dr. Verity to *exactly analyse* that phrase and see where it leaves him and me, not to say us.

A few names more or less is not the only consideration by any means, for what we say is, that the exact analysis is not there, we are given only part of the true picture, according to the artist's own admission, for a quarter, or half, or perhaps three quarters of the picture has been "neutralised," not by "confusion," but by elimination, and if the artist and the student of phenomena would try and realise this, I think it might make a modification and would certainly be better for the science in which we are all fellow workers and each one endeavouring to take his own individual part.

Referring to our good Secretary's note on the method of names "in comparison" I think with him, that if one is giving a list of captures or a locality list, it is only necessary to say *Arctia caja*, but if one is comparing that species with its varieties it is then advisable to use *Arctia caja caja* so as to differentiate from *Arctia caja baja*, (an imaginary name) or *caja nigra* or whatever it might be, and here I would say there should be no hyphen or comma or anything between *caja baja*. I notice in my note (ante p. 11) I am made to use *A. coridon-roystonensis*. I did not put the hyphen there and it should not be there, though I should like to say here that I should have written it as *coridon f. roystonensis*.

Some Swiss Butterflies in 1925 and 1926.

By T. BAINBRIGGE FLETCHER, R.N., F.L.S., F.E.S., F.Z.S.

When we concluded, at the beginning of 1925, to take a spell of leave after fifteen years continuous service in India, my wife and I decided that a stay in Switzerland was best calculated to secure a happy holiday, as the bracing air and climate of the Alps would restore health, which necessarily gets run down in the Tropics even under the best conditions, whilst the abundant insect fauna would provide both occupation and enjoyment. Neither of us had ever been to Switzerland before and, after reading up all the papers on the subject which we could find in the older volumes of the *Ent. Record* and after looking over a large pile of pamphlets sent to us by the Swiss Federal Railways, each extolling a different resort as the best of all, we found considerable difficulty in choosing where we should go first. However, we decided to select first a place at a moderate elevation and then to go on to a real alpine locality later on, and Grimmialp and Arolla caught our fancy as fulfilling these requirements, and I may add here that we did not regret either choice.

Grimmialp seems to be very little known entomologically, if not unexplored altogether. It is not included at all in the lists of localities given by Wheeler or by Vorbrod, and we were told there that no

entomologist had visited it previously; yet it is easily accessible and provided some interesting captures. It is reached from Spiez by rail to Oey, on the Spiez-Montreux railway, and from Oey a good road up Diemtigen valley takes one after about eight miles to Grimmialp, situated at just over 4,000 feet at the entrance of four valleys and set in pleasant surroundings of alpine meadows, forests and peaks. Scattered over the lovely meadows, whose fresh greenness and wealth of flowers are a joy to the eyes, are a few wooden chalets built in the picturesque style of the Bernese Oberland. On a great natural terrace, the Schwendenegg, formed by an ancient moraine, stands the comfortable and commodious Hotel, from which access is easy to numerous good collecting-places in the valleys of the Filderich to the South-East, of the Grimini (or Senggi) to the South-West, of the Alp to the North-West, and of the Diemtigen to the North-East. The slopes on all sides are crowned by thick forests of conifers whose dark green contrasts admirably with the lighter tints of the meadows lower down. Peace and beauty are the key-notes of the scenery in all directions.

We reached Grimmialp on June 23rd 1925 and stayed until July 16th. The breaking up of a long spell of fine weather unfortunately coincided with our arrival, so that at first the weather was wet and cold, with fresh snow on the surrounding hills, but it improved by the end of June and we enjoyed many glorious days, exploring the surroundings and finding numerous collecting-places, one of the best of those being at the foot of the flowery slopes on either bank of the Filderich stream just above the wooden foot-bridge in the direction of Gsür.

We left on July 17th for Zürich to attend the Entomological Congress, during which two trips were made to the Uetliberg (about 2700 feet), where the best collecting ground seemed to be in the vicinity of the railway station just below the summit. Here *Apatura iris* was fairly common and *Limenitis rivularis (camilla)* was also taken.

On July 27th we left Zürich, viâ Bern, the Loetschberg, Brigue and Sion, and arrived the same evening at Evolène, at about 4,500 feet in the Val d'Herens. The next two days were gloriously fine and yielded many interesting captures but July 30th and 31st were wet and cold and little could be done. Evolène has already been described by Tutt in the *Ent. Record* (Vol. XVI. p. 146) so that it is unnecessary to say much about it here; but from the brief glimpses which we had of it, it seems quite a good locality for collecting and would repay a longer visit.

Luckily the morning of August 1st was fine and we set out for Arolla, distant some eight miles and about 2,000 feet above Evolène, and only accessible by a mule-track above Les Haudères. As we rode up this track, numerous *Parnassius apollo* and other butterflies were flying around, but Evolène had already provided a good series of these and so we were able to admire them without any ulterior designs on their liberty. Arolla was reached in about three hours and a brief hunt in the afternoon in the pine-woods around the Grand Hotel revealed a veritable garden of wild flowers and a wealth of insect life, of which a large proportion possessed all the charm of novelty. We stayed at Arolla during the whole of August 1925 and had many perfect days with a not excessive proportion of wet and snow on the ground on two occasions (August 2nd and 12th); the snow-fall,

however, was followed by bright days and it was curious to note butterflies flying actively in the bright sunshine over the snowy ground and vegetation. Arolla has been so excellently described by Tutt (*Ent. Rec.* XVII. 1-6) that I cannot add much to his description. In fine weather it is an ideal place for a holiday, its only draw-back being that it is cold when wet and rather inaccessible. A few of the butterflies which Tutt mentions were not met with by me but on the other hand I came across many which he does not record. A notable absentee was *Pieris callidice*, which Tutt found commonly in the Hotel grounds, but of which I saw no trace; probably it was over earlier than usual.

We left Arolla on September 1st and went down to Montreux-Clarens, where we found very excellent accomodation at the Hotel Liliana, and stayed there until October 26th, 1925, returning there again from May 27th to July 17th and from September 8th to 17th, 1926. Montreux itself is not a very good collecting-ground for butterflies, but forms an admirable centre for collecting-trips in its vicinity, as there are many electric trams and railways to localities near by and on the hills above it, and frequent and convenient train services to more distant places such as Martigny and Eclépens. It may be useful to refer here to some of these. Blonay (about 2,000 feet) is easily reached by the grey tram which starts from the Clarens Quay; taking this tram to Fontanivent or Brent, one follows the path to the right just before the bridge at Brent, crosses the bed of a small stream, where there are usually many *Pararge maera* on the stones, and passes through a small kitchen-garden above the right bank; here one is at the foot of a flowery slope, with sunny aspect, with a footpath leading up the slope to Blonay. This slope, especially the foot of it, is quite a good collecting ground. From Blonay a rack-railway runs to the top of Les Pleiades, about 4,500 feet, where *Erebia medusa* and *Coenonympha iphis* occurred commonly—the former, indeed, abundantly—at the end of June, 1926. *Limenitis populi* also occurs in the woods a little below the summit, but I did not see it there myself. There are several stations and halts on the way up and one day I got out at Fayaux (about 3,000 feet) collected around there and walked down, but, except for one *Lycæna arion*, did not obtain anything which I did not get at Les Pleiades or at Blonay. Mont Pelerin is reached by a funicular railway from Vevey; we only visited it once, on September 22nd, 1925, when it was too late in the season, but it did not look very promising. Les Avants (about 3,500 feet) is reached by the Montreux-Oberland railway from which one gets a splendid view of Montreux and the Lake of Geneva as the electric train climbs the hillsides; we went there on June 12th and 21st, 1926, striking up the steep road towards the Jaman, and collected chiefly in a small valley exposed to the sun and gay with *Narcissus* and Globe-flowers. Here, in a very restricted area thickly overgrown with *Polygonum* and dock, *Heodes (Chrysophanus) amphidamas* was quite common, as was also *Pamphila palaemon*, whilst the delightful little *Adela rufimitrella* was visiting flowers of *Cardamine pratensis*.

Caux (about 3,000 feet) is on the rack-work railway to the Rochers de Nay (about 7,000 feet), which we also visited on October 7th 1925; but there had been snow and frost and all the local butterflies seemed to be quite over, the only species seen being *Aglais urticae*, *Colias croceus* and *C. hyale*, which had doubtless flown up from lower down.

We visited Caux on June 29th, 1926 and went up the road, above Caux towards Jaman, to a height of about 4,000 feet. The fields were full of flowers and hawthorn was still in bloom in shady corners and red horse-chestnuts still in flower. There were, however, comparatively few butterflies about, although *Erebia medusa* was common and in fair condition and a few *Coenonympha iphis* were met with.

Returning to the immediate neighbourhood of Montreux, the slopes above the Clarens gas-works produced a few local butterflies, including the only specimen seen of *Euchloë simplonia* f. *flavidior*. The woods above Chillon are also a locality for *Limnitis sibilla*, *Pararge achine*, *Coenonympha arcania* and *Erebia ligea*. *P. achine* flies rather sluggishly in the woods, rather like *A. hyperantus*, often settling high up in trees, and there are more about than are seen on the wing, *C. arcania* seems to prefer woods to fields, looking on the wing not unlike a Theclid, and settling on leaves.

Villeneuve is easily reached from Montreux by the tram. A road towards Bouveret leads across an area of marshy ground where in June *Melitaea aurelia*, *M. dictynna* and *Brenthis (Argynnis) ino* occur commonly. On June 20th, 1926, two *M. dictynna* were seen feeding on a slug which had been squashed on the road. Another road leads from the railway station up the hill between vineyards and takes one into the Tinière Valley, which is also a good collecting ground.

Martigny is reached by an hour's run in the train from Montreux and is a famous hunting-ground. Passing through the town northwards, a path leads through the hay-fields at the foot of the cliffs towards Vernayaz; it is not at first sight a very promising collecting-ground but many butterflies are to be found here; amongst others taken I may here specify *Papilio polalirius*, *P. machaon*, *Pieris manni*, *Euranessa antiopa*, *Melitaea didyma*, *M. berisali*, *M. cinxia*, *M. dictynna*, *Argynnis daphne*, *Erebia stygne*, *E. erias*, *Chrysophanus aleiphron* ssp. *gordius*, *C. phlaeas*, *Polygonmatius thersites*, *Glaucopsyche cyllarus* and *Lycaenopsis argiolus*. A drawback to this locality is the strong wind which often blows up the Rhone Valley, but one can usually find sheltered corners. A path from the main road leads up to the Batiatz Tower, originally an old Roman outwork, and on the hill at the foot of the Tower *Satyrus aleyone* and *S. statilinus* occur commonly, only a few odd specimens being noticed elsewhere.

St. Maurice is in the Rhone Valley a little nearer Montreux than is Martigny. We only went there once, on September 10th 1925, rather late in the season, and it was not a very good day, with a strong wind, but I took *Melitaea athalia*, *Ruralis betulae* and a few other butterflies.

Eclépens has become a regular Mecca for Lepidopterists although it is not mentioned in Wheeler's book. It is near Cossonaye and is easily accessible from Montreux by a through train leaving about 10 a.m. and arriving about 11.30, but from Lausanne there is a more convenient train leaving about 8 a.m. Eclépens also at first sight is not a very promising ground. It is a rather flat valley bordered to east and west by low hills, covered with mixed forest, whilst to the west of the railway station is a succession of flat marshy fields, which are said to form an excellent locality for "Blues" and "Coppers." Alongside the station is a quarry, where *Satyrus briseis* has been taken. The woods are the haunt of *Apatura iris*, *A. ilia*, *Limnitis populi*, *L.*

sibilla, *Argynnis paphia* and other wood-loving butterflies. The main industry of Eclépens seems to be centred in the tileworks and to the east of the station, just at the foot of the wooded hill, is a large pit from which is dug the clay used for tile-making; it is to these pits that the Emperors are attracted and here they may be caught without much difficulty. I visited Eclépens on four occasions (June 22nd, July 1st, 12th, and 14th, 1926) but the *Apatura*s were late in appearing and were not found before July 12th, although in 1925 they were said to have appeared on June 21st. A cold, wet May and June in 1926 retarded all the summer emergences although, curiously enough, it did not seem to effect *L. populi*, which was already worn by 22nd June. Another place which was worth visiting was a small lane running along the north side of the marshy area to the west of the station; along this lane were growing many plants of *Sambucus ebulus*, in full flower on July 12th and 14th and extraordinarily attractive to butterflies, especially *Thecla w-album*, *T. ilicis*, *T. acaciae* race *nostras* and a fine local form (*saleriana*) of *Coenonympha arcania*. Yet another locality which should not be missed is the wooded ridge at the western end of the marsh; here, in a very limited area, I came across *Parnassius apollo* f. *niratus*, a very fine, large and white Jura form; here also *Apatura iris* and *A. ilia* occur commonly and, as the trees are small, can often be found within reach as they rest on them. A trip to Eclépens should certainly not be omitted from the itinerary of any lepidopterist visiting this part of Switzerland in July.

Bérisal is situated at an elevation of 5,000 feet, in a loop of the Simplon Road, on the North slope and almost on top of the Brigue-Iselle Tunnel, and consists simply of the Hotel and its outbuildings, part being the third of the old Refuges which were provided for wayfarers on the completion of the road over the Simplon Pass. Of these Refuges, the First was destroyed by fire and never re-built; the Second, about three miles below Bérisal, and the Fifth, at about 6,300 feet, a little way below the Kaltwasser Gallery, are frequently referred to in Wheeler's *Butterflies of Switzerland*; the Fourth is at Sothwald and the Sixth, almost completely carried away by an avalanche some thirty years ago, is at the Kulm a short distance before the Kulm Hotel. Bérisal is pleasantly situated amongst woods of mixed conifers, birch, sallow, alder, etc., and hay-fields which form a blaze of flowers until August; nestling on the slopes of flowery meadows bordered with forest against a background of snow-capped peaks, whilst the air is filled with a constant murmur of water-falls, its surroundings are truly a joy to the eye of all lovers of Nature, leaving an irresistible impression of restful loveliness, whilst the bracing air corrects any *dolce far niente* tendency. Down the Simplon Road, some 400 feet below the Hotel, is the Ganter Bridge, below which the road runs fairly flatly down to the Second Refuge. This stretch of narrow road, edged with steep slopes above and below, dusty and unattractive as it seems, forms a very prolific collecting-ground, and many butterflies, found here, do not occur above the Ganter Bridge. Above the Bridge eastwards runs the Ganter-tal, best reached from the Hotel by the lower of the two paths through the woods, and this valley, with its hay-fields and open spaces and permanent masses of snow in the bed of the Ganter stream, is also a good collecting-ground. The Simplon Road above Bérisal is not so productive but a walk up it for about three miles, to the nine-

teenth kilometre, brings one to the verge of the Kulm ground which produces many alpine species found (if at all) less commonly below 6,000 feet. Bérisal is thus well situated for collecting, not only in its immediate vicinity, but at lower and higher altitudes. It is easily reached from Brigue, from which it is distant 13 kilometres (8 miles) by a Post Motor-coach leaving Brigue daily at 7 a.m.; on Saturdays in July and August there is an additional coach leaving Brigue about 4.30 p.m. It is very necessary to book seats in these coaches well beforehand. The above details, well-known to all who have visited Bérisal already, may perhaps be of use to those who have not been there; certainly we found it difficult to procure any information about Bérisal and how to get there from the Tourist Offices and Information Bureau in Montreux.

We reached Bérisal on the evening of July 17th, 1926, with the intention of staying there for a month, but we found the place so attractive that we prolonged our stay until September 7th. Except for a dull spell—with, however, little rain—at the beginning of August, we enjoyed very fine weather and from August 12th until the end of our stay we had a constant succession of brilliantly fine days. June had been wet and cold and so the season was at least three weeks late in July, but fine weather in August tended to even things, so that by the beginning of September the season was probably about normal. July seems to be the accepted collecting-month for Bérisal and all the other nets had departed by the beginning of August. In an early or normal year August may be too late for many of the local species but in 1926 certainly August proved to be an excellent month for butterflies, and I imagine that there are many worse collecting-grounds than Bérisal even in a normal August or September.

Simplon Kulm (5,500 feet) is easily reached from Bérisal by the road (9 kilometres; $5\frac{1}{2}$ miles). Time and energy are saved by taking the morning coach which leaves Bérisal at 8 a.m. and gets to the Kulm about 8.30. The Kulm is an open stretch of rolling hillside, clothed with grass and flowers and low bushes of *Rhododendron ferrugineum* and overlooked by the snowy masses of the Kaltwasser Glacier and Monte Leone to the east and of the Fletschorn and other mountains to the west, whilst to the south rise rocky slopes and on the north one has a splendid panorama of the snow-clad peaks of the Bernese Alps. The open ground, on the hillside above the Kulm Hotel, especially in the numerous sheltered hollows and sun-bathed slopes, is carpeted with flowers and alive with butterflies. So numerous are these, indeed, that it often proves difficult to follow the flight of one individual and, on attempting to catch a single example, one often finds five or six other butterflies in the net. Working from Bérisal, a good day's programme is to take the morning coach to the Kulm, strike uphill above the Hotel and to collect on the flowery slopes, working upwards to the stony slopes, alongside the patches of snow, where *Erebia lappona* occurs. On the flowery slopes *Cotias phicomone* occurs in almost incredible numbers, whilst *G. palaeno* is less common and much swifter on the wing. *Erebia tyndarus*, *Melitaea varia* and *Brenthis pales* are also very abundant, *Lycæna glandou (orbitulus)* is abundant, whilst *L. optilete* occurs in lesser numbers, and *Hesperia cacaliae* is common, especially along the banks of streams. Most of the forenoon can be devoted very profitably to these slopes above the Kulm Hotel;

then, walking down the road to the lower end of the Kaltwasser Gallery, one finds just above the road some sunny slopes, starred with asters and other alpine flowers, which repay working. Here occur *Parnassius delius*, *Lycaena alcon* and a few other butterflies which do not seem to reach the slopes above the Kuhn itself, whilst along the roadside at the foot of these slopes *Polygonmatius eros* is fairly common. By this time, one's boxes are generally overflowing but the walk down the road to the nineteenth kilometre will soon fill any vacant space. Along this stretch of road, on a hot afternoon, all wet patches by the roadside are extraordinarily attractive to *Erebias* and "Blues," a small patch the size of a plate often holding a dozen or a score of butterflies, of half a dozen different species, all greedily imbibing the grateful moisture, whilst *Erebia euryale* basks in hundreds on the roadside rocks exposed to the afternoon sunshine.

Simplon Dorf is a small village at about 5000 feet elevation on the southern slope of the Simplon Pass, and can be reached from Bérisal by the morning coach. I only went there once, on July 22nd, 1925 in company with Commander Stanhope Forbes, when we struck along a rough path up the hillside above the village and worked towards the entrance of the Laquintal, but this hillside did not prove very productive of butterflies, far less so than Bérisal at the same elevation on the North slope. A few *Erebia ceto* occurred in one limited area and I took one fresh and nicely-marked female of *Chrysophanus hippothoë* f. *evirdice*.

I cannot hope that the above notes will be of much interest to those numerous collectors who know Switzerland but possibly they may be of use to those who—as in our own case on our arrival there—have not yet experienced the joys of seeing an extensive butterfly fauna under new skies and amongst lovely surroundings. My list of captures, I see, includes 140 species out of 200 found in Switzerland, and these I have arranged in the order used in *Die Schmetterlinge der Schweiz*, by Vorbrodts and Müller-Rütz (Bern: Vol. I., 1911; Vol. II., 1914), a book which seems to be remarkably unknown to British collectors, although it is the latest complete work on the local Lepidoptera and forms a most useful revision of Wheeler's *Butterflies of Switzerland*, now, I believe, out of print. In using *Die Schmetterlinge* reference should be made to the numerous corrections and additions issued in the *Mitteilungen* of the *Schweiz Entom. Gesellschaft*.

I am indebted to Mr. B. C. S. Warren for very kindly identifying my *Hesperinae*.

(To be continued.)

A Study of Chinese Pyralidae and its Bearing on our Knowledge of Geographical Distribution.

By L. B. PROUT, F.E.S., and G. TALBOT, F.E.S.

Ueber Chinas Pyraliden, Tortriciden, Tineiden. Nebst Kurze Betrachtungen, Zu Denen Das Studium Dieser Fauna Veranlassung Gibt. By Aristide Caradja. Academia Romana Mem. Sect. Stiint. Ser. iii, Tom. iii, Mem. 7, Bucarest. 1925.

Monsieur Caradja gives us, in this memoir, the results of his study

of the large collection of *Pyralidae*, *Tortricidae* and *Tineidae*, made by Hoene in various parts of China from the year 1917 to 1923. The first part of the memoir is occupied with a discussion of the biogeographical aspects. The second part is devoted to a systematic catalogue of the species composing the collection.

Part I occupies 36 pages and constitutes an interesting and illuminating philosophical account of adaptation and general distribution problems. The author considers (p. 8) each separate and local fauna to possess its own peculiar factors operating to produce changes in the organism. He considers that apart from such factors as climate, light, electricity, nutrition etc., there exists something else unknown, a certain *genius loci*, which operates considerably in causing the changes undergone by the organism. We may be permitted to point out that this specific "Einwirkung" would emerge from the *interaction* of the various factors which are proved to exist. After speaking of the struggle for existence of species he remarks that:—"Its individual life asserts itself to-day more in maintaining the position already attained, than in throwing out or producing exceptional forms. This struggle and this susceptibility must be recognised as most strongly operative on the fringes of two adjacent faunas. Here the species have to develop all their latent powers to retain their outposts, which can only be achieved through complete adaptation to their environment."

We do not see why variations should be suppressed by the intensification occasioned by a foreign influx on these fringes. We conclude that the struggle for existence is keenest on the fringes of a faunistic area, although there may not be a fauna to oppose it. There remain still the factors of flora and climate, soil and elevation, which will conduce to a similar struggle on the part of those organisms which may endeavour to extend their range. It does not follow that all species will not be at home in a new country.

He admits that his material may be too limited to draw conclusions but would reply that "Nature is as far as we can perceive an indivisible harmonious whole. From whatever point of view we approach it, we have it before us in all its magnificence and grandeur;" One may conclude therefore that any single group of animals in China would bear the stamp of its geographical environment. But this still implies all the individuals of the group and in case of *Pyrales* he has but a fraction of the whole.

He remarks (p.13), in speaking of faunistic boundaries that there is an absolutely sharp limit of the Palaearctic fauna southwards and westwards. The heights of Mogan Shan which run south-west from the low-lands have already a purely sub-tropical fauna with quite an astonishingly little admixture of Palaearctic forms. Without large material from this area it is difficult to know which of the two faunas is actually dominant. There are no lists of forms found in each place by which one can judge the value of certain conclusions drawn in a general way.

He remarks that "an already settled specialised fauna is very resistant to the influx of foreign elements." We do not think that it is the author's meaning that the creatures themselves are responsible for this resistance, but we must suppose that the ensemble of the conditions produces the resistance.

The author explains at some length his theory of a land connection

between Burma (Cape Negrais) and Java by way of the Andamans, and emphasises the distinction between the faunas of Burma and the Malay Peninsula. He suggests that at some time the peninsula was not joined to Burma.

The second part gives a list of 726 forms of which 325 are newly recorded for the Chinese fauna, 206 are endemic, and 91 are described as new to science. The distribution of each form is given. The number of specimens received is not stated, so that we do not know whether sufficient material was available on which to found races. The great help in identification given by Mr. W. H. T. Tams is acknowledged and Mr. Tams' remarks are frequently introduced showing that he (Tams) was not always certain about the identification. In most of these cases the author has made new species or races.

Two photographic plates illustrate 74 of the new forms. Some of these specimens appear to be worn and are impossible to recognise by the figure. It is a pity that dissections were not made of many of these obscure forms.

It appears to us very doubtful if the wide generalisations made by the author can be founded on a collection of *Pyralidae* and *Tineidae*. Very little comparatively is really known about these groups and many of their genera are in doubt. More important still, these groups are little-known faunistically, and therefore so is their distribution. It is doubtful whether a species from Japan is identical with a similar form from the Bismarck Is. or from Africa. What are we to say when a trained systematist like Sir G. Hampson included several species and genera in a single series under one specific name! Yet dissection has shown this to be the case. Therefore it seems to us unsafe to draw conclusions from such groups of insects. We suggest that the family of the *Sphingidae* would provide much safer material on which to base theories of geological and biological changes, and of distribution.

Apart from these considerations, Mons. Caradja's memoir provides food for thought and will be of assistance to future investigation on the origin of faunistic areas and the communities which compose them. The problems are difficult, and as Mons. Caradja shows, are bound up inseparably with geological and physiographical phenomena.

Nomenclature. Errors I.

Owing to various causes the specific names of our British Butterflies and Moths are often mis-spelled. Perhaps the most universally used of British Catalogues has been that of R. South based on Staudinger's 1871 *Catalog* Ed. II., and published under the auspices of our contemporary the *Eutomologist* in 1884. South's Catalogue was a vast improvement on all lists published previously and not only brought British nomenclature up to date, but assimilated the names used in Britain with those in use generally throughout Europe. In the 40 years, which have elapsed since the issue of the list, much nomenclatorial and systematic work has been done. It has been shown that many names used then are really new ones and the prior names have since been reintroduced by some authors. The prior spelling has been altered in some cases by printer's errors, in other by errors in copying, often by adoption without consultation of the original author's work, and often, we fear, by some reviser obsessed by an idea of the

paramount importance of his knowledge of Latin and love for putting something right, and afraid of offending the eye of some non-entomological friend erudite in classics.

It is proposed, from time to time to note those names, which have suffered from these various causes, and to quote the correct spelling from the original description of the species; at the same time the correct prior name will be given, where the name used is not the original.

For the uninitiated, it might be pointed out here, that one of the great causes of the alteration of our names was the change, which arose in the "sixties" of basing the Linnaean binomial system of nomenclature from the 10th edition of the *Systema Naturae*, 1758, instead of on the 12th, 1767, which had hitherto been done. This necessitated numerous changes in the names if the prior name was to stand. Some of these were pointed out by W. F. Kirby in his *Synonymic Catalogue* of 1871, but little notice was taken of his corrections until recently owing to the too-ultra conservative tendencies of our modern authorities.

edusa.—This was the name used by Fabricius in his *Mantissa* II. 1787. It had been described by Fourcroy, *Entomologia parisiensis*, II. 1785, under the name **croceus**, which therefore must replace it. This was pointed out by Kirby, *Syn. Cat.*, 1871, but even Staudinger, strange to say, ignored this correction, which is only now coming into use. [Immediately it was recognised that *croceus* was undoubtedly the old name, some of those obsessed with their classical learning wanted to alter it again, to *crocea*!].

sibylla.—This was described by Linneus in *Sys. Nat.*, XII. ed., 1767, as **sibilla**, which therefore is the correct spelling. Staudinger, *Cat.*, 1907, quotes *sibylla* with r, i.e., "rectified." But when a name is once given it should not be tampered with or we shall leave the nomenclature worse than before. [An extraordinary example of "rectification," so called, occurs with the Noctuid *Apamea nickerlii* of Freyer, in *Lep. Phalaenae of the B.M.*, where it is spelled *nickerli*!! and thus its patronymic origin from Nickerl the Bohemian entomologist is completely effaced. Another example of classical super-obsession.]

polychlorus.—This spelling one often meets with in M.S. and occasionally in print. It was spelt **polychloros** by Linnaeus, *Sys. Nat.*, X. ed., 1758.

CURRENT NOTES AND SHORT NOTICES.

We have received during the past year three parts of a work on the pests of Russia (U.S.S.R.). No. 1 deals with the subject generally and is termed Introduction, No. 2 treats of the Locust; and No. 3 the Rodents. The articles are mainly in Russian, but there is a summary to each in English. The text is well illustrated with black and white diagrams, tables, maps and figures, and shows that much solid, continuous, and useful scientific work is being carried on. Among the list of authors and workers we note some well-known names, J. N. Filipjev, A. K. Mordvilko, V. F. Boldyrev, etc. The short summaries show that economic work is being done very thoroughly; the whole country is mapped out into administrative and experimental areas.

The *Ent. Tidskrift* (Sweden) for the past year consists of about 260

pages with numerous plates and figures. The matter is varied and contains among other articles, P. Benander on some *Argyroproctæ* species (Tort.), K. Ander on the larva of *Pyrrhia* (*Chariclea*) *umbra*, N. A. Kemner on the larvae of *Staphylinidae*, T. D. Alfken on a few Swedish bees, C. Aurivillius an obituary of J. Meves, and a very interesting and important article on pupal structures with many figures by D. Ljungdahl. There seem to be many good workers in the *Soc. ent à Stockholm* by whom the *Tidskrift* is published.

The Zool.-Botan. Gesellschaft in Wien have just brought out their *Vorhandlungen* for 1926, in which year they celebrated their 75th anniversary under the Presidency of Dr. Anton Handlirsch the well known worker in the study of fossil insects. At the Annual Meeting Prof. R. Wettstein gave an interesting account of the Progress of Biology during the past 75 years. The Report contains a long paper on the Lepidoptera of Corsica, Herr Reisser dealing with the Macro-lepidoptera and Herr Kauty with the Micro-lepidoptera, and a shorter but well illustrated paper on the Biology of *Lestes viridis* (Odon.).

The *Insecten Börse*, published by Messrs. Kernen at Frankfort-a-Main, now mothers the *Ent. Zeit.*, the *Soc. Ent.* and the *Ent. Rund.*, so that a subscription to the weekly *Ins. Börse* includes the above three magazines alternately. The *Ent. Zeit.* is now octavo size, while the others retain their original large quarto. The *Ins.-Börse* contains little or nothing beyond advertisement, while the three magazines have none.

REVIEWS AND NOTICES OF BOOKS.

BRITISH BARK-BEETLES, by Dr. J. W. Munro, Forestry Commission Bulletin, No. 8, 1926. 32 Text Figures, 10 Plates. pp. 57.—This work is divided into four Chapters and two Appendices as follows:—

CHAPTER I. GENERAL BIOLOGY: Introductory; Bark-beetles proper; Ambrosia Beetles; Life-history; Host-plants; Distribution; Comparison of British and Continental Bark-beetles; Fauna; Natural Enemies.

CHAPTER II. IMPORTANCE IN FORESTRY: General; Losses caused by Bark-beetles; Prevention and Control of Bark-beetle Outbreaks.

CHAPTER III. STRUCTURE AND CLASSIFICATION: Structural and Morphological Characters; Classification and Identification.

CHAPTER IV. BRIEF ACCOUNT OF GENERA AND SPECIES: Family *Platypodidae*; Family *Scolytidae*; Sub-family *Scolytinae*; Sub-family *Hylesininae*; Sub-family *Ipinae*.

APPENDIX I. LIST OF BRITISH BARK-BEETLES ARRANGED ACCORDING TO HOST PLANTS.

APPENDIX II. BIBLIOGRAPHY.

This paper is, on the whole, a very good production, being both conscientious and painstaking, and a worthy addition to our Coleopterous literature. The drawings and plates are excellent. The account of the life-histories, the anatomy, both external and internal; and the tables to separate the genera and species, are most helpful. There are a few points which appear to require criticism, though some of them are, perhaps, of minor importance. The chief defect, however, which to the mind of this reviewer is a serious one, is that no mention is made of so many of the beetles parasitic on Bark-beetles. It is true

they may be listed in Kleine's paper cited by the author, but in a publication of this kind which is chiefly written from the point of view of the effect of these insects on Forestry, it would be much more suitable that individual mention should be made of the known parasites of the different species. These we propose to enumerate briefly later; but first it might be as well to refer to one or two points which require modifying, etc.

Ambrosia Beetles (p. 10). A very complete account of these beetles is given by Wheeler in 1907 and should be mentioned in any paper referring to them.

The sentence (p. 16)—“The *Cleridae* are represented in Britain by two species, the Ant beetle, *Clerus* (*Thanasimus*) *formicarius*, L., and the rarer *Clerus rufipes*, Brahm’s”—is rather ambiguous. If this means that there are only two Clerids in Britain it is, of course, inaccurate. If, however, it only means that these are the only two which are parasitic on bark-beetles it is probably correct, and our other Clerids (for example *Tillus longatus* parasitic on *Ptilinus pectinicornis*, *T. unifasciatus* parasitic on *Lyctus brunneus*, *Corynetes coeruleus* parasitic on *Anobium domesticum*) are not known to prey on bark-beetles. I should not, however, care to say they never do and never would do so. The statement that the two species of *Clerus* “appear to be confined to coniferous woods” is not the case (though a common error), at any rate, for *C. formicarius*. I took it in the borings of *Agrilus biguttatus* in oak bark, in an oak and beech wood, in Sherwood Forest, July 12th, 1908; and in the borings of *Dryocoetes villosus* in oak bark, in a wood chiefly oak and beech, in Windsor Forest on May 26th, 1926. In both cases no conifers occurred.

With regard to the Hymenopterous enemies of the bark-beetles (p. 17) reference should be made to two papers by E. A. Elliott and Claude Morley (1907 and 1911).

Scolytus rugulosus, Ratz. (p. 46) Laurel (*Laurus nobilis*) and Blackthorn (*Prunus spinosa*) may be added to the host plants of this little species. On December 15th, 1900, I dug it out of dead stems of laurel at Reigate, where Dr. Chapman had previously found it; and on June 12th, 1907, it was not uncommon in Blackthorn twigs in Epping Forest. I have also beaten it off birch (at Leighton Buzzard on June 10th, 1906), but the fact does not prove that it was breeding in the tree.

Hylastes cunicularius, Er. (p. 56). I should rather describe this species as—with a widely scattered distribution in Britain, than “widely distributed” which might mean a continuous one. Also I regard it as a decidedly rare species.

Hylastes angustatus, Hbst., and *H. attenuatus*, Er. (p. 57): I regard these two beetles as quite distinct species. I captured the former in Scots pine sea-breakers, at Bournemouth, on December 20th, 1897; and the specimens did not vary in any way. My specimens of *H. attenuatus* differ from the insects just mentioned in every particular as given by the late Dr. Sharp (who introduced the species to our list in 1920), Munro, Reitter, etc. It has undoubtedly spread of late years and I took a specimen in the bathroom of my house at Putney on May 15th, 1921; in August, 1923, I found it in abundance in Scots pine trunks at Padworth, in Berks; and in August and September, 1926, it occurred in numbers in a Scots pine stump in Windsor Forest.

Trypodendron quercus, Eich. (p. 60). I should not have thought that

any experienced Coleopterist would mistake this species for *T. domesticum*, even in the field; and I personally regard it as a rare species. I have found *T. domesticum* in many localities (on the last occasion in Windsor Forest, in beech on March 11th, 1926); but I have only once taken *T. quercus*, on April 16th, 1907, at Porlock, Somerset, when my friend Sir Thomas Beare and I dug a series, with great difficulty, out of very hard oak logs. We at once recognised that it was not *T. domesticum*. Apart from the differences in the club of the antennae (so ably figured by Munro), etc., *T. quercus* is more robust, and is never so light in colour as *T. domesticum*.

Trypodendron lineatum, Ol. (p. 60), is said to be widely distributed in Britain. Personally, I only know of records from Scotland, Cumberland, and Durham; and have only taken it at Rannoch. Of course I may have missed other records, as my time has been so taken up with my ant work of late years.

Dryocoetes abni, Georg. (p. 71) is said to have only been recorded "from the vicinity of Birmingham and Manchester and in Surrey." This species was "found in profusion by Mr. Perrins in an alder grove near Kidderminster; in a plantation of about an acre scarcely a tree was to be found which was not, or had not been, attacked."—Ashe (1922). Perrins very kindly took Beare and the writer to the locality near Kidderminster in 1921, and we found the species was present in abundance.

Dryocoetes autographus, Ratz. (p. 71). The only English records are said to be from Northumberland and Yorkshire. Bagnall (1910) recorded it from Gibsie and Westgate-in-Weardale, Durham. See also Fowler and Donisthorpe (1913).

Some Coleopterous parasites on British Bark-Beetles not mentioned in Dr. Munro's paper.

Colydium elongatum, F. This rare species, which is confined to the New Forest in Britain is, according to Fowler, parasitic on *Platypus cylindrus*, F. It is not however solely a parasite of *Platypus*, as I have taken it in the burrows of *Melasis buprestoides*, L., and *Scolytus intricatus*, Ratz., and Bouskell took it with *Dryocoetes villosus*, F.

Teredus nitidus, F., has only been found, with us, in Sherwood and Windsor Forests. According to Blatch, who rediscovered it at Sherwood in 1884, it is associated with *Dryocoetes villosus*. At Windsor, where I (1926) have taken 18 specimens of this scarce beetle, I did not find it with *Dryocoetes*, but the trees where it occurred harboured *Xestobium tessellatum*, F., and *Anobium domesticum*, Fourc. On one occasion I took it in the burrows of the longicorn, *Callidium variabile*, L.

Aulonium trisulcum, Geof. This fine species is parasitic on *Scolytus destructor*, Ol., and *S. multistriatus*, Marsh. It was first discovered by Pool (1904) in Britain, who took it in the burrows of these beetles at Enfield, Edmonton, and Winchmore Hill. On August 12th, 1926, I took it in the burrows of *Scolytus destructor* in Windsor Park. This is the first time it has been found anywhere else besides Pool's localities in Britain; but it is not surprising considering the presence of the two great avenues of elms at Windsor.

Aulonium ruficornis, Ol., is parasitic on *Ips laricis*, F., and was first taken in Britain in the borings of that bark-beetle by Beare, Crystal, and the writer in Dean Forest, on August 3rd, 1922.

Nemosoma elongatum, L., is parasitic on *Pteleobius vittatus*, F. It

is a very rare and local beetle, but sometimes occurs in numbers when found. J. Collins (1923) discovered it at Water Eaton near Oxford in elm rails tenanted by *P. vittatus*. He kindly took me to this spot on September 3rd, 1913, when the beetle was present in numbers.

Laemophloeus ater, Ol., is parasitic on *Phloeophthorus rhododactylus*, Marsh, and may be found in numbers in the burrows of that insect in gorse and broom. It is very local and rare. I once found it in numbers in dead broom stems in company with its host at Mildenhall, on May 17th, 1920.

Laemophloeus clematidis, Er., is a parasite on *Xylocleptes bispinus*, Duft., but is very rare in Britain I only know of four localities—Gravesend, Dartford, Henley and Higham. I have never taken it, though I have found its host in numbers, at Boxhill, etc., and especially at Bristol.

Hypophloeus bicolor, Ol. I have little doubt, though I am not aware if it has been published before, that this beetle is a parasite on *Scolytus destructor* and *S. multistriatus*, I took it in company with *Aulonium trisulcum* in burrows of *S. destructor* at Windsor, and Pool took it with the same three beetles at Enfield. It is a local and, more or less, rare beetle. I have also taken it in *Scolytus* burrows in elm bark in Richmond Park, etc.

Hypophloeus fraxini, Kug., is parasitic on *Ips sexdentatus*, Börn. Over a dozen specimens were taken by Beare, Crystal and the writer, in the burrows of *T. sexdentatus* in large felled Scots pine in Dean Forest on August 3rd, 1922.

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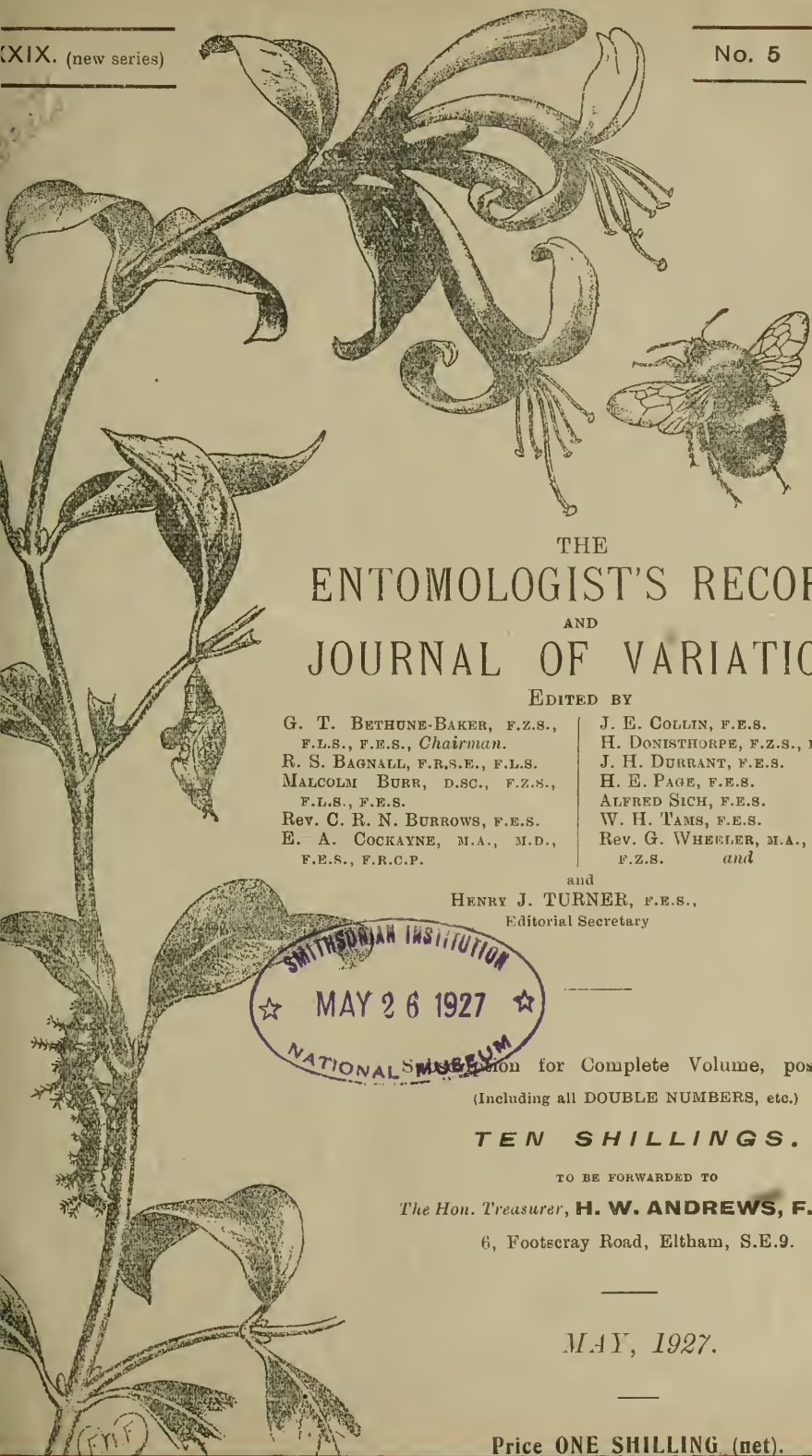
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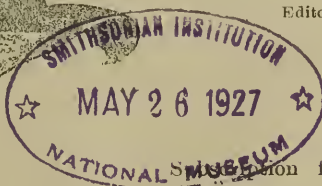
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A Contribution to the Life-History of *Senta maritima*, Tausch.

By E. A. COCKAYNE, D.M., F.R.C.P., F.E.S.

The food of the larva of this moth has been a puzzle to entomologists for many years. Barrett quotes Wilde and Hoffmann, who state that it feeds on other reed-frequenting insects, both larvae and pupae, and says "This seems to be an extraordinary habit, but is confirmed by Schmidt. Doubtless the ordinary food is the reed-leaves." Herr Leonhardt told me that in Hamburg the local collectors go to the reed beds when the water is frozen and take the larvae, which they bring to maturity on raw meat and fat.

Mr. H. M. Edelsten told me last year that he believed the natural food was the delicate lining of the dead reeds. Mr. Edwin Sharp showed me his larvae at night eating dripping and passing frass, and this suggested to me a simple way of solving the problem. I collected larvae from a reed bed in Surrey, finding most of them inside the open ends of broken reeds. One was hiding in the empty cocoon of a large ichneumon fly in an old pupation chamber of *Nonagria geminipuncta*. I watched my larvae at night and thought I detected one eating the lining of a reed, and inside another reed I thought I could see a place where the lining had been eaten. This was inconclusive, so I adopted the method I had decided on at Eastbourne. Taking frass from half a dozen boxes, in each of which a single larva had been confined, I teased the bits out on separate slides and looked at them under the microscope. In every case the frass was composed of little pieces of the lining membrane, which showed the cellular structure clearly. In one bit of frass there were some thin short fibres, that looked like the woolly substance covering the lining of some stems, and there was a piece built of larger broader cells than the membranous lining I had mounted for comparison. To confirm the discovery I examined the contents of the alimentary canal of a larva, taken a day before and kept without food, and found similar bits of lining membrane in it. In every case the frass examined was produced from food eaten before capture.

This proves conclusively that the usual food of big larvae is the lining of the dead reeds, *Phragmites arundo*, as Mr. Edelsten shrewdly suspected. I was also lucky in seeing a larva, taken the week before, in the act of changing skin, its head snow white and the old skin still clinging to the posterior segments, and so proved that some larvae at least pass their last instar in the spring.

With regard to the observations of continental authors there is no doubt that they will eat larvae of their own species. Three of mine taken at Easter were eaten in this way. Mr. Sharp tells me they eat larvae of *Chilo phragmitellus*, and it is probable that they will eat those of *Leucania straminea*, but he thinks that this is due to thirst. In captivity they are fond of drinking droplets of water and it may be necessary to them owing to the dry nature of their food. On April 24th, I found three pupation chambers. All were in rather large open-ended broken reeds, which had been closed by thin silk and chips of reed. About the length of a larva below this was another similar diaphragm, and the larva itself lay between this and the node. One larva was dead and black, the others were healthy and one pupated on April 25th.

MAY 15TH, 1927.

Some Observations on Coccinellids and New Aberrations.

By G. CURTIS LEMAN, F.E.S.

Herr Leopold Mader of Vienna is publishing in parts a comprehensive and interesting work on Palearctic Coccinellids in the *Ent. Anzeiger* with plates, and has, meantime, sent me his preliminary separata on his new aberrations published in the same journal in 1926, on both of which I wish to make some observations.

A. *Epilachna chrysomelina*, L.—Weise (B.T. 1879) locates the spots on this species as follows: "1 und 2 am Grunde, 3 und 4 in der Mitte (4 an der *Nath* gewöhnlich weiter vorn), 5 an der *Nath* in $\frac{2}{3}$ Länge, und 6 an Aussenrande ein Stück vor der Spitze," = 2, 2, 1, 1.

His var. *nigrescens* has any of the following confluences: 4+6, or 3+4+5, or 1+2, but in view of what follows I cannot help thinking that his confluence 4+6 should have read 4+5. At the same time Della Beffa (*Rev. Cocc. It.* 1913) and Mader both figure specimens with 4+6.

Be that as it may Weise then describes var. *hieroglyphica*, Sulz., as having the two confluences 4+6 and 3+5 forming two long bands ("bilden 2 Laugsbinden.").

In *L'Abeille Jour. Entom.* XXVIII. p. 6 (which contains a translation into French of Weise B-T. 1885, of which I know of no copy in England) we find Weise stating that the confluences 3+5 and 4+6 form two separate bands ("3+5 et 4+6 formant deux bandes séparées (*hieroglyphica*, Sulz.)").

Weise continuing in 1879 states that, where 3+5 and 4+6 "bilden eine V-förmige Zeichnung," we have var. *elaterii*, Rossi, while if 1+2 are also confluent, we get his var. *furva*.

I have not been able to see the original description of v. *hieroglyphica*, Sulz., but if *L'Abeille's* translation of Weise (1885) is correct (and I think we can well assume this) that this aberration has two separate bands, then the two confluences must be 4+5 and 3+6 to obtain the V form of v. *elaterii*, Rossi, the formula of which must be 3+6+5+4 to form this V.

In fact 4+6+3+5, if correct per Weise, do not make two separate bands, but an X.

While Mader numbers the spots on his diagram according to Weise, his plate for ab. *hieroglyphica*, Sulz., actually shows the two separate confluences of 3+6 and 4+5.

Della Beffa follows the same procedure, but while his figure agrees with Mader's, his text follows Weise!

Accepting Weise's position of the spots with 5 at the suture and 6 at the apex, the formulae for the above aberrations will be:—

ab. *nigrescens*, Wse. (s. str.)—1, 2, 3, 4+6, 5.

ab. *hieroglyphica*, Sulz.—1, 2, 3+6, 4+5.

ab. *elaterii*, Rossi—1, 2, 3+6+5+4.

ab. *furva*, Wse.—1+2, 3+6+5+4.

In my view ab. *nigrescens*, Wse., should be limited to the above formula, and the other two require new names:—

1. ab. *marrineri*, m. nov. nom. 1, 2, 3+4+5, 6.

2. ab. *sulzeri*, m. nov. nom. 1+2, 3, 4, 5, 6.

and the following are new aberrations:—

3. ab. **maderi**, m. nov. ab. 1, 2, 3+6, 4, 5.
4. ab. **donisthorpei**, m. nov. ab. 1, 2, 3, 4+5, 6.
5. ab. **beffai**, m. nov. ab. 1+4, 2, 3, 5, 6.
6. ab. **rossii**, m. nov. ab. 1, 2, 3+6+5, 4.
7. ab. **hawkesi**, m. nov. ab. 1, 2, 3, 4+5+6.
8. ab. **lestagei**, m. nov. ab. 1+2, 3+6+5, 4.
9. ab. **meieri**, m. nov. ab. 1+2, 3+4+5+6.
10. ab. **weisei**, m. nov. ab. 1+2, 3+6, 4+5.

I do not find any aberration with Weise's formula of 1, 2, 3+5, 4+6, and the two latter forming an X recorded, nor do Della Beffa or Mader figure any such aberration.

B. *Synharmonia conglobata*, L.

(a) Mader in his *separata* proposes in a laudable attempt at group naming to give his ab. *pruni* three separate formulas: 1, 2, 3, 4+5+S, 6+7, 8: 1, 2, 3+4+5+S, 6+7, 8 and 1, 2, 3+4+5+S, 6+7+8, but his aberration cannot stand for such different formulas and he agrees with me that ab. *pruni* must be confined to the first named formula and to my naming the other two:

1. ab. *pruni*, Mader. 1, 2, 3, 4+5+S, 6+7, 8.
2. ab. **maderi**, m. nov. nom. 1, 2, 3+4+5+S, 6+7, 8.
3. ab. **donisthorpei**, m. nov. nom. 1, 2, 3+4+5+S, 6+7+8.

(b) The same remarks apply to ab. *importuna*, Mader:—

1. ab. *importuna*, Mader. 1+2, 3+4, 5+S, 6+7+8.
2. ab. **walteri**, m. nov. nom. 1+2, 3, 4+5+S, 6+7, 8.
3. ab. **depolii**, m. nov. nom. 1+2, 3+4+5+S, 6+7, 8.
4. ab. **marrineri**, m. nov. nom. 1+2, 3+4+5+S, 6+7+8.

C. *Anatis ocellata*, L.—Mader in his *separata* has also attempted group naming in a series of aberrations which cannot stand and his new aberrations will only stand for the following formulae and with this he also agrees:

1. ab. *4-notata*, Mader—1, 6.
2. ab. *6-notata*, Mader—1, 4, 7.
3. ab. *8-notata*, Mader—1, 2, 3, 6.
4. ab. *10-notata*, Mader—1, 2, 6, 8, 10.
5. ab. *12-notata*, Mader—1, 2, 4, 6, 7, 8.
6. ab. *14-notata*, Mader—1, 2, 3, 4, 6, 7, 8.
7. ab. *16-notata*, Mader—1, 2, 3, 4, 5, 6, 7, 8.

In any event in his group 6 Mader had overlooked ab. *prava*, Heyd., with formula 1, 2, 3, 4, 5, 6, 7.

I propose to name the following new aberrations:—

8. ab. **maderi**, m. n. ab. 1, 2, 4, 6.
9. ab. **donisthorpei**, m. n. ab. 1, 2, 3, 4, 5, 9.
10. ab. **marrineri**, m. n. ab. 1, 3, 4, 5, 7, 9.
11. ab. **hawkesi**, m. n. ab. 1, 3, 7, 8, 9, 10.
12. ab. **caprai**, m. n. ab. 1, 3, 4, 7, 8, 9.

Notes on *Synanthedon formicaeformis*, Esp., in South Hampshire.

By WM. FASSNIDGE, M.A., F.E.S.

Although no mines of *S. flaviventris* have been found here so far this season, one interesting result of prolonged search for them has been the discovery of a very flourishing colony of *S. formicaeformis* at

New Milton. This colony presents certain features which have been considered worthy of record. In the first place the larvae were found feeding on *Salix caprea*, and in the second place they were behaving as genuine gall-makers, which does not appear to have been noted in England before, and about which considerable doubt seems to exist on the continent.

With regard to the foodplant the authorities are agreed that the larva of this Aegeriid mines in various species of *Salix*, and nearly all the records give willows and osiers as the usual foodplant, with no mention whatever of any swelling of the twigs or stems. Buckler gives an excellent figure of the larva and of a mine which shows no trace of a swelling. There are records too, of larvae found in the cut stumps of willows and osiers, and between the living and dead wood of old willows. In Spuler's *Schmetterlinge und Raupen Europas* we find the following note: "According to Gross-Steyr and Sorhagen in goitrous outgrowths of younger stems and twigs of *Salix caprea* in sunny places; that these growths can be caused by the larvae is improbable, for the latter are also present without there being any swelling or similar growth." Hering, *Biologie der Schmetterlinge*, 1926, says: "*S. flaviventris* is found in swellings and *S. formicaeformis* in goitrous outgrowths on *Salix*," evidently repeating what earlier writers had said. But by far the most important continental work on the question of gall-making lepidoptera is: "Révision Critique des espèces de Lépidoptères Cécidogènes d' Europe et du Bassin de la Méditerranée" by J. de Joannis in *Annales Soc. ent. de France*, Vol. XCI (1922). This excellent article is a critical revision of a part only of a more general work on the plant galls of the same region, and the writer has given in it all additional knowledge up to 1922, together with some corrections and additions. Speaking of *S. formicaeformis*, after quoting all available information at considerable length he concludes; "the larva of *S. formicaeformis* is not a gall-maker, but only an occasional gall-eater," and he deletes the insect from the list of gall making lepidoptera. It is the main purpose of this note to show that *S. formicaeformis* does cause galls on *Salix caprea*, and to reinstate it on the short list of lepidopterous gall-makers.

The locality at New Milton where the insect occurs is a piece of rough, swampy ground on the outskirts of a wood, where possibly in the past, sand or gravel has been dug out. The whole expanse is now overgrown with willow, birch, briars, buckthorn and bramble, except for the very wettest spots where grow stunted willows among fleabane, rough long grasses and sedge. Where water stands are a few reeds and bulrushes among the willows. The mines of the clearwing were found at heights from just above ground level to the top of the willow bush. All the highest mines and a very large proportion of the lower ones that were in thin stems and twigs had been already in December pecked open by birds, and the larvae were no longer there. Those hidden by grass and sedge were invariably untouched, as were usually those in thicker stems. Mines occurred in stems of thickness varying from one sixth or even less to nearly one inch in diameter. The age of the stems where mines were found is estimated as varying from two to five years.

The appearance of the swelling varies very considerably, chiefly perhaps according to the thickness of the stem, and possibly also to the number of larvae it contains. In thin twigs I have not been able

to distinguish it from the gall made by *Saperda populnea* or *S. caprea*, of which I have examined many hundreds, or that caused by *S. flaviventris*, of which I have seen about a dozen. It can be assumed, I think, that normally only one larva is present in a mine, except sometimes in the case of mines in thick stems. In stems near ground level and hidden more or less among long grass a peculiarly shaped swelling is often formed, for the diameter of the stem *above* the gall is greater than that below, and continues so for some little distance. Where mines are in the thickest stems there is sometimes very little swelling and the term gall would perhaps hardly be applicable. In nearly all cases the characteristic circular scar made by the young larva in its passage round the stem just under the bark, before it bores into the wood, can be plainly seen. It is possible that this method of boring first round the stem horizontally, which is the cause of what I have termed the characteristic circular scar, may be the direct cause of the swelling, for it would interfere with the flow of sap, and as mentioned below, it often causes the upper part of the stem to die off. Only very rarely were to be found the comparatively large, rough, gall-like excrescences, caused probably by the presence of several larvae, which are noted as "goitrous outgrowths" by Sorhagen and others. Unfortunately these large excrescences are very easily discovered by birds, and the two or three found had been pecked almost to pieces and no larvae were left in them. All thinner twigs die off above the mine, having been more or less completely ringed by the larva; they are then easily broken off and fall to the ground. In several cases where such a break was seen, the mine containing the larva was found on the ground close by. This observation applies also to mines of *S. populnea* occasionally, and of *S. flaviventris* perhaps commonly, and may save many larvae from their great enemy the tit. The number of mines collected by myself and my friend Mr. S. A. Jones, of New Milton, was about sixty—not all of course contained larvae as was afterwards discovered—exclusive of mines broken open and attacked by birds. A moderate estimate of the number pecked open by birds would be at least double as many. Of course it does not follow that because the larvae of *S. formicaeformis* were found in these swellings, these latter were therefore caused by them, but we were unable to find any other possible cause, and up to the present, after prolonged search and examination of the galls on sallows during the last three winters, I have not found similar galls in any other locality, and at New Milton I could not find a gall of this kind that did not show by the frass that it either was or had been tenanted by a lepidopterous larva.

A certain number of mines were opened either by accident or design, and out of about thirty larvae thus seen, only two were found in the stem just below the swelling, all the others being either in the gall, or just above it. In one large swelling three fully grown larvae were found, but it is possible that some workings may contain even more. The larva of an ichneumon, as yet unidentified, was found occasionally in the larval borings. It is curious that out of nine specimens of this ichneumon bred, there was not a single male.

There is no great difficulty in breeding this Aegeriid under ordinary forcing conditions. In the forcing cage the larvae at once give proof of their presence by extruding a quantity of frass, so that any mines not containing a living larva can easily be distinguished. In the present

case insects began to emerge on March 13th 1927 and up to the end of the month 13 had emerged at irregular intervals, 10 females and 3 males. Curiously enough, on January 31st I found a weevil in the cage, which had emerged from one of these mined stems of willow. I recognised it at once as *Cryptorhynchus lapathi*, L., a species I had dug out in fair numbers from mines in alder stems, showing no trace of any swelling, in the dry bed of the of the Gave de l'an at Luz-St Sauveur in the Hautes-Pyrénées in August 1926.

As I expect to be away from home during April, a number of mines were carefully examined on March 31st and the following observations made: some mines that showed no trace of fresh frass were found to be untenanted; in the few good mines opened were found one pupa which had recently changed, two larvae not yet preparing to pupate and another spun up in its cocoon; in one swelling a small boring was observed showing fresh frass, and in it was found a non-lepidopterous larva about one quarter of an inch long, possibly that of *C. lapathi*, the weevil already mentioned.

On the variations and relationship of *Coenonympha arcania*, L., and *C. gardetta*, De Prun. = *philea*, Hb. = *satyrion*, Esp.

By ROGER VERITY, M.D.

(Concluded from page 40.)

Races of exerge *gardetta*, de Prun. = *philea*, Hüb. = *satyrion*, Esp.†

The variations of exerge *gardetta* are quite different from those of exerge *arcania*, because they are much broader and more striking and it is easy to see they consist chiefly in a series of grades along a single line of variation, leading from forms scarcely discernible from *arcania*, such as nymotypical *darwiniana*, Stlgr., to the extreme nymotypical *gardetta*, so different looking that it has by Wheeler* (*Butt. Switz.*, p. 118) even been suggested it might be a variety of *C. iphis*, Schiff.!

My personal experience of them stands as follows: At the Passo di Colle, n. 1400, above Lake Maggiore, a race referable to *darwiniana* on account of the distinct yellow circles edged by a black ring, as in *arcania*, constantly present around the eye-spots on underside of hindwings, but otherwise very similar in size and in general aspect to *epiphilea* (race **philedarwiniana**, mihi), emerged at the end of June in large numbers during very few days; by the 6th of July all the individuals were very worn. There then appeared on the wing some males of the much larger *insubrica*, exactly similar to those I had collected two weeks earlier lower down on the same mountains; at the Passo di Colle they were, however, accompanied by individuals indistinguishable from them by their size and by the look of upperside, but which on the underside of hindwings were like *philedarwiniana*: broad white space including the first eye-spot and with its inner outline lacking the central projection towards cell (form **insubridarwiniana**, mihi).

* The suggestion was not mine, but Tutt's.—G.W.

† In 1871 Kirby pointed out that *philea*, Hb., was prior to *satyrion*, Esp. In F. Moore's annotated copy of Kirby's Cat., which I possess, *gardetta*, de Prun. is held by F.M. to be *philea*, Hb.—H.J.T.

Amongst the *philedarwiniana*, I have collected another form of transition to *arcania* exactly similar to fig. 186-7 of Herrich-Schäffer, which is the "type" of Staudinger's *darwiniana*, because he quotes it in his original description of 1871: it is a little larger than *philedarwiniana*, the eye-spots of underside are larger and have thicker rings; the first, or costal one, stands a little further from the second and the white space is as narrow as in the *parvinsubrica*, in which it is narrowest, so that it only just falls short of being an *arcania*. What conclusions is one to draw from these observations? At first one might think that two lots of individuals with different features emerging on the same grounds at a different time could only be two species, but the number of intermediate ones found in both lots must modify this view, suggested by Guenée and by Oberthür. Several authors, without going as far as admitting three species, have maintained that *arcania* and *satyrion* are distinct and they then group *darwiniana* with the former as its mountain form. The facts described above prove biologically that, anyhow, this would be a mistake, because *darwiniana* in the Tessin acts as *gardetta*=*satyrion* does in other regions, when it meets with true *arcania*, and that it should be grouped with the former, in consequence. I see that Vorbrodtt in his "*Schmetterlinge der Schweiz*," I., p. 102, had already made this correction. He also states that *satyrion* must be a distinct species from *arcania* on the strength of the genitalia. The more of these questions I examine the greater my conviction becomes, that genitalia are never a conclusive proof, because the slim, catabolic, exerge of a species can have markedly different ones from its heavy anabolic exerge, so that it is just as difficult to conclude from genitalia as it is from other characters. In this case it seems to me the facts observed on the field are contrary to admitting true specific distinctness. In the Carnic Alps *epiphilea*, Rebel, a form of *gardetta*=*satyrion*, emerged in large numbers from the end of June to the beginning of August (females abundant only from July 25th) in every sort of surroundings, from 900m. upwards. At S. Stefano and at Cima Sappada I struck the two colonies of true *arcania* described above, flying amongst bushes, and around them *epiphilea* flitted over the grass. This, as in Tessin, might seem again to suggest two species, but here, too, there was evidence to the contrary in that some of these *epiphilea* exhibited yellow and black rings around the eye-spots, so that they were exactly like my *philedarwiniana* of that region. In the other localities, where *arcania* did not exist, not a single specimen was found bearing this character, so that in the Carnic Alps it was obviously due to interbreeding. The frequency of these intermediate individuals here, as in Tessin, and the existence of these successive grades, which, also racially, lead gradually from extreme *gardetta*=*satyrion* to *arcania* are, it seems to me a proof that there is no sterility between them and thus no specific distinction. One can only suppose that the two possess distinct hereditary characters, which are kept up by the fact their different constitutions oblige them to inhabit different regions. As, however, the active catabolic one of *arcania* causes it to spread in every possible direction, it is continually pushing up the Alpine valleys and encroaching on the grounds of *gardetta*=*satyrion*, where it succeeds by its strong physiological reaction and vitality to fix itself and to survive in particularly sheltered and less unfavourable spots. The *gardetta*=*satyrion* constitution, at least as far as the *philedarwiniana* grade, seems to be the

anabolic one of the species: most of the vitality is concentrated in the reproductive organs; some females are so loaded with ova they can scarcely fly and the swarms of individuals one meets with show how actively they reproduce; the soma is thus sluggish, its physiological reaction weak, and it cannot face variable and unfavourable conditions, so that it has been obliged to gradually develop an organic balance exactly adjusted in each case to its surroundings, and it cannot wander away from them: the extreme *gardetta* = *satyrion* race is found in the colder and damper localities of the western Alps, of their northern watershed, and of the Carpathians; on the drier Dolomites *epiphilea* replaces it nearly entirely and on the still drier and more barren summits of the Tessin *philedarwiniana* and probably, in some localities, *darwiniana* in the exact, restricted, sense of this name, are racially fixed. I have observed that the two latter are much more active than the two former and that they fly on stony slopes, settling on the stones and on bushes, whereas the others prefer grass and damp spots on the roads which pass through it, flitting lazily and heavily on their flimsy wings. I have already shown how several Palaearctic Lepidoptera exhibit this phenomenon of having split into two groups, one catabolic and the other anabolic, usually inhabiting different regions and only blending along the boundary between the two, so that they are "exerges." One can assume that the *gardetta* = *satyrion* exerge was evolved during the epochs of glaciation, which were too much even for the adaptability of true *arcania*, so that it was only by modifying its organic balance that it succeeded in surviving conditions similar to those now existing on the Alpine summits. During these epochs true *arcania* probably retired southward and the two fluctuated and replaced each other according to the alternate climates of the various epochs. It seems likely that *arcanioides*, Pier., of North Africa is also but a third exerge, which could perfectly interbreed with *arcania*, but which is organically modified so as to stand great heat and long periods of drought. Their relationship will have to be worked out in Southern Spain, if they really meet there, as stated by Ribbe and Seitz, but the latter's expression that "stray" specimens are known from it, seems hardly appropriate and their supposition that an insect such as *arcanioides* should get blown over from Africa every year seems rather fantastic.

The following summary of forms and races of exerge *gardetta* will clear and complete the remarks I have made above about it:

Group *darwiniana*. Stdgr.: Upperside markings as in the individuals of *arcania* with broadest black outer area of forewing; on underside apical eye-spot of forewing nearly always present, but on an average smaller than in *arcania*; on hindwings inner outline of white band-like space lacking the large point, which in *arcania* projects towards the cell and encroaches on it; eye-spots, on an average, of more equal size; first not set as far (inward) from the others; yellow circles paler; black rings thinner:—

Grade I: nymtypical *darwiniana*, Stdgr., as figured by Herr.-Schäff., from the Valais (Vol. I., p. 85): size, intensity of colour and general appearance as in *parrinsubrica*, but with the white band and the eye-spots as just described; in that figure the band is also extremely narrow, but this is, no doubt, purely individual, as in some *parrinsubrica*.

Grade I. bis: *insubridarwiniana*, Vrtý.: very large size and bright colours, as in *insubrica*, but with outline of broad white band and eye-spot features characteristic of the *darwiniana* Group. I have stated my "type" emerged in company with *insubrica*, later than the *philedarwiniana* of the same locality, so that it may constitutionally be an *arcania* rather than a *gardetta*.

The race Oberthür describes (*Ét. Lép. Comp.*, IV., p. 28) from Fusio and which he says is larger and brighter than the one of the French Basses-Alpes evidently consists of forms similar to the two just described.

Grade II.: *philedarwiniana*, Vrtý.: similar to *epiphilea* of the following Group by its smaller size and duller colouring than in the preceding and by the general features of underside, but distinguishable from it at a glance by the nearly constant presence of the apical eye-spot of forewing and by that of pale, but distinct, yellow rings around those of hindwing. A few specimens I have from the Simplon and others from the Basses-Alpes, seem to belong to a race identical with my "typical" one from the Southern Tessin (Lake Maggiore). This is probably also the *darwiniana*, which Frühstorfer says is prevalent at Klausen, in S. Tyrol.

Group *gardetta*, De Prun.: Size much smaller than in *arcania*; frailer structure; wings more flimsy; colouring much duller; tendency of black suffusion to invade the whole of forewing; on underside, apical spot of forewing usually entirely obliterated or reduced to a minute dot; eye-spots of hindwing small, all of about equal size and set at equal distances from each other; no trace of the yellow circles nor of the black rings around them, except, occasionally, a trace of yellow in some races; there usually is a broad, shaded, grey suffusion along outer-margin of forewing; the white band-like space of hindwing is prolonged anteriorly along the costa, well beyond the first eye-spot, which it encloses broadly.

Grade III.: *epiphilea*, Rebel: forewing still broadly fulvous in the majority of individuals, but of a dull, saturated tone, often partly suffused thinly with black scales. Its author gives Switzerland, Tyrol and Carinthia as its habitat. He names *orientalis* a very similar form from Eastern Bosnia, which he had described and figured in the *Ann. Naturh. Hofm.*, XIX., p. 174, pl. V., from a single specimen; amongst my Carnic specimens I have several exactly like his figure in all respects, except the double apical eye-spot, which surely, can only be aberrant. With it Frühstorfer (*l.c.*, p. 4) compares a race from Saratow and from Serbia, which he names *chrysoaspida*, but these two extraordinarily different localities and the vagueness of his description are very unsatisfactory.

Grade IV.: *philea*, Hüb. = *satyrion*, Esp. The former in his text of 1805 (where he renames it *neoclidus*, without giving any reason) gives "the Alps of Tyrol and also the mountains of Savoy" as habitat; the latter gives "Bünden" and his original text ends with this word, which I take to mean the Grisons (Charpentier in his edition of 1830 carried it on, adding more localities). Their "types" thus were from the Eastern Alps, Hübner's is a male, entirely overshadowed with black scaling on upperside, except a light suffusion of fulvous scales on the inner half of forewings; Esper's is a female with forewings entirely ochreous and hindwing only lightly overshadowed with grey. The latter

form is prevalent in some localities and especially in the less damp Eastern Alps, whereas in others, and especially in the Western Alps, the females have a broad black margin to forewing and the hindwing is entirely dark. As a matter of fact, in these two races both sexes differ in that the first is less saturated with pigments, whilst the second gives the impression of being more heavily coloured and more melanic. This difference shows well even in the extreme individual form *unicolor*, Wheeler, produced by both.

Grade IV. bis: *gardetta*, De Prunner. The Piedmontese race I have collected in the Cottian Alps is the more richly pigmented one, just described, and to it applies this name more exactly.

The Basses-Alpes in May-June, 1926.

By Lieut. E. B. ASHBY, F.Z.S., F.E.S.

(Continued from page 42.)

The Coleoptera which I obtained at Digne and district during this trip were *Lytta vesicatoria*, L., locally abundant on small trees up the Grand Gorge on the way to the Mt. Cousson; *Anthaxia cyanicornis*, Fab. (= *hungarica*, Scop.); *Cicindela campestris*, L.; *Clytus arietis*, L.; *Rhaqium inquisitor*, Fabr.; *Saperda scalaris*, L.; *Agapanthia carlini*, L.; *Philonthus cyanipennis*, Fabr.; *Lampyris noctilinea*, L., ♀; *Cantharis rufa*, L.; *Cantharis nigricans*, Müll.; *Clytus arcuatus*, L.; *Attelabus curculionoides*, L.; *Phyllopertha horticola*, L.; *Cantharis obscura*, L.; *Ampedus sanguineus*, L.; *Cantharis lividus*, L.; *Byctiscus betuleti*, F.; *Oedemera flavescens*, L.; *Oedemerastra podagrariae*, L.; *Anthaxia nitidula*, L.; *Lacon murinus*, L.; *Uoplia farinosa*, L.; *Melanotus haemorrhoidalis*, F.; *Lachnaea serpunctata*, Scop.; *Henicopus ater*, F.; *Ptosima norem-maculata*, Fab.; *Harpalus ruficornis*, F.; *Dascillus cervinus*, L.; *Arinia brevipennis*, Illig., abundant; *Hippodamia tredecimpunctata*, L.; *Oeypus morio*, G.-R.; *Coccinella 11-punctata*, L.; *C. bipunctata*, var.; *Leptura scutellata*, Fabr.; *Ecosoma lusitonica*, L.; *Strophosomus lateralis*, P.K.; *Molytes glabratus*, F.; *Adimonia tanacetii*, L.; *Cebrio lepturoides*, F.; *Henicopus pilosus*, Scop., ♀ only; *Pyllobius pyri*, L.; *Psilothrix cyaneus*, Oliv.; *Permestes undulatus*, Brahm.; *Gastroidea polygoni*, L.; *Phyllodecta vitellinae*, L.; *Coccinella 10-punctata*; *Corymbites purpureus*; *Otiorrhynchus tenebricosus*, Hbst.; *O. picipes*, F.; *Pyllobius maculicornis*, Germ.

Leaving Digne on June 7th I broke my journey, as I have often wanted to do, at St. Maurice-en-Trièves, where there is an indifferent Terminus Hotel. There is excellent ground leading up into the woods from the station on the west side of the line, and one can collect in both directions. There was a wealth of flowers, but unfortunately the sun was hidden and the ground sappy, but I took *G. cyllarus*, *C. minimus*, *Pararge hiera*, *Leptosia sinapis* and *M. aurinia* with a sprinkling of Geometers and other insects. I think this ground at St. Maurice-en-Trièves, of which there is plenty to the west of the railway station, would yield more profitable results in July and early August.

The Hymenoptera taken during this trip included *Crabro lituratus*; *Eumenes coarctata*, L.; *Halictus scurfasciatus*; *Coelioxys quadridentata*; *Allantus perkinsi*; *Halictus scabiosae* (*zebrus*), Rossi; *Anthophora acerrorum*, L.; *Melecta luctuosa*, Scop.; *Anthidium manicatum*, L.;

Bombus ligusticus; *Chalicodonia muraria*; *Pelanaspis crassitarsis*, Costa; *Salix fuscus*, ♀, L.; *Athalia glabricollis*; *Bombus sylvarum*; *Teuthredopsis excisa*; *Xylocopa cyaneus*; *Proanthidium laterale*, Latr. = *4-lobum*, Per.; *Odynerus parietum*, L.; *Tenthredopsis litterata*, Geoffr.; *Allantus dahlia*, Klug.; *A. bifasciatus*, Müll.; *A. amareus*, Gravenhorst = *cingulum*, Kl.; *Osmia kohli*, Ducke; *O. tricornis*, Latr.; *Oryssidae*: *Oryssus abietinus*, Scop.; scarce in collections, life-history required to be described; *Psammochares fuscus*, L.; *P. riaticus*, Fabr.; *Macrophya blanda*, F.; *Xylocopa cyaneus*, Brullé.; *Andrena morio*; *Nomada succincta*; *Gorytes mystacens*; *Osmia pilicornis*; *Arge euodis*; *Anthophora megilla*; *A. fulvritarsis* var. *scopipes*, Spin.; *Anthophora retusa*, var. *nigra*. These were all taken in the environs of Digne.

(To be concluded.)

Note on the Antiquity of some Orthopterous Groups.

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

Although the fossil orthopterous and orthopteroid insects have been studied in some detail, there is an aspect of the geological side of Orthopterology which I have seldom noticed referred to, perhaps due to lack of familiarity with recent literature. There are two points that have struck me as of extreme interest and I think they are worth putting on record in the hope of stimulating students to further investigation.

Probably everyone, who has collected in Spain, is familiar with a numerous group of big, fat, sluggish grasshoppers, which are common in bushes all over the peninsula, called the *Ephippigeridae*; they are obese, with big, round heads, staring eyes, plump abdomen and no wings, while the elytra are reduced to mere stridulating instruments. There are probably about a hundred species, and if their distribution be plotted on the map, it covers an area shaped like a horseshoe with the centre about Gibraltár, the two arms extending westwards on the two sides of the Mediterranean; the main mass extends to the Atlas on the south and to the Pyrenees on the north, whence they thin out towards the west; in Europe, two or three species reach the coast of Dalmatia, and one only, the advance guard of a perhaps extending group, reaches northern France, central Europe and as far east as the middle of Russia. There are several other groups by no means closely allied which have similar general characteristics, evidently a case of parallel development, such as the *Bradyporidae* of the Pontic fauna, the *Zichyas* of Central Asia, and the *Hetrodidae* of Africa, though the latter are fairly close to the *Ephippigeridae*. Apart from purely structural features, the *Ephippigeridae* have the peculiarity that both sexes chirp equally well, and that they stridulate with anger when handled, as well as from sheer *joie de vivre*.

The most characteristic species in Spain is *E. perezii*, one of the largest and widest spread in the Iberian Peninsula. In the Balearic Islands, at least in Majorca, there is a species, *E. balearica*, which is so closely allied that it is hardly more than a local form, distinguishable only by a slightly different shape of the pronotum.

Now it is agreed among geologists that the Balearic Islands were

separated from the mainland of southern Spain during the Oligocene Period, when great earth movements formed the Straits of Gibraltar and connected up southern Spain with the mainland of Europe. Consequently, the Balearic Ephippigers have been isolated from the main stock since the Oligocene and yet during this great lapse of time, they have only developed a trifling physical difference. Even if we admit that their isolated position has protected them from the intensity of the struggle for existence which has been keener on the mainland, we are compelled to ask how long it has taken to develop the four or five score of species, with several genera, and to conclude that the family itself must be of very ancient origin.

The other case occurs among the earwigs. There is a small subfamily called the *Esphalmeninae*, with but a single genus comprising about half a dozen species. They are flightless creatures and flattened, probably living under stones; their abdomen is dilated posteriorly, sometimes remarkably so; in these characteristics they resemble several other groups, especially the *Psalidae*; a clear case of parallel development. But they are sharply distinguished by the marked narrowing of the prosternum posteriorly, and above all by the peculiar and complex development of the male genital armature. They are characteristic of the Andes, from Patagonia to Ecuador and are rare in collections. But there is one species, *E. peringueyi*, from the Caledon River, Cape Colony.

When I first referred this species to this genus Zacher wrote me that surely I must be mistaken, as I had acted upon external features only. I was then lucky enough to secure some material in alcohol and so able to examine the genitalia, and this completely vindicated my determination; the armature was extremely close to the known armatures of the Andean forms and quite different from any other type known in the Dermaptera. The South African species is an undoubted Esphalmenid and very closely related to the Andean species, the differences being not greater than specific.

Now there is much evidence to show that the southern portion of Africa, the Falkland Islands and part of South America were part of one continent through vast ages of geological time, at least from the Lower Carboniferous to the end of the Trias, when it seems that they were separated. If that is so, *E. peringueyi* has been separated from its congeners since the end of the Trias, during which vast interval of time it has developed only specific characters; how great, then, must have been the lapse during which the subfamily developed its identity, and how ancient it must be, and how inconceivably old must be the splitting of the Proto—from the Endermaptera and the evolution of the earwigs as a group. The Tertiary earwigs of Florissant, described and figured by Sudder, have apparently a decidedly archaic appearance, though the earwigs preserved so perfectly in Oligocene amber in the Baltic have a very up-to-date look. Yet the *Esphalmeninae* of the Trias must hardly have been different from those of to-day.

Very numerous cases of like nature among the Orthoptera could doubtless be quoted; it seems certain that the existing distinctive groups of the Orthoptera are extremely ancient. But so few are preserved in fossil form that it is only by a study of their geographical distribution that we can form a conception of their antiquity.

Our general knowledge of the orthopterous fauna of the world has made great strides in recent years and it is not now premature to attempt generalisation on this fascinating, but so far much neglected, aspect of Orthopterology.

NOTES ON COLLECTING, etc.

REFERENCES FOR COLLECTING IN THE ENGADINE AREA:—

- ENGADINE:—*Ent. Rec.* XXVII. 163, etc. *Ent. Mo. Mag.* XXXIV. 25: XLIV. 238. *Ent.* XVIII. 307.
- PONTRESINA:—*Ent. Rec.* XIX. 43: XX. 193: XXIV. 266: XXVI. 228, etc. *Ent. Mo. Mag.* XXXVII. 130, etc.: *Ent.* VII. 77.
- ST. MORITZ:—*Ent. Rec.* XXIV. 87.
- BERNINA PASS:—*Ent. Rec.* XXIV. 88: XXVI. 243.
- GUARDA:—*Ent. Rec.* XXI. 166.
- ALBULA PASS:—*Ent. Rec.* XIX. 43: XXIV. 41.
- MALOYA PASS:—*Ent. Rec.* XIX. 42.
- ROSEGG THAL:—*Ent. Rec.* XIX. 43: XX. 194.
- ZERNETZ:—*Ent. Rec.* XXI. 197.
- SUVRETTA THAL:—*Ent. Rec.* XIX. 44.—H.J.T.

HIbernated POLYGONIA C-ALBUM.—It may be of interest to note that hibernated *P. c.-album*, have appeared in my garden to-day, March 17th, and also *Gonepteryx rhamni*.—PETER HAIG-THOMAS, F.E.S., The Grange, Goring-on-Thames.

MICRO-LEPIDOPTERA OF THE BRITISH ISLES.—May I suggest that a new list of the so-called "micros" would fill a long felt want and would probably pay for the trouble and expense.—(Lieut.) S. A. JONES, "Biskra," New Milton, Hants.

[Much as we should welcome this project we doubt whether at the present time a dozen copies would be sold. The number of those who are interested in the "micros" is almost negligible. It is very rarely that "micros" are exhibited in our societies except now and again a species which has demonstrated its power to be of economic importance.—Hy.J.T.]

A HUMOROUS EXPERIMENT WITH PROCESSIONAL CATERPILLARS.—The *Evening News* in its issue of February 12th, describes an amusing experiment played upon the Colony of these insects at the Zoological Gardens, which is perhaps worth recording in a less ephemeral journal. On the occasion of one of their periodical route marches the experiment was made of linking up the head of the procession to the tail by means of the guiding silk thread laid by the leader, with the result that, although the leading caterpillar may have been somewhat surprised at finding himself unexpectedly at the rear of his column, he did not hesitate, but loyally followed on and so the caterpillars solemnly tramped round and round for a day-and-a-half. When tired they are stated to have simply curled up where they were, and on waking to have resumed their rotatory peregrination, and that though food was plentiful, apparently they ignored it. The end of this rotatory walk would obviously have proved disastrous had not one caterpillar fallen out from exhaustion, and in his fall carried away some of the guiding thread, with the result that, before he could resume his place, he had

automatically become the leader, and the rest following loyally after him down the thread, the vicious circle was broken. The writer pathetically adds how happy certain Politicians would be if only their followers were as faithful!—G.C.L.

CURRENT NOTES AND SHORT NOTICES.

The Annual Appeal is being made for the Wicken Fen Fund, for the upkeep and supervision. There is no endowment to rely upon and the only regular income in the past has been from the sale of the sedge for litter. Owing to the decrease in horse traction the demand for sedge is very small and this source of income is fast failing, so that if the fen is to be kept in its normal natural condition further sources of income must be encouraged. If the fen be left without care, the whole character of the growth will soon become altered and with the change will come the consequent alteration in the fauna. What is now so interesting to the student and to the lover of nature under the uncommon local conditions prevailing will gradually pass away without possibility of renewal. Mr. W. G. Sheldon would be only too pleased to receive subscriptions sent to him at the Entomological Society's offices, 41, Queen's Gate, S. Kensington, S.W.7.

We should like to call attention to the two journals published by our correspondent and friend Dr. Walther Horn, of the Deutsches Entomologisches Institut, Berlin-Dahlem. The *Entomologisches Mitteilungen* is issued in 6 parts each year, the whole volume containing about 450 pages with plates and text figures. The articles are not all in German, some are in French, English and Italian. At the price of M8, eight shillings, this is extremely reasonable. The other journal *Supplementa Entomologica* comes out at irregular intervals and consists of a series of monographs of various groups, from one to three numbers a year. Several numbers have dealt with the Fauna of Formosa and shortly several parts will treat of the insect fauna of Sumatra. The price of the parts are about M6 each with a discount to subscribers of the *Ent. Mitt.* One or two numbers of the latter in our library are of the utmost use for reference, and we are pleased to call attention to these publications.

Capt. A. Pearman, "Egerton House," Christchurch Street, Ipswich is anxious to get into touch with micro-lepidopterists in the eastern counties. Unfortunately we know of none in that area at the present time. Indeed there seem but few workers at this group now.

We hope our subscribers are getting their copies regularly. It is rarely that the magazine is delayed issue more than a day or two. One of our American subscribers received only three numbers out of eleven sent him last year. Will our subscribers let us know of any such irregularity in receipt, within a reasonable time from the date of issue. Some time ago a number of copies were found deposited in the letter-box of an empty house with a considerable amount of correspondence, put there by a "Weary Willie" specimen of a postman.

In the *Ent. News* for March is an interesting review of Warren's *Monograph of the Hesperinae*, which was recently issued by the Ent. Soc. of Lond. It is really a paean of praise throughout, of the "excellence" of the work, "a remarkable paper, which seems to be the last word as to the European species, and which also contains a great deal of information on the subject of the male genitalia and on

the other species of the old world." Of the plates the reviewer says "their unusual clearness and accuracy in reproduction, and the general set up of the plates, without crowding and well arranged, make it exceedingly pleasing to the eye, and in my opinion, truly artistic."

We should like to call attention to one of our newer contemporaries, the *Zeit. Österreichischen Entom.-Vereines, Wien*, which, established in 1916, has apparently come to stay. Each monthly part contains 10 to 12 pages and there are occasional plates (three this year already, two of which are coloured) and numerous half-tone figures. The matter is practically wholly lepidopterous and many forms new to the Palaearctic Fauna are described and the articles by some of the leading Austrian entomologists are of a high order. Among the contributors during the past year are Dr. Schaweda, Dr. Zerny, Dr. J. F. Berger, H. Neustatter, H. Kauty, Prof. H. Rebel, H. Reisser, Fritz Wagner, Jos. Nitsche, etc. The amount of information in the limited space is quite remarkable.

It is announced that there will shortly be published a comprehensive work, *The Butterflies of California*, written by Dr. John Adams Comstock, Los Angeles, Cal. A great feature of the work is stated to be the coloured plates of which there are sixty-three. Every species, of both sexes where necessary, are figured, with many of the more obtainable varieties. The life-histories are fully described, where known, and there are many half-tone and line illustrations in explanation. The various plates sent out with the prospectus show that the work must prove very useful in identification. It is interesting to note in the fauna of the Western side of the Rocky Mts. that many species and forms of species occur which are not present in the vast plains and mountains of the Eastern United States, and also that the number of species recorded is considerably greater.

REVIEWS AND NOTICES OF BOOKS.

FOLIA MYRMECOLOGICA ET TERMITOLOGICA.—This interesting little Magazine is of comparatively recent origin, the first part of Volume I. having been published in October, 1926; and the second and third part together in November and December, 1926. It is produced by Dr. Anton Krausse of Eberswalde, and printed at the Hussiten Druckerei, Bernow bei Berlin. The sub-editors are Dr. R. Brun, Prof. Dr. Ed. Bugnion, Prof. Dr. H. von Buttel-Reepen, Mons. Bruno Finzi, Prof. Dr. August Forel, Dr. N. A. Kemner, Herr R. Kleine, Herr Heinrich Kutter, Dr. Carlo Menozzi, Prof. Dr. A. Reichensperger, Dr. Santschi, Forstmeister Schulz, Dr. R. Stäger, Dr. G. Steiner, Dr. Heinrich Stitz, Prof. Dr. E. Strand, Dr. Graf Hermann Vitzthum, Dr. E. Wasmann, S.J., Prof. Dr. W. M. Wheeler and Prof. Dr. M. Wolff. The contents of Part I consist of:—"Ants of the Balearic Islands," by W. M. Wheeler; "Deux nouvelles fourmis parasites de l'Argentine" by Santschi; "Können myrmekophile Brenthiden fliegen," by R. Kleine; "Ein neues Formicarium," by Anton Krausse; and "Unterirdische 'Grabkammern' in einem Nest von *Formica pratensis*," by R. Stäger.

As its name implies this publication is entirely devoted to Ants and Termites, and is indispensable to all students of those orders. The last number seen was published in February.—H.D.

FLUGLER, by Dr. H. Bischoff, Custodian of the Zoological Museum of the University of Berlin. pp. 600, figs. 224. RM. 27.—This is another of those valuable works on natural history rather than systematics, of which we have had other excellent examples in the past few years, such as Butler's "Biology of the British Hemiptera-Heteroptera," Hering's "Biologie der Schmetterlinge," Forel's "Les Mondes Social des fourmis," and Wheeler's "Social Life among the Insects." Chap. I. Gives an account of the general structure of the Hymenoptera, a summary of the systematic arrangement, a short sketch of the phylogeny of the order, with notes on its distribution and the incidence of the lines of variability. Chap. II. Movement and Rest. The mechanics of flight and the power of spring are correlated with the structure of legs and wings, with the modifications for special movements such as under-water progress and larval habits. The daily resting state, as well as the hibernation and aestivation, is considered. Chap. III. Feeding. A most interesting chapter on the structures and habits for the acquirement and assimilation of food in all stages and in the diverse sections of the order, the bees, the wasps, the ants, the gall-makers, the parasites, the wood-borers, the leaf-cutters, with sections on Trophallaxis, Myrmekophily, Gall-making, Honey-extracting, etc. Chap. IV. Treats of Respiration and Circulation, with discussion of special cases of these in the different stages, in the cocoon, in the case of internal feeders, etc. Chap. V. The nervous system and sensation. The sense of sight, orientation, the finding of prey both in the open and concealed, the appreciation of temperature, the structure and uses of the antennae, are all considered at length. Chap. VI. The special habits of the solitary aculeate Hymenoptera and their relative position in the order. Chap. VII. A similar consideration of the social Hymenoptera; only a few pages are devoted to the ants, which have been so ably and thoroughly dealt with by Forel and Wheeler. Chap. VIII. The egg and oviposition. Chap. IX. Anxiety of the female for its offspring. This is a most interesting summary of the maternal preparations for the future generation, dealing in detail with all sections of the order. Chap. X. Parasitism. Another fine chapter, which no-one interested in the subject could afford to miss. It is a collection of the facts of, perhaps, the most intricate relationships in the whole range of natural history. This chapter contains a list of European bee-parasites and their hosts. Chap. XI. The ordinary and special incidents in the life of the Hymenoptera, with sections on slave-making, the keeping of "gnests" by ants, polygyny, etc. Chap. XII. Sexual relationship. Primary sexual characters, secondary sexual characters, polymorphism, generation, parthenogenesis, pairing, protandry, etc. Chap. XIII. The various stages and conditions of individual development, larvae, cocoons, pupae, etc. Chap. XIV. A few special items not included in the previous chapters such as Hygiene, Mimicry, the Strepsiptera, woodlice and other parasites. The book concludes with a Bibliography mostly of continental works. We note that Emery, Saunders and Donisthorpe's works are omitted and also that Schultess. Morice has only one reference given and that a very ancient one. There is a capital index of 16 pages of 3 columns. This is a book which is of such intrinsic value to all world workers, that one would like to see it translated into English so that it could then reach the larger circulation it deserves. The pages are large and the printer's part has been well done.—HY. J. T.

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Entomologist in out of way part of world desires exchange entom. literature—especially current works on classification, anatomy, heredity, etc.—for papered insects from Argentine Chaco. Will give double rate for *Camb. Nat. Hist.* (Insects), *Hudson's Nat. in La Plata*, and special for *Ridgeway's Colour Charts*. Basis butterflies or moths 20/- per 100 papers, coll. 35 butterflies all different 10/-, other orders by arrangement. Or will sell for cash to enable purchase. Lists to *K. J. Hayward*, *Villa Ana*, *F.C.P.S.F.*, *Argentina*.

Mr. M. R. SMITH, A. and M. College, is anxious to know where he can obtain any of *Emery's* papers on North American ants ; and also to know of any Europeans who would like to exchange separates and correspondence with him concerning ants.

Signor ALFREDO FAX, Calle Bandera 714, Santiago Chili, is willing to exchange first class Chilean Coleoptera, especially *Carabus*, sps., for striking Coleoptera from all parts of the World.

Wanted.—To correspond with some Entomologist resident in Scotland, Ireland, or the Isle of Man who is interested in Noctuae and vars. with a view to exchange of species and forms.—*A. J. Wightman*, "*Aurago*," *West Chiltington Common*, *Pilborough*, *Sussex*.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. June 1st.

The South London Entomological and Natural History Society, *Hibernia Chambers*, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. May 26th. June 9th.—*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.*, *J. P. HARDIMAN*, *C.B.E.*, *B.A.*, 1, *Chatsworth Road*, *Brondebury*, *N.W.2*.

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All communications should be addressed to the Acting Editor, Hx. J. TURNER, 98, Drakefell Road, New Cross, London, S.E.14.

IMPORTANT TO ENTOMOLOGICAL SOCIETIES and MUSEUMS.

BACK VOLUMES OF

The Entomologist's Record and Journal of Variation.

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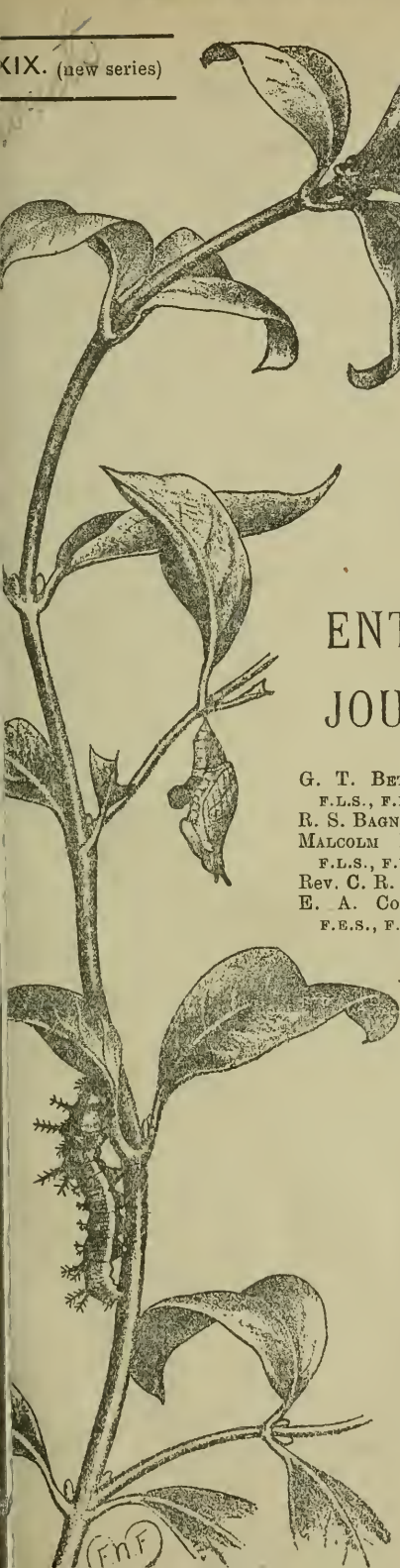
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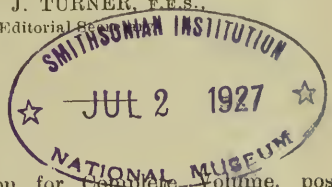
THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

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Notes on Egyptian Lepidoptera
observed at

Reservoir Aswan, 1919-1922.

By KENNETH J. HAYWARD, F.E.S.

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Notes on the Spanish form of *Hesperia cinaræ*, Rbr.

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

In the summer of 1926 Signor O. Querci collected a fine series of *H. cinaræ* in Spain, which fills a great blank in our knowledge of this species. When I was writing the account of *cinaræ* for my "Monograph of the Tribe Hesperiiidi," I was unable to find, or hear of any Spanish specimens, other than the one in the Chapman collection which I figured (l.c. pl. XLVIII. f. 3 and 5), I noted at the same time (p. 135) that this one Spanish specimen differed a good deal from all eastern specimens, but of course as it was only a single example one could not be sure that it was typical of the species in Spain. Signor Querci's captures have now given the required data. He and Signora Querci between them captured over a hundred specimens, which all agreed exactly with Dr. Chapman's Tragacete specimen, and form a remarkable contrast when compared with eastern *cinaræ*. I have pleasure in naming this fine southern subspecies after Signora Querci, for Signor Querci tells me that the great proportion of his specimens were taken by her between Valdecabras and Huelamo, when he was collecting elsewhere.

Signora Querci first noticed the species on July 21st, a certain number were taken in August, and three small specimens between September 1st and 5th. Signor Querci also took some specimens at Tragacete from July 13th-15th. These dates show that the flight period of the species extends from mid-July to the end of August, or early September.

S-sp. **clorinda** s-sp. nov.—Types in my collection, ♂ from Tragacete (figured *Trans. Ent. Soc. Lond.* Vol. 74. 1926., pl. XLVIII. f. 3 and 5.) (T. A. Chapman), ♀ from Villacabras, Cuenca (C. Querci).

The characteristics which distinguish this race from the type (eastern form) are: the bright yellow ground colour of the underside of the hindwings (invariably a very dull ochre in eastern European, or Asiatic specimens) and the clearly visible nervures of the same, outlined in a light yellow and in consequence contrasting sharply with the ground colour. The bright shade of the ground colour also suffuses the costa and apex of the forewings underside. On the upperside the light markings of the hindwings are slightly buff, or cream in the ♂, and of a deep, almost ochre shade in the ♀. On the whole the colouring of s-sp. *clorinda* and the difference between it and *cinaræ* is an exactly similar development to that which distinguishes s-sp. *iberica* from *H. fritillum*. In both cases the Spanish insects have developed an altogether richer and warmer colouring than their eastern and northern forms, and the effect is very much more striking than the description would lead one to suppose. It may be well to point out here that Rambur's name (*cinaræ*) though first used in his *Faune de l'Andalousie*, pl. 8, f. 4. 5., and described in his *Cat. Syst. des Lép. d. l'Andl.* (footnote p. 68), was applied to the eastern form and not to the Spanish, his description of the colour of the underside of the hindwing proves this clearly, but even if it did not do so his note in the *Faune*—"mais je ne décris qu'en note celles qui sont étrangères à l'Andalousie"—definitely settles the point. He describes *tessellum*, *cacaliae*, *carlinae*, *cirsii* (typical *fritillum*), *centaureae*, and *alreolus* only in

foot notes, while continuing the practice in the *Cat. Syst.* he describes *melotis* and *cinarae* also in footnotes.

Signor Querci notes that in his series of s-sp. *clorinda* the ♂s vary in size only, and that the ♀ is much more variable both in size and markings. The ♀s as a rule are darker on the upperside than the ♂s, owing to a dark superscaling partly obscuring the white markings of the hindwings, and a tendency to reduction in size of the white spots of the forewings. The underside of the hindwings in the ♀ is as a rule a brighter yellow than in the ♂, and the white spots are often a shining pure white never seen in the ♂. There also occurred several specimens of both sexes in which the inner edge of the central spot of the median band projects strongly towards the base of the wing (ab. **extensa** ab. nov.), such specimens resembling *H. umida* to a certain extent. The occurrence of this form of variation in *cinarae* is of considerable interest, for it is more than probable that it is a variation which is found in every species where the usual formation of the central spot exhibits a straight inner edge. In all cases when this extension of the central spot occurs, the affected specimen assumes a likeness, more or less pronounced, to some other species. So far no specimen of this ab. has come to my notice among eastern *cinarae*.

The distribution of s-sp. *clorinda* is still uncertain. All the known specimens so far come from Cuenca. Signor Querci however thinks that he got some specimens in the Sierra of Albarracín the year before, but as these specimens have all been sent to America and were not identified at the time he cannot now say with certainty if they were *cinarae* or not.

Some Swiss Butterflies in 1925 and 1926.

By T. BAINBRIGGE FLETCHER, R.N., F.L.S., F.E.S., F.Z.S.

(Continued from page 57.)

1. *Papilio podalirius*, L.—Martigny: June 11th, 1926, common but worn; June 26th, 1926, two, very fresh, apparently the second brood. Eclépens: June 22nd, 1926, one worn female. The Martigny specimens presumably belong to the local Valais race *ralesiaca*, Verity. Bérisal: August 22nd, 1926, seen.

2. *Papilio machaon*, L.—Grimmialp: abundant from June 29th to July 14th, 1925; the earlier specimens belonged to the Spring brood, the first example of the second brood appearing on July 12th. Arolla: a larva, found on August 21st, 1925, pupated on August 31st and emerged (in a heated room) on March 29th, 1926; although this butterfly is often found on hill-tops—in India it occurs at 15,000 feet in Kashmir—Arolla seems to be an unusually high elevation to find it breeding. Martigny: June 11th, 1926, freshly emerged. Les Avants: June 12th, 1926, freshly emerged. Bérisal: August 1st and 17th, 1926, seen.

4. *Parusianus apollo*, L.—Grimmialp: July 11th and 13th, 1925, fairly common in the meadows bordering the Filderich stream. Evolène: July 28th and 29th 1925, abundant on the rocky slopes along the East side of the Valley. Arolla: August 3rd to 14th, 1925, fairly common around and just above the Kurhaus, occurring on the same ground as *P. delius* but less abundantly. Above Les Haudères,

at about 5,000 feet: September 1st, 1925, common but worn. Villeneuve: September 14th, 1925, one, worn; June 2nd, 1926, one, fresh. Eclépens: July 12th and 14th, 1926, fairly common in a restricted area a little above the western end of the marsh; these specimens, very large and white, belong to the Jura race *niratus*. Bérissal: common along the road just below the Ganter Bridge and in the Ganter-tal from July 21st to September 1st, 1926; around Bérissal itself *P. apollo* seems decidedly scarce but it reappears again on the Simplon Road at about 6,000 feet, where it occurred commonly throughout August.

5. *P. delius*, Esp.—Grimmialp: July 14th and 16th, 1925, a few examples some way up the Grimm-tal; these are decidedly larger than the Arolla specimens. Arolla: abundant from August 3rd to 31st, but mostly worn by the latter date. Simplon Road: common on August 2nd, 1926 on the slopes just below the Kaltwasser Gallery, at about 6,400 feet; one on August 9th, 1926 at 6,000 feet, on the same ground on which *P. apollo* was occurring; generally speaking, however, *P. delius* seems to occur here at a slightly higher elevation than *P. apollo*.

6. *P. mnemosyne*, Linn.—Bérissal: abundant in the flowery meadows just above the Hotel on July 18th, 1926, and occurred there commonly until August 1st. Also abundant a little way up the Ganter-tal. My last specimen, a male in good condition, was taken a little way above the Ganter Bridge, as late as August 16th.

7. *Aporia crataegi*, Linn.—Grimmialp: common from July 1st to 11th, 1925. Martigny: June 11th, 1926, abundant. Bérissal: July 18th, 1926, common. Simplon Kulm: August 2nd, 1926. Simplon Road, 6,000 feet: one worn male seen as late as August 26th.

8. *Pieris brassicae*, Linn.—Grimmialp: July 1st to 13th, 1925, common. Uetliberg: July 21st, one female. Arolla: August 3rd to 31st, 1925, common, a fresh male taken on the latter date, which looks as if more than one brood occurred here. The Arolla specimens are very large. Tutt notes that he did not find it at Arolla. Blonay: September 3rd and October 4th, 1925. Mont Pelerin: September 22nd, 1925, common but mostly worn. Martigny: June 11th and September 14th, 1926. Les Avants: June 21st, 1926. Simplon Road, 6,000 feet: September 3rd, 1926, one very fresh female. Villeneuve: September 15th, 1925, a few about.

9. *P. rapae*, Linn.—Grimmialp: common from July 1st to 12th, 1925: males taken on July 1st and 4th are *metra*, whilst one on July 12th is *rapae*. Evolène: July 28th, 1925. Arolla: common throughout August 1925, one at about 7,500 feet on August 28th. Montreux: common around Montreux during September and October, 1925; it seems to go on breeding as long as the weather is favourable, freshly emerged specimens occurring as late as October 4th, on which date females were ovipositing; common again from May 28th to June 30th, 1926, and in September. Bérissal: a few, July 18th, August 15th, 1926. Simplon Road: one fresh female at 6,300 feet on August 13th, and fresh specimens at 6,000 feet on August 26th. Martigny: September 14th, 1926, abundant around the town.

10. *P. manni*.—Martigny: June 11th and 26th, 1926, September 8th, 1925, and September 14th, 1926, these later specimens belonging to the summer form, *rossii*, Stef. This species is common under the

cliffs towards Vernayaz but does not seem to occur around Martigny itself, where it is replaced by *P. rapae*.

11. *P. napi*, Linn.—Grimmialp: the form *bryoniae* was abundant at the end of June and beginning of July, 1925. Uetliberg: July 19th and 21st, 1925. Montreux: common during September, 1925, and worn specimens occurred as late as October 21st; again on May 28th, 1926. Martigny: June 11th and 26th, 1926. Les Avants: June 12th and 21st, 1926. Eclépens: July 12th, 1926, common; one female, with the markings almost entirely obsolete on hindwing beneath, seems to be *leorigilda*, Frühst. Bérisal: *bryoniae* common during the second half of July, 1926. Simplon Dorf: July 27th, 1926, *bryoniae*. Simplon Kulm, 6,500 feet: August 2nd, 1926, a few *bryoniae*.

14. *Euchloe simplonia*, Frr.—Montreux: May 28th, 1926, one *flavidior*, Wh., on the slope above the Clarens gas-works.

15. *E. cardamines*, L.—Grimmialp: common from June 30th to July 11th, 1926. Montreux: May 28th, 1926, three females. Martigny: June 11th, 1926, one male. Les Avants: June 12th and 21st, 1926, many males but no females seen. Bérisal: July 18th, 1926, one female; a male seen on July 26th.

17. *Leucophasia sinapis*, Linn.—Grimmialp: common at the beginning of July, 1925. Uetliberg: July 19th and 21st, 1925, common. Chillon: June 1st, 1926. Martigny, June 11th and 26th, 1926. Les Avants: June 12th and 21st, 1926, common, worn by the latter date. Eclépens: July 1st, 12th and 14th, 1926, common. Bérisal: common from July 18th, 1926, until well into August, often seen on the hot, open road below the Ganter Bridge, an apparently unlikely locality.

18. *Colias palaeno*, Linn.—Arolla: August 1st, 1925, several in the wood around the Kurhaus; not seen again until August 29th, when I took a fresh male. Simplon Kulm: one fresh female *herrichi* with yellow spots on the black border, on August 2nd, 1926, and two males on August 13th. Simplon Road, 6,000 feet: August 31st, one female *herrichi* without any yellow spots on the black border of forewing.

19. *C. phicomone*, Esp.—Grimmialp: common and fresh from June 30th to July 13th, 1925. Arolla: very abundant throughout the whole of August, 1925; noted on August 27th as mostly worn and in lessened numbers. Simplon Kulm: August 2nd and 13th, 1926, literally in thousands; I noted on several occasions females *in cop*. before their wings were dry. Bérisal: August 12th and 25th, a few; this species occurs at least as low down as the tenth kilometre on the Simplon Road (about 4,500 feet) but is not common at that elevation: about 6,000 feet seems to be the altitude at and above which it occurs really abundantly.

20. *C. hyale*, Linn.—Grimmialp. June 23rd to July 13th, 1925, common. Evolène: July 28th, 1925. Arolla: August 6th, 1925, one on the moraine just below the Arolla glacier; Tutt notes that his Arolla specimens were very small, but my single example is a particularly large one. Montreux: abundant throughout September and October, 1925; it seems to go on breeding very late, freshly-emerged examples occurring as late as October 21st; on October 22nd I took one aberration with black suffusion joining the discoidal spots of the

upperside of the forewings to the apical black patches; again on May 28th, 1926 (fresh females) and June 1st. Martigny: September 8th, 1925, some fresh, others very worn; June 11th and 26th, 1926. St. Maurice: September 10th, 1925, one very fresh and another tattered. Les Avants: June 12th, 1926. Bérisal: July 21st to September 1st, 1926, common.

21. *C. croceus*, Fourcroy.—Common around Montreux during the latter half of September and in October 1925, but far less common than *C. hyale*; in September, 1926, however, both species seemed to be equally common; a fresh female was taken on October 4th, 1925; one worn *helice* on October 22nd, 1925. Bérisal: one very large female on August 18th, 1926. Rothwald: one fresh female on August 13th, 1926.

22. *Gonepteryx rhamni*, Linn.—Uetliberg: July 19th and 21st, 1925, common and freshly emerged. Arolla: a solitary male on August 30th, 1925; this seems an unusually high elevation (6,800 feet) for this species. Martigny: June 11th, 1926, several males seen, mostly worn but one fairly fresh; June 26th, several battered males seen. Montreux: common around Montreux during September and October, 1925.

24. *Apatura iris*, Linn.—Uetliberg: July 21st, 1925, one male and one female. Eclépens: July 12th and 14th, 1926, five males attracted to excrement in the clay-pits.

25. *A. ilia*, Schiff.—Eclépens; July 12th and 14th, 1926, fourteen males, of which four are *clytie*, in the clay-pits and also amongst the trees on the hill-side at the west end of the marsh.

26. *Limenitis rivularis*, Scop. (*camilla*, Schiff.).—Uetliberg: July 21st, 1925, one.

27. *L. populi*, Linn.—Eclépens: July 1st, 1926, one rather worn, along the road going up the hill through the forest.

28. *L. sibilla*, Linn.—Eclépens: July 1st, 12th and 14th, 1926, common, but worn on the later dates. Chillon: July 5th, 1926, two, fresh.

30. *Vanessa io*, Linn.—Evolène: July 28th and 29th, 1925, several, fresh. Arolla: August 10th, 16th and 27th, fresh. Montreux, common in September, 1925 and 1926, and October, 1925. Simplon Road, 6,000 feet: August 31st, 1926, one. Bérisal: August 17th and 27th, 1926.

31. *V. urticae*, Linn.—Grimmialp: common at the end of June and beginning of July, 1925, fresh specimens emerging from June 30th. Arolla: August 21st, 1925, one only. This species was not seen at all around Montreux in September and October 1925. Les Avants: June 12th, 1926, several fresh specimens seen; June 21st, 1926, worn. Blonay: June 28th, 1926, fresh. Bérisal: common from August 18th, 1926; larvæ in numbers on nettle.

32. *V. polychloros*, Linn.—Blonay: September 3rd, 1925, one, rather worn. Eclépens: July 14th, 1926, one, fresh, taken near the railway station, and another seen, attracted to excrement in the clay-pits.

33. *V. antiopa*, Linn.—Blonay: September 5th, 1925, one, around a plum-tree with ripe fruit. Martigny: June 11th, 1926, two seen, very worn.

34. *Polygonia c-album*, Linn.—Uetliberg: July 19th, 1925, one, fresh; July 21st, one, worn. Common around Montreux from Sep-

tember 14th to October 11th, 1925. Martigny: June 11th, 1926. Les Avants: June 12th, 1926.

36. *Pyrameis atalanta*, Linn.—Grimmialp: June 30th, a worn female ovipositing on nettle. Arolla: August 18th, 1925, one, quite fresh, near a bed of nettles alongside the Post Office. Blonay: September 9th, 1925, one. Villeneuve: October 3rd, 1925, one; September 15th, 1926, one.

37. *P. cardui*, Linn.—Grimmialp: common on hill-tops from June 23rd to July 1st, 1925, but all were rather worn and doubtless immigrants, and after the latter date they seemed to disappear. Montreux: June 7th, 1926, two, worn. Martigny: June 26th, 1926, one seen, apparently in good condition. Caux: June 29th, 1926, rather worn. Bérisal: July 18th, 1926, abundant but worn, a migration flight in progress, the butterflies flying westwards over the meadow above the Hotel; this, however, is not necessarily the direction of the flight, as they were following the curve of the hillside; Commander Forbes noticed this flight on the same day at Simplon Kulm and told me that there the butterflies were flying South; by timing individuals crossing a line of hillside about sixty yards in length I estimated that from one hundred to one hundred and twenty individuals crossed this line in an hour, so that there must have been thousands on the move. Fresh specimens appeared at Bérisal on August 24th and September 1st. Common and fresh around Montreux on September 9th and 10th, 1926. In 1925 I did not see a single example around Montreux in September or October.

41. *Melitaea aurinia*, Rott., race *merope*, Pr.—Simplon Kulm: August 13th, 1926, a few high up the hillside at about 6700 feet.

42. *M. cinxia*, Linn.—Martigny: June 11th, 1926, one, fresh.

43. *M. phoebe*, Knoch.—Evolène: July 29th, 1925, one worn female. Bérisal: common from July 23rd, 1926, until the end of August. A pupa, found suspended on a rock, produced a female on September 5th.

44. *M. didyma*, Ochs.—Evolène: July 29th, 1925, common. Martigny: September 8th, 1925, one fresh male; June 26th, 1926, one male. Eclépens: June 22nd, 1926, one female. Bérisal: common throughout August, 1926.

45. *M. berisali*, Rühl.—Martigny: June 11th and 26th, 1926, common; September 8th, 1925, one fresh male of the second brood.

46. *M. athalia*, Rott.—Evolène: July 29th, 1925, two. St. Maurice: September 10th, 1925, two, fresh.

47. *M. aurelia*, Nick.—Evolène: July 28th and 29th, 1925, common. Les Avants: June 12th, 1926. Villeneuve: June 20th, 1926.

49. *M. parthenie*, Bkh.—Blonay: September 15th, 1925, two, worn; June 28th, 1926. Eclépens: June 22nd, July 1st and 12th, 1926, common. Bérisal: common from July 18th to end of August, 1926.

49 (part). *M. varia*, M.D.—Simplon Kulm: abundant and fairly fresh on August 2nd, less common and getting over on August 13th, 1926.

50. *M. dictynna*, Esp.—Grimmialp: quite fresh on June 30th, 1925, and occurred commonly until July 11th. Villeneuve: June 14th, 1926, just appearing; June 20th, common. Martigny: June

26th, 1926, common. Eclépens: July 12th, 1926. Simplon Dorf: July 27th, 1926. Bérissal: July 18th to August 19th, 1926, a few only.

53. *Argynnis euphrosyne*, Linn.—Grimmialp: common from June 23rd to July 13th, 1925, but all rather worn. Arolla: August 10th, 1925, one, rather worn; August 17th, one, very fresh. Villeneuve: June 2nd, 1926, worn. Martigny: June 11th, 1926. Les Avants: June 12th, 1926. Les Pleiades: June 24th, 1926. Bérissal: July 20th, 1926, in fair state. Simplon Dorf: July 27th, 1926. Simplon Kulm: August 2nd, 1926, worn, silvery spots accentuated. Simplon Road: August 26th, 1926.

54. *A. pales*, Schiff.—Arolla: abundant throughout August, 1925, and variable. Simplon Kulm: August 2nd and 13th, 1926, abundant. Bérissal: August 31st, 1926, a single specimen; surely a very low elevation, at just 5,000 feet. Simplon Road, 6,000 feet: August 31st, 1926.

56. *A. dia*, Linn.—Common around Montreux in September, 1925 and 1926, but worn by the beginning of the month. One very worn specimen was still on the wing on October 21st, 1925. St Maurice: September 10th, 1925.

57. *A. amathusia* Esp.—Grimmialp: common from June 30th to July 13th, 1925. Evolène: July 28th and 29th, 1925. Arolla: common throughout August, worn by the end of the month. Bérissal: common from July 18th to the end of August, 1926. Simplon Dorf: July 27th, 1926, common.

58. *A. daphne*, Schiff.—Martigny: June 26th, 1926, two, fresh.

59. *A. ino*, Rott.—Evolène: July 28th, 1926, common. Villeneuve: June 14th and 20th, 1926, common.

60. *A. lathonia*, Linn.—Arolla: August 18th, 1925, one, fresh; August 31st, one, worn. Montreux: common around Montreux in September and October, 1925; a fresh brood appeared at the beginning of September and another on October 21st. Blonay: June 28th, 1926, one fresh male; September 10th, 1926. Eclépens: July 12th, 1926, one fresh male. Bérissal: July 23rd, 1926, one worn female; August 5th, one fresh male, and others until September 4th. Simplon Road, 6,000 feet: August 31st, 1926.

61. *A. aglaia*, Linn.—Martigny: June 26th, 1926. Eclépens: July 1st, 1926. Fayaux: July 13th, 1926. Bérissal: July 18th to August 13th, 1926, fairly common. Simplon Dorf: July 27th, 1926. Simplon Road, 6,000 feet: August 31st, 1926.

62. *A. niobe*, Linn.—Grimmialp: July 8th to 13th, 1925, common. Uetliberg: July 21st, 1925. Evolène: July 28th and 29th, 1925. Arolla: common throughout August, 1925, a fresh male as late as August 31st. Fayaux: July 13th, 1926, one *eris*. Bérissal: common throughout August, 1926. Simplon Kulm, 6,700 feet: August 13th, 1926, common. Simplon Road, 6,000 feet: August 26th, 1926, common all along the road from Bérissal; at 6,000 feet *eris* was much commoner than *niobe* but many intermediate forms occurred; August 31st, very common, but nearly all worn, mostly *eris*; September 3rd, abundant above 6,000 feet, mostly worn, a few in fair state, three or four *eris* to one *niobe*. It was so abundant along this road that it would be only a slight exaggeration to say that there was a *niobe* to every thistle-flower along the roadside!

63. *A. cydippe* (*adippe*), Linn.—Uetliberg: July 21st, 1925, common. Blonay: September 23rd, 1925, one worn male; October 11th, 1925, one female; June 28th, 1926, one male. Eclépens: July 12th, 1926. Villeneuve: September 15th, 1926, two, worn, including one *cleodora*.

64. *A. paphia*, Linn.—Blonay: September 5th and 9th, 1925, a few worn; September 10th, 1926, a worn male and female in the same place as in the previous year. Eclépens: July 1st and 14th, 1926. Simplon Road above Bérisal, about 5 500 feet, one worn *valesina* on September 3rd, 1926; this is an unusual height for this species, as Vorbrodtt gives 1,200 metres as its extreme height at Airolo.

67. *Melanargia galathea*, Linn.—Evolène: July 28th and 29th, 1925, common. Eclépens: June 22nd, July 1st and 14th, 1926, common. Blonay: June 28th, 1926, abundant, freshly emerged. Chillan: July 5th, 1926. Fayaux: July 13th, 1926. Bérisal: abundant along the road below the Ganter Bridge from July 21st to September 4th, 1926, by which date it was, of course, very worn.

68. *Erbia epiphron*, Knoch, form *cassiope*, Fb.—Arolla: August 12th, 1925, one.

69. *E. melampus*, Fuessly.—Grimmialp: July 1st to 16th, 1925, common. Evolène: July 29th, 1925. Arolla: common throughout August, 1925, often found in the evening sitting on grass-stems in little colonies. Bérisal: July 19th to end of August, 1926, common. Simplon Dorf: July 27th, 1926. Simplon Kulm: August 2nd, 1926. Simplon Road, 6000 feet: August 9th and 26th, 1926.

73. *E. unestra*, Ratz.—Arolla: August 6th to 28th, 1925, fairly common, but usually only found singly. Bérisal: July 24th and August 23rd, 1926, single specimens only, and another on September 3rd at about 5500 feet on the Simplon Road. Simplon Dorf: July 27th, 1926. Simplon Kulm, 6700 feet: August 13th, 1926.

74. *E. pharte*, Hb.—Grimmialp: July 8th, 1925, one only.

75. *E. manto*, Esp.—Grimmialp: July 15th and 16th, 1925; perhaps overlooked before, but it seemed to be just appearing at the very end of our stay.

76. *E. ceto*, Hb.—Simplon Dorf: July 27th, 1926, a few in a very restricted locality on the hill above the village. Bérisal: found only in the Ganter-tal, where it occurred abundantly on July 24th, 1926 in good or fair condition, and I took one female with the spots yellow. According to Wheeler, this species has a very brief flight, restricted to the first three weeks of July, but in 1926, worn females were on the wing up to August 25th.

77. *E. medusa*, Fb.—Les Avants: June 21st, 1926, one only. Les Pleiades, June 24th and July 2nd, 1926, abundant, but getting over on the latter date. Above Caux, 4000 feet: June 29th, 1926, abundant and in good condition.

78. *E. oeme*, Hb.—Grimmialp: June 23rd to July 16th, 1925, common.

79. *E. stygne*, Ochs.—Martigny: June 11th and 26th, 1926.

80. *E. erias*, God.—Martigny: June 11th, 1926, fresh.

82. *E. glacialis*, Esp.—Arolla: August 6th, 1925, on the moraine below the Arolla glacier; rather worn.

84. *E. goante*, Esp.—Arolla: common throughout August, 1925. Also common, but worn, along the road from Arolla to Les Haudères

on September 1st, 1925. Bérissal : common on the rocky sides of the road below the Ganter Bridge from July 24th to September 4th, 1926. Simplon Road, 6000 feet : common from August 9th to September 3rd, 1926 ; one specimen has small blind spots on the forewing.

86. *E. aethiops*, Esp.—Grimmialp : July 4th, one, fresh, and another on July 16th, 1925. Evolène : July 28th and 29th, 1925, fresh. Blonay : one (worn), on September 5th, and another (very worn) on September 29th, 1925 ; one worn female on September 10th, 1926. Bérissal : a few just below the Ganter Bridge, between August 6th and 18th, 1926, but not common. Simplon Road, 6000 feet : August 26th and September 3rd, 1926, worn.

87. *E. eurycala*, Esp.—Grimmialp : June 30th to July 14th, 1925, common ; some are large and scarcely separable from *E. liyea*. Evolène : July 28th and 29th, 1925. Arolla : August 5th to 13th, 1925, a few. Blonay : September 5th, 1925, two, worn. Bérissal : abundant along the roads from July 17th to September 4th, 1926. Simplon Dorf : July 27th, 1926, abundant. Simplon Road, 6000 feet : abundant throughout August, its numbers diminishing towards the end of the month ; at the beginning of August it was in almost incredible numbers, a dozen or more drinking at every damp patch by the roadside, whilst I saw quite fifty settled on one small rock in the afternoon sunshine ; it occurs as high up the road as 6400 feet ; one specimen, taken on August 9th, has white blotches on the right forewing and hindwing and on the left forewing.

88. *E. liyea*, Linn.—Grimmialp : July 1st to 14th, 1925, common. Uetliberg : July 19th and 21st, 1925, common and unusually large. Chillon : July 5th, 1926, two, just emerging. Fayaux : July 13th, 1926, common.

89. *E. lappona*, Esp.—Simplon Kulm : August 2nd, 1926, common at over 6700 feet up the hillside above the Hotel. Apparently over by August 13th.

90. *E. tyndarus*, Esp.—Evolène : July 28th, 1925, one, worn. Arolla : abundant throughout August, 1925. Bérissal : abundant from July 18th to September 7th, 1926. Simplon Dorf : July 27th, 1926. Simplon Kulm : August 2nd and 13th, 1926, abundant and found up to 6700 feet. Simplon Road, 6000 feet : abundant throughout August and up to September 3rd.

91. *Oeneis aello*, Hb.—Bérissal : July 26th, 1926, one worn female on the eleventh kilometre, below the Ganter Bridge.

93. *Satyrus alcyone*, Schiff.—Martigny : September 8th, 1925, one ; September 14th, 1926, a few worn females, one taken on a rotting fallen pear. Bérissal : common on the tenth and eleventh kilometres of the Simplon Road from July 23rd until the end of August but mostly more or less worn after July. These specimens all belong apparently to the form *genava*, Fruhst.

96. *S. semele*, Linn.—Martigny : September 8th, 1925, a few worn examples ; September 14th, 1926, mostly worn but one female in good state. Eclépens : July 14th, 1926, one male : apparently just appearing. Bérissal : common from July 23rd to the end of August, 1926, along the Simplon Road from the tenth kilometre to just above Rothwald ; the first female was taken on August 9th ; one male ab. *caeca*, Tutt, on August 23rd.

98. *S. statilinus*, Hufn.—Martigny : September 8th, 1925, one

male; September 14th, 1926, common at the foot of the Batiar Tower but mostly very worn, a few still in good state. These examples apparently belong to the form *onosandrus*, Frubst.

99. *S. cordula*, Fb.—Bérisal: common on the tenth and eleventh kilometres of the Simplon Road from July 23rd to the end of August, 1926, but mostly worn after the end of July.

101. *Pararge aegeria*, Linn.—Uetliberg: July 19th, 1925, one, worn. Blonay: September 9th, 1925, three, fairly fresh. Villeneuve: October 3rd, 1925, one, very worn. Montreux: October 18th, 1925, one large, fresh specimen taken in the Rue du Lac, Clarens. Martigny: June 11th, 1926, one. Les Avants: June 21st, 1926, one large female with pale-yellow spots. Eclépens: July 1st, 1926, one.

102. *P. megera*, Linn.—Martigny: September 8th, 1925, common; June 11th, 1926, one fresh female; September 14th, 1926, abundant, nearly all very worn but one fresh male. St. Maurice: September 10th, 1925. Blonay: September 14th, 1925; September 23rd, 1925, one fresh female. Villeneuve: October 3rd, 1925.

103. *P. hiera*, Fb.—Les Avants: June 12th and 21st, 1926. According to the text-books, this is a common species, but this was the only locality in which I came across it.

104. *P. maera*, Linn.—Grimmialp: common from June 23rd to July 15th, 1925. Evolène: July 29th, 1925. Arolla: August 9th and 14th, 1925, not common; the second specimen was taken at about 7,500 feet. Martigny: September 8th, 1925, one worn female; June 11th and 26th, 1926, common. Common around Montreux in September and October, 1925. Fayaux: July 13th, 1926, common. Bérisal: common from July 20th to the beginning of September from below the Ganter Bridge to over 6,000 feet on the Simplon Road.

105. *P. achine*, Scop.—Uetliberg: July 19th, 1925, one, worn. Chillon: July 3rd and 5th, 1926. Eclépens: July 12th and 14th, 1926, worn. Blonay: July 13th, 1926, a few along edges of woods, in good condition.

106. *Aphantopus hyperantus*, Linn.—Grimmialp: July 13th, 1925, one, very small. Uetliberg: July 19th and 21st, common. Martigny: June 11th, 1926, abundant. Villeneuve: June 14th and 20th, 1926. Caux: June 29th, 1926. Eclépens: July 12th, 1926.

107. *Epinephela jurtina*, Linn.—Grimmialp: July 1st to 13th, 1925, common. Evolène: July 29th, 1926. Common around Montreux during September and the first week of October, 1925; the first male appeared on June 7th, 1926. Villeneuve: June 20th, 1926. Eclépens: June 22nd, July 1st and 12th, 1926. Martigny: June 26th, 1926, one female. Bérisal: July 23rd to August 10th, 1926, not common but a few scattered individuals along the road below Ganter Bridge, and on August 29th a very battered female was basking with outspread wings on the leaves of an ash-tree by the Hotel.

108. *E. lycæon*, Rott.—Evolène: July 28th and 29th, 1926, common, Bérisal: males common from July 21st, females from August 5th, until the first week in September, along the road below the Ganter Bridge.

113. *Coenonympha iphis*, Schiff.—Blonay: June 28th, 1926. Caux: June 29th, 1926, common. Fayaux: July 13th, 1926.

114. *C. arcania*, Linn.—Uetliberg: July 21st, 1926, two. Chillon: July 3rd and 5th, 1926. Eclépens: July 12th and 14th,

1926, common and attracted to the flowers of *Sambucus ebulus*; these Eclépens specimens apparently belong to the form *saleriana*, Fruhst.

115. *C. satyrion*, Esp.—Grimmialp: June 24th to July 12th, 1925, common. Arolla: common throughout August, 1925. Les Pleiades: July 2nd, 1926, race *obscura*, Rühl, common. Bérisal: common from July 23rd to the end of August, 1926, and occurring up the Simplon Road as far as the Kaltwasser Gallery (about 6,400 feet). Simplon Dorf: July 27th, 1926, common.

116. *C. pamphilus*, Linn.—Grimmialp: June 23rd to 29th, 1925, common. Evolène: July 29th, 1925. Les Pleiades: September 6th, 1925; July 2nd, 1926. Common around Montreux in September, 1925, and again on June 1st, 1926. Martigny: September 8th, 1925. Les Avants: June 12th, 1926. Eclépens: July 14th, 1926. Bérisal: August 22nd and 24th, 1926, a few on the tenth kilometre, below the Gaunter Bridge; according to Vorbrodt, there is only one brood in the Alps, but these specimens were quite fresh and evidently belong to a second brood.

119. *Nemeobius lucina*, Linn.—Martigny: June 11th, 1926. Les Avants: June 21st, 1926. Les Pleiades: June 24th, 1926. All rather worn.

121. *Thecla w-album*, Knoch.—Eclépens: July 12th and 14th, 1926, common on flowers of *Sambucus ebulus*.

122. *T. ilicis*, Esp.—Eclépens: July 12th and 14th, 1926, in some numbers with *T. w-album*.

(To be concluded.)

Notes from the Cape Verde Islands.

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

The Cape Verde Islands are little visited by entomologists, though Darwin's account in the "Voyage of the Beagle" is a classic. There is, as a matter of fact, little to attract the naturalist, for they are of astonishing sterility. But they are familiar enough to travellers, as British boats on the lines to South Africa and South America pass through them and often call at São Vicente, but seldom stop for more than an hour. Many years ago, in 1891, I passed through for the first time, but was unable to go ashore, and had to be content with the splendid sight of two sperm whales swimming up the channel between two islands. In 1913 I passed again and was particularly anxious to get ashore, as my curiosity had been aroused by their original appearance; I had also noted that de Saussure had questioned the identity of a species of *Sphingonotus* recorded from the islands and fresh material was needed. I was told that the boat might stop for an hour only and that it was not possible to go ashore. Then I conspired with the ship's doctor, a most excellent man, capable of appreciating the interest of a scientific problem: he introduced me to the chief engineer and over the walnuts and the wine I told the story of the misunderstood grasshopper. My eloquence was rewarded, for the worthy Scot became quite interested and the consequence was that he required two hours or more the next morning for sundry minor repairs and I got a full hour ashore.

It was not much, however, for a collecting expedition, nor had I net or killing-bottle available, nor even a drop of spirit; nothing but a

small tube and my fingers; moreover, the *Oedipodidae* are nimble creatures and difficult to catch at any time when stimulated to activity by a hot sun. But I enlisted the services of half a dozen little nigger boys and returned on board in triumph, with my tube crammed with kicking and lively grasshoppers. I never had occasion to work them out properly, but I remember that among them was a *Sphingonotus* with no black fascia to the wing, which I took to be *S. caeruleans*, the commonest European species, one of the common red-winged *Acrotylus* and also the pretty yellow-winged species, *A. longipes*, Charp., the latter an African insect which extends its range to the extreme south of Europe.

On neither of the return journeys did we stop, and so, when early in April I called on a Portuguese vessel, I was very glad that we had more business to do, discharging cargo and taking coal, than do the British boats. We arrived in the evening of April 6th and I hurried ashore with my companion, Pavel Stepanovitch Nazarov, the well-known Russian traveller and naturalist. It was a race with darkness and the darkness won; it was impossible to do anything and we returned on board crestfallen in inky blackness. We were due to sail during the night, but owing to some contretemps fortunate for us, we were still in port the next morning and Pavel Stepanovitch and I were able to spend several hours ashore collecting Orthoptera.

This was at the island of São Vicente, which owes its importance to its geographical situation, for it is a submarine cable station and also a very important coaling station and the harbour, which is the drowned-out crater of the old volcano, is always full of shipping. The island consists of very rugged lavas with a sharp and jagged outline against the sky and is absolutely sterile. In the little town there are a few wind-stricken palms and other trees planted in soil imported at great cost. To the south and east of the town there is a flat expanse of the detritus of the rocks and beyond that a range of dunes; this part is exposed to the prevailing wind from the north east which was blowing that day with uncomfortable vigour. The sands are loose and shifting but the Portuguese have planted tamarisks and other shrubs to hold them, with considerable success. We wandered among the tamarisks and moved a fair number of *Oedipodidae*, their coloured wings flashing prettily in the sun when they flitted from spot to spot, but they harmonise so closely with the sand and volcanic ashes that they are difficult to see when settled. The wind was so strong that it was far from easy to catch them with a heavy sweep-net and I was glad to enlist the spontaneous services of an inquisitive and jolly little nigger boy aged about ten, who crawled on his tummy and stalked them with considerable success. We never saw a glimpse of a red wing; the commonest was the *Acrotylus longipes*, Charp. This is a pretty little creature distributed widely in Africa and occurring in a few localities in the extreme south of Europe; I had made its acquaintance in the Transcaucasus and in Macedonia. There were two species of *Sphingonotus*, with pale blue wings, one with no black mark on the wings, like the common south-European *S. caeruleans*, L., but, in fact an apparently local form of *S. rubescens*, Wlk., from the deserts of N. Africa, and one with a well-defined black fascia, which must be *S. canariensis* of Saussure, the species which I wanted but failed to get in 1913. But these species are extremely interesting, as they are very imperfectly known.

There was little other sign of insect-life save a few flies and considerable numbers of a small buff Micro-Lepidopteron; it was hopeless to try to catch and preserve specimens of so delicate a creature, armed as I was only with a heavy sweep-net, in that gale, and I gave up the attempt.

At one spot in the midst of the tamarisk grove we came upon a round, flat open space, like an eastern threshing-floor; that it could not be, as there is nothing there to thresh. Pavel Stepanovitch remarked that in the Kirghiz deserts he had seen similar phenomena where there is much salt in the soil, as he thoughtlessly jabbed holes in the level surface with his stick. At that moment I caught sight of a small round hole lined with tin, and it dawned upon me that we were trespassing upon golf links! There is a colony of British at the submarine cable station and as an inevitable consequence, the links. I trust they will pardon the inquisitive but perfectly innocent damage which we did to their dark brown "green."

The forbidding reddish-brown mountains all round have a depressing effect, as they appear to be lifeless and probably are. A more cheerful effect is produced by the relief of a garden where the Portugese authorities, at great expense, have laid out a nursery, and also a hard tennis-court, evidently attributable to the staff of the cable. Here there were numbers of a small bird like a sparrow, while Egyptian vultures soared overhead, sharing with a sooty-necked crow the duties of public scavenger. We sat and rested under the precarious shade of a big tamarind and watched our little black-faced colleague chew great quantities of the bitter fruit, to the great benefit, no doubt, of his internal arrangements.

Pavel Stepanovitch made the interesting observation that similar effects can be brought about from totally different materials when conditions are similar. His first exclamation was that he felt himself back in Turkestan; there were the same naked, uninviting mountains, the dusty sand dunes, wind-battered tamarisks, the hazy sky. The only obvious difference is that there the people are Mahommedans, Sarts and Kirghiz, while here they are mulattoes and negroes. But the deserts of Turkestan are perhaps the most remote spots on earth from any sea, and the sand is derived from palaeozoic rocks, while here we have an oceanic island with sand formed from the lavas of young, though extinct, volcanoes; the tamarisks are of a different species, African instead of Asiatic, but the general resemblance is extraordinarily close.

There are two advantages in being on board a Portugese vessel. In the first place, having local business, they stay longer and make an excursion ashore easier; in the second place they call at other islands where British vessels seldom or never put in. Two hours run from São Vincente brought us to São Thiago. We arrived early in the morning and anchored in a good-sized bay with cliffs of lava enclosing it; it was interesting to see one flow of lava resting on a horizontal surface of pale yellow sand, so there must have been at least two distinct periods of volcanic activity with a considerable interval between them. São Thiago is less lofty than São Vincente and enjoys greater moisture; there is more vegetation; tufts of rank grass can be seen on the cliffs, whereas those of the other island are absolutely barren. The town of Praia, the administrative and ecclesiastical centre of the archipelago, is

situated on a substantial elevation in the middle of the bay, with an extensive palm grove at the foot. The town is pleasantly laid out, well kept, with well-groomed gardens, where the presence of really green turf is evidence of the greater rainfall. Moreover, at São Martini, about half an hour's drive into the interior, there are coffee plantations producing the best berry of any of Portugal's numerous colonies. Unfortunately we were not able to hire a horse and trap, as it was market day and everyone was busy, and so were compelled to abandon our idea of visiting the plantations and to confine our ambitions to a walk outside the town.

After passing another palm-grove and a negro village of stone huts roofed with palm leaves we came upon an open arid plain with a few scattered mimosa trees; the ground consisted only of stones and dust, but there was little animal life there apart from the few goats resting in the shade of the trees. *Acrotylus longipes*, Charp., is the common grasshopper of the island, as it is at São Vincente, and we moved great numbers of them, their bright yellow wings flashing prettily in the sunshine. They are active and it was extremely difficult in that stiff breeze to catch any with the sweep-net. We followed up the dry bed of a desiccated watercourse, where an occasional blue flash revealed the presence of some *Sphingonotus*. I was able to catch one only; it was *S. rubescens*, Wlk., subsp.

So far we had seen no difference in the fauna between the two islands, but soon we flushed a bird that was obviously our first really Ethiopian representative. It was *Halcyon leucocephala* r. *actem*, and a very beautiful creature too; its brilliant deep blue wings and tail glitter brightly in the sunshine, contrasting with the pale grey or dirty white head and shoulders. As it perched on the top of a mimosa it showed the red-brown belly, and its profile was exactly that of a kingfisher. The beak is long, straight and sharp; it was orange-yellow in the first specimen we saw, but in another, which we took for the cockbird, it was bright red and disproportionately long, giving it a clumsy appearance. There was nothing European about him as, indeed, it occurs only on São Thiago and on the Brava of the Cape Verde Islands. I turned over many stones in the hopes of finding some earwigs, but found nothing but quantities of a small black and a small brown beetle.

Presently a tiny flash of pink caught my eye and I picked up a pair of *Pyrgomorpha* sp., a representative of an African genus that extends its range into the southern extremities of Europe. I also found a nymph, so the season here begins several months earlier than in the Mediterranean countries. Then I saw another kind of grasshopper, very numerous, but so active that I despaired of taking one. I caught a glimpse of pink, and thought it must be a *Caloptenus*; it was too slender for the common European species, but might be a local form, corresponding to the *C. vulcanius* of the Canary Islands; then I saw that the red was on the posterior femora, so I thought it must be an *Epacromia*. At length patience was rewarded and I took one, to find to my surprise that it was a male, too big for either of the genera mentioned. It was a *Catantops*, *C. axillaris*, Thnbg., a typically African species already known from the Cape Verde Islands, but not existing in the Canaries. Altogether I took two males and a female. I saw also another large grasshopper, as big as *Anacridium aegyptium*, but they sat on the highest twigs of the mimosas and the mass of tough,

woody branches and sharp strong thorns made it impossible to catch them; when disturbed they flew off actively to a distant tree. Although the *Catantops* occurred frequently enough on the stony hillsides generally, they seemed to prefer the neighbourhood of the nimosas, on which they frequently settled and probably found their nourishment.

It is quite likely that search would reveal other species and in all probability they would have African affinities; very likely representatives of other groups are to be found in the vegetation of the plantation area, though these would be more likely to be imported species. I do not know the age of the islands but they are certainly quite young, geologically speaking; as volcanoes they are dead, though the island of Fogo is not quite extinct and has been in eruption during the past hundred years, as in 1891 a ship's captain told me that many years previously he had seen it showing signs of activity. They must be younger than the Canaries, although Teneriffe is still a quite active volcano, for the latter have developed a very rich and highly characteristic fauna and flora. It is doubtful whether there are any endemic species peculiar to the Cape Verdes, which must have been colonised from the African coast and by insects and other smaller creatures imported in plants. The islands are essentially part of Africa; the brown, naked rocks are quite un-European in appearance and the presence of lofty palms and the mulattoes and often very good-looking creoles of São Vincente and the negroes of São Thiago speak for themselves.

The birds, too, are mostly African; apart from a swift and the kites hawking over the waters of the bay, the other birds we saw are not European; the gorgeous kingfisher is certainly Ethiopian and so must be the very variegated sparrow, quite different from any of our European species of *Passer*; the crows, too, seem different, with sooty hoods like jackdaws, and a raven we saw was smaller than ours, with weaker beak, and a greyish spot on the side of the neck.

It was tantalising not to be able to explore further, nor to visit the interesting island of Brava, but we must be thankful for mercies received and treasure the modest collection that we were able to make.

Nomenclature. Errors II.

NOTE:—My colleague, W. H. T. Tams, points out that I am spelling the name of the author of the *Sys. Nat.* wrongly. That is so, *vide* title page of the *Sys.*

adippe.—**cydippe**. See Report of the British National Committee on Entomological Nomenclature, *Trans. Ent. Soc. Lond.* (1915) and *Ent. Record*, XXVIII., p. 148 (1916). Many entomologists seem still ignorant of this authoritative decision. Frohawk's book uses *adippe*!

latona: *latouia*: *lathona*.—Linnaeus described this species under the name **lathonia**, *Sys. Nat.*, ed. X. p. 481 (1758).

artemis: *aurinea*.—**aurinia**. Rottenburg, *Naturforscher*, VI., 5 (1775) in considering Hufnagel's *Tabellen* (1765) appeals to the work of Geoffroy, *Histoire abrégée*, II., 45 (1764). Both authors mix a number of species under the name *ciuvia*, but the latter perceives that there are

several forms, and separates out four of them without naming them, but clearly describing them. To these descriptions Rottemburg adds names one of them being *aurinia*, with an *i*, and not as some authors do *aurinea*, vide Frohawk, etc. Hübner's name *artemis* is of much later date, about 1808.

plexippus: *erippus*.—**archippus**. This was discussed at great length in *Ent. Rec.*, V., 1-5, 1894. Linnaeus definitely says "with a white fascia as in the next species (*chrysippus*) which it resembles." Habitat N. America. Later Linn. adds China to this. The presumption is that "N. America" was erroneous, a most likely one. Fabricius redescribes it as *archippus* in 1793, *Ent. Sys.* III. 49. Cramer in *Pap. Fa.* I. 4, described and figured a form from S. America as *erippus*. These two latter were subsequently found to be forms of the same species. In Linnaeus' collection the American species is named *archippus* and the Asian species *plexippus*. The pedant would go farther and insist on *erippus* (1779) and not *archippus* (1793)

galatea.—Linnaeus wrote **galathea** *Sys. Nat.* ed. X. 474 (1758). Another "r."

egeria.—Linnaeus wrote **aegeria** *Sys. Nat.* ed. X. 473 (1758). Another "r."

janira.—**jurtina**. Linnaeus described the female first under the name *jurtina* and subsequently the male with the name *janira*, *Sys. Nat.* ed. X., nos. 104 and 106 respectively (1758). The idiosyncrasies of our early entomologists on the question of the consideration of the female biased their actions and they chose *janira* ♂ as the name. We have corrected this peculiarity and use the prior name *jurtina*.—Hy. J. T.

CURRENT NOTES AND SHORT NOTICES.

We are pleased to see that Mr. Donisthorpe's name has been added to the staff of the new myrmecological magazine which was reviewed in the last number: *Folia Myrmecologica et Termitologia*.

The South Eastern Union of Scientific Societies has just concluded a most successful Congress at Hastings. Only one paper dealt definitely with Entomology, *viz.*, that of Mr. W. H. Thorpe, B.A. of the Zoological Laboratory, Cambridge, whose theme was "The Fauna of the Brackish Pools of the Essex Coast." This was really an account of his study of the life of aquatic insects in relation to the differences of the medium in which they lived. Pools had been chosen whose salinity varied with the season, the weather, the amount of fresh-water or of sea-water which at regular periods reached them, etc. Records had been made of the salinity at all times, and lists of the species living in the various pools, their abundance, their comparative size and vigour, etc., were given. The work was as yet incomplete and in conclusion he could only point out, that there was great scope for the ecological work of careful observations on the most commonplace animal communities. What was desired was to study the interactions of the animals living together in communities and the influences upon them and the surroundings in which they lived.

In our July number we shall publish Dr. Verity's "Explanation and Justification" with Mr. Bethune-Baker's remarks thereon.

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Mr. M. R. SMITH, A. and M. College, is anxious to know where he can obtain any of Emery's papers on North American ants; and also to know of any Europeans who would like to exchange separates and correspondence with him concerning ants.

Signor ALFREDO FAZ, Calle Bandera 714, Santiago Chili, is willing to exchange first class Chilean Coleoptera, especially *Carabus*, sps., for striking Coleoptera from all parts of the World.

Wanted.—To correspond with some Entomologist resident in Scotland, Ireland, or the Isle of Man who is interested in Noctuae and vars. with a view to exchange of species and forms.—*A. J. Wightman, "Aurago," West Chilington Common, Pullborough, Sussex.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 6th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. June 23rd. July 14th.—*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.*, J. P. HARDIMAN, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

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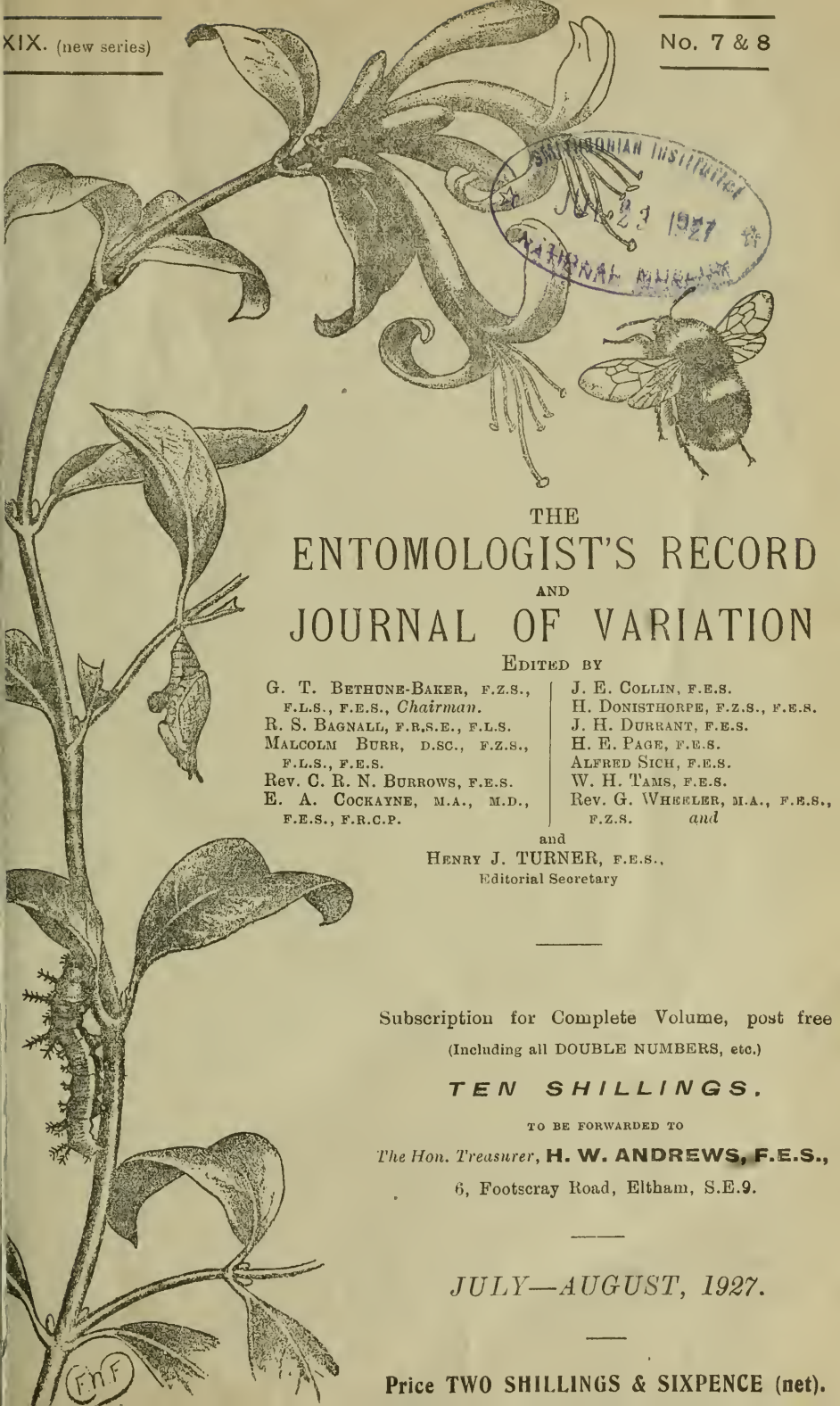
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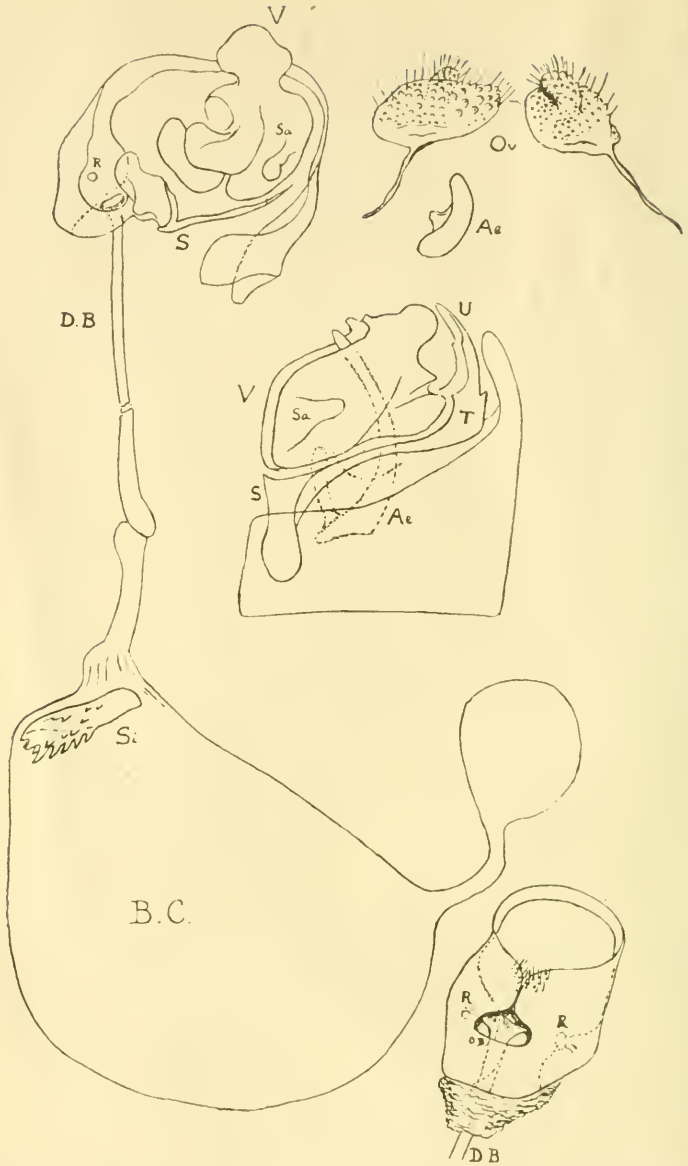
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The Entomologist's Record.

del. E. A. Cockayne.

GYNANDROMORPH OF COLIAS LESBIA.

Aberration in *Colias lesbia*.

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

For some years past correspondents in South America have occasionally sent me specimens of *Colias lesbia*. Latterly Capt. Kenneth J. Hayward has sent on some very noticeable colour aberrations and among them a most remarkable gynandromorphous example in which the superficial characters of ♂ and ♀ are jumbled together in a most irregular and curious manner. At first the impression was that the three chief forms, the orange-yellow female and the greenish-white female, a most unlikely combination I am told, were represented. Specimens typical of the three forms were submitted to Dr. Cockayne with the gynandromorph, and he now reports as follows.

"Gynandromorphous specimens combining the colour and pattern of the yellow or orange male and white female have been described in several species of *Colias* and those recorded before 1915 are mentioned in my paper on Gynandromorphism and Kindred Problems. The inheritance of the white colour in this genus has been investigated very thoroughly by Gerould, who has shown that though white is dominant to yellow the male even when homozygous for white still develops the yellow pigment. From the results of his earlier experiments Gerould believed that the homozygous whites were non-viable, but his later experiments have convinced him that this is not so.

"In the egg the gynandromorphous *lesbia* was probably a heterozygous male, but at one or more cell divisions in a later stage of development one of the Z chromosomes was lost and its absence from part of the insect allowed female characters and white pigment to appear. The great irregularity in the distribution of the male and female parts suggests that several abnormal cell divisions took place. Using the symbol Z for the sex chromosome, A for the autosomal chromosome carrying the factor for white, and O for the other autosomal chromosomes, the male part of the gynandromorph can be represented as ZZAO and the female as ZAO.

"I know of no example of *Colias*, which combines male parts with both white and yellow female parts as Mr. Turner at first believed to be the case in this insect, but such a combination is theoretically possible. If at some of the abnormal cell divisions a Z chromosome and at others both a Z chromosome and the autosomal chromosome carrying the factor for white were lost, the parts derived from them would be ZZAO, male, ZAO, white female, and ZO, yellow female. It is believed that loss of an autosomal chromosome is incompatible with life, but if it only happened in a cell, from which a portion of the wing was destined to develop, it could not be fatal, though it might prevent the development of the wing from taking place."

Cockayne, E. A. Journ. Genetics. 1915, V. 93-4.

Gerould, J. H. The inheritance of white wing color, a sex-limited (sex-controlled) variation in yellow Pierid butterflies. Genetics. 1923, VIII. 495-551.

Röber in Seitz (American Rhopalocera) describes the Argentine and Brazilian form as dark orange-yellow in the male, specimens shot JULY-AUGUST.

with violet reflections being not rare. The narrowness of the black-brown margin readily distinguishes the males from those of other species. In the females the ground-colour is said to be very variable on the upper surface, from orange-yellow like the male, through yellow, yellowish or white with grey dusting, greenish grey, even practically white. The last is called ab. *heliceoides*.

A series of some eighty specimens lies before me. In some of the males the orange-yellow is very beautifully shot with violet, approaching in intensity that shown by species of the genus *Meganostoma*, particularly when exposed to bright sunlight. The ground of some males has lost the orange shade and is of various shades of yellow, but still retaining more or less of the purple reflection. One extra large male is of a beautiful delicate pink-tinged yellow, a colour which shows up well with the deep black outer margins from which deep black veins run a certain distance into the disc of the wing. The delicate fringes of the same shade as the ground add to the beauty of the specimen. There are several dwarf males, measuring hardly half the expanse of an average-sized example.

The ground colour of the orange females varies in the same way, but there seems only one specimen that one can say is an intermediate between the "orange" and "white" forms, and on that there hangs a doubt, for it looks much weather-worn and there are traces of the orange in irregular clouds, and all is more rather than less "fuzzy." One of the orange females is very dusky, again a weather-worn look about it.

Several of the white females have the lower wings almost marking-less, and they vary much in the amount of yellow spotting in the marginal band of the forewings, as well as in the shade of green in the ground.

DESCRIPTION OF THE GYNANDROMORPH.

UPPERSIDE.—L. forewing greenish-white ♀ predominant. Below costa in upper part of cell and produced of irregular width half-way from thence to costa, a wide streak of ♂ colour, and several short wide striae of the same orange colour inside the black marginal area and very slightly along inner margin.

L. hindwing, wholly greenish-white ♀.

R. forewing, greenish-white ♀ predominant. The streaks of ♂ colour are in the same positions on the wing as on the L. forewing, but all much more extended distally, orange patches also occur in the wide dark outer margin but do not seem to be of the series of pale spots natural to the band. A wide streak of orange runs along the inner margin enclosing a small streak of greenish-white about the middle.

R. hindwing is predominantly ♂ with only three radiations of ♀ greenish-white from the base, that along the lower margin of the cell and that inside the body-hollow of the inner margin reaching nearly to the outer margin, the middle streak going only to the disc.

UNDERSIDE.—L. fore- and hindwing wholly ♀. R. side wholly ♂.

The result of Dr. Cockayne's morphological examination follows this.

Colias lesbia. Description of Genitalia of a Gynandromorph.
(Plate III.)

By E. A. COCKAYNE, D.M., F.R.C.P.

Normally the tenth somite in the male consists of the uncus and possibly part of the tegumen and in the female of the ovipositor and rods. This somite in the gynandromorph is entirely female; the two halves of the ovipositor and their rods (Ov) are both present, but are asymmetrical and abnormal in shape. In the diagram they are drawn separately and with a magnification about double that of the other parts. The ninth somite in the gynandromorph is partly male and partly female. In the normal male it consists of a ring of chitin formed by the narrow saccus or vinculum ventrally and the broad tegumen or part of the tegumen dorsally. In *Colias* these are firmly welded together and, where the two halves of the saccus meet on the ventral surface, there is a large projection directed forwards, a lateral view of which is shown in the diagram. In the gynandromorph the sole representative of these structures is the ventral part of the saccus (S), which is very narrow and rather more developed on the left side. The projection forwards is much reduced in size and bent to the right. All the rest of the somite is female. In the normal female the dorsal part is a fairly narrow simple band of chitin, which becomes much wider and more complicated in structure ventrally. Anteriorly the chitinous belt is complete, but posteriorly there are two flaps which almost meet in the mid-ventral line and then curve sharply first outwards and then inwards where fusion takes place. A nearly complete circular opening, the ostium bursae, is formed in this way, and the funnel shaped beginning of the ductus bursae is attached by delicate membrane to its edges. On each side the chitin of the anterior part of the ring curves back and forms a lateral flap with its convexity pointing in a dorsal direction, and from the inner aspect of each flap and at right angles to its surface arises a short thin rod (R) ending in a knob. In the insect when at rest most of this somite lies hidden inside the eighth. In the gynandromorph the dorsal part of the ninth somite is of the usual width on the right but becomes narrower on the left, and sweeps around to the ventral surface, where the thickened chitin ends near the mid-line and is attached by a delicate membrane to the saccus. Though this side is quite abnormal in structure the lateral flap is recognisable but its rod is missing. The somite is more normal on the right side but is much narrower ventrally than it ought to be. The ostium bursae is incomplete posteriorly and its inner side is formed by a piece of chitin arising from the tip and right side of the imperfect saccus. The lateral flap with its rod (R), seen end on and indicated in the diagram by a small ring, is very nearly normal. To turn to the internal parts of this somite, there are two valves (V) both lying on the left side. The right valve is very small and simple in structure, the left one is much bigger though only about half the normal size. It has a posterior portion partially constricted off representing the posterior part of a normal valve and an anterior portion representing the anterior part of a normal valve with a slender process of very thick chitin attached to its inner surface, probably a rudimentary sacculus (Sa). This ought to have been drawn in dotted lines in the diagram, because it lies behind and internal to the valve. The third part of the valve consists of a large

lobe attached ventrally and posteriorly with the inner part of its free border overlapping a portion of the right valve. In the diagram of a normal male the oblique line running up towards its extremity indicates the free border of a flap on its inner aspect, and the curious lobe on the valve of the gynandromorph probably corresponds with this. The aedaeagus (Ae) drawn separately is very short and broad and the long projection, which arises near the base on the concave side of the normal aedaeagus, is present in an aborted condition. The existence of two valves is not surprising. Even in halved gynandromorphs there are nearly always two, though as in this case the inner one is usually very much the smaller.

From the ostium bursae run a ductus bursae and a bursal neck both properly formed, but the bursa copulatrix itself is imperfect. In the normal female the first portion forms a large pear-shaped organ, and from the middle of its broad distal end there is a tube leading to a smaller globular portion. At the narrower and thicker proximal end is the heavily chitinised signum with a number of teeth at both extremities. The bursa of the gynandromorph has only half a signum (Si) and is flattened on its inner side. The tube arises from a point near the inner side instead of from the middle of its distal extremity and the second portion of the bursa is flattened in the same way as the first. The bursa is really only a half bursa and is very like the one in the halved gynandromorph of *Eronia hippia* var. *gaea*, which I described and figured in the *Trans. Ent. Soc.* 1916, Pl. CIV. fig. II. This also had only half a signum. The eighth and seventh somites of the gynandromorph *Colias* are female.

EXPLANATION OF PLATE.

Ninth somite of gynandromorph of *Colias lesbia*. (Ventral view).
Tenth somite of gynandromorph with about twice the magnification (Ventral view).

Tenth and ninth somites of male. (Lateral view with magnification about half that of ninth somite of gynandromorph).

Ninth somite of female. (Slightly oblique view of ventral surface. Magnification about two-thirds that of ninth somite of gynandromorph).

V. valve. Sa. sacculus. S. saccus. U. uncus. T. tegumen. Ae. aedaeagus. Ov. ovipositor. R. rod of ninth somite. O.B. ostium bursae. D.B. ductus bursae. B.C. bursa copulatrix. Si. signum.

A few words of Explanation and Justification.

By ROGER VERITY, M.D.

I am sorry to use some of the precious pages of this *Journal of Variation* where so many interesting facts await recording, in disquisitions, which in some cases exhibit a shade of pedantism, but, as I have recently been criticised in a very direct and personal manner, a few words of explanation from me on some points, which have not been fully grasped, seem necessary. I am sorry I have given the impression of talking in a tone of "superiority" and I am grateful to my friend Mr. Bethune-Baker for having corrected this impression, through his personal acquaintance of me. All I can claim is that

thirty years of work on a subject may give one a right to a certain amount of assurance in one's statements, although, of course, *errare humanum est* and I have made mistakes, like all those who work have. What I do not understand is why I am made personally responsible for the use of terms and for methods of analysis of variation which have been introduced long before my time and developed on a broad scale by some of the leading lepidopterists. Tutt, Bingham, Oberthür, for instance, have used the term "race" all through their large and masterly works. That of "*forma alienius loci*" would be a somewhat cumbersome substitute and, in most cases, it would not even be correct, because most races, as distinct from exerges and subspecies, consist in the predominance of a form, which is *not* confined to the region where it is racial and which does exist in other races, although in the latter it has a limited, or nearly no, influence in their aspect on account of its scarcity as an extreme individual variation. Let us take one of the first examples one finds in the Vol. I. of Tutt's *British Butterflies*, p. 158: in his *Hand-book* of 1896, he had described *ab. flava* of *Urbicula comma* as a very rare "aberration" in Britain; in his *Brit. Butt.* of 1906, he raises it to the degree of "var." remarking that "at Mendel Pass, in Tyrol, it is quite a racial form, most of the specimens having the spots yellow, although some have them distinctly white." Here, then, is a form found in most European localities, but so much more abundantly, although not exclusively, in some of the southern ones that it gives a series of specimens from there quite a different look from a series collected further north. This, according to Tutt, constitutes two races. Some of my races, which have been criticised, have been erected exactly on the same lines. I agree they are not as satisfactory as the races which consist of a form entirely peculiar to one region, but I see no reason to deny them a standing as good races, as the difference between these two sorts of cases is purely quantitative and one cannot draw the line anywhere. As far back as the eighties of last century Nicéville in his *Butt. of India*, p. 317 (quoted by Tutt, p. 350) expresses exactly the same view in connection with *R. phlaeas*, saying that the Indian races blend in a complete gradation, but that "this does not prevent the local races being distinct and capable of discrimination at their respective headquarters." I have always found that this conception of races and this way of illustrating geographical variation answers its purpose perfectly well and that is why I have always worked along these lines. I cannot make out what has made Mr. Bethune-Baker so indignant about the race of *Agriades coridon* of the Susa Valley, which I have described and named *rufosplendens* on the strength of the remarkable tinge of the underside in as many as 70% of the individuals. There are a great many races described, not by me, but by leading authorities, in which the *forma alienius loci* is considerably scarcer than that and which, notwithstanding, are very striking when an adequate series of specimens is compared with series from other localities. It must also be observed that it would be a mistake to include exact statistical data in the original diagnosis of a race, as some of my critics suggest I should do, because the name by which one designates it is meant to cover all the localities where the features described are more prominent than other features, but from one spot to another their predominance usually varies to a marked extent and the series of "co-types" is unlikely to belong exactly to its

highest degree. On the other hand I quite agree it is very advisable to mention roughly in what proportion the well characterised specimens are and with what other forms they are mixed, in order to convey an exact idea of the general aspect of the original series of specimens, and authors of local Catalogues should then complete our knowledge in connection with each region. If anybody can suggest a better way of describing geographical variation than that which has been in use till now I will only be too pleased to adopt it, but what I resent vigorously is that secondary defects of the system should be taken as excuses to sit down and give up working at variation. Some entomologists candidly confess their reason for so doing is that they do not feel equal to facing the proportions this subject is now attaining. The answer to this is that one must look at things in a new light. In the past a man could boast of bearing in mind, more or less, all the variations of the butterflies of Europe. Now one must give up any pretence of this sort and, when one starts to work at a species, one must recur to the Catalogues, which are being published, and read up the literature about it. Even the few words one finds in general text-books are very often extremely misleading. Specialisation is bound to increase, as it is in all branches of human activity, following the laws of organic evolution. I have, over and over again, experienced a phenomenon, which it is important to remember before jumping to conclusions: when at first one examines series of specimens of a species, one is not particularly acquainted with, one often is quite blind to differences there may exist between them; it is only after having done so several times, at intervals, that one's eyes gradually open and one is then quite surprised at not having detected sooner the characteristics of the various series. *Agriades coridon* is one of the species which is very apt to play this trick on the observer and that explains how, in perfectly good faith and, possibly, with perfectly adequate materials before him in his large collection, Mr. Bethune-Baker can have made about its races the negative statement he publishes at p. 50. Only, he gets unnecessarily hot about it and actually speaks of crossing swords with me. To enliven the pages of this Journal for the general reader, although I do not feel as pugnacious, I will strike back by recalling the fact that he has already shown a tendency to be too precipitate in his judgments when he described and named (1926, p. 84) "A new species of *Zygaena* from Spain" from dwarf individuals of the second generation of *trifolii*, which Sagarra, in agreement with my opinion, had already described and named in this sense. Burgeff has since gone into the matter and come to the same conclusion. My good friend accuses me of seeing races where they do not exist, but he has, anyhow, gone still further and has done it with a species. I must also remind him of the fact that when he came to Florence he sneered at the work I had done on the number of generations of the Pierids and on the features which distinguish them from each other, whereas, after he had seen my collection, he had to admit it had been a revelation and that northern entomologists could have no idea of these seasonal variations in the south, because they did not possess series of specimens collected systematically during all the year in this region. This should have taught him that large series straight from their haunts reveal facts which it is otherwise impossible to see and, as he knows that an enormous amount of fresh materials passes before my eyes every year,

ne might have abstained from his irreverent insinuation that I forge races for the pleasure of describing them! What, however, absolutely astounds me is that he should find fault with me for saying that in describing a race one must single out its characteristics and "eliminate" the features and the individual variations, which run, more or less, all through the species in all its races, so that they have geographically no interest, but which combine in different ways with the locally predominant features and create "confusion" by producing different effects in the various individuals. In a few individuals the local features may even be entirely absent, as I have noted in the *comma* and *phlaeas* examples, mentioned above, without its infirming the existence of the race, but one must, particularly in some cases, have sufficient specimens to prove it and to show if the race of the locality one is dealing with can be designated, on the whole, simply by one name or if it must be combined with the name of the minority of individuals. When the latter are not too numerous and prominent I use the expression of "*trans. ad.*"; when they are, and the race is very variable, I simply join the names of the leading forms by a hyphen. I have been so particular in working all this out in my *List of Peninsular Italy* and other works that I can only suppose those who have criticised me for inaccuracy in this very respect have not even taken the trouble to glance through them before formulating their judgment! I fear there is a considerable amount of prejudice against me, like there has been in the past against Fruhstorfer and others, who have done a great deal of work. I am glad I can end with a word of reassurance to those who seem so terrified by these developments and state that, in my experience, most of the geographical variations of the butterflies of Western Europe have now already been described and named and that the work which remains to be done consists chiefly in establishing their distribution and their relationship and in discovering the causes which produce them. If this end can be attained, the labour which has been devoted to recording them will be amply justified. With mutual confidence and mutual aid great deeds are done and great discoveries made!

Remarks on Dr. Verity's "Explanation and Justification."

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

Dr. Verity's explanation—I omit the word "justification"—calls for some remarks from me, for I had not the least intention to make him "personally responsible for the use of terms and methods of analysis" developed by Tutt, etc. Since the lamented death of my friend Tutt, we have advanced far and we have come to a more concrete and scientific basis of work. Were Tutt alive to-day he would certainly have advanced with the times and would have used the word "race" in a different way to how he did then.

"*Forma alicuius loci*" (for which we in England use the single word "form" or "f. loc." and not infrequently the simple letter "f" though we need to be more accurate than this now) is not equivalent to the word race; nearly all of Dr. Verity's names, or at least a great many of them, come under f. loc. I do not now refer to Dr. Verity's

instances of Tutt's example for the reason that they do not apply to-day in the advanced state of our knowledge.

Then again I am quite unconscious of being indignant about the naming of *A. coridon rufosplendens*, I merely cited it, without any adjectives or other strong expression, or any feeling of any kind, as an example of a misconception as to what a race was. Again my friend says I was "unnecessarily hot about the variations of *A. coridon*"; his idea of heat is unusual, I expressed no feeling whatever in my remarks, but simply as I thought stated cold bare facts, which were intended to show how Dr. Verity eliminated some characteristics and so was able to magnify others; here perhaps I might say that I think I have specialised and studied the *Lycaenidae*, and among them *coridon* has had long attention, both structurally, in the field and in the cabinet, for many more years than has Dr. Verity and I am very far from not noting minute differences.

An amusing incident is that Dr. Verity considers I have been precipitate in judgment when I described a small *Zygaena* as a new species under the name *clorinda*, and he says it is merely a dwarf form of *trifolii* and that others agree with him. I had a long correspondence with Querci on this very point and on every incident of its capture, so that I am able to judge the question, and as it is a group on which I have specialised for a good many years, and have genitalia preparations and scale and other preparations of most of the species, I claim the right of my own opinion. It may be a matter of opinion or it may be a matter of fact, but the fact remains that I have before me a fine series of *trifolii* and of *clorinda* taken in the same place at the same time, and that they differ both structurally and in general appearance. This is not the time and place to go into the differences which I enumerated sometime ago, but the facts at present support my view and I have no doubt in my own mind that they are quite distinct. There is one thing I might here draw attention to and that is that Dr. Verity's idea of the value of structure is quite different from mine; from casual remarks and a general inference of dealing with what he calls "exerges," it is evident that I put a greater value on structure than he does, and that marked differences in structure have little weight with him. I think Dr. Verity had better read very carefully again what I said about the *elimination of variations and neutralising confusion*, it bears a very different construction to that he puts upon it and it needs to be emphasised rather than otherwise.

The two principle points, in the early part of my paper (ante p. 49, etc.) and at the end, are left entirely untouched by my friend, and his idea of a "complete picture of geographical variation" lacks both the foreground and the background leaving a very incomplete picture, in which very much is obscured or left to individual imagination, much in the manner of our present day futurist artists.

Races and their Naming.

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

It is a natural fact that most species exist, not generally distributed, but in colonies over more or less limited areas, determined by the presence of the food of their larvae primarily, but also by numerous other factors, climatal and natural. Such distribution, tending in

many cases to more or less isolation, must, with differences in local conditions, react upon the members of the colony and produce variations which in time will become fixed and genetic.

It has been customary in the past, when the continued isolation has thus acted and produced special characteristics in colonies, to term them "sub-species" and "geographical races."

Naturally there exist varying degrees of the effects of such isolation. The extreme cases would be when every individual of the colony showed the special characters produced. Between a colony of the typical form and this extreme there exists every degree of characterisation, from colonies in which only a small percentage of individuals have peculiar facies to colonies in which the bulk of the individuals are noticeably variant.

It is obvious that in these two quite separable cases the same term of relationship is, to say the least, hardly applicable. One kind of colony is a near approach to a species, the other kind of colony is in every case but a step towards the colony in which every individual has the peculiar facies.

In course of time there has sprung up a differentiation of the use of the two terms, "subspecies" and "geographical race" (or simply "race"). The term "subspecies" has been invariably used for the perfectly characterised colony and never for the imperfectly differentiated colony; "geographical race" has been generally used for both categories of colonies; and the term "race" has been used predominantly to indicate those colonies which are incompletely differentiated. Particularly has this been so in our societies' discussions, in our magazine articles, and in general conversations.

Such a recognition having come into general use, and thus acknowledged to be convenient and intelligible it would appear to be quite inopportune to attempt to ignore it and go back to the previous confusion. It is a matter of growth, of evolution; as our knowledge of facts increased, so we must appreciate that knowledge by definition to further future advance.

But the crux of the whole question has arisen on account of the extraordinary desire to name, which has come into fashion among naturalists. While one does not complain of names given to definite conceptions, of which subspecies are examples, there is a well-founded complaint against the naming of imperfect, indefinite conceptions, of which the colonies we have called "races" above, are examples.

Almost in every case these names indicate nothing in particular, they are not applicable to all the individuals, nor even to the bulk of them, they rarely have reference to any characteristic, they are largely irrelevant and give no information to those unfamiliar with the race, more or less useless for future workers, they are a burden to the memory and, in fact, a hindrance to future progress. Often such names are published in obscure journals or magazines and in years to come may compel a deal of trouble to unearth. Patronymics are an extreme example of such names; of the personal connections but few present individuals know and practically all future students will be ignorant; it is pandering to the personal vanity or supposed personal vanity. And when this proclivity is extended to each of the generations of a species, which may, or may not, be differentiable, the practice loses all semblance of utility.

'Tis here I, personally, criticise the action of Dr. Verity and others in giving names, of necessity, from the nature of the phenomena, irrelevant, to so many races and generations. For instance it would have been amply sufficient and immeasurably more informative and consequently more scientifically useful to have spoken of the races of the *Polyommatus* on the Riviera as the W. French Rivieran race, the E. French Rivieran race, the W. Italian Rivieran race and the E. Italian Rivieran race, at the same time indicating the generations by I. gen., II. gen. Reader and hearer would at once know to what form writer and speaker referred without tedious reference and waste of time. This is no innovation but simply confining ourselves to refer to any particular colony as "the Box Hill race," "the Dover race," "the Pyrenean race," etc., etc., and refrain from adding to our already overburdened nomenclature and indexes.

From the purely scientific reasons I have given, I submit that the present practice and method of naming races, exclusive of subspecies, is detrimental in its results and repellant in its influence on the future advancement of our beloved science.

The Basses-Alpes in May-June, 1926.

By Lieut. E. B. ASHBY, F.E.S., F.Z.S.

(Concluded from page 75.)

The RHYNCHOTA taken were *Harpactor iracundus*, Scop., *Corixa geoffroyi*, Leach; *Coreus denticulatus*, Burm.; *Capsus campestris*, L.; *Camptopus lateralis*, Germ.; *Piezodorus lituratus*, Fab.; *Stenocephalus aqilis*, Scop.; *Graphosoma semi-punctata*; *G. lineata*; *Homodemus m-flarum*, Goeze.; *Dolycoris baccarum*, L.; *Rhinocoris erythropus*, L.; *Notonecta glauca*; *Gonocerus acuteangulatus*, Goeze.; *Syromastes marginatus*, L.; *Phytocoris obliquus*, Costa; *Stenotus binotatus*, Fabr.; *Philaenus spumarius*, Fall; *Eurygaster maurus*, L.; *Pieromerus nigridens*, Fabr.; *Carpocoris fuscispinus*, and *C. purpureipennis*, D.G.

I took the following specimens of Rhynchota at Digne, in May, 1925, and I must here express my cordial thanks to Mr. H. Willoughby-Ellis for the trouble he has taken in determining the species, viz.; *Rhinocoris annulatus*, L.; *R. erythropus*, L.; and *Gonocerus acuteangulatus*, Goeze.

HYMENOPTERA.—From later research I find that I also took in addition the following species *Allantus zonnula*, Klug.; *Macrophya pallidilabris*, Costa = *coquata*, Moss; *Crabro lituratus*; *Andrena hattorfiana*; *Coelioxys vectis*, Curt.; *Dioxys cineta*, Jurine; *Ammobates carinatus*, Ploz; *Colletes fodiens*; *C. picistigma*; *Allantus marginellus*; *Pimpla rufata*; *Phobocampa obscurella*; *Barichneumon augustator*; *Pimpla instigator*; *Alomyia debellator*, Fab.; *Macrophya annulata*, Geoff.; *Acauthocryptus 4-spinosus*; *Microcryptus perspicillator*; *Ichneumon stramentarius*; *Cryptus armatorius*; *Polyblastus prateusis*; *Casinaria orbitalis*; *Craticheumon annulator*, and *Euryglabus torvus*.

Thanks are entirely due to the kind trouble, which Mr. H. Willoughby-Ellis has taken; he has determined the following beetles, which I took at Digne in May, 1925, viz.; *Leochomus nigromaculatus*, Goeze., var. *flavipes*; *Biopanes meridionalis*, Muls.; and several specimens of a spotted form of *Olibrus bisignatus*, Men.; and others.

Amongst the DIPTERA which I took at Digne in May and June of this year were *Mesembrina meridiana*; *Chrysotoxum arcuatum*, Panz.; *Merodon clavipes*, Fabr.; *Tabanus ater*, Fabr.; *Sargus irridatus*; *Lucilia caesar*; *Chloromyia formosa*, Scop.; *Xylota sylvarum*, Meig.; *Fristalis nemorum*, L.; *F. pertinax*, Scop.; *Bombylius pictus*, Panz.; *B. medius*, L.; *Fallenia fasciata*, Fabr.; *Bibio leucopterus*, Mg.; *Machaerocera grandis*, Rond.; and others.

In conclusion I must again express my thanks to those Naturalists both of the South Kensington Museum Staff and others who have so kindly assisted me to determine the species found on this trip.

Notes of Collecting in Spain in 1925-26.

By DR. E. ROMEL.

In the *Ent. Rec.*, 1925, p. 26, I made a few remarks about our Spanish collecting. During the two past years we have made two other trips to Spain and we have visited Sierra Nevada, Moncayo, Cerdanya, Montseny Mass, Sierra Guadarrama and Serrania of Cuenca. A few remarks about what we have observed, may be not uninteresting to your readers.

1. *Zygaena (Hyalia) sarpedon*, Hb.—Rambur gave the name *hispanica* to the dull and transparent form which he collected in Andalusia along the coast-line (*Cat. Sys. Lep. de l'Andalousie*, 167). Oberthür (*Lep. comp.*, IV., p. 454) remarks that a similar form lives also in Castile.

In Serrania of Cuenca (Eastern Castile) we have met with a form of *sarpedon* as poorly scaled as the one described by Rambur. It flies in the environs of Cuenca during the month of July.

In Sierra Nevada, at the level of 3,500 ft., above Guadix, we have found quite a different form of *sarpedon* from the *hispanica* of the lowest spots of Andalusia; this form is thickly scaled and bright red coloured as *balearica*, B., and *carmenita*, Ob. To call the attention to the natural phenomenon that the Andalusian *sarpedon* varies according to altitude I propose to name **bethunei**, the showiest race which emerges in June, in alpine surroundings, on the northern side of Sierra Nevada.

The Spanish *sarpedon* varies everywhere in a considerable way. In my large series of *hispanica* from Cuenca, and *variabilis*, Bgff., from Catalonia, I see a few specimens which are very like Hübner's type figures, on the other hand the typical form never occurs in my series of more than one hundred individuals of *bethunei*, the blue margin of the hindwings always being much thinner than in typical forms.

All the males of *bethunei* differ in a striking way from those of *hispanica*, in which the basal zone of the hindwings is perfectly transparent, while in *bethunei* the red scaling of the hindwings is uniform. This differential character is not absolute in the female sex because in my series of 30 females of *hispanica* from Cuenca I see 3 specimens in which the hindwings are as uniformly scaled as in those of Guadix. The most peculiar difference between *hispanica* and *bethunei* is that it is difficult to differentiate sexes in the Sierra Nevada form, while the males of *hispanica* are always much duller than the females so that the sexes can be identified at first sight.

Bethunei differs from *balearica* by the extent of the apical spot of the forewings which is small and round; exceptionally we have found two aberrant specimens, one male and one female (Lord Rothschild's collection Nos. 754-755) in which the red pattern of the forewings and apical spot are so extensive that they resemble *loyselii* as it is figured by Oberthür, *Ét. Lep.*, 1890, ff. 76, 77. Of course in the Andalusian individuals the red collar is missing.

The race *bethunei* is allied to the most widespread French race which Oberthür named *carmencita*, but the forewings are not so green as in France and the blue band of the hindwings is less extensive.

Burgell (*Kommentar*, No. 147) named the Catalan race, which really varies in a surprising way, *variabilis*. I possess some specimens from Catalonia which do not differ from Hübner's type figure, a few others are still darker than those of *hispanica* and *trimaculata*, Esp., many are as bright as those of *bethunei*; however, I remark that the reddest specimens from Northern Spain are more thickly scaled and that the red spots and dashes are more reduced than in *bethunei* from Southern Spain at high level.

2. *Zygaena (Thermophila) trifolii*, Esp. — The sub-species we have collected, in June, 1925 and 1926, near Jerez del Marquesada, in Sierra Nevada, at the level of about 3600ft., varies in a considerable way by the extent of the blue band to the secondaries. Rambur sent to Lederer some specimens from Sierra Nevada by the name of *australis* (Ramb., *in litt.*) and Lederer published that name which remains to Andalusian *trifolii*.

Oberthür named the extreme variation of *australis* in which the hindwings are very dark, *caerulescens*. In speaking about the variation of the Spanish *trifolii* it is indispensable to distinguish also the opposite variation to *caerulescens* in which the blue border of the secondaries is most reduced. This light form looks so different from the dark one, that reading Rambur's papers it seems he was doubtful they may belong to the same species.

Not to add a new name to literature we may apply the one of **tenuelimbata**, which Verity (*Ent. Rec.*, 1921, p. 147) used for one of the variations of *jilipendulae*, to the lightest form of Andalusian *trifolii*. Rambur, on Pl. I of his *Cat. Syst. Lep. And.*, figures the three forms of *trifolii* from Sierra Nevada: f. 5 is *caerulescens*, f. 6 represents the most frequent form *australis* and f. 7 is *tenuelimbata*.

In my series of about 800 *trifolii* from Sierra Nevada there is one female (Lord Rothschild's coll., No. 774), in which the hindwings are so dark that the specimen resembles Oberthür's ff. 72, 73 (*Ét. Lep.* 1890, Pl. 8) of *seriziati*. However, while in the *seriziati* the median spots are confluent, in my aberration they are sharply separated, but I have several *trifolii* from Andalusia (Lord Rothschild's coll., Nos. 768 to 769) in which the median spots are confluent but the secondaries are as light as in *seriziati* f. 71 (Obth., l.c.).

The form *caerulescens* and the specimens of the most frequent form of *australis* are so peculiar to the Andalusian fauna that it is quite useless to compare them with the other named forms of European *trifolii*; instead the extreme form *tenuelimbata* is more allied to the form of *trifolii* from Central and Northern Spain.

After having reunited all the *tenuelimbata* of my set I am comparing

them with my series of *intricata*, Sag., from Llobregat near Barcelona. Not even one individual from Andalusia is like any of Catalonia: the specimens of *intricata* are always more greenish, the red tinge is paler and the border of the secondaries is thinner.

Trifolii from Serrania de Cuenca, in Castile, is intermediate between *teuuelimbata* and *intricata*; the male specimens are as metallic blue as the Andalusian ones, while the females are as greenish as those from Llobregat.

3. *Zygaena (Polymorpha) transalpina*, Esp.—Is very scarce in Spain. Burgeff (Komm. 285) named the Northern Spanish race *centricat-alonica*.

I find that *transalpina* is never recorded from Central Spain. We have collected some specimens of *transalpina* early in August, 1926, in the Serrania de Cuenca (Castile). The tinge of these individuals from Central Spain is the same as Catalan *transalpina*, the underside of the forewings is as widely suffused with red scaling as in the western races of this species; however, the two apical spots of the forewings are as sharply separated as in Italian specimens, and the blue margin of the hindwings is thinner than most named forms.

The *transalpina* from Cuenca, which I propose to distinguish by the name of **philippsi**, is allied to *provincialis*, Ob. (*Lèp. Comp.*, 1904, ff. 192, 193) but the size of the females is larger, the red spots are bigger and the red ring to the abdomen is always missing.

Philippsi is also remarkable for its habitat, which is the most occidental in Europe.

(To be concluded.)

Some Swiss Butterflies in 1925 and 1926.

By T. BAINBRIGGE FLETCHER, R.N., F.L.S., F.Z.S., F.E.S.

(Concluded from page 91.)

123. *T. acaciae*, Fb.—Eclépens: July 12th and 14th, 1926, common on *Sambucus* flowers with the two preceding species. This is reputed a rare species in Switzerland, where the local race is *nostras*, Courv.

125. *Zephyrus betulae*, Linn.—St. Maurice: September 10th, 1925, one male, worn. Villeneuve: September 16th, 1925, one female, rather worn. Blonay: September 19th, 1925, one rather worn female; October 18th, 1925 (surely a very late date), one worn female.

127. *Callophrys rubi*, Linn.—Grimmialp: July 16th, 1925, one worn male. Martigny: June 11th and 26th, 1926, common but mostly worn; flying around *Rubus* bushes and settling on the leaves with wings canted right over until they were nearly parallel with the surface of the leaf; also noted in some numbers sporting around beech. Les Avants: June 12th, 1926, one fresh ab. *immaculata*, Fuchs; June 21st, 1926, a few seen, rather worn.

128. *Chrysophanus virgaureae*, Linn.—Evolène: July 29th, 1925, one fresh male. Arolla: abundant throughout August, 1925, the first females noted on August 8th; the males all worn, but some females fresh, by the end of the month. Bérisal: abundant from July 19th to September 4th, 1926, from about 4,500 to over 6,000 feet; the first

females were taken on August 12th; some females from 6,000 feet were very dark; two males had the right hindwing white and a third male has a white right forewing.

129. *C. hippothoë*, Linn.—Grimmialp: June 29th to July 9th, 1925, fairly common in one very restricted area at the foot of a flowery slope leading down to the Filderich stream; some already worn by July 1st; the local form here is *hippithoë*. Bérissal: July 19th to August 23rd, 1926, fairly common around Bérissal and in the Ganter-tal. Simplon Dorf: July 27th, 1926, one fresh female. Simplon Road: August 2nd, 1926, a few along the roadside a little below the Kaltwasser Gallery. All these Simplon specimens belong to the form *euridice*, Esp. (*eurybia*, Ochs).

131. *C. alciphron*, Rott., race *gordius*, Sulz.—Martigny: June 26th, 1926, two males and one female under the cliffs towards Vernayaz. Bérissal: July 19th to September 4th, 1926; fairly common around Bérissal and along the road below the Ganter Bridge; attracted to flowers of wild thyme and thistle; the emergence seems to be irregular—or broods overlap—as quite fresh specimens were on the wing in the first week of September. Simplon Road, 6,000 feet: August 9th, 1926.

132. *C. phlaeas*, Linn.—Martigny: September 8th, 1925, one, worn; June 26th, 1926, one, worn. Bérissal: August 30th to September 4th, 1926, fairly common on thistle flowers on the slope above the roadside just below the Ganter Bridge; these specimens belong to the tailed form *aestiva*.

133. *C. tityrus*, Poda (*dorilis*, Hufn.)—Martigny: September 8th, 1925, one worn female; June 11th, 1926, one worn female. Blonay; September 3rd to 5th, 1925, three worn males; September 10th, 1923, a few worn examples of both sexes.

C. tityrus r. *subalpina*, Speyer.—Arolla: August 1st to 31st, 1925, a few, worn by the end of the month.

134. *C. amphidamas*, Esp.—Les Avants: June 12th and 21st, 1926, fairly common in a restricted area where dock and *Polygonum* were growing abundantly; in very fresh condition on June 12th but getting worn on June 21st.

139. *Cupido minimus*, Fuessly.—Grimmialp: June 23rd to July 7th, 1925, common. Villeneuve: June 2nd, 1926. Martigny: June 11th, 1926. Les Avants; June 12th and 21st, 1926. Bérissal: July 18th to 31st, 1926, common. Simplon Kulm: August 2nd and 13th, 1926.

161. *C. sebrus*, Bdv.—Bérissal: July 24th, 1926, one female taken in the Ganter-tal.

140. *Lycaena idas*, Linn. (*argyrognomon*, Bgstr.) Evolène: July 29th, 1925, common. Arolla: abundant throughout August, 1925. Martigny: September 8th, 1925, common; September 14th, 1926, a few, worn. Bérissal: abundant from July 18th to September 4th, 1926: very variable in size and markings; the females, from the end of August onwards, including a large proportion of blue forms; very fond of flowers of *Centaurea jacea*, sometimes as many as six or seven on a single flower-head and so intent on feeding that they were easily examined for aberrations; there seemed to be no regular broods, freshly emerged specimens occurring throughout the period of observation: abundant from below Bérissal to the Kulm, often sitting on the road in

large numbers on wet patches in company with other Blues and Erebias. Simplon Dorf: July 27th, 1926, abundant.

141. *L. argus*, Linn. (*aegou*, Schiff.).—Bérisal July 21st to August 19th, 1926, fairly common along the road below the Ganter Bridge, but far less common than *L. idas* and seemed to disappear before the end of August.

142. *L. sephyrus*, Friv., race *lycidas*, Trapp.—Bérisal: July 23rd to September 1st, 1926, common along the road below the Ganter Bridge. Its headquarters are reputed to be in a field near the Second Refuge, some three miles below Bérisal, but I found it sufficiently common on the rather bare rocky slopes above the road for a short distance on either side of the eleventh kilometre post. So far as I could make out, there seem to be no regular broods, very localized colonies, apparently breeding on the slopes above the roadside, hatching out a few fresh specimens at a time, so that a stretch of a few yards would produce a small series of fresh specimens for a few days whilst a week or so later another batch of fresh examples would occur along another patch of road, perhaps only a hundred yards away from the first stretch; by working regularly along the productive area, one soon discovers where the species is appearing on any particular date. Vorbrodtt gives the period of flight as from the end of May into August; I took two very fresh males on August 18th and worn females occurred up to the end of the month.

143. *L. baton*, Bgstr.—Bérisal; August 18th and 30th, 1926, two males only, both taken just below the Ganter bridge.

145. *L. optilete*, Knoch.—Simplon Road: August 2nd to 26th, 1926, fairly common from about 6,000 feet up to the Kulm, where it goes up to 6,700 feet. Along the road it is found sitting on wet patches with other Blues. The local form is apparently *cyparissus*, Hb.

146. *L. glandon*, Prunner (*orbitulus*, Esp. *nec* Prunner).—Bérisal: July 24th to August 15th, 1926, common in the Ganter-tal and a few odd specimens on wet patches by the roadside below the Ganter Bridge. Simplon Kulm: August 2nd and 13th, 1926, abundant on the slopes (about 6,700 feet) above the Hotel.

147. *L. orbitulus*, Prunner (*pheretes*, Hb.).—Arolla: August 5th, 1925, one fresh male, on the rocky slopes above the Mont Collon Hotel. Simplon Road, 6,400 feet; August 2nd, 1926, one worn male on the slope above the road just below the Kaltwasser Gallery.

148. *L. medon*, Esp. (*astrarche*, Bgstr.).—Grimmialp: June 24th to July 14th, 1925, common. Evolène: July 28th and 29th, 1925. Arolla: abundant throughout August, 1925. Martigny: September 8th, 1925. Montreux: common around Montreux during September 1925 and up to October 22nd. Les Avants: June 21st, 1926. Eclépens: June 22nd and July 12th, 1926. Bérisal: July 20th to September 4th, 1926, abundant. Simplon Road, 6,000 feet: August 9th to September 3rd, 1926, abundant. Simplon Kulm: August 2nd and 13th, 1926.

149. *L. nicias*, Meigen (*donzelii*, Bdv.).—Arolla: August 16th to 29th, 1925, common. Simplon Kulm: August 2nd and 13th, 1926. Simplon Road, 6,000 feet: August 9th to September 3rd, 1926, common on wet patches on the road. Bérisal: August 14th to September 1st, 1926, a few.

150. *L. emmedon*, Esp.—Simplon: July 27th, 1926, common. Béréal: July 29th to 31st, 1926, mostly taken in the evening resting on *Geranium sylvaticum*. Simplon Kulm: August 2nd, 1926. Simplon Road, 6,000 feet: August 9th and 26th, 1926, common.

151. *L. icarus*, Rott.—Grimmialp: June 30th to July 12th, 1925, common. Arolla: August 27th, 1925, two males. Martigny: September 8th, 1925, common, worn; September 14th, 1926, one female only. St. Maurice: September 10th, 1925, one worn male. Abundant around Montreux during September, 1925, and occurred up to October 22nd, some quite fresh as late as October 18th; and again from May 28th to June 28th, 1926. Eclépens: July 12th, 1926. Béréal: July 18th to 23rd and August 16th to September 2nd, 1926, common along the road below the Ganter Bridge.

151(A) *L. thersites*, Cantener.—Blonay: fairly common in September and October 1925: September 10th, 1926, one male. Martigny: June 11th and 26th, and September 14th, 1926. Les Avants: June 21st, 1926. Béréal: July 23rd to August 28th, 1926, fairly common along the road below the Ganter Bridge, where no *L. icarus* were flying during the first half of August.

152. *L. eros*, Ochs.—Evolène: July 28th, 1925, one male. Arolla: August 28th, 1925, one male. Simplon Road, 6400 feet: August 2nd and 13th, 1926, common at the foot of the slope above the road just below the Kaltwasser Gallery. Simplon Road, 6,000 feet: August 31st, 1926, one male. Béréal: August 17th, September 2nd and 4th, 1926, a few on the slope below the road about a mile below the Ganter Bridge.

153. *L. hylas*, Esp.—Grimmialp: July 1st to 16th, 1925, common. Arolla: August 5th to 31st, 1925, common; one female ab. *metallica* at over 7,500 feet on August 14th. Les Haudères: September 1st, 1925. Blonay: September 5th to October 6th, 1925, a few, mostly worn; June 28th, 1926, one fresh male. Martigny: June 11th and 26th, 1926, worn. Eclépens: July 12th, 1926, a fresh male. Béréal: July 21st to September 2nd, 1926, abundant along the road below the Ganter Bridge. Villeneuve: September 15th, 1926, one worn male.

156. *L. escheri*, Hb.—Béréal: July 21st to September 2nd, 1926, common along the road below the Ganter Bridge. According to Vorbodt, there is one brood in June-July but apparently there are small local colonies breeding and hatching out continuously until nearly the end of August. My series includes four male ab. *punctulata*, Wh., and one male with all the internal markings of the hindwing obsolete.

157. *L. bellargus*, Rott.—Grimmialp: July 3rd to 13th, 1925, not common. Les Pleiades: September 6th, 1925, one male. Martigny: September 8th, 1925, common but worn; June 26th, 1926; September 14th, 1926, males worn. St. Maurice: September 10th, 1925, common, one female ab. *ceruus*. Common around Montreux in September and up the beginning of October 1925. Les Avants: June 21st, 1926, one fresh male. Caux: June 29th, 1926, males worn. Fayaux: July 13th, 1926, one worn male. Béréal: August 24th to September 4th, 1926, common along the road below the Ganter Bridge; one female, taken on August 30th, has the hindwings blue above and with the spots obsolescent beneath.

158. *L. coridon*, Poda.—Grimmialp: July 4th to 12th, 1925, males common but no females. Evolène: July 28th and 29th, 1925, common. Arolla: abundant throughout August, 1925. Martigny: September 8th, 1925, worn. St. Maurice: September 10th, 1925, common. Common around Montreux during September, 1925, and worn males on the wing as late as October 21st. Bérisal: abundant from July 21st to September 4th, on which latter date many were worn but some males, quite freshly emerged, seemed to indicate a new brood; occurs from below the Ganter Bridge all up the Simplon Road to the Kulm but not commonly above the Kaltwasser Gallery.

159. *L. damon*, Schiff—Evolène: July 27th to 29th, 1925, common. Arolla: August 31st, 1925, a single worn male. Above Haudères: September 1st, 1925, common, worn. Martigny: September 8th, 1925. Blonay: September 9th, 1925, one worn male; September 10th, 1926, one worn female. Eclépens: July 14th, 1926, one fresh male. Bérisal: July 23rd to September 2nd, on which latter date several quite fresh specimens were found; the first female was taken on August 10th; abundant on the road below the Ganter Bridge especially at the lower end of the eleventh kilometre.

162. *L. semiargus*, Rott.—Grimmialp: June 29th to July 14th, 1925, common. Arolla: common throughout August, 1925. Common around Montreux in September and October, 1925, a fresh brood emerging in the first week of October; May 28th, 1926, one worn female; June 9th, 1926, one female. Martigny: June 11th, 1926. Les Avants: June 21st, 1926. Les Pleiades: June 24th, 1926. Bérisal: common from July 24th to end of August, 1926, a fresh brood emerging about August 24th; found all along the Simplon Road up to the Kulm. Simplon Dorf: July 27th, 1926, common.

163. *L. cyllarus*, Rott.—Martigny: June 11th, 1926, three worn males.

164. *L. alcon*, Fb.—Bérisal: July 24th, 1926, one male up the Ganter-tal. Simplon Road, about 6400 feet: August 2nd, 1926, a worn male and a good female on the flowery slope above the road just below the Kaltwasser Gallery.

167. *L. arion*, Linn.—Grimmialp: June 26th, to July 11th, 1925, common. Evolène: July 28th, 1925. Fayaux: July 13th, 1926, worn. Bérisal: July 18th to 26th, 1926, common, and a few tattered examples still on the wing as late as August 25th. Simplon Road, 6,400 feet: August 2nd, 1926, just below Kaltwasser Gallery. Simplon Dorf: July 27th, 1926, common.

168. *Cyaniris argiolus*, Linn.—Martigny: June 11th, 1926, a few worn females.

170. *Pamphila palaemon*, Pallas.—Arolla: August 3rd, 1925, one, worn; an unusually high record, nearly 2,000 feet above its normal habitat. Les Avants: June 21st, 1926, fairly common.

171. *Thymelicus lineola*, Ochs.—Evolène: July 28th and 29th, 1925. Arolla: August 31st, 1925, one worn male. Martigny: June 26th, 1926, common in one hay-field. Bérisal: July 21st to the end of August 1926, common (often abundant) from below the Ganter Bridge to the Kulm.

172. *T. thaumas*, Hufn.—Grimmialp: July 11th to 17th, 1925, males common, no females taken. Eclépens: July 12th and 14th, 1926. Bérisal: July 21st to the end of August, 1926, common around

and below Bérissal but not going much further up the Simplon Road. Blonay: September 10th, 1926, one, worn.

174. *Angiades comma*, Linn.—Arolla: abundant from August 1925. Evolène: July 29th, 1925. Les Pleiades: September 6th, 1925, one worn female. Bérissal: abundant from July 21st, to the beginning of September, 1926, going up the Simplon Road to over 6,000 feet.

175. *A. sylvanus*, Esp.—Grimmialp: June 30th to July 11th, 1925, common. Uetliberg: July 19th and 21st, 1925. Montreux: June 1st, 1926. Martigny: June 11th, 1926. Villeneuve: June 14th, 1926. Eclépens: June 22nd and July 12th, 1926. Bérissal: July 21st, 1926.

176. *Carcharodus lavaterae*, Esper.—Bérissal: July 31st, to September 24th, 1926: a few odd specimens on the slopes below the Ganter Bridge and in the lower end of the Ganter-tal.

178. *C. althaeae*, Hb.—Blonay: October 6th, 1926, one fresh specimen. This certainly looks as if there were an extra late brood.

180. *Hesperia sertorius*, Hoffm. (*sao*, Hb. nec Bgstr.)—Grimmialp: June 23rd and July 4th, 1925. Les Pleiades: July 2nd, 1926. Bérissal: July 23rd to the end of August 1926, common on the road below the Ganter Bridge and in the Ganter-tal.

181. *H. carthami*, Hb.—Bérissal: July 21st to the end of August 1926, common along the road below the Ganter Bridge and in the Ganter-tal.

182. *H. alvens*, Hb.—Evolène: July 29th, 1926. Grimmialp: July 1st to 13th, 1925, common. Arolla: abundant throughout August, 1925. Blonay: one fair specimen on October 6th and one quite fresh on October 21st, 1925. Les Pleiades: June 24th, 1926. Fayaux: July 13th, 1926. Eclépens: July 14th, 1926. Bérissal: abundant from July 23rd to September 4th, 1926, found from below the Ganter Bridge to about 6,400 feet on the Simplon Road.

183. *H. carlinae*, Rmbr.—Grimmialp: July 15th, 1925, one. Evolène: July 28th and 29th, 1925. Arolla: August 3rd to 15th, 1925, probably common but not distinguished from *H. alvens* at the time of capture. Bérissal: July 21st to September 4th, 1926, common. Simplon Kulm, 6,400 feet: August 13th, 1925. Simplon Road, 6,000 feet: September 3rd, 1926.

184. *H. onopordi*, Rmbr.—Bérissal: September 2nd, 1926, one specimen on the road below the Ganter Bridge, at about 4,600 feet; this is an unusually high elevation for this species.

185. *H. matroides*, Elwes.—Arolla: August 21st, 1925, one, fresh, Martigny: June 26th, 1926. Simplon Road, 6,000 feet: August 2nd and 9th, 1926, worn.

186. *H. serratulae*, Rmbr.—Bérissal: August 16th, 1926, one on the road below the Ganter Bridge.

187. *H. cacaliae*, Rmbr.—Simplon Kulm, about 6,700 feet: August 2nd, 1926, common alongside streams. Simplon Road, 6,000 feet: August 9th, 1926; August 16th, 1926, common from about 6,000 to 6,400 feet.

189. *H. malvae*, Linn.—Villeneuve: June 2nd, 1926, common over one bank by the roadside a little way up the Tinière Valley. Les Avants: June 12th, 1926.

190. *Nisoniades tages*, Linn.—Grimmialp: June 27th to July 7th, 1925, common but rather worn. Villeneuve: June 2nd, 1926, worn. Les

Avants: June 12th and 21st, 1926, abundant but mostly worn by the latter date. Les Pleiades: June 24th, 1926. Martigny: June 26th, 1926. Caux: June 29th, 1926, very worn. Simplon Dorf: July 27th, 1926. Bérisal: July 19th to August 1st, 1926, a few.

Before finishing this paper, I may perhaps add a few remarks on some enemies of butterflies. Birds of course come into this category and every field-worker must often have noticed birds attacking butterflies, although in my experience it is the hidden observer who is most likely to see this, as birds are remarkably shy of observation. I cannot add any direct observations, but certainly one *Lycæna coridon* taken at Bérisal had a narrow triangular piece neatly taken out of each hind-wing which could only have been caused by a sharp-beaked bird. At Bérisal, especially on the rocks along the road below the Ganter Bridge, lizards are extremely numerous and undoubtedly levy a heavy toll on butterflies, as one often finds quite fresh specimens with large patches bitten out of the wings. Ants are also ruthless foes and often attack resting butterflies. One day at Bérisal I saw a female *Parnassius apollo* fluttering in the grass just above the road and, on catching it, found that it was swarming with ants which had attacked it and would undoubtedly have killed even such a large butterfly as this is; on another occasion I saw an *Erebia aethiops* jerking itself violently up and down and this proved to have an ant firmly attached with its jaws dug into the club of one antenna.

A good deal has been written by numerous observers (mostly botanists) on the relations between butterflies and flowers but accounts usually merely state that a particular butterfly (often unnamed) visits certain flowers. As regards cross-fertilization the point is that the butterfly should visit successively flowers of one particular species. At Arolla I made a few notes on such cases. On August 17th, 1925, one individual of *Colias phicomone* was seen to visit a small blue Gentian, one plant after another. Another individual confined its attention strictly to a small yellow dandelion, which was also visited by *Erebia tyndarus*, *E. melampus*, *E. goante*, *Argynnis pales*, *Argiades comma* and *Hesperia alveus*. I saw one *E. tyndarus* visit nine of these flowers in succession, passing over thistle-flowers, which were attracting other *E. tyndarus*. Another *E. tyndarus*, however, visited a butter-cup flower and then went to a dandelion. On August 18th, a *Colias phicomone* visited successively two buttercups and a dandelion; another individual visited a dandelion, then settled on the ground for some minutes, then visited two buttercups and a red clover; the sun was clouded over and *Colias* was not flying freely. An *Argynnis amathusia* visited two dandelions successively. A male *Argynnis pales* visited thirty dandelions in succession; after visiting the sixth, tenth, fourteenth, twenty-sixth and thirtieth dandelions, it settled momentarily on a buttercup, evidently attracted by the similar yellow colour, but flew off again without feeding. On August 23rd I saw a female *Colias phicomone* visiting red clover flowers; it visited five in succession, then a white clover, then another red clover (which seemed very attractive as it was on it for at least fifteen minutes, busily probing it, and returned again and again), then another white clover, then two red clovers; the white flowers did not seem attractive, as it did not remain on them for any time, whereas it was feeding busily on red

clover. The above notes are very brief, but the subject is interesting and perhaps other lepidopterists will make further observations.

I have written of the joys of collecting in Switzerland but one of the drawbacks lies in the large number of Tabanid Flies whose persistent and bloodthirsty attentions often detract considerably from the charms of collecting other insects, and some protection for one's legs is very necessary. Curiously enough, inquiry showed that the National Collection contained no Swiss specimens of *Haematopota* and very few of *Tabanus*; but there was little difficulty in helping to fill this gap!

NOTES ON COLLECTING, etc.

AN UNUSUAL DATE AND PLACE OF EMERGENCE.—On Sunday, April 3rd, I saw a specimen of *Hypocrita (Euchelia) jacobaeae* fluttering about the ground in the precincts of the Savoy Chapel, Strand. The specimen was apparently newly emerged, and over the average size. Of course it may possibly have escaped from a breeding-cage, as the locality and time of year are both abnormal for the species. The sun was shining.—HUBERT E. PHILLIPS (F.Z.S., F.E.S.), 12, Hereford Road, W.2.

SYNANTHEDON FORMICAEFORMIS.—With reference to Mr. Fassnidge's interesting article on gall-formation by the larvae of *S. formicaeformis*, it may be worth recording the habits of this species in the osier plantations of Cambridgeshire and Huntingdonshire. The willows in these plantations consist of a low woody stump, 6-12 inches in height, and in established plantations, as much across. The shoots or "rods" for basket-making are usually cut from the stump every year during the winter and spring, and in consequence any clearwing larvae which had tunneled up the rod for more than an inch or so would be removed and probably destroyed. It is, however, relatively seldom that this occurs, for normally the larvae remain in the stump, making their tunnels a short distance below the surface, and under these conditions it is obviously unlikely that galls would be caused.

Together with the *S. formicaeformis* are found larvae of the beetles *Cryptorrhynchus lapathi* commonly, and fairly frequently those of *Aromia moschata*. Occasionally larvae of *Sphacia bembeciformis* occur in the stumps but this species prefers to work in "rods" which are left for two or three years, as for instance, when required for the framework of baskets or for stakes. The attacks of these different insects cause the gradual death of the stump, and as soon as there is dead wood, it is invaded by another beetle *Ptilinus pectinicornis*, which in its turn is followed and preyed upon by *Tillus elongatus*, so an old osier-stump containing both living and dead wood forms an interesting entomological study.

Finally, it may be added that *S. formicaeformis* seems to have a preference for *Salix viminalis* whereas *S. triandra*, which produces the better quality "rods," is far less susceptible.—J. C. F. FRYER, (M.A., F.E.S.), Harpenden.

EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. H. J. TURNER, 98, Drakefell Road, New Cross, S.E.14.

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Desiderata.—Back volumes of Trans. Ent. Soc. Lond., and entomological magazines, bound or unbound.—*Fredk. J. Killington, 177, Leigh Road, Eastleigh.*

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Duplicates.—Very many in first class condition, high-set only f. i. Herminia flavicrinalis, Andreas, Nych. dalmatina race andreasaria, Warnecke, about 30 species of rare Acidalias; pupae of Eupithecia illuminata or cash.—*Karl Andreas, Wiesbaden, Goethestr. 23, Germanu.*

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Entomologist in out of way part of world desires exchange entom. literature—especially current works on classification, anatomy, heredity, etc.—for papered insects from Argentine Chaco. Will give double rate for Camb. Nat. Hist. (Insects), Hudson's Nat. in La Plata, and special for Ridgeway's Colour Charts. Basis butterflies or moths 20/- per 100 papers, coll. 35 butterflies all different 10/-, other orders by arrangement. Or will sell for cash to enable purchase. Lists to *K. J. Hayward, Villa Ana, F.C.P.S.F., Argentine.*

Mr. M. R. SMITH, A. and M. College, is anxious to know where he can obtain any of Emery's papers on North American ants; and also to know of any Europeans who would like to exchange separates and correspondence with him concerning ants.

Signor ALFREDO FAZ, Calle Bandera 714, Santiago Chili, is willing to exchange first class Chilean Coleoptera, especially *Carabus*, sps., for striking Coleoptera from all parts of the World.

Wanted.—To correspond with some Entomologist resident in Scotland, Ireland, or the Isle of Man who is interested in Noctuae and vars. with a view to exchange of species and forms.—*A. J. Wightman, "Aurago," West Chiltington Common, Pillborough, Sussex.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 6th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. July 28th. August 11th, 25th.—*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., J. P. HARDIMAN, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.*

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IMPORTANT TO ENTOMOLOGICAL SOCIETIES and MUSEUMS.

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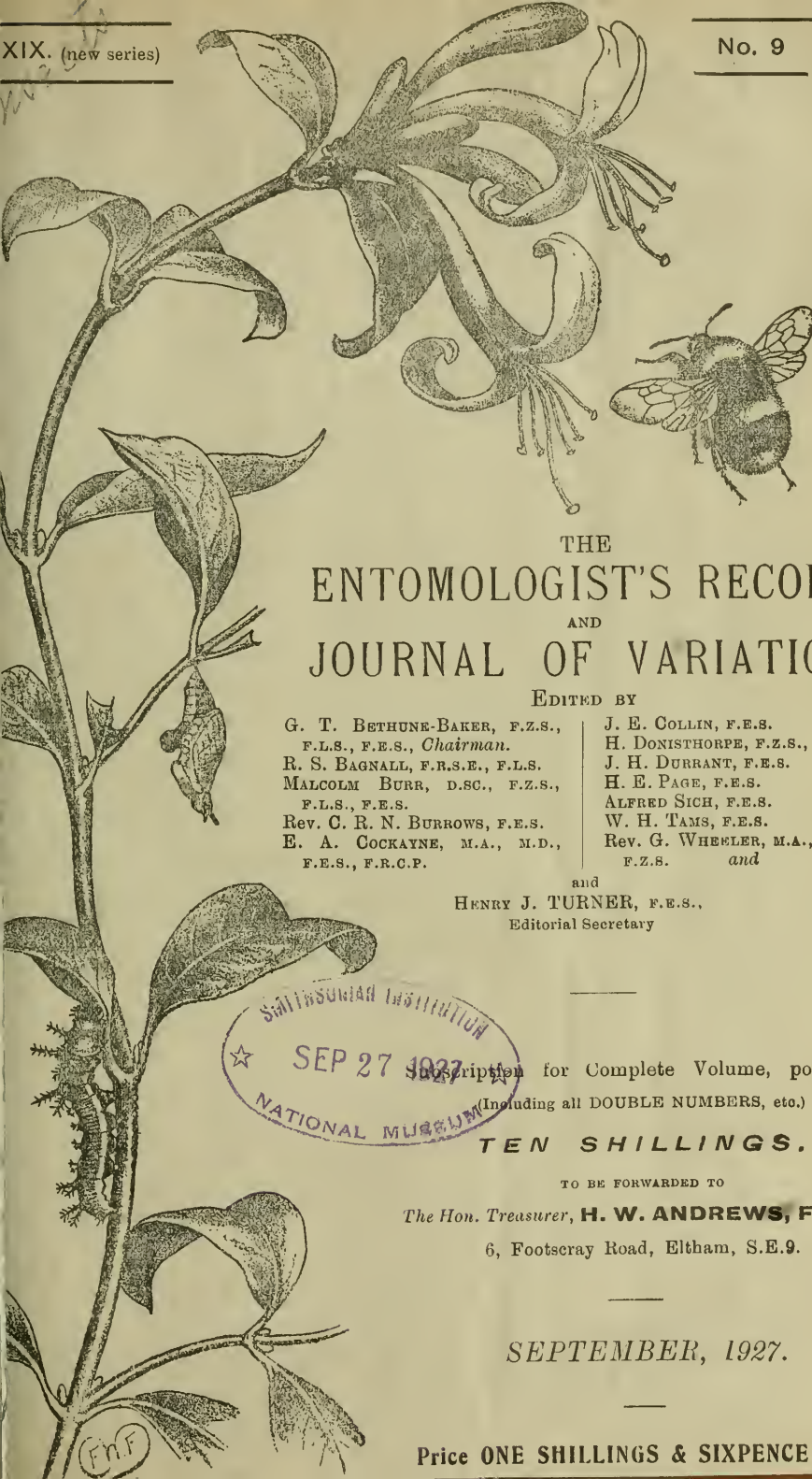
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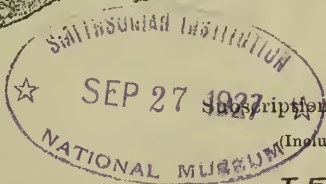
THE
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 AND
 JOURNAL OF VARIATION

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Notes on Egyptian Lepidoptera
observed at

Reservoir Aswan, 1919-1922.

By **KENNETH J. HAYWARD, F.E.S.**

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São Thomé and Principé.

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

In the Gulf of Guinea, with Nigeria to the north and the Cameroons to the east, there is a series of small oceanic islands of volcanic origin. Nearest to the coast is Fernando Po, a Spanish possession; next come Principé and São Thomé, both Portuguese, the latter lying on the equator, and the most remote and furthest out to sea the isolated Spanish rock of Anobon.

Principé and São Thomé are as strange and picturesque as any spot on the earth; the skyline is formed of a series of serrate crests, great rounded bosses, and triangular fangs; at Principé these project beyond the forest and rise naked to the heaven; at São Thomé a dense vegetation covers them almost entirely. The alkaline rocks of which they are composed, mainly basalts and phonolites, are broken down by the heavy rains into a rich soil, so fertile, the local folk say, that if you lean on your walking-stick for a few minutes, it will take root and start sprouting. At São Thomé itself the annual rainfall is only about 40 inches, which has to be supplemented by irrigation for the cocoa plantations, but at one corner of the island it rains throughout the year and the annual fall is nearly 120 inches.

Such humidity in a tropical climate produces an astonishing exuberance of vegetation, but there is little of the original forest left; it has nearly all been replaced by the energy of the planters and is replaced by a solid mass of banana-trees, oil and cocoa palms, and fruits of every kind. It was most tantalising to spend just one hour collecting at both these islands, to know that within reach there was at least some area of unspoilt natural conditions and that at São Thomé at least and most probably on Principé too, on the higher altitudes, there is a special alpine flora; there is the local conifer, *Podocarpus manni*, Hook., and at least ten peculiar species of plants, while others are common to the island of Fernando Po, the volcanic mountains of the Cameroons, Kilimandjaro and Nyassaland. In this reeking atmosphere the trees are covered with epiphytes; many of the trees have beards of the lichen, *Usnea barbata*, over a yard long and dead trunks rotting on the rank ground are covered with fungi, ferns and *Peperomia*; Begonias grow wild and the finest is the endemic *Begonia baccata*, Hook., which attains a height of fifteen or sixteen feet, with leaves over a yard long.

I had an hour collecting at Principé on April 15th, and an hour on São Thomé the following day. Among the bananas and palms I found but little; it was in the few spots where some grassy and weedy vegetation enjoyed a little freedom that I picked up a few species of Orthoptera. Thus, on the path by the landing stage at Principé, in rank grass, there are two species of *Xiphidium*; one is very like *X. fuscum*, the commonest species in southern Europe, but the other has abbreviated organs of flight and recalls our British *X. dorsale*.

In the longer herbage at the edge of the trees there is *Conocephalus* sp., closely resembling the common European *C. mandibularis*, but adult specimens were few at this date. The commonest grasshopper is the pretty green *Oxya hyla*, Serv., extremely like, but not at all related to *Parapleurus alliaceus*, Germ., which occurs in similar situations in southern and central Europe; the last time I had seen it was in the

SEPTEMBER 15TH, 1927.

distant Caucasus, near the eastern shores of the Black Sea ; with it a brown *Euprepoenemis guineensis*, Kr., hopping and flying clumsily in the wet grass like the south-European *E. plorans*. Sweeping in the grass produced a small elongated *Tettix*, just like our familiar *T. subulatus*, and the quaint little cricket *Trigonidium cicindeloides*, Ramb., with indigo elytra and buff femora, which extends almost all over Africa and Asia and is common on the northern shores of the Mediterranean.

The thing that struck me most was the European aspect of the Orthoptera. The only exotic touch was a cluster of ugly black apterous cockroaches under a rotten bunch of palm fruit. I was disappointed at first, as I hoped to make the acquaintance of new and unfamiliar forms or things, that I had so far known only in museums, but a little reflection told me that of course these familiar genera, if not species, were really Ethiopian, and extend their distribution to the southern extremities of Europe which, after all, were part of the African continent until the great geographical disturbances of the Oligocene which transferred the south of Spain, most of the Mediterranean islands, Sicily and southern Italy to Europe, where they have not developed new characters during the great lapse of time. To my inexperienced eye, at Principé even the butterflies had a decidedly Palaearctic appearance ; a *Papilio* was quite common that to me looked merely somewhat larger and decidedly blacker than *P. machaon* ; the blues looked familiar enough ; a *Vanessa* was like enough to *Aglais urticae* not to look very strange, and a Satyrid, I felt quite sure, was *Aphantopus hyperantus*. The birds, too, produced the same impression ; there was nothing suggestive of the Zoological Gardens ; three white egrets flew across the bay and a purple heron ; kites were hawking over the port. In the dark green waters a few huge, red, sea bream lazily rose to the refuse thrown from the ship ; they must have run to 20 or more pounds ; I saw no sharks and the only really strange-looking creature we noticed at Principé was a long narrow fish like an elastic pike that had been stretched to double its normal length ; it was dark green above and white beneath, with a sharply marked boundary line between the two colours ; it had long sharp nasty-looking jaws, with which it snapped at rubbish floating by the sides of the vessel. Of reptiles we saw but one, a slender grey snake that looked like a coluber, but Pavel Stepanovitch was positive that it had a triangular head ; we let it go, and it slipped down a hole that must have been made by an animal twice the size of a rat.

At São Thomé the impression was different ; true, the same *Euprepoenemis* was numerous and the same *Conocephalus* and *Xiphidium*, but an unfamiliar note was struck by another species of *Euprepoenemis*, handsome in a livery of rich dark green and yellow. Sweeping some shrubs produced half a dozen very immature green mantids, but I was lucky enough to take an adult, a female, sitting waiting its prey on a bunch of ornamental daisies in a wonderful garden ; it closely resembles *M. religiosa*, but the wings are strongly tinted with crimson : a striking difference is that, instead of the black spot on the inner face of the trochanters the whole of that surface of the segment is of a bright hedge-sparrow blue, the first time that I have noticed this colour in the Orthoptera. The lining of the femora has also a conspicuous dark spot ; neither of these colours are visible in the ordinary position of the forelegs, that is, when they are more or less closed like the blade of a clasp-knife ; to show them, the creature must extend and expand the

raptorial limbs; that they do this seems probable but I am not aware of any recorded observation on the point. Other species produced by sweeping grass were a *Tettix*, and a very small, fragile, pale buff cricket, *Nemobius* sp., which to me looked like a pale form of the variable and widely distributed *N. saussurei*, Burr, or *N. tartarus*, Sauss., which occurs through most of Asia and extends its range into eastern Europe.

The only opportunity I had of observing Orthoptera in any spot other than in the artificial forest was on the open yard of the headquarters of the great and wealthy plantation of Boa Entrada, which covers some twenty square kilometres of cultivation; it was raining as seems usual here, but on the wet ground in the finer intervals I picked up a pair of *Acrotylus patruelis*, H.S., another species familiar to us in southern Europe, but of Ethiopian origin, and a single Oedipodid, only in the nymph stage; this was unfortunate, as it is likely to be an interesting species.

Of course, in both islands the vegetation is of the most tropical, both in its amazing exuberance and in kind; the bananas, the mangroves, tamarinds, the Heveas and the *loquats* (*Friobotrya* = *Photinia*), the sugar-canes, the coffee and cinchona, the cocoa-nuts (*Cocos nucifera*), the cocoa-palms and lofty oil-palms (*Elaeis guineensis*) and the graceful *Friodendrum* towering above them, there is nothing suggestive of Europe in these, unless it be of the hothouses at Kew. The population, too, is mainly of African blacks, mostly from Angola, but in recent years there has been an influx from Mozambique; these are not so fine a people as the Angolans and may be distinguished by the ornamentation of their faces, consisting of rows of short parallel scars cut along the forehead and the cheeks. The birds too, at least at São Thomé, afford an exotic touch; I understand there are parrots there, which is quite likely, but we did not see them. I caught a glimpse of one sweet-voiced little creature, a small blackish bird with a white belly, about the size of a sparrow, with a long and slender curved beak; another, which looked like a pied flycatcher crossed with a wagtail flew up on to a telephone-wire at the headquarters of the plantation we visited; the most extraordinary feature was its immensely long tail, twice as long as the body or more, and it was not stiff, like most bird's tails, but wavy and seemed to be forked; it streamed in the air like a pennant when the pretty little creature flew up from the ground. The butterflies, too, at São Thomé, produce a much more exotic impression; we saw several very beautiful species, which I am sure I have often enough seen in collections and museums; they are probably common and familiar African forms, and there was certainly nothing European in the appearance of any of them.

Our visit to the islands was brief in the extreme and merely served to whet our palates; it is quite probable that insects in general and Orthoptera in particular of very great interest occur in the unspoilt regions and especially on the peaks; there is certainly one small apterous grasshopper, *Parathericles elephantulus*, Burr, described by me in 1899, one of that strange equatorial family the *Enmastacidæ*, which is most probably peculiar to the island. As far as I am aware only one specimen exists in collections, the type, now in the Vienna Museum. It was disappointing not to see the virgin forest on the equator; the last I had seen was on the edge of the Arctic, in northern Siberia, and

Pavel Stepanovitch was fresh from Chinese Turkestan and Tibet, so we were both well prepared for some striking impressions. However, it is better to be thankful for the brief moments ashore which were vouchsafed to us, and it were ungrateful indeed to grumble.

Miscellaneous Notes from Argentina. VIII.

By KENNETH J. HAYWARD, F.E.S.

THE LARVA OF *CHLORIDEA ARMIGERA*, Hb.—Length 32 mm.

Head olive brown, shiny, with blackish mouth parts.

Body pale green with fine longitudinal pale yellowish-white lines. A dorsal stripe consisting of a fine double black line. Dorsally on the forward portion of the abdominal segments a yellowish patch. Upper lateral area darker, the longitudinal lines being fewer on a slightly darker ground. The lower lateral area yellowish with some intermingling of the ground colour. Prominent black tubercles with grey setae. These are most prominent as follows. On the thoracic segments the anterior trapezoidals, and both anterior and posterior trapezoidals on the abdominal segments. Between these trapezoidals is a darker shade. A supra- and smaller post-spiracular on each segment. On the last segment a secondary tubercle on the dark shade above the spiracle and the darker area between the trapezoidals very black and prominent. The trapezoidals shaded laterally with a pinkish flush. The larva light green beneath.

Remained in the pupal state 15 days.

Foodplant *Eupatorium hecatanthum*, (DC) Back. (*Compositae*). Locally known as "Tempetary."

Imago and empty pupa case sent to B. M. Nat. Hist. under No. 7032.

THE EGG AND LARVA OF *EUDAMUS CATILLUS*, Cram.—Whilst in the forest at Villa Ana on February 7th (1926), I noticed a specimen of this insect behaving in a rather subdued manner, and watching it carefully concluded that it was ovipositing. After one or two fruitless searches I chanced on the foodplant and thereafter found the eggs in some abundance. Young larvae however defeated me for a time until I discovered their mode of living in a tiny tent made by eating partly around a section of the leaf and then turning it back on to the rest of the leaf and fixing it with a few strands of silk. The imagines were at that date very common, and as the larvae eventually hatched again in mid-March and there is a spring brood in September to October, the insect appears to have three distinct broods in this district.

Eggs.—The eggs are laid singly on the leaves of *Rhynchosia seuna*, Gill., usually on the underside, though this is by no means a hard and fast rule. Once the foodplant has been located the eggs are easily spotted owing to their light colour on the green leaves. The eggs appear to be laid near the edge of the leaf, but whether this is always the case, I do not know. The egg when first deposited is white in colour, round, of 1.10 mm. diameter, slightly flattened at the poles and ribbed between the poles bearing fourteen such ribs terminating at either pole on a slightly raised ring, which encloses a smooth surface, the surface of the egg outcurved between each rib. The eggs are

attached in place by means of the usual gummy substance. After laying, the egg rapidly becomes creamy in colour and by the end of the second day has become yellow. On the fourth day the centre of the egg becomes somewhat transparent, which process is continued very slowly till the eighth day, when the egg becomes much darker, the young larva emerging the 9th day. (This description for eggs of the February generation).

LARVA.—The young larva on emergence is about 2mm. long with a black head, the first thoracic segment being shiny, with an anterior band of jet black appearing like a collar, the remainder of the larva bright yellow. Commences feeding after about three hours, at first eating small holes through the leaf from above. Within the first day the young larva forms for itself a tent by eating inwards from the edge of the leaf for some distance and then bending the "flap" over and fixing it to the surface of the leaf with a few silk threads. The bending process is much assisted by the fact that the cut portion of the leaf tends to bend over inwards, due to the withering process it naturally undergoes. This habit of forming a tent continues throughout the life of the larva, though in later stages, when larger accommodation is necessary, it often draws two or more leaves together.

From the 7th to 9th day the larva undergoes its first change. Head dull black with an orange brown spot on either side above the mouth parts. First thoracic shiny, jet black on the dorsal area to just below the centre of the lateral area, the remainder of the segment deep orange yellow. Remainder of larva pale bluish green the alimentary canal showing bluish, a faintly defined upper lateral yellowish line, the larva closely covered with slightly raised yellowish speckling.

About the 18th day the larva again changes. The head is now much increased in size, being quite disproportionate to the rest of the larva, ochreous in colour at first with the mouth parts black with a solid inverted V of yellow immediately above, and with four dark blackish patches, the upper two larger and placed so as to appear as large eyes, the lower pair more oval and on the cheeks of the "false face." In a very short time the colouring of the head changes slightly, the yellow V becoming light brown and the ochreous of the remainder of the head chocolate brown. First thoracic of a dull earth colour, shiny, a saddle of yellow forwards dorsally and the segmental fold between it and the head ochreous, remainder and also underside and legs maroon. Second and third thoracic and abdominal segments pale yellowish green, shading lighter towards the anal end. A very fine central dorsal stripe of minute black spots, the whole body freely covered with similar spots. Commencing on the second thoracic and diminishing in size to the first abdominal and thereafter faintly indicated a yellow upper lateral line. The ground colour continues below this line over about half the lateral area then gradually merging into the greyish colour of the underside. Dorsally transverse on segment nine a raised shiny black ridge within the upper lateral lines. Forward of the 11th segment the body is circled by an indistinct double white hairline. The legs on both thoracic and abdominal segments except those on the first thoracic are yellow, the legs on the sixth abdominal with very developed hooks. Length of larva when entering this stage from 21 to 23 mm.

The larvae under observation entered yet another stage before pupating, the period elapsing between the last two changes being for some reason, possibly that of faulty feeding, very variable. The length now from 26 to 30 mm., the head yet larger but with the same markings. Head somewhat darker in colour, the V very dark brown, surface of head punctiform and the lower or "cheek" spots having five small pimples on their edges, four on the inner edge, the upper one at the apex and the lower one just below the half way, the fifth pimple on the outer side in line with the lower on the inside. Segmental fold to first thoracic, black. First thoracic reddish with a black shiny collar over dorsum extending about half way down over lateral area. Remainder of larva at first greenish khaki, a colouring that later gives way to a pinkish, almost mauve, colouring as the larva draws near to the time for pupation. The larva is covered somewhat closely with small, irregular, slightly raised, black spots. The upper lateral line formerly yellow now deep red-orange. Prolegs on first thoracic deep red whilst those on the other two thoracic segments as also the thoracic underside, orange-red. Remainder of underside lighter orange. Dorsally on the fifth abdominal a yellowish orange flush.

The orthodox tubercles as also the spiracles are very poorly defined and I was quite unable to find them with the magnifying power at my disposal, the larva examined being a spirit specimen after 24 hours immersion in 80% alcohol.

The full period of the larval state varied considerably, as I have mentioned above, but the period for those specimens that first pupated was 38 days. The larva reached a final length of 40 mm., pupating on the side of the breeding cage in a pupa covered with whitish "bloom." Emergence took place nine days after pupation, between nine o'clock and midday. Lack of time prevented my describing the pupa, a lapse which must be rectified next season.

Specimens have been forwarded to B.M. Nat. Hist under the following numbers. Eggs No. 6911. Larva No. 7039. (Unfortunately this specimen has shrunk to about half its size in the spirit). Empty pupae cases No. 7038. Imagines No. 7035. Foodplant. *Rhynchosia senna*, Gill. (*Leguminosae*), known locally as "Sen del zorro" (Fox senna).

Zygaenae, Grypocera and Rhopalocera of the Cottian Alps compared with other races.

By ROGER VERITY, M.D.

(Continued from Vol. XXXVIII., p. 176.)

Coenonympha arcania exerge arcania, L., race *parrinsubrica*, Vrtj. :—Oulx (end of June to mid-July, on the hedges of a shady path). Exerge *gardetta*, de Prun., = *phileta*, Hb. = *satyrion*, Esp., race *gardetta*, de Prun. : Clavières, on damp, grassy slopes; Sestrières, on peat-bog.

Coenonympha iphis race *bertolis*, de Prun. :—Sestrières, in company with preceding. De Prunner's description unmistakably refers to this species and the locality is "Castrum Delphinum." His name thus has more than a century of priority over that of *belisaria* given in 1910 by Oberthür (*Ét. Lép. Comp.*, IV., p. 17) to the same race from La

Grave (Hautes Alpes). Also *subalpina*, Reutti., of Baden, and *carpathica*, Horm., are based on descriptions, which afford no differential characters from *bertolis*. Considering the large number of striking races which have been neglected in other species, it is queer how this one has been favoured, whereas it varies geographically very little. The nymotypical race of Vienna is found as far south as Rome and *bertolis* is, more or less, that of all the mountain ranges of Western Europe. Form *anavagoras*, Assm., is an intermediate one, often prevalent in Central Europe. Race *anavarete*, Frhst., is a larger and less melanic form of *bertolis*, from the Moulinet, near Mentone, and *ecommatica*, Rebel., is a prominently marked one of nymotypical *iphis*, from Istria, but it seems to occur individually also elsewhere, because I have a Vienna specimen answering Rebel's description.

Aphantopus hyperantus race *rufilius*, Frhst.:—Oulx, by the lake (July 23rd). Intermediate in size between the small nymotypical *hyperantus* of Sweden and the giant race *maxima*, Vrty., described from Turin, it is a little smaller than true *rufilius* of S. Tyrol, but quite like it by the warm, saturated tone of underside.

Hyponephele lycaon race *lycosura*, Frhst.:—Oulx and Cesana (males from about the 7th of July: females from the 17th and a few still emerging at the beginning of August). I think I can safely refer this race to *lycosura* of the Maritime Alps, although Frühstorfer's descriptions are most confusing. The race of Oulx is similar to the one I have collected at the Baths of Valdieri in the Maritime Alps, from which it only differs in never producing the extreme *permagnocellata*, Trti. and Vrty., form of the female, with ocelli of a size never attained in any other race, except the Spanish *macrophthalma*, Frhst. At Oulx, as well as at Valdieri, however, the ocelli are on an average larger than in the nymotypical *lycaon* of northern Germany; they, notwithstanding, never exhibit the minute white pupil seen in the latter and the base of the wing is in most females much more broadly patched with fulvous; otherwise they both resemble very much nymotypical *lycaon*. The race I have from Zermatt and from Austria and which should be *ephisius*, Frhst., differs most strikingly from the latter by its much smaller size, frailer build, thinner scaling, lighter colouring on both surfaces and very broadly fulvous female, but Frühstorfer's description conveys nothing of the sort and Vorbrod't's is more like it, but not complete. The "type" of *ephisius* is from Courmayeur; presumably Zermatt must have been included by mistake in its habitat; its race is quite different and should be distinguished by another designation: **degener**, mihi.

Epinephele jurtina race *phormia*, Frhst.:—Oulx and Cesana (males already abundant at the end of June; females appeared at the beginning of July, but the mass only in August and freshly emerged ones were still met with on the 16th). The race is the large and brightly coloured one of the warmer valleys of the Alps, often producing the broadly fulvous female, which has been credited with the name of *hispulla*, Esp., in all the catalogues of that region, although there has never existed a specimen like the real *hispulla* of Portugal amongst them. The name of *subhispulla*, Strand (*Entom. Zeitschr.*, XXV., p. 254, 1912) is perhaps the right one to use for them, although the "type" is from Holland and may be less marked.

Erebia ligea race unknown:—Monfol—1600m. above Oulx (one female on August 15th).

Subspecies *philomela* race *etobyma*, Frhst.?:—Cesana (one fresh male on July 15th). It may belong to this race of the Maritime Alps, but it does not exhibit its broad red brown band nor its large eye-spots to their full extent, so that it points to the race of the Valais; this, however, occurs individually also in the Maritime Alps and it is impossible to judge of the race from one specimen.

E. epiphron race *cydaneus*, Frhst.:—Clavières (males all worn, females emerging on July 29th); Sestrières (one worn male on August 8th). This race agrees with the one of the Baths of Valdieri in the Maritime Alps and with Frühstorfer's description from the mountains near Mentone.

E. melampus race unknown:—One male above Oulx, with the following.

E. ceto race *ceto*, Hüb.:—Along the mule-path from Jouvenceau to Notre Dame des Broussailles, 1400m., above Oulx (both sexes emerging on July 2nd). Similar to the nymotypical race of the Valais, and thus different from the three very distinct races which surround it: *tyrsus*, Frhst., in the Upper Aosta Valley, *frenus*, Frhst., at very high altitudes to the west, in France, and *cetra*, Frhst., to the south, in the Maritime Alps. With *obscura*, Rätz, from the Laquintal, etc., they make no less than five striking races in the Western Alps, and the series of specimens in my collection fully confirm their distinctness.

E. tyndarus race **subcassioides**, mihi:—Sestrières, on peat-bog (both sexes emerging on August 8th); one fresh male at Oulx on August 12th which resembles *cleo*, Hb., by the nearly uniformly grey underside of hindwings, with a bright silvery gloss, but of a much darker tone of grey, with markings less effaced, an insect of smaller size: **paracleo**, mihi. Reverdin in his interesting paper (*Bull. Soc. Lépid. Genève*, I., June, 1908) on this species has pointed out that there exist two very distinct geographical forms, which are never found together; he states that even intermediate individuals are scarcely ever found. As compared with the generality of geographical variations in most species this remark is certainly worth making, because as a rule it is quite true that the local races of *tyndarus* fall quite distinctly either in the nymotypical *tyndarus* group or in the *cassioides* one, but intermediate individuals do occur and it will probably be found that even intermediate races are not too rare. The one I have collected at the altitude of 2035m., at Sestrières, affords a good example to record, and Oberthür records frequent transitions at Lanslebourg, in Savoy (*Ét. Lépid. Comp.*, III., p. 340). It is important to take note of their existence in connection with the question which will have to be settled as to whether the species has divided into two groups bearing different hereditary factors, or "exerges," or whether its variations are all simple races, only differing in aspect owing to the effects of local conditions during individual development. For the present this seems to be the case, because these transitions exist, because the two forms are distributed together, though locally separate, in all the Alpine area (whilst exerges are seen to inhabit different areas, only blending on the boundary between them), and finally because the two constitute together one series of variations, of which *tyndarus* covers the lesser and *cassioides* the greater degrees of development of the ocelli and other

features. Taken as a whole, the Sestrières race gives the impression of being a *cassioides* of small size and with unusually small ocelli, but many individuals have the wings more rounded in shape, as in *tyndarus* proper, and the underside is always of the darkly sprinkled, and dull grey type. I have a specimen of the same sort from 1900m. on Mount Spinale, in the Trent district. No doubt it is racial also there, just as the other races *aquitania*, Frhst., described from the Col di Tenda, *carmenta*, Frhst., from Courmayeur, nymotypical *cassioides*, Hohenw., from Pasterze in Upper Carinthia, *paracleo*. Vrty., of Oulx, *cleo*, Hüb., from the Tyrol, *murina*, Rev., from the Moléson in the Fribourg canton, which are, more or less, successive grades leading from *subcassioides* to the most extreme *cassioides* type of structure and pattern, constitute local races by keeping remarkably true to their grade in each locality, but are found in such conditions dotted about over most of the Alpine region.

E. neoridas race *epineoridas*, Trti. :—Oulx (first male on Aug. 3rd and then soon abundant: first females on Aug. 15th, so that with those of *N. statilinus* and with *P. megera*, they were the last Rhopalocera to appear). This race is noteworthy, because it is a giant as compared with *nicochares*, Frhst., of the Maritime Alps, and to all the other races, in the same way that at the foot of the Susa Valley one finds the largest known race of *E. aethiops*: *taurinorum*, Vrty. It might seem rather strange that *neoridas* should produce its most flourishing race in the very locality where no other *Erebia*, except *tyndarus*, seems capable of existing. The explanation probably is that these two species emerge and oviposit later than the others and are at the chrysalid and imago stages during the long summer drought, which is a feature of the Susa Valley, whereas the next generation of the other *Erebia*, at that time, has already emerged from the ova and the very young larvae need sprouts of grass, which do not exist at Oulx till later in the season.

Melanargia galathea race **pedemontii**, mihi. :—Oulx (males already abundant at the end of June; females from July 13th, and still emerging at the beginning of August). For some years after I had first seen the descriptions by Frühstorfer of numerous races of this species I confess I was considerably sceptic as to whether they were really distinct and their features could thus be fixed and defined. I set to work to procure series of specimens of each to ascertain the truth about them. The result was what I usually have found it to be in similar cases of hasty criticism: the man who has done the work with the proper materials before him is perfectly right and it is only ignorance on the part of others that makes them doubt it, and hinders progress in the knowledge of facts by false preconceptions, sustained by a lazy tendency to shrink from the effort of facing new complexities. Having made this effort, I found that the characteristics pointed out by Frühstorfer are perfectly correct and that one can summarise the geographical variation in the Alpine region as follows: In the Jura there is a race transitional between nymotypical *galathea* of Germany and the dwarf *pygmaea* of the Geneva district; in the Valais, at low altitudes, one finds the much larger *nerens* with more elongated wings; on the French watershed of the Western Alps race *doris* spreads from the Isère (Allevard) to the Basses Alpes (Digne). These races all belong to the nymotypical Group by the thin streaks and the light grey suffusion of underside. We next come to the large southern

Group with broader black markings above and thicker streaks and darker suffusion on underside, which consists of several races, all included, till Frühstorfer began distinguishing them, under the sweeping name of *procida*, Herbst. It seems hopeless to try and establish where the specimen originally so named came from, "Italy" being the only locality mentioned. Frühstorfer supposes the little Island of Procida is the most likely, but it seems more reasonable to make use of the term for the dark individual form of any race in which it may occur. In the Alpes Maritimes and in the Var one meets with the superb race described by Oberthür from la Turbie, figured as *procida* by Seitz, pl. 38, and named *akis* by Frühstorfer. On the southern watershed of the Simplon and in northern Tessin flies the handsome *florina*, which I have collected also at Vanzone, 700m., in the Anzasca Valley; I notice one of its peculiarities is the elongated shape of the wings in the male, as in *nerens*. In southern Tessin it is replaced by the smaller and darker *arogna*, with shorter, rounder wings; I have found it at Premeno, 800m. above lake Maggiore and at Montevecchio, 450m. on the last hills of the Brianza, in Lombardy. Finally on the eastern watershed of the Western Alps I have from Oulx, from Turin and from the Baths of Valdieri a race, which stands nearest to *arogna*, but which differs from it by its much greater sexual dimorphism: the males are rather smaller, the females, on an average, considerably larger; the females in many individuals exhibit a larger extent of blackish suffusion at the base of the wings, but, on the other hand, the marginal black band is very often broken by a complete row of white premarginal spaces; this feature is very prominent also in the females of *akis*, making it contrast sharply with its male. In the Eastern Alps *sakaria* of the low valleys of S. Tyrol belongs to the nymotypical Group and, in fact, is very much like *nerens*; the much smaller, but otherwise similar, race of high altitudes, which I have collected at the Mendola Pass and at Klobenstein, might be distinguished by the name of **microsakaria**, mihi. Specimens I have from Vetricolo 1500m. above Levico, are identical with my *microprocida* of S. Italy (*Ent. Rev.*, 1919, p. 125). From S. Stefano di Cadore, 900m., in the Carnic Alps, to the Carso, 300m. above Trieste, I have constantly met with exactly the same race *elriva*, with very marked *procida* features, described from Gorizia. From Wippach eastward there exists the most melanic race of the species: *tenebrosa*, described from Laibach. (Frühstorfer's descriptions of the races mentioned above are in the *Ent. Zeit.*, 1910, p. 240; in *Soc. Entom.* XXXI. (1916) n. 7, p. 33, in the *Archiv Naturg.*, 82 (1916), 2, p. 19 and 86 (1921), 9, p. 109.)

Satyrus megera race *viridior*, Vrtv.:—Oulx (the first males appeared on Aug. 17th, when I left the locality). No doubt the first generation *megera*, L., had been on the wing at the end of the spring and the second only emerges when the summer period of drought is over. The same phenomenon occurs in particularly hot and dry localities even further south, whereas there, in less dry ones, in which the grass is kept green by moisture in the soil, another generation is produced at the beginning of the summer, the first being then much earlier than at Oulx.

*See: R. Verity, "A Systematic Index of the races of Palearctic *Rhopalocera* described by H. Frühstorfer" in the "Archiv für Naturgeschichte," 91 (1925), Abt. A.9. Heft.

Notes of Collecting in Spain in 1925-26.

By DR. E. ROMEI.

Hesperia armoricanns, Ob.—This species which is so common and widespread in Italy, Catalonia and Asturias according to the data of our captures, and in most European countries according to Warren's references (*Mon. Tribe Hesp.*, p. 123), is instead very scarce in Serrania de Cuenca (Castile) where we collected some specimens from August 18th to September 12th, 1926.

The late emerging form from Cuenca, which I propose to distinguish by the name of **petheri** strikes one for its frail appearance. Above, less development of white spots in forewings and light areas in hindwings. Fringes hardly divided by darker nervures. Beneath, ground colour hindwings considerably lighter fulvous than in any Spanish specimen from Aragon and Asturias. Forewings ground colour much resembling Italian *tersa*, Vrty., being without rich brown shade of other Spanish races, so that white spots are in much less contrast.

Generally much nearer to Italian than other Spanish forms but always smaller expanse specially owing to the reduced size of the body.

Types in Wm. Pether's collection in London.

Adopaea lineola, O.—As in the case of *H. armoricanns* r. *petheri*, Romei, the *lineola* we have found near Jerez del Marquesado, in Sierra Nevada, strikes one for its frail build. It is no doubt the smallest known race of this species: males 21-23 mm., females 23-25 mm. Beside its dwarf size *lineola* from Sierra Nevada at the level of 3600ft, which I propose to name **hemmingi**, differs from the forms of other localities by the male androconia which are almost as sharply outlined as in *semicolon*, St. In the female sex the anal zone of the upperside of the hindwings is still less suffused with brown scaling than in the lightest females from Aragon and Castile. The fringes are whiter than in any other form of *lineola*.

A. lineola varies in a graduated way from Northern Spain to Northern Africa. In Catalonia we have collected a big race in which the hindwings are largely suffused with brown scales; in Aragon and Castile two forms are mixed, one resembles the Catalan race, the other is a transition to Andalusian *hemmingi*; this last is a transition to the African *semicolon*, which is a true subspecies of Central European *lineola* and to which *hemmingi* is an allied race.

Aricia medon, Hüfn.—In the *Ent. Rec.*, 1925, p. 25, we spoke about the phenomenon of two different forms living together at Albarracin. In 1925 we collected the dull form (*medon*) in alpine surroundings of Catalonia and the bright form (*crameri*) in the Catalan plain. During a trip which I made to Moncayo mass (Aragon) I collected *medon* at high level and *crameri* a little lower. Last year, in Serrania of Cuenca we have caught about 400 *medon* and 200 *cramera* living quite at the same spot and at the same time; the two forms might be easily distinguished even looking at specimens on the wing. Sexual dimorphism is remarkable in *medon* from Cuenca, while in *crameri* of the same spot males and females are identical on both sides.

In Andalusia we have met only with *crameri* with some individuals very like the true *crameri* from Canary Is. We have made some trips up to 7000ft. attempting to get *medon* but we have not found it

although this insect does live certainly in Sierra Nevada according to Rambur and Oberthür's data.

Agriades thetis, Rott.—It seems to be very scarce in Spain. We have collected a few specimens in Catalonia and Aragon, but they have not attracted our attention, being similar to the Italian ones.

In Serrania of Cuenca *thetis* began to emerge late in August; it is a frail insect, its body is small the shape of the wings is rounded. Above it resembles the smallest specimens of the Italian summer brood, which Verity named *etrusca*, the fringes are sharply divided by black dashes in a more prominent way than in *etrusca* and also along the hindwings.

Along the margin of the hindwings there are often a series of black spots as in the African *punctifera*, Ob.; the form *rubro-maculata*, Ob., often occurs. This Castilian race of *thetis*, which I propose to name **langhami**, is nothing else than a dwarf race* of the Algerian *punctifera* to which it is like also on underside which is brown with big and prominent black dots tidily outlined by a pure white ring; the orange lunules are yellowish and rather small. In my set there is an aberrant female in which the lunules, above, are exceptionally extensive and confluent. This abnormal female may perhaps be referred to the individual form *alfacariensis*, Ribbé.

The names used by Tutt and Muschamp to designate the small specimens which may occur everywhere can not be applied to this race from Central Spain which shows several peculiar characters and, save the constantly small size, is similar to the African *thetis*.

Agriades coridon, Poda.—In the *Ent. Rec.*, 1925, p. 37, we explained our views about this insect. Now I have to confirm that also in Serrania de Cuenca distinct forms are living together and that we have found not even one transitional specimen. At Cuenca, during the months of July and August, 1926, we have seen on the wings an immense number of the *thetis*-like insect which Verity named *caelestissima*. Mr. Turner writes us that the individuals from Cuenca are exactly like Dr. Chapman's *lilacina* and should be called by that name. In the big puzzle of *coridon* I will not enter in to the litigious question of nomenclature; I will give my data. Lord Rothschild, Mr. Bethune-Baker and Mr. Henning have so big a set of *coridon*-like specimens from Cuenca that I trust that in a short time British entomologists will speak about the problem.

Besides several thousand specimens of the small and showy form (*caelestissima* or *lilacina*?) we have collected several hundred individuals of the large and grey form which we named (*E.R.*, l.c.), *aragonensis* and 55 individuals of the most *coridon* type-like form, which look equal to the other 19 specimens we collected, in 1924, at Tramacastilla (Aragon) and which, in our paper, we named *caerulescens*.

The three different forms are well represented at Cuenca by a suitable number of specimens of each. We have separated the males with no difficulty while for the female sex we have some doubtful specimens. One must bear in mind however that it is not an easy task to separate the female sex of *coridon* and *thetis* in the spots where these two species live together.

In a trip to Montarco, 10 miles from Madrid, we made together

*Why name it then?—E.A.C.

with Prof. Candido Bolivar of the University of Madrid, we collected the most interesting race of the subspecies (or species?) *albicans*. The *coridon*-like form from Montarco is much smaller than *albicans* from Andalusia of which I have specimens caught by Mr. René Oberthür at Huejar, in 1870, and at Sierra de Alfakar, in 1879, they are also smaller than the smallest *arragonensis* from Sierra de Albarracin and Serrania de Cuenca. The brown pattern of the upperside is very reduced, the blue shading above is almost missing so that the fresh male looks to be a white butterfly. The female upperside is most characteristic because the brown tinge instead of being uniform, is interrupted by light and whitish spaces between the nervures.

The underside is clearer than in any other race and the orange lunules are very pale and reduced. I propose to name **bolivari** the race we have collected at Montarco early in July, 1926.

In 1925 we made a big collecting of *coridon*-like forms in Catalonia. In Catalan plain (Vallvidrera, S. Pere de Vilamajor, S. Antony and Llinas) an insect *hispana*-like emerges almost without interruption from May to October; some small specimens of the summer emergence are very like Herrich-Schäffer's type figure of *hispana*.

On the Eastern side of Montseny mass, 2000 to 4000ft., we met with true *coridon* only; at Seva, on the western side of Montseny and at Ribas, in Low Cerdanya we found *coridon* and *hispana* living together just as it occurs above Florence (*Ent. Rec.*, 1917, p. 241). At least we have separated, at first glance, both sexes of two different *Agriades*.

In High Cerdanya (Puigmal Molina) we have found a small form of *coridon* and no *hispana*.

We are always interested in the *coridon* enigma, but we have to recognise that we have not been able to reach a definite result.

I can summarise the data as follow, from my knowledge: In the high Apennines of Central Italy, Pyrenees mass and Cantabrian Mts, we have collected a pale-blue *coridon*-like insect *sibyllina*, Vrtý., *minute-punctata*, Vrtý., and *asturiensis*, Sag., which seems to be intermediate between true *coridon* and the *thetis*-like form of Central Spain but more allied to this last by the small size and the underside general pattern.

On the mountains above Florence, in Montseny mass (Catalonia) and in alpine surrounding in Aragon and Castile we have caught the *coridon*-type-like form (*apennina*, Z. in Italy), *arbonensis*, Vrtý., on Montseny and what I name *caerulescens* in Central Spain.

In the Tuscan and Catalan plains we found nothing else than *hispana*, H.S., while at middle altitude we meet *hispana* and *coridon* living together during summer.

In alpine surroundings of Sierra Alta (Aragon) only the *thetis*-like form (*caelestissima*, Vrtý.?, *lilaciua*, Tutt?); I do not know how to name that magnificent insect.

Near Albarracin (Aragon) the large and grey form which we named *arragonensis*, Gerh.

At Tramacastilla and in the environs of Cuenca, *coridon*, *arragonensis* and *caelestissima* live together and they are three quite different insects.

I conclude by saying that it is impossible that the above forms strikingly dissimilar and often living together can belong to the same species. I trust that in the future this will be proved either by dissection of genitalia or by breeding from ova. We regret not to be able to make these investigations.

SCIENTIFIC NOTES AND OBSERVATIONS.

FLIGHT OF *NEPTIS LUCILLA*, FAR.—In a garden here I have had the pleasure of watching the flight of this species for the last three weeks. There are several bushes of a cultivated *Spiraea* belonging to the *japonica* section and near some bushes of *Deutzia*; these latter are in flower. While the sun is out *N. lucilla* flutters continuously around and over these bushes, generally keeping from two to five feet above the ground. I have not seen it sail like a *Limnitis* but it often spreads its wings out, as if about to settle and bask in the sun, then on it goes without alighting. While on the wing it appears a purely black and white butterfly and it is only on the very rare occasions when it settles that one sees the beautiful colour of the underside. Like other butterflies when they meet they will fly around each other but they soon return to their up and down flight around and over the bushes. They appeared in the fourth week in May and were still on the wing when we left Levico in the fourth week of June. I presume that this species is single-brooded and that emergence is spread over a long period from May to the end of July. This garden lies about 1700 feet above sea-level and the weather was very hot.—ALFRED SICH (F.E.S.), Levico, June, 1927.

FALL OF A BUTTERFLY.—On June 15th, 1927, I was sitting under a lime about 6 p.m. and noticed a ♀ *Pieris brassicae* flying under the same tree above my head. It was evidently seeking a resting place for the night. After preliminary fluttering she selected a faded group of flowers. What exactly happened then I did not see but the next moment, straight down came the butterfly, with wings closed, still clinging to the flowers. She fell thus about six feet then opened her wings and flew off and the flowers fell at my feet. I may remind the reader that the blossoms of the lime are attached by their common stalk to the middle of a comparatively long and wide bract. In this instance the bract came down with the flowers and acted as a parachute, or rather kept, the whole combination in a perpendicular state, as the weight of the flowers plus that of the butterfly made the fall rapid. The closed wings of the insect appeared to cut the air like a knife and it may have required a special effort on the butterfly's part to open her wings during the fall. I have before seen butterflies settle on a flower that fell off with their weight, but then the insect immediately spread its wings and flew off and did not experience a real fall as that I have attempted to describe.—ALFRED SICH (F.E.S.), Levico. 1927.

CURRENT NOTES AND SHORT NOTICES.

CHANGE OF ADDRESS—Will all correspondents please note that after September 24th, my new permanent address will be

“LATEMAR,” WEST DRIVE, CHEAM (NEAR SUTTON, SURREY).

It is possible that the October number may be late as the marking of the proofs must await the arrangement of books and records for reference if necessary.—HY. J. TURNER.

We understand that early in the new year there will be started a

supplement to Vol. I. of Seitz "Palaeartic Rhopalocera." In the 18 years since Vol I. was published there has accumulated a vast amount of additional matter which needs collecting and collating.

The Fourth International Congress of Entomology, Ithaca, U.S.A., August, 1928. The Organising Committee is collecting funds for the assistance of a certain number of European members of the Congress who cannot afford the expenses of the voyage and who do not receive a grant from other sources. Entomologists, who wish to attend the Congress and to take advantage of this scheme are asked to apply for further particulars as early as possible to Dr. Karl Jordan, Zoological Museum, Tring (Herts).—K.J.

We are pleased to announce that arrangements have been made to publish as a supplement in October, November and December a revision of "A Brief Review of the Indigenous Coccidae of the British Islands," by E. Ernest Green, F.E.S., F.Z.S., a past President of the Entomological Society of London. By kind permission of the Council of the South London Entomological Society, in whose Proceedings the paper originally appeared, we shall be able to reproduce the four plates containing Mr. Green's excellent drawings of details. The supplement on British Noctuae will also be continued as the MS. is completed.

In the passing of G. C. Champion (1851-1927) the students of Coleoptera lose one of the most accomplished devotees of the order, and the Entomological Society one of its oldest members. He joined that body in 1871 and the following year helped to found the popular South London Society, of which at the time of his death he was an honorary member. On several occasions he was Vice-President of the Entomological Society and for 30 years he was responsible for the Library. Nearly four years he spent in the wilds of Central America collecting and studying the Fauna of that then practically unknown area, under the auspices of Col. Godman and Mr. Salvin who eventually published the famous *Biologia Centrali Americana* from the results of the various expeditions organised by them. On his return Champion was largely in charge of the material collected and did much in furthering the publication of the *Biologia*, subsequently joining the staff of the British Museum, when the collections were deposited at South Kensington. He was a keen collector of British Coleoptera and contributed regularly from 1868 to the *Ent. Mo. Mag.*, eventually joining the staff of its editors and finally, in 1910, became its editor-in-chief. He was A.L.S. (Associate of the Linnean Society) a coveted and honourable distinction, bestowed only upon a few, for meritorious service in the pursuit of natural science. He was a great personal friend of the late Dr. T. A. Chapman and often they spent continental holidays together, the results of which were published in the *Trans. Ent. Soc. Lond.* and other periodicals. Lately he had interested himself particularly in the Coleoptera of the Himalayas, the material being sent to him by his son, Mr. H. G. Champion.—H.J.T.

It is still impossible under the pressure on our limited space to give Reports of Societies, even as summaries. A great number of most interesting matters are dealt with at both the Entomological Society of London and at the South London Entomological Society of which we can only wish we could publish accounts. The latter Society has just

issued its Annual Proceedings for 1926 of 170 pages with eleven plates. We hope to issue a review later on.

A Meeting of the Entomological Club was held at "Hodeslea," Eastbourne, on June 25th, 1927, Mr. Robert Adkin in the chair. Members present—Mr. Robert Adkin, Mr. H. Donisthorpe, Professor E. B. Poulton, Mr. H. Willoughby-Ellis, Mr. W. J. Kaye. Visitors present—Dr. E. A. Cockayne, Capt. N. D. Riley, Mr. W. H. T. Tams, Mr. E. Step, Mr. A. E. Tonge. The guests arrived during the morning and were received by Mr. and Mrs. Adkin at "Hodeslea," when luncheon was served. In the afternoon the party visited the Downs and Beachy Head. The Club Meeting took place at 6 o'clock, when supper was served. The host extended his invitation for the week-end to those who were able to remain and accommodation was provided at "Hodeslea." On Sunday morning, an Entomological excursion by motor-car was made to Vert Woods near Laughton. The weather was rather dull and cold and few insects were collected, *Acidalia immorata*, however, was flying in its old haunts. During the afternoon and evening Mr. Adkin's large collections of British Lepidoptera and his Library were inspected with much pleasure. On Monday morning the party dispersed after having had a most enjoyable Meeting.

It might be interesting to Readers to know that the Entomological Club Collections have now been secured and are deposited temporarily in the Meeting Room of the Entomological Society of London, 41, Queen's Gate, and are available for inspection to Fellows of the Entomological Society of London by applying for the keys to the Assistant Librarian.—H.W.E.

Two Meetings of the Entomological Club were held at Oxford, July 16th-18th at the invitation of Professor Poulton and Dr. Harry Eltringham. Members present—Professor E. B. Poulton, Dr. Eltringham, Messrs. Robt. Adkin, H. Donisthorpe, H. Willoughby-Ellis, Jas. E. Collin, W. J. Kaye. Visitors present—Dr. Hugh Scott, Dr. C. A. Wiggins, Dr. Hanitsch, Prof. E. G. Waters, Commander J. J. Walker, Dr. F. A. Dixey, Messrs. E. S. Goodrich, L. W. Grensted, W. A. Lamborn, W. H. T. Tams, H. J. Turner, H. L. Andrewes, H. J. Wainwright. On Saturday afternoon the guests met at the Museum where they were received by Professor Poulton and Dr. Harry Eltringham and during a pleasant Entomological Conversazione tea was dispensed by Mrs. Poulton. In the evening a Meeting of the Club was held at Jesus College, Professor E. B. Poulton in the Chair. Accommodation was provided at Wadham College for Members and guests who were able to stay the week-end. On Sunday morning various Entomological excursions were organised. The weather was somewhat dull but several interesting captures were made. After luncheon at Wadham College, the annual picnic was arranged in boats on the River Cherwell, and as the weather greatly improved, a very enjoyable time was spent. In the evening a Meeting of the Entomological Club was held at Wadham College, Dr. Harry Eltringham in the chair, after which the usual business meeting of the Club was conducted. The guests retired at a late hour after spending a very enjoyable evening. Several of the party remained to work at the Museum during Monday morning and the whole party dispersed before luncheon.—H.W.E.

EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. H. J. TURNER, "Latemar," West Drive, Cheam.

Duplicates.—Several hundred species of Coleoptera (carded) from Hants and Dorset, including several rare species from the New Forest, etc.

Desiderata.—Scarce and local British Coleoptera (carded).—*A. Ford, 42, Irving Road, Bournemouth, Hants.*

Duplicates.—British Lepidoptera, many species.

Desiderata.—Back volumes of Trans. Ent. Soc. Lond., and entomological magazines, bound or unbound.—*Fredk. J. Killington, 177, Leigh Road, Eastleigh.*

Desiderata.—British Coleoptera, especially Chrysomelidae.

Duplicates.—West Virginia Coleoptera and Lepidoptera.—*Paul N. Musgrave, 601, Walnut Avenue, Fairmount, West Virginia, U.S.A.*

Desiderata.—Ova or pupae of *christyi*, *abruptaria* v. *brunnea*, *black consonaria* and *bidentata*, *extensaria*, *curzoni*, *jasionata*, *venosata* (Shtetl.) and other melanic Geometers and Noctuae.

Duplicates.—Very many in first class condition, high-set only f. i. *Herminia flavicrinis*, *Andreas*, *Nych. dalmatina* race *andreaaria*, *Warnecke*, about 30 species of rare *Acidalias*; pupae of *Eupithecia illuminata* or *cash*.—*Karl Andreas, Wiesbaden, Goethestr. 23, Germany.*

Duplicates.—*P. apollo nevadensis* and rare Palaearctic Rhopalocera, also African Danaidae, Charaxes and Hypolimnas.

Desiderata.—Many rarer and few common species Rhopalocera. European only.—*W. G. Pether, 4, Willowbridge Road, London, N.1.*

Duplicates.—Fine bred *prunaria grossulariata* varieties and many other species.

Desiderata.—Ova of *truncata* and *citrata*.—*Rev. G. H. Raynor, The Lilacs, Brampton, Huntingdon.*

Entomologist in out of way part of world desires exchange entom. literature—especially current works on classification, anatomy, heredity, etc.—for papered insects from Argentine Chaco. Will give double rate for Camb. Nat. Hist. (Insects), Hudson's Nat. in La Plata, and special for Ridgeway's Colour Charts. Basis butterflies or moths 20/- per 100 papers, coll. 35 butterflies all different 10/-, other orders by arrangement. Or will sell for cash to enable purchase. Lists to *K. J. Hayward, Villa Ana, F.C.P.S.F., Argentine.*

Mr. M. R. SMITH, A. and M. College, is anxious to know where he can obtain any of Emery's papers on North American ants; and also to know of any Europeans who would like to exchange separates and correspondence with him concerning ants.

Signor ALFREDO FAZ, Calle Bandera 714, Santiago Chili, is willing to exchange first class Chilean Coleoptera, especially *Carabus*, sps., for striking Coleoptera from all parts of the World.

Wanted.—To correspond with some Entomologist resident in Scotland, Ireland, or the Isle of Man who is interested in Noctuae and vars. with a view to exchange of species and forms.—*A. J. Wightman, "Aurago," West Chiltington Common, Pillborough, Sussex.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 5th, 19th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. September 22nd. October 13th.—*Hon. Sec.*, Stanley Edwards 15, St. German's Place, Blackheath, S.E.3.

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CHANGE OF ADDRESS.—Hy. J. Turner (from Sept. 22nd), from 98, Drakefell Road, New Cross, S.E.14, to "Latemar," West Drive, Cheam: C. B. Williams, from Ministry of Agriculture, Cairo, Egypt, to Research Institute, Amani, Tanga, Tanganyika.

Communications have been received from or have been promised by Messrs. Dr. Verity, H. J. Turner, K. J. Hayward, C. J. Wainwright, A. H. Martineau, W. H. Edwards, J. S. Taylor, Lieut. E. B. Ashby, A. Sich, Dr. Malcolm Burr, G. T. Bethune-Baker, Signor Querci, Dr. Romei, E. E. Green, and Reports of Societies.

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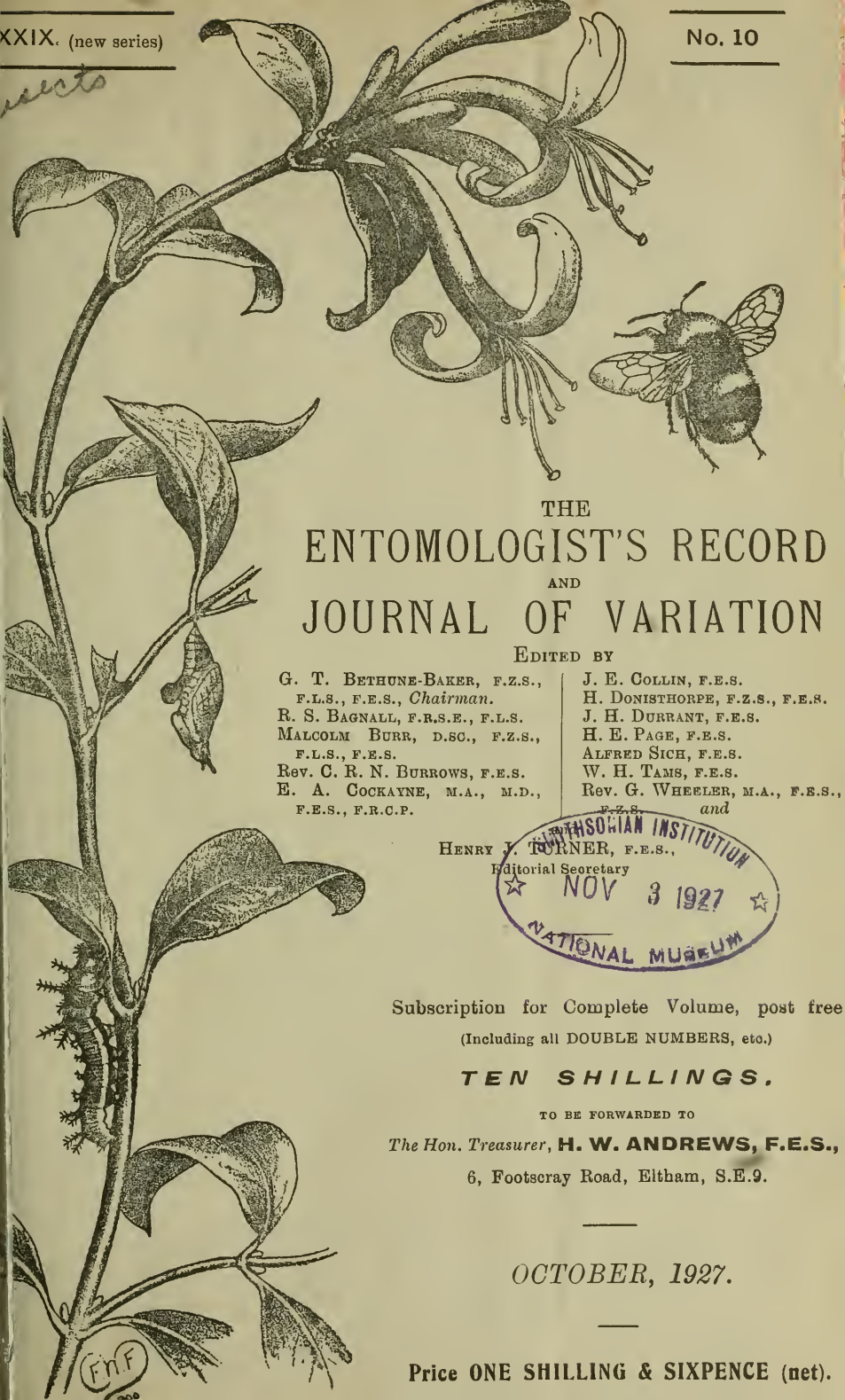
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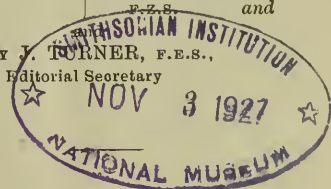
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JOURNAL OF VARIATION

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Notes on Egyptian Lepidoptera
observed at

Reservoir Aswan, 1919-1922.

By KENNETH J. HAYWARD, F.E.S.

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Field Notes from Angola.

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

I. LOANDA. FIRST IMPRESSIONS.

Our boat, the good ship "Nyassa," once German but now Portuguese, put in at Loanda, the capital of the Portuguese colony of Angola, on April 19th, 1927, and we were able to get a couple of days ashore and make excursions to the high ground outside the town.

Loanda is one of the older cities of Africa, and the houses are substantially built in the Portuguese style, with upstairs rooms opening on to a balcony that surrounds the *patio*; I had hoped that the strong illumination and the flowers in this courtyard would attract insects, but was disappointed, though at the same time relieved to find no need for applied entomology in the bedrooms.

The country outside is a gently undulating, green plain, my first view of the characteristic scenery of the great savannahs of Africa. The scattered and bushy trees gave the impression of an English park, but, of course, the few Euphorbias and the numerous baobabs gave a distinctive appearance. The latter tree, *Adamsonia digitalis*, looks like gigantic seakale; the smooth bulbous trunk is very pale, and in the distance looks white, while the top is tufty and green; from several of them there hung great pods, about a foot long, green, heavy, hard and woody, and, I believe, quite useless. The bark is valuable for paper-making.

The grass is rank and long; we are approaching the end of the rainy season and everything is fresh, green and moist. Orthoptera are numerous but about half the specimens are not yet mature. Two or three species similar to *Stenobothrus* are common; one is a very elegant little fellow, somewhat recalling *Omocestus rufipes*, with pale white band on antennae and black markings on the body, and about the commonest; another prominent fellow is big for this group, pale buff in colour, like some south European forms of *Ch. pulvinatus*, with distinctive orange posterior tibiae and orange-red lining to posterior femora. One of my first captures was a handsome Phaneropterid of the size of an *Acrometopa*, but quite different; the elytra are rounded at the tips and have wide and even reticulation in the male, evidently forming a fine sounding-board; the ovipositor is gently curved and long for this group. A small *Phaneroptera*, probably *Ph. nana*, was common in the grass. Other species with a familiar appearance were a grey *Epacromia*, in appearance and habits resembling the common *E. strepens*, dashing vigorously to light in the town and even on the ship at some considerable distance from the shore; it is of a grey colour, with no red. Another good-looking Truxalid is *Paracinema tricolor*, or something very like it; it is an African species that extends its range to the southern extremities of Europe. A small Truxalid with ensiform antennae recalled *Ochrilidia*, while one of the commonest was, to my eye and memory, indistinguishable from *Acrida turrita*; a female came clumsily dashing to light in the town in the evening.

The *Oedipodidae* were feebly represented in this grass country; I found one or two of what seems to be an *Acrotylus* with pale blue wings, and one handsome fellow, with pronotum keeled and ribbed and

OCTOBER 15TH, 1927.

acute posteriorly, with wings crimson at the base and a well-marked black fascia.

There was little stridulation, perhaps owing to the lowering sky, sprinkling drizzle and feel of thunder in the air, which usually encourages some Locustids to song, but not the Acridians who prefer the sunshine. However I heard one note that seemed reminiscent of *Chorthippus parallelus* and traced it down to a blade of grass which seemed somewhat thicker about the middle. This thickening was a brownish grasshopper of extreme elongation (probably, a *Mesopsis* sp.), the head and ensiform antennae were that of *Acrida*, and the last abdominal segment is produced into a long point, as in immature *Acrida*; the colour is greyish brown and the wings are smoky and considerably shorter than the body; its appearance closely resembles *Acrida* but the legs are short, including the hinder pair, and there is a small compressed tubercle on the prosternum suggestive of Acridiid and not Truxalid affinities. I took two males and a female and also a larva which is pale green.

In the Acridians, two big locusts, *Cyrtacanthacris*, one pair of a marbled and banded grey uniform; the spines of the posterior tibiae are striking, being white, then bright red and then tipped with black; the other species is mainly green, banded with black and yellow; in this case the spines of the posterior tibiae are tipped with black. Another Acridian with a flattened head and pronotum looked like a fully-winged Podismid, but the strangest of all was a species recalling *Paracaloptenus*, with wings shorter than the body and pronotum banded with black and pale; this was not very numerous and I took only a couple of females and a single male; it is the latter which is remarkable owing to the very unusual form of the antennae, in which eight of the segments have a triangular flattened lobe, increasing in size to a maximum and then rapidly reducing; the effect is that the antennae are strongly crenate, a phenomenon I have not before seen in the Orthoptera.

The Conocephalids were represented by two, or perhaps three, species of *Xiphidium*; one, which was the commonest, recalls our *X. dorsale* with its abbreviated wings, but the apex of the abdomen is bright orange, making it rather conspicuous in the grass; it seems to be the same species that I took at Principé and São Thomé; I associate with it a female with fully developed wings and elytra and, for this genus, a moderately long ovipositor. Another species, also fairly common, was greyish, with a relatively short ovipositor.

Crickets were in evidence towards dusk, and their chirping resounded, but I was not able to see any; I heard notes distinctive of *Gryllus* and of *Gryllotalpa*, but the only Gryllids I saw or took were a few *Oecanthus* just like our familiar south European *O. pellucens*.

Of Blattids I saw but two, a yellowish brown fellow, apparently a Phyllodromiid; if so, it was living up to its name for I found it when sweeping thick shrubs covered with creepers like bryony, and a whole flock of white butterflies, marbled with green underneath, were playing up and down by it and occasionally settling.

Mantids were represented by two species resembling *Ameles*, one with bluntly pointed eyes and fully developed wings, the other with rounded eyes and elytra reduced to mere rudimentary flaps, so that at first I took it for a larva; adult specimens were not by any means

numerous, but I took a pair of *Empusa*; these quaint creatures are fully developed as early as May in the south of Europe, while the Mantids proper do not reach maturity till the late summer. I saw one immature green one, seemingly *Mantis*.

While picking up the *Empusa* among long grass, with a few dead twigs around, I was delighted to see one of the thinnest of the twigs move; I touched it and it froze; it was a Phasmid of extreme tenuity and delicacy which would certainly have escaped my eye if it had remained motionless.

In two afternoons I had taken twenty-five species of Orthoptera, not a very large number when we think of the wealth of the Ethiopian fauna. What struck me most was the absence of any species of strikingly exotic form; the slender Phasmid of course must be a typically African species, and very likely has a restricted range, but we have Phasmids, and very thin ones too, in southern Europe. The grasshopper with the crenate antennae was strange too, but apart from this feature, it had nothing very foreign in its appearance. The *Acerida*, *Stenobothrus*, *Epacromia*, *Phaneroptera* and some of the *Xiphidium* all had a very homely appearance; the big *Phaneroptera*, it is true, is a distinctive form, but no more exotic in appearance than our *Acrometopa*, and the *Ameles* and *Empusa* are quite familiar to collectors in the Mediterranean. The most exotic species were the two handsome *Cyrtacanthoeris*.

But if the Orthoptera did not strike one as being a foreign assemblage, other orders did. Butterflies were not very numerous but were different from anything I have seen in any part of Europe; they seemed vaguely familiar from museums and collections, but the various Pierids, including an out-size orange-tip, and some Vanessids gave quite an exotic touch to the scene, as did a strange beetle, with elytra flattened and strongly broadened out, brown, tipped with black, so that it looked like a moth when settled on a shrub; I have seen him in collections but he provided the longed-for local colour, as did a pretty and delicate Homopteron pale grey speckled with black, with light blue wings and long extended snout. But I have no doubt we shall get plenty of local colour before long and may even get tired of it. At Loanda it was chiefly supplied by the niggers and the baobabs.

It was interesting to note that a fairly extensive insect fauna flew on board to light; we were moored at a good distance from the shore, quite a mile, but the vessel was brilliantly illuminated. Numerous creatures were attracted and sat prominently on the fresh white paint. Of Orthoptera, an *Epacromia* did not surprise me, as I was accustomed to him as a night-flyer in the Caucasus, though one hardly associates the grasshoppers with nocturnal habits: the Locustids, of course, are largely vespertine or nocturnal, but I hardly expected to find *Xiphidium* addicted to long night flights, yet I took three on the boat after dark; all three were females, closely resembling *X. fuscum*, and this fact further encourages me to think that it is the female of the brachypterous male with the orange-tipped abdomen. Other visitors were a number of small ants with wings and a few Pentatomid and other Rhynchota, but no beetles nor Hymenoptera.

In a previous letter I have referred to the brilliant pale blue coloration of the interior, and usually concealed, surface of the trochanters of the fore-limbs in *Mantis*. The same phenomenon is fairly

general in the praying-insects; in the *Empusa* taken at Loanda they are red near the base, dotted with white spots; these die out as the red passes into deep indigo, shading off to black, but with the same bright blue of the hedge-sparrow tint showing clearly at the sides.

There were few insects around the bright lamps in the streets and gardens in the town at night, nor was there as much stridulation as I expected; there was one that to my ear was indistinguishable from the chirp of our familiar *Locusta viridissima* and on two trees another very distinctive and to me quite unfamiliar voice; it was a single metallic note, repeated at short periodic intervals; it was impossible to locate the performer at night in thick foliage of a big tree, and doubtless a very active customer. I hope that with luck and patience I may be able to identify it and run it down to the musician which may be a familiar creature, but in this the element of chance plays a great part; it took me many years to identify the common *Phaneroptera* of Europe with its gentle, and to many people inaudible, *tss tss tss*, to be heard in south Europe among the trees on dark still evenings.

Of other forms of animal life we did not see much; small lizards were common among the grass and Pavel Stepanovich saw a large *Agama*. Birds were not numerous; the commonest was a crow with white neck and belly, but on one tree we watched a bird that looked like a whitethroat but as big as a thrush feeding its young as big as itself. Gulls with black backs and wings hawked around the boat, and a flock of cranes or storks was visible through the fog of an advancing storm.

(To be continued.)

Notes of Collecting in Spain in 1925-26

By DR. E. ROMEL.

(Concluded from page 129.)

STRYMON SPINI, Schiff.—The race from Serrania of Cuenca, during the month of July, can be referred to *bojilli*, Sag., the white lines and red spots of the underside being as reduced in extent as in *bojilli* from Aragon. However the form *lynceus*, F., is more frequently found at Cuenca than at Albarracín.

Amongst the *spini* we have collected at Cuenca, we have found two aberrations which are now in Wm. Pether's collection in London. Mr. Pether has sent me the description of them which I may publish here:

ab. **fusca-extensa** (subtus), Pether. Blue patch entirely suffused with black scales.

ab. **albo-extensa** (subtus), Pether. White lines crossing hindwings developed outward into broad band, extending beyond the antemarginal black and orange spots and blue patch at usual angle. In this beautiful aberration the white band of the underside of the hindwings is more extensive and the red spots more reduced than in the ab. *albosparsa* as it is figured by Oberthür (*Lep. comp.* IV, f. 401).

ZERYNTHIA RUMINA, L.—In May, 1925, I collected a few specimens at high level, 4000 up to 5000ft., in Sierra Nevada. Expanse under

average 38-42 mm. Ground colour between type and *castiliana*, Rühl, much deeper than *medesicaste*, Ill. Black spots prominently red centered as in *medesicaste* but differing from this form in having all black markings well developed; this black being well powdered with scales of a clearer white rather than of a blueish tint as in the type form.

Red submarginal spots in hind-wings differ from *castiliana* in being completely backed by a solid black band. *Castiliana* have this black band distinctly divided by yellow of ground colour each side of black veins.

Quoting the specimens of the type series in Wm. Pether's collection, the tone of red marking varies as follows; very deep (Nos. 559 and 690), shaded with lighter (No. 691), much paler (No. 558).

I propose to distinguish by the name of **petheri** this form from alpine surroundings in Sierra Nevada. Two specimens sent to Mr. Pether by Bang-Haas as *nana* (a commercial name) ex Malaga exactly agree with *petheri* except in the smaller development, in size, of the red spots.

COENONYMPHA IPHIOIDES, St.—Dr. Otto Bang-Haas has notified to us that the type specimen in Staudinger's collection was caught at S. Idelfonso. It seems that the nymotypical form is widespread all over Castile, because our *iphioides* from Cuenca do not differ from those of Western Castile we have seen in the Museum of Madrid.

Instead the specimens of *iphioides* we collected in July, 1924, near Sierra Alta (Teruel) in Aragon, differ in a constant way from the Castilian ones. Not even one of my large series from Aragon is like any individual from Castile so that I propose to name **pearsoni** the subspecies from Sierra Alta above Orihuela del Tremedal.

Pearsoni is always much smaller than nymotypical *iphioides*; the whole underside is thickly suffused with brown scaling, the yellow ring around the ocelli is thinner, the silver line of the underside of the hind-wings, which is well marked in Castilian specimens is either faint or missing in Aragon. The ocelli of the underside of the hindwings are not so regularly disposed as in nymotypical *iphioides*; they are set almost as in *amyntus*, Poda (1761) = *iphis*, S.V. (1775).

According to my opinion *pearsoni* from Aragon is a transition between *iphioides* from Castile and *amyntus* from Central Europe.

EREBIA ZAPATERI, Ob.—I have long series from Aragon and Castile. The Castilian specimens look duller than those from Aragon, but I think this is due to the fact that the individuals from Sierra Alta were caught in 1924 while the ones from the Province of Cuenca are two years younger, having been collected in 1926.

E. zapateri is very abundant in the Serrania of Cuenca at the level of 4200ft., above Tragacete; lower, at the level of about 3500ft., the species is much scarcer and the apical ocelli have a tendency to be reduced. This tendency is so marked that in some extreme forms the lowest spot of the left wing is missing. I propose to name **castiliana** the most common form of the Serrania of Cuenca at low altitude in which the apical spots are either very small or partially missing.

Among the individuals from Sierra Alta, whence came Oberthür's type, we observe the opposite tendency. Mr. Pether has sent me the description of some aberrations.

ab. **excessa**, Pether.—First and second apical spot followed by a

third which is smaller, not white centered. On underside there is also an extra (blind) black spot corresponding in position with fourth above.

ab. **lutescens**, Pether.—Brownish-yellow area in fore-wings replaced by very pale buff above and below.

ab. **argenteopunctata**, Pether.—Area of black apical spots replaced by translucent silvery, faintly tinged with black and white centered, above and below.

HIPPARCHIA HIPPOLYTE, Esp.—I propose to name **williamsi** the true subspecies we have caught at Puerto del Lobo, 5000ft., in Sierra Nevada. The underside of the hindwings, which is of an almost uniform tinge in Eastern forms, is instead nicely variegated in Andalusia. Every Andalusian specimen differs in a striking way both from Russian types and other Oriental forms. Esper and Hübner figured Eastern individuals, while Herrich-Schäffer represents *williamsi* perfectly.

A Note on a curious aberration of *Euxoa segetis*, Schiff. (*segetum*), and on the so-called ab. *subgothica* of *Euxoa tritici*, L.

By W. PARKINSON CURTIS, F.E.S.

In the summer of 1907 I was collecting for an extended period in the Isle of Purbeck, and on July 1st I captured a very pale specimen (No. 18523 coll. mihi) of *Euxoa segetis*, Schiff. I had on the preceding June captured an *Euxoa* in company with *Euxoa cinerea* ab. *tephrina*, Stgr., which in the field I had referred to *Euxoa cinerea*, without hesitation. That specimen has occupied several positions in my collection since and I have always felt very uneasy about its determination. On the division of the spoils for the 1907 season No. 18523 fell to my brother's share and the other No. 5310 coll. mihi, to mine. Having recently acquired the whole of my brother's collection, which included fine series of many of the British Agrotids I have been incorporating that collection with my own. This led me to a further examination of No. 5310 and to still further dissatisfaction with its determination. A few days ago I had an opportunity of submitting it to a joint critical examination by Mr. W. H. T. Tams and myself and to a careful comparison with the species of *Euxoa* in the National Collection. We both came to the conclusion that it was an undersized and unusually sparsely marked specimen of *E. segetis*, Schiff., a ♂ with a curious feature of great reduction in the development of the reniform stigma. There is no specimen as small, nor any exactly like it in the National Collection, but there are two that bear a resemblance. One a specimen from Cyprus and the other, which, but for its larger size, is strikingly like it from a Central Asiatic locality ex the Leech Collection. Herein lies the special interest of No. 18523, which is normal in size, but is as near true ab. *pallida*, Stgr. as possible and *pallida* is a Central Asiatic form. It piques my curiosity that the only two notable abs. of *Euxoa segetis*, which have fallen to my hunting should have been Central Asiatic in facies and captured within a couple of hundred yards of one another with an interval of three weeks between the captures. What were the weather conditions in the winter of 1906-1907 that produced a Central Asiatic appearance in two insects in Southern England? The slight

notes that I have of that winter shew, that in Poole Harbour there was a rather unusual abundance in the Autumn of waders and wildfowl, which we usually associate with cold weather further North, and my recollection is that sport was rather unusually good that winter. Recollection is not much to go on, but in this case it is sharpened by the fact that in the October, whilst out in my gunning punt, I got the full benefit of the recoil of a heavy stanchion gun in the mouth owing to slack gun ropes, and the damage to my front teeth was visible and permanent. Anyone with a like experience will bear me out in the statement, that a smack in the mouth of that description is a vivid memory aid superior even to Pelmanism. The following is a short description of the specimen and as it is probably not likely to be repeated it is not worth while giving it a name.

Sex ♂. Exp. 32 mm. measured from the right apex to the centre of the thorax and out to the left apex. Normal *segetis* measured thus run from 42 to 46 mm. The general tone of colour is greyish putty-colour much the tone that would be obtained by mixing raw sienna, lampblack and yellow ochre with a good body of flake white. The thoracic hairs are a colder tone, the abdomen matches the fore-wings. The pectus is clothed with nearly white hairs. The forewings are a little glossy and but for a few sparse and ill-defined sepia patches of scaling of very small area devoid of any marking basad from the antemedial line. The antemedial line is well-defined, but is visually not double. It is just possible with a lens to trace a few scales here and there proximad shewing the course of the normal limit of the inside of the double line.

What there is of the claviform is entirely detached from the antemedial line, it consists of a very small area barely darker than the ground with just a sensation of a definition in sepia scales above and below. The orbicular is very small, only just marked and has part of an annulus distad consisting of 6 single sepia scales at wide intervals.

There is no central shade. There is a dark mark on the costa above and just before the reniform followed by a second where the postmedial line rises; the reniform consists of a small almost circular area of the ground colour barely enclosed; with a small patch of sepia brown scales above and a larger patch below, but the whole marking is quite insignificant.

The postmedial is a single festooned line following the normal course, of sepia brown scales sharply defined but exceedingly tenuous. The apical dark marks on the costa are scarcely visible.

Of the subterminal line and the terminal shade there is barely a trace, but the usual interneural black incisions on the termen are quite conspicuous.

The hindwings are bluish pearly white very slightly semihyaline and glossy; the principal nervures are defined in very pale brown. The termen is defined with a very narrow but firm brown line and there are a few brown scales in the apical area. The specimen is a little worn.

Locality Purbeck, Dorset. Date 8.VI.1907. Captor W. Parkinson Curtis.

The same cause, *viz.*, the said acquisition of Agrotids above referred to led me to consider the named aberrations of *Euvoa tritici*, L., and also led me to the conclusion that the very general use of ab. *subgothica*,

Haw., as a name for any aberration of *tritici* is wrong and here I must confess that I lay the blame for the confusion on the late J. W. Tutt. My conclusions in the matter leave me a little bewildered as to why such an able and careful worker should have ensnared himself and others by an *a priori* argument, when he could have had access to Haworth's type.

I am presuming that the specimen standing in the National Collection as Haworth's type is in fact the type and I know not the slightest reason for supposing that the authenticity of that specimen leaves any room for doubt at all.

Haworth's type is the North American species *jaculifera*, Gn. It is very unlike *tritici*, and it is not an *Euroa* but a *Feltia* as Sir G. F. Hampson has treated it in his *Cat. Phal. Lep.* IV., p. 345. The only thing that I do disagree with Sir G. F. Hampson over in his treatment of the species is that he states 'the British localities of the older authors are erroneous.'

The older authors very circumstantially state the place of capture and captor of at least one specimen and why should they not be believed? Other American insects occur in this country. I have seen *Danais archippus* on the wing once at Swanage and once at Poole Quay at a time when Canadian and American hay was being freely brought into the port.

At the time W. Raddon is stated to have captured *subgothica* at Barnstaple the West of England ports had a thriving trade with America and large fleets of small wind jammers—Poole had for example. Accidental importation was a very likely possibility and it is not long ago that an American Amatid was caught flying down the High Street of Marlborough, Wilts. Personally I am a little chary of contradicting others about locality records without exceptionally good grounds for it. I have had too many of my own records contradicted by some pragmatical pundit and have had the trouble of ramming an incontrovertible fact down a reluctant throat.

Staudinger in his *Cat. Pal. Lep.* I., p. 150, No. 1375 gives the synonymy:—

subgothica, Haw., *Lep. Brit.*, p. 224.

As above stated this is *subgothica* = *jaculifera* the American species. *subgothica*, Steph., II., p. 126, pl. 22 f.3.

This figure and the letterpress leave not the slightest doubt that the insect referred to is Haworth's species.

subgothica, Tutt., *Brit. Noct.*, II., p. 43.

This from Tutt's own letterpress refers to an ab. of *tritici* since he specifically argues that the early authors had confounded the ab. with which he was dealing with the American species which he suggests should be *subgothica*, Grote, and states the American authors to be in error.

subgothica, Barr., *Brit. Lep.*, III. sp. 351. pl. 133, f.2.

Barrett's plate and letterpress both relate to true *subgothica*, Haw., and he states that latterly British authors have ignored this species as British.

Humphreys and Westwood, *British Moths*, I., p. 123, pl. 24, fig. 1, is true *subgothica* and they quote Haworth; Curtis; Stephens *l.c.*; and Wood's *Inder Ent.*, pl. 9, f. 149. The copy of Humphreys and Westwood, which is before me is a very good figure, but a little pale;

it however shows the rosy tone of *jaculifera*, which has the rich ruddiness of *Agrotis ditrapezinum* or *A. brunnea*. All these authors save Tutt dwell on the high development of the claviform, or as the early authors called it, the teliform stigma. As a matter of fact in true *subgothica* the interneural space between vein 1 and the cell and vein 2 is almost wholly dark (at any rate basad) cut across very strikingly by the pale basal and antemedial lines. I have seen many *tritici*, (my own series is over a 100), and I have never seen one with anything approaching this marking. Culot's figure referred to below certainly does not show it.

Hampson, op. cit., pp. 293 and 345 ignores all reference to Tutt's *British Noctuae*.

Unfortunately the result of Tutt's treatment of *subgothica*, Haw., is that Staudinger, in his turn following Tutt, has led Culot astray in his beautiful work Vol. 1, p. 77, pl. 12, fig. 11 pl. 12, fig. 13, where he figures specimens of *tritici* as *subgothica*, Haw., which they are not, nor are they at all like it.

The only way to get the matter cleared for the future is to give a new name to *subgothica*, Tutt, and I propose the name **pseudogothica** for it, since until it is rechristened, the aberration of *tritici* will still be sometimes called *subgothica* and the confusion will grow.

The synonymy will then stand as follows—*F. subgothica*, Haw.; Curtis; Steph; Wood; Humphrey and Westwood; Hampson; Packd.; Saunders. = *jaculifera*, Gn.; Smith. = *tricolor*, Lintner. *F. tritici* ab. *pseudogothica*, mihi. = *subgothica*, Tutt; Stdgr.; Culot.

A Note on some South African Lepidoptera of Economic Importance with especial reference to the Eastern Transvaal.

By J. SNEYD TAYLOR, M.A., D.I.C. (*Cotton Entomologist, Union Department of Agriculture.*)

Among the minor pests of cotton in the Eastern Transvaal are a number of leaf-feeding Lepidopterous larvae. Perhaps the most important of these is *Cosmophila auragoides*, Hbn. (formerly *erosa*, Hbn.) (*Noctuidae*), which occasionally does serious damage as in the season 1925-26, when in one field, which came under the writer's notice, practically every plant was defoliated. At the same time hundreds of adults were to be seen on the wing, flying about in the sunshine. The larva of *C. auragoides*, feeds openly upon the leaves and pupation takes place in a loose cocoon among the leaves or bracts. In April and May 1926, larvae of this species were heavily parasitised by a species of Chalcid, the adults of which emerged from the pupae of the former. A species of Tachinid was also obtained. These parasites probably account for the comparative scarcity of *C. auragoides* during the past season, 1926-27.

Another leaf-feeder is *Xanthodes graellsii*, Feisth., which has been more plentiful during the past season than *C. auragoides*. As is the case with the latter species the larva of *X. graellsii*, feeds openly upon the leaves and is easily recognised by the presence of a large and conspicuous scarlet spot on the anal end. Pupation takes place in an earthen cocoon in the soil and during the summer months the adult

emerges after a pupal period of about eighteen days. Hibernation takes place in the larval stage within the cocoon in the soil. Larvae which entered the soil in May 1926, formed cocoons but did not pupate until the middle of the following October. The adults emerged early in November. A species of Tachinid was obtained from larvae of *N. graellsii* this year.

Larvae of *Laphygma erigua*, Hbn. (*Noctuidae*), were found by the writer attacking cotton foliage in January of this year. This species has previously been recorded on cotton in S. Africa and Egypt. The larvae were found forming thin webs on the undersides of the leaves and then eating their way through, with the exception of the upper epidermis, which in many cases was left intact. Pupation took place in the earth and adults emerged after about eighteen days. The larvae occurred in scattered patches throughout the field in which they were found, and in these patches the damage due to them was considerable. One larva was found with six small ova adhering to its dorsal surface; on the following day these hatched and the resulting larvae proceeded to eat their way into the host. By the evening of the next day they had spun cocoons under the remains of their host and six days later adults of a small species of Braconid emerged. *L. erigua* is commonly known as the "Lesser Army Worm" and, as the name implies, the larvae are gregarious in habit.

The larva of *Tarache nitidula*, F. (*Noctuidae*), also attacks the leaves of cotton, but has not been found in large numbers by the writer. In behaviour this species is very similar to *N. graellsii* and, as with the latter, pupation takes place in the soil.

A pest which wrought great havoc towards the close of the season just over was the "Army" or "Mystery Worm," the larva of *Laphygma exempta*, Walk. This species derives its common name from its gregarious nature; the larvae occur in enormous numbers and may be seen on the field for miles at a stretch, eating their way through the grass and leaving bare ground behind them. Outbreaks occur every few years and there was a severe one during the past season. As well as grasses, various cereal crops are attacked such as maize, caffir-corn, oats, wheat, millet and teff. At the beginning of March numerous adults were seen on the wing. These were quickly succeeded by the appearance of legions of the larvae on the field. Many fields of young maize were stripped bare. Cotton was not attacked. Experimental plots of cotton alongside others of millet which were eaten out were left untouched as were also plots of cow-peas. Volunteer cotton plants in maize fields where the maize was all devoured were also left unscathed. A subsequent outbreak occurred but on a smaller scale. The larvae of this generation were found to be heavily parasitised and two species of *Ichneumonidae* have been obtained from them up to date. Larvae of *L. erigua*, the "Lesser Army Worm," are often mistaken for those of *L. exempta*, owing to their somewhat similar habits. The species are easily distinguished, however, by means of their mandibles; those of the latter are but slightly indented, while the mandibles of *L. erigua* are sharply toothed.

The control measures advocated for "Army Worm" are scattering poison bait in front of the advancing larvae, or ploughing two or three furrows across the line of advance and heavily baiting them.

The "Army Worm" combined with the recent prolonged drought has rendered the problem of winter food for cattle a very serious one.

Of *Citrus* pests there are several belonging to the Lepidoptera, the most important of which is *Agropyloce leucotreta*, Meyr. [*Eucarmonia batrachopa*, Meyr. (I.)], (*Tortricidae*), the "False Codling Moth." As well as in the Union this species also occurs in Rhodesia and in various parts of Central, East and West Africa (II.).

Navel oranges are the most susceptible to attack but other varieties of *Citrus* also suffer. In addition to citrus the larva of *A. leucotreta* is found in the fruits of guava, pomegranate, apricot, peach, plum, persimmon, olive, walnut and oak, as well as in a number of wild fruits (II.). The larva has also been recorded as attacking cotton bolls in Nigeria and Uganda, but there is, as yet, no record of it as a cotton pest in South Africa, although it will readily feed upon cotton bolls in captivity. Attacked fruit becomes mouldy and rotten, spores being enabled to enter by means of the larval burrows. Eggs are laid upon the fruit and on hatching the young larva makes its way in, frequently at the navel end of the orange. Usually only one larva occurs in a single fruit, although two are sometimes found. When full fed the larva leaves the orange and constructs an earthen cocoon upon the soil surface. Occasionally the cocoon is formed within the fruit. The larva may remain as such within the cocoon for nearly three weeks before pupation takes place, after which it may be a month before the adult emerges (II.). From some larvae placed out of doors in tins containing earth during May of this year adults were obtained after periods of from twenty-eight to forty-one days. There are three generations during the season, which somewhat overlap one another and hibernation takes place as a pupa (II.). The adult is an inconspicuous moth and is not often seen during the day.

Apart from the usual clean cultural methods and picking up of all dropped fruits and burying them, baiting experiments for the control of the adult are being carried out. These consist of (1) foliage bait, a treacle (or sugar) and arsenical mixture applied to the leaves of the trees by means of a hand syringe, (2) bunch bait, bunches of Eucalyptus or other twigs dipped in the same mixture and suspended in the trees, and (3) fermented and unfermented treacle and arsenical baits placed in the containers, which are hung on or beside the trees, similarly a pollard and arsenical mixture. The variety of insects taken in these tin containers is large.

Papilio demoleus, L., is another but not so serious citrus pest. This large and striking looking butterfly is very common throughout the country and is often to be seen in gardens flitting about among the flowers. Eggs are laid upon the young shoots and leaves of citrus trees upon which the larvae feed. Pupation takes place on the trees or upon neighbouring plants. Older trees are not usually seriously affected but young trees may be entirely defoliated. When irritated the larva everts a long osmeterium which has a somewhat alarming effect upon the uninitiated. The writer was once solemnly assured that it was a poison fang!

Adults of the Noctuid, *Sphingomorpha chlorea*, Cram., which pierce and suck fruits, cause considerable losses to citrus as well as other fruit growers. Control measures take the form of fermented baits.

Owing to the delicate nature of the trees in general great care has

to be taken in dealing with citrus pests. Forms of control adopted for similar pests on other plants might cause irrevocable injury. This renders the task of the entomologist doubly difficult.

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On the use of Names in the Study of Variation.

By ROGER VERITY, M.D.

Mr. Turner has successfully stated in a few lines the upshot of the discussions which have been carried on in these pages during the last few months. There is nothing new about it. It is the old question, which has remained unsolved ever since the times of Father Linneus, unsolved as a general principal, but invariably solving itself in practice in the same way. Every time a naturalist devotes particular attention to variation in a group of animals or plants, analyses it more thoroughly, restricts old names and erects new ones, there is a chorus of protests raised by those, who had the same materials before their eyes, but who had not taken the trouble to work them out. The saddest case amongst lepidopterists was that of poor Rambur, who was so laughed to scorn by his contemporaries for his discovery of several species of *Grypocera*, that they drove him frantic and he died of liver trouble as a result. Seventy years elapsed before it was realised that he was perfectly right, and now one wonders how so many clever entomologists can have been so foolishly blind and so stubborn in this respect. Again and again the same thing repeats itself, but usually a few years are sufficient to see the new names taken up into current use and lately also the old names, which during last century one was only acquainted with as useless synonyms, are being revived by revisors. A glance of this sort on past events is the most eloquent proof that names are not so much of a plague as some want to make them out. In one way it might seem as if it stood to reason that they constitute an additional effort with which we tax our brains artificially, besides the facts we have to remember. In practice, however, one finds that they turn out to be, not only useful, but necessary implements to assist memory. Man's brains have evolved so far in the sense of developing the power of speech and memory connected with it, that it has become a natural instinct to name every fact and every object he finds it necessary to recall. The first thing a child or an ignorant person asks about anything new they see is: What is it called? They often do not care to know anything more about it. In the same way, in every branch of human activity, most extraordinary words drawn from ancient or from foreign languages are invented for every instrument and for every phenomenon and are made use of technically. All this goes to show how names are not a useless artificial strain we put our brains to, but are a help we need if we wish to remember facts.

We also have the counterpart proof of this in the way a large number of excellent descriptions are utterly lost, when they are represented by no name; one never sees them quoted on any account by later authors. Rühl affords a good example in his *Pal. Grossschmett.*; he has described a large number of seasonal and geographical variations, but all those he has not named are ignored by Staudinger and by all others, whereas those he gave a name to are by this time well known. Some of the former have subsequently been named by others, who are credited for their discovery. This is only one case out of scores. There is nothing surprising about it. In our days of specialisation and minute analysis we are compelled to work with the help of catalogues. Is it possible in these to record a variation as: "the Var. described from such-and-such a place by Mr. so-and-so"? I doubt a catalogue under this form having much success. And, yet, if names were not to be given any more, the only alternative would be to stop working at variation, considering our knowledge quite sufficient. An extraordinary piece of presumption! There are also synthetic tables, which could not be drawn out, without a short way of designating each form. There are collectors, most of whom do not even consider varieties, if they cannot label them with a name, so that they do not collect them or pay a price for them, encouraging professional collectors to look out for them and discover new ones. In short, names are a necessity in so many ways that to try and stop developments on this line would not only be hopeless, but to my mind, absolutely a mistaken attempt, unless a better method of working out and designating variation were invented.

Where, on the contrary, warnings can never be too strong is in respect of the judgment required when describing and naming individual forms, which are infinite in number, and which, anyhow, should only be named once for all the species of a genus or even, in some cases, of larger groups. I cannot agree with Mr. Turner about seasonal variations, which are incomparably fewer and at the same time very important, because they are the most suitable by which to work out the causes that produce them. It has not yet been sufficiently grasped that the number of generations produced every year is perfectly definite, even in the south of Europe, for each species and that each generation has interesting characteristics. These, however, vary and replace each other in some cases, according to the altitude, the latitude and the nature of the surroundings, so that it is most necessary to have a short way of designating them in tables of variation and in local catalogues. Besides, if some years ago what was then supposed to be a single summer generation of some species had been simply called "II generation" and the September one had been called "III generation" the most dreadful confusion would now exist in literature when referring to them, because it has been found that there are two summer ones and that the September generation is the IV, so that at different times the same description would have been designated by different figures. Instead, by restricting the original name and by erecting a new one it is possible to make corrections of this sort quite clearly. Letters and numbers have always been found to be most unsatisfactory in designating variations and sooner or later they invariably have been replaced by names, ever since Geoffroi and others described several species and Rottemburg got the credit of their discovery by giving them names, in the place of the α , β , γ , etc., designations used by the former.

In answer to Mr. Turner's particular remark about myself I might add that the practice of naming seasonal variations has been going on for the last century, so that there was no reason to leave a certain number of generations with characteristic features without names, when many others had them. I have had to give several, because it is I who have been fortunate enough, after a great many years observations, to fill rather a serious gap in our knowledge of the commonest diurnal species in this respect. Now, however, I believe there are in Europe very few more names of this sort to be given.

As to races, it is quite impossible to make rules and to establish theoretically, which should be named and which should not. It has happened over and over again that characters which for years had been considered most irrelevant and which Staudinger, for instance, had condemned in his *Catalog* by a disdainful "*Vix nominanda*," have turned out actually to be specific. Everyone knows that species are often so like each other that it needs a specialist to separate them and that, instead, most conspicuous individual differences can be produced by the slightest change in surroundings during the chrysalis stage. How, then, can we trust our judgment as to whether a character is irrelevant or not? Our only chance of working out facts as completely as possible is to record carefully all variations which we find to be prevalent in some localities; the day will come when their exact value and position can be determined. Any work done in this sense will be anything but useless. My experience makes me always more confident that extremely interesting results will be obtained in a very near future. The first has already been to make one realise the important difference between exerges, and subspecies in general, and simple races and the necessity of setting to work to separate them. It is next becoming obvious to those who have devoted enough attention to this subject that even races are far from being indefinite and innumerable, as it had always been thought. A few species, such as *Paruassius apollo*, L., but very few, do vary geographically to an extraordinary extent and so erratically, that it seems hopeless to try and make out any law of variation from them, but, as a rule, the number and the distribution of the races of each species correspond to certain regions, or to local conditions within the latter, which can usually be made out to be altitude and moisture, so that four races can be expected in each region in sensitive species. In this *Journal* of 1922, p. 177, I have, in the Introduction to my Catalogue of Peninsular Italy, given a rough sketch of the zones in which Europe can be divided in connection with the distribution of species and their races. I will in future develop this interesting subject more fully. What I want to point out here is, that in the last few years not a single new race has been found in Peninsular Italy, whereas, before, so many came to my notice that, no doubt, some entomologists must have thought me crazy on account of the number of descriptions and names I published, when that region had not yet been fully worked out. Now, whatever new localities we explore, we find the same races turn up. No better proof could be given of how definite races are, notwithstanding the very different surroundings one meets with in such a large region. The Iberic Peninsula is confirming the same fact: during two years Querci and Romei found quite a number of new races to record to complete what was known about it, although it was already much better known than

Peninsular Italy, when we took it up; on the third year collecting in several regions of Spain scarcely produced anything new and this year Querci writes to me from Portugal that he has found the races described by Fabricius, Esper, Hübner and others, and races similar to Spanish ones, but extremely few novelties. I think we can conclude from such eloquent facts, that very soon the European races of butterflies will be known fairly completely, and that the work done during the first quarter of this century has carried Lepidopterology a stage further than it had reached during last century. A catalogue of the seasonal and geographical variations would already show a considerable advance on Standinger's of 1901. This, however, should not be our only aim, but the means of attaining much broader results in our search for truth, because, as Bates cleverly expressed it, the wings of butterflies are tablets on which nature has written her secrets. Let us not, through prejudices and lack of energy, shut our eyes to the Light that is sent to us.

[This letter has been printed with many misgivings. The real point as issue has been camouflaged by an excess of argument in favour of designating certain phases of natural phenomena the existence of which is not questioned. 'Tis the *method* of designating these phases of variation that is under discussion and it is considered by many of us that to treat these indefinite conceptions by naming them by the same method as we do definite conceptions is not only wrong, but confusing and unscientific, and adds excessively to our overburdened nomenclature and hinders rather than aids future developments of the study of these phases of variation.

Races, which are indefinite, compared with subspecies, can be much more conveniently called by the locality just as one does in conversation and discussion, *e.g.*, The Dover race, the Simplon race, etc., etc., and in this way can be catalogued just as well and with much better indication than a name such as *thompsoni*, *alpina*, etc., etc. Equally well can a catalogue contain I. gen., II. gen., etc., and such a designation is infinitely better from a practical point of view, than an irrelative name such as one often gets in these cases. These are "short ways of designating them" and quite available and suitable for use "in tables of variation and in local catalogues." I may add that those responsible for the *Zoological Record* are refusing to accept all racial names apart from subspecies. Thus entomologists are beginning to recognise that such names are too indeterminate to be treated as nomenclature.—H.J.T.]

CURRENT NOTES AND SHORT NOTICES.

A Meeting of the Entomological Club was held at "Durandesthorpe," 19, Hazlewell Road, Putney, on August 17th, 1927, Mr. H. Donisthorpe in the Chair.

Members present in addition to the Chairman—Messrs. H. Willoughby-Ellis, Jas. E. Collin, W. J. Kaye. Visitors—Dr. Karl Jordan, Rev. C. E. Tottenham, Messrs. F. Laing, G. C. Leman, W. H. T. Tams, G. J. Arrow, Hy. J. Turner, E. Step, K. G. Blair, P. Harwood.

The guests were received in the drawing-room where tea and light

refreshments were provided. During the evening the Host's collections were inspected, one of the features being the exhibition of 161 species of Coleoptera captured by him in Windsor Forest, of which 15 were new to Britain, 12 rediscovered after a long interval of time, and the rest consisted of the rarer species, some of which have heretofore only been taken in the New Forest. Supper was served at 8 o'clock, the menu being decorated with figures which will illustrate the Host's forthcoming book on Myrmecophiles. The guests dispersed at a late hour after spending a most enjoyable evening.—H.W.-E.

The Supplement on the British Coccidae is postponed to the new volume owing to the author having to describe several new species to Britain which he wishes to include in his Revision. The four plates are already in hand and may be given in this volume if the author agrees.

One of our subscribers writes, "May I suggest that our Editor gives us a bit more English and not so much of the Foreign matter, during 1928. All of us are not experts, in fact, I am of opinion it would meet the views of the bigger proportion of your subscribers." It is always the case that those who want English articles are among those who never contribute themselves. That is they are all take and no give, they want everybody's brains and experiences but have no sense of mutual confidence and aid. Again, I fear if the Editor were to contribute too much, although it might be English matter, a good many subscribers would soon be sick of the magazine. May I point out that the magazine was established as a "Journal of Variation" and that in the study of this, it is necessary to record and consider the varieties of British species, not as occurring in Britain alone, but also as found in other areas, where conditions of existence and surroundings differ. For example our *Pararge aegeria*, one of our most interesting species, when obtained on the continent, differs immensely in colour and facies, and the forms there prevailing in different climatic and geographical conditions probably afford clues as to the influences, which may produce certain very aberrational forms in our more northern clime. I will only refer to the breakaway from our close insular view of entomological subjects, to a broader outlook of our beloved study. Tutt's wonderful work on the British Butterflies would never have been a tithe so thorough had he not passed on to a wider purview.

Authors of papers involving extensive numerical observations, are requested to consult the recommendations of the British Association Committee on Biological Measurements 1927, obtainable from the British Association, Burlington House, W.1., price 6d.

Arrangements have been made whereby original data, too extensive for complete publication may be deposited at the British Museum (Natural History) or with the Royal Society of Edinburgh and so be made available for future workers. Authors desirous of depositing data whether zoological or botanical, in this manner should communicate with either the Keeper of Zoology, Natural History Museum, S.W.7., or the General Secretary, The Royal Society of Edinburgh, 22 George Street, Edinburgh, enclosing full bibliographic reference to the publication in which the results are summarised.

Mr. Donisthorpe's new book "*The Guests of British Ants*" has just appeared and will be reviewed in the November number.

EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. H. J. TURNER, "Latemar," West Drive, Cheam.

Duplicates.—Several hundred species of Coleoptera (carded) from Hants and Dorset, including several rare species from the New Forest, etc.

Desiderata.—Scarce and local British Coleoptera (carded).—*A. Ford, 42, Irving Road, Bournemouth, Hants.*

Duplicates.—British Lepidoptera, many species.

Desiderata.—Back volumes of Trans. Ent. Soc. Lond., and entomological magazines, bound or unbound.—*Fredk. J. Killington, 177, Leigh Road, Eastleigh.*

Desiderata.—British Coleoptera, especially Chrysomelidae.

Duplicates.—West Virginia Coleoptera and Lepidoptera.—*Paul N. Musgrave, 601, Walnut Avenue, Fairmount, West Virginia, U.S.A.*

Desiderata.—Ova or pupae of *christyi*, *abruptaria* v. *brunnea*, black *consonaria* and *bidentata*, *extensaria*, *curzoni*, *jasionata*, *venosata* (Shetl.) and other melanic Geometers and Noctuae.

Duplicates.—Very many in first class condition, high-set only f. i. *Herminia flavicrinalis*, *Andreas*, *Nyct. dalmatina* race *andreasaria*, *Warnecke*, about 30 species of rare *Acidalias*; pupae of *Eupithecia illuminata* or *cash*.—*Karl Andreas, Wiesbaden, Goethestr. 23, Germany.*

Duplicates.—*P. apollo nevadensis* and rare Palaearctic *Rhopalocera*, also African *Danaidae*, *Charaxes* and *Hypolimnas*.

Desiderata.—Many rarer and few common species *Rhopalocera*. European only.—*W. G. Pether, 4, Willowbridge Road, London, N.I.*

Duplicates.—Fine bred *prunaria grossulariata* varieties and many other species.

Desiderata.—Ova of *truncata* and *citrata*.—*Rev. G. H. Raynor, The Lilacs, Brampton, Huntingdon.*

Entomologist in out of way part of world desires exchange entom. literature—especially current works on classification, anatomy, heredity, etc.—for papered insects from Argentine Chaco. Will give double rate for Camb. Nat. Hist. (Insecta), Hudson's Nat. in La Plata, and special for Ridgeway's Colour Charts. Basis butterflies or moths 20/- per 100 papers, coll. 35 butterflies all different 10/-, other orders by arrangement. Or will sell for cash to enable purchase. Lists to *K. J. Hayward, Villa Ana, F.C.P.S.F., Argentine.*

Mr. M. R. SMITH, A. and M. College, is anxious to know where he can obtain any of Emery's papers on North American ants; and also to know of any Europeans who would like to exchange separates and correspondence with him concerning ants.

Signor ALFREDO FAZ, Calle Bandera 714, Santiago Chili, is willing to exchange first class Chilean Coleoptera, especially *Carabus*, sps., for striking Coleoptera from all parts of the World.

Wanted.—To correspond with some Entomologist resident in Scotland, Ireland, or the Isle of Man who is interested in Noctuae and vars. with a view to exchange of species and forms.—*A. J. Wightman, "Aurago," West Chiltington Common, Pillborough, Sussex.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 19th. November 2nd, 16th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. October 27th. November 10th, 24th.—*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., J. P. HARDIMAN, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.*

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CHANGE OF ADDRESS.—Hy. J. Turner (from Sept. 22nd), from 98, Drakefell Road, New Cross, S.E.14, to "Latemar," West Drive, Cheam: G. T. Bethune-Baker, 9, Eversfield Road, Eastbourne.

Communications have been received from or have been promised by Messrs. Dr. Verity, H. J. Turner, K. J. Hayward, C. J. Wainwright, A. H. Martineau, W. H. Edwards, J. S. Taylor, A. Sieh, Dr. Malcolm Burr, G. T. Bethune-Baker, Signor Querci, E. E. Green, P. P. Graves, H. E. Page, and Reports of Societies.

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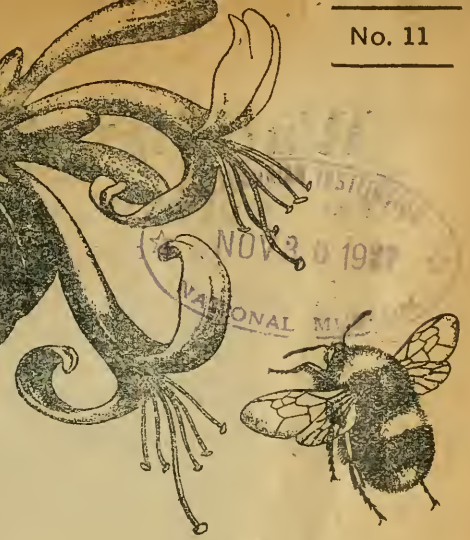
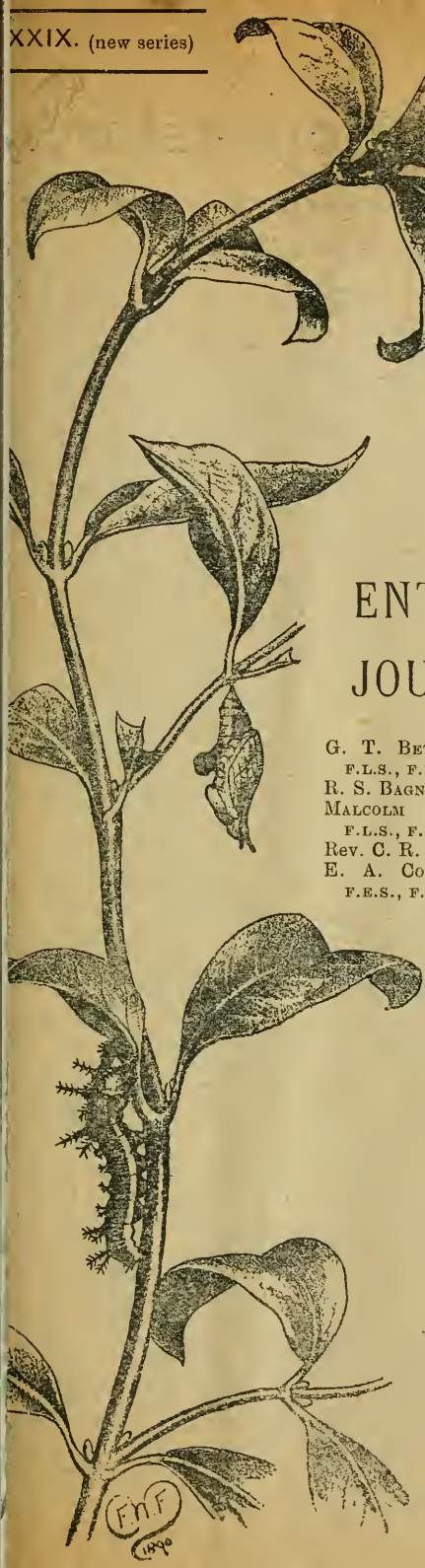
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An Endowment for Wicken Fen.

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

The custodians of Wicken Fen, the National Trust for Places of Historic Interest or Natural Beauty, have made an appeal to the public, and especially to naturalists and nature lovers, for an endowment that will enable them to keep this unique portion of the old Fen country in its pristine condition; and as a member of the Executive, and therefore fully acquainted with its aims and requirements, I am writing to call the attention of entomologists to this appeal, and to ask them to help it as generously as possible.

The Nature Reserve of Wicken Fen has peculiar claims upon them, for it was founded very largely by the generosity of two entomologists, the late G. H. Verrall, and the late N. Charles Rothschild.

At the time the main portion of the Fen was left to the nation, in 1912, the donor, Verrall, did not consider it necessary to endow it because in those days the principal crop, the sedge, was valuable for forage, litter, and thatching; but at the present time, mainly owing to the motor so largely superseding the horse, and the old picturesque thatched houses of the district being rapidly destroyed in favour of hideous yellow brick and slated abominations, the sedge is no longer saleable in quantity, and the amount that can be sold only realises prices that will not cover the cost of the labour involved in getting it.

In order to keep the Fen in its present or recent condition, that is to say to preserve its unique flora and fauna, it is necessary to cut the sedge every fourth year, and to prevent the entire area from becoming a thicket of Buckthorn, Guelder Rose, Sallow, and other similar growth, these shrubs must not only be cut down periodically, but they must be eradicated by grubbing up the roots. In addition to this the numerous dykes require clearing out every few years: when it is taken into consideration that all this work must be carried out over an area of 618 acres, it will be understood that a large annual expenditure must be made on upkeep.

Other causes that have largely added to the responsibilities of the custodians during recent years are the increased cost of labour, and the rates levied by the Ouse Drainage Board. This latter item is an exceptionally exasperating charge, because the Fen, unlike the surrounding agricultural land, does not require draining, in fact draining would be fatal to the greater and the more interesting portions of its flora and fauna.

The result of all this is that the National Trust has been compelled for some years to reinforce the finance from its own very scanty resources to the extent of several hundreds of pounds per annum. It is unable to continue to do so, and unless the endowment it asks for is forthcoming the Fen cannot be kept in a condition that will preserve its amenities.

The custodians are aware that there have been justified criticisms that sufficient growth has not been cut during the last few years, but the reason for this is simply the inadequate finance available.

It is the policy of the National Trust that in regard to any property they acquire, the wishes of the donors should be especially studied, and that it should be kept in a manner to accord with them so

far as they can be ascertained or surmised, and they hold, in the case of Wicken Fen, that as it is an area so largely given by entomologists for the purposes of entomology, it must be held to be primarily an entomological reserve, and that especial facilities should be afforded to entomologists for inspection and study, and that they should be allowed to collect specimens in it, to an extent that is reasonable.

Many entomologists have during the last ten years very generously supported a fund collected by myself to assist the upkeep of the Fen, and I assure them that this help has been keenly appreciated by the custodians.

Wicken Fen is well known to most British entomologists, but there are some who apparently do not know even where it is; to these I would say it is situated midway between Ely and Newmarket. The nearest railway station is Soham, about three miles away. Accommodation for visitors can be obtained in Wicken village, where several inns and numerous private houses offer comfortable, if in some instances rather primitive, apartments.

Although usually spoken of as Wicken Fen, the area under the administration of the National Trust comprises in addition, Edmonds' Fen, Burwell Fen, and Adventurers' Fen.

The custodians became possessed of the first small portions in 1899. In 1912, Verrall bequeathed 239 acres: altogether the Hon. N. C. Rothschild and his executors gave 134 acres. In 1926, the Rev. E. Milner-White gave 36 acres, and numerous other small plots have been purchased or given to make up the total area of 618 acres.

The whole is managed under the Executive and Estates Committee of the National Trust, by a local Committee amongst whom are many entomologists, including two members nominated by the Entomological Society of London, and seven other Fellows of that Body.

The insect fauna of the Fen and the immediate vicinity is very rich, it being held that it contains at least 4,000 species, including 737 species of Lepidoptera. The great importance of the Fen is that it has never been drained or cultivated and thus it constitutes a bit of the real old Fenland, which until comparatively recently comprised hundreds of thousands of acres in the East of England.

Amongst the Lepidoptera may be mentioned *Papilio machaon*, *Hydrilla palustris* (in Britain almost peculiar to Wicken), *Macrogaster castaneae*, *Arsilonche alborensa*, *Senta maritima*, *Nascia ciliaris*, *Laspeyresia orobana*, *Aristotelia quaestionella*, *Meliana flammea*, *Cidaria sagittata*, *Tapinostola hellmani*, and *Bankia argentula*.

Amongst the Birds the glory of Wicken is the Montagu's Harrier. The history of this fine bird at Wicken is a striking instance of the value of protection. Up to about 1900 from time immemorial it had bred constantly in the Fen; after this date, however, the persecution was so effectual that only at intervals was an odd pair known to nest. Soon after the National Trust took possession, however, and quiet and security obtained, first one pair, and in a few years two pairs, bred regularly, and they have continued to do so until the present time. Amongst other birds that frequent the Fen are the Grasshopper Warbler which is plentiful, Garganey, Quail, Water Rail, Snipe, Redshank, Mallard, Reed Bunting, Shorteared Owl, Sedge and Reed Warblers, and numerous other small birds.

In former times Savis Warbler, the Bittern, Shoveller, Avocet, Ruff,

and many other water birds frequented the Fen, and most of these may be expected to return to it now sanctuary is available.

The custodians appeal for a sum of £10,000. A gift of £20 carries with it Life Membership of the Trust, whilst one of £100 entitles the giver to Honorary Membership.

Donations should be forwarded to the Secretary, the National Trust, 7, Buckingham Palace Gardens, London, S.W.1.

Field Notes from Angola.

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

II. AMBOIM.

Amboim is a small town nearly fifty miles inland, but the few bungalows at the little bay which serves as its port, about half way between Loanda and Lobito are usually referred to by the same name. It is marked by a prominent bluff, geologically of the same age as our familiar gault, where a recent exposure due to a fall of cliff shows the almost vertical bedding. Just beyond is a flat bay, about a couple of miles across, beyond which a high crest of steep-faced hills covered with woods looked attractive.

Our boat stopped long enough to make a comfortable trip ashore possible. The long rank grass and low shrubby plants just above the beach looked very promising. I did not, however, find a great variety; *Paracinema tricolor* is numerous, or what I take to be this species. It is a great inconvenience in an unfamiliar region not to know the names of the creatures; one feels the insistent need of some sort of label, and in many a case I shall have to invent one. When, however, I see what seems to be a familiar genus or species, and I know that it ranges through Africa, I cannot resist calling it by the familiar name. Most names used in these notes will be of this character, and they must not be taken as serious determinations until the material has been worked out, as I hope it will by Mr. Uvarov. In the meanwhile, I must use some descriptive form of label for purposes of reference.

The most prominent species was a kind of *Euprepocnemis*, which occurred in swarms in the long grass; the female is so big and clumsy that she is very conspicuous, especially when half a dozen or so rise with each step as you walk, and fly off a few yards and settle again; while the sun was still fairly high they were so active that it was a long time before I caught one; sometimes when startled they would slip down the grass on which they were sitting and wriggle away among the roots, where it was impossible to get them, or else they would fly off on the approach of the net. Later on in the evening when the sun was lower they were more sluggish and it was not difficult to catch them.

Other Orthoptera were some, whose acquaintance I had already made at Loanda, the little *Xiphidium* with abbreviated wings in the male and orange tip to the abdomen; the females were just like those of *X. fuscum*, with no sign of orange and with fully developed organs of flight. They are very different, and the flying powers of the female make her very mobile, far more so of course than the male, yet I feel

sure that they are the sexes of one species, for I have taken plenty of them by now, together, and not found a female with abbreviated organs of flight nor male with long ones; that is to say, among the green Xiphidiids, for there is another species, with well-developed organs of flight in both sexes, and a shorter ovipositor than the one referred to; besides, the colour is a brownish grey.

What I take to be *Phaneroptera nana* is common enough, and I picked up a male of the larger relative referred to in the previous "Notes," a fine handsome fellow, with very ample and widely reticulated elytra and long spidery legs, which are often much darker in colour than the rest of the body. I found also a single specimen of a larger species of *Phaneroptera*.

The pale-blue winged *Acrotylus* was there on the sandy places, but not in any numbers, but what I take to be *Ochridia* was common enough in the grass. A day-flying cockroach was a novelty to me.

The event of the day, however, was the capture of a fine Hetrodid. I saw him settled on the top of a mimosa; he was sluggish in his movements, and on my approach simply dropped to fall, not to the ground as he had anticipated, but into my net. Readers of the *Ent. Record* may possibly remember the account of the habits and appearance of a big, fat, corpulent, wingless, entertaining grasshopper, which I wrote from Macedonia in 1916 and 1917; I cannot now recall whether it was *Bradyporus*, *Callimemus* or *Dinarchus*: it does not matter which, as these names are either synonymous or represent creatures so closely allied that it is indifferent which we use for the present purpose. These are very big, as big as a good-sized mouse, very obese, sluggish Locustids, with great rounded heads, very spiny legs, long pronotum under which are tucked away the elytra, reduced to mere short musical instruments. They are remarkable, have a penetrating stridulation, live in colonies in shrubs, generally among thorns, seem to be peaceable bovine sort of creatures, using their powerful mandibles for chewing grass and herbage; when handled, they often chirp to show their anger and also squirt out from the folds in the abdominal segments and on the pronotum a bright yellow fluid in considerable amounts; this is rather startling, but the fluid seems to be harmless, and I let it run freely over my hand without experiencing the slightest effect; the *Bradyporidae* consist of but a few species which occur only in the countries around the Black Sea. Further, both sexes stridulate.

A group that is somewhat similar in habits and appearance is the *Ephippigeridae*, whose main home is Spain and Morocco; these have very similar habits, the same corpulent body, big rounded heads, the same stridulating apparatus with the pronotum produced posteriorly to act as a sounding-board; I do not know if they squirt a yellow fluid, but think it probable; another point in common is that both groups chirp to express anger and the remarkable fact that both sexes chirp equally well. Yet these two families are not considered related and are not placed near each other in the systematic works.

The *Hetrodidae* is another small family which performs in Africa the same functions that the above-mentioned ones do in the Iberian and Pontic areas respectively. They are generally placed at the end of the series of Locustid families remote from the *Bradyporidae*, yet to outward appearance and in habits they strongly resemble them. They

are nearer to the *Ephippigeridae*, and in his *Prodromus* Brunner placed in the *Hetrodidae* some genera, which have since been removed to the *Ephippigeridae*.

Is this striking series of points of resemblance in appearance and habits due to parallel development? or does it indicate a closer relationship than the actual structure leads us to consider?

I was familiar with the *Hetrodidae* in collections, but had never before seen them alive and it was a delight to come across them in nature. The first thing that struck me was the astonishing resemblance to my old Balkan friend *Bradyporus*. The only obvious difference was the somewhat lesser size, the very short ovipositor and the long spidery legs, And their habits are the same. I suspected the presence of a colony and soon found three or four more on the mimosa. A few yards further there was a patch of flat clayey mud with no vegetation but clumps of a low-growing, juicy plant. Here I saw several; they were chirping, not very insistently nor loudly; the note recalls that of *Bradyporus*, but was less loud; I saw one standing out on the naked mud, and then I noticed a difference; *Bradyporus* is a squat fellow with short legs, but this Hetrodid has long limbs and out on the mud he made full use of his height, as though to inspire fear and stood on tip-toe, so to speak. In this spot they were so numerous that I counted sixteen without moving from where I stood.

I quickly filled my large killing-bottle to the brim and then had to wait until they were dead and empty them into the leather case and carry the bottle in my hand; I became so blasé and tired of stooping to pick them up that I refused to take any unless I could sit down comfortably and pick up at least four without moving from the spot. The bottle was crammed full a second time, and then I put half a dozen or so alive into the net and carried them on board alive, to kill as soon as there was accommodation for them in the bottle. Altogether I had fifty.

There were three distinctly different forms. The smallest were black, with a pale border round the pronotum, red head and face and red base to the legs. I take it these were immature. The commonest form was a size larger and the prevailing colour a purplish red-brown, the pronotum sometimes tending to greyish and the formidable spines of the thorax black; the third form is decidedly larger and the dominant colour is light green, the abdomen shading to reddish, and the thoracic spines brown at the base. The red and black type of coloration is characteristic of some members of the family in the adult stage, cf. *Eugaster guyoni* and *E. spinulosus*.

Had I taken them separately I should have regarded them as three distinct species, but I could find no really distinctive character other than size and colour, and as they all occurred together, I think it is probable that they are all one species. It is instructive, for instance, that the only immature specimens were of the red and black colouring and that there were only three, two males and a female, of the large green form, though some of the others showed a tendency towards green.

I walked about two miles on and back again, but found no more except in this colony until dusk. Then, walking through a field on my way back to the boat, a chorus of Locustid music resounded all around; I could not spare time to stop to collect, but was able to

catch one of the singers. It was my Hetrodid, one of the big green ones. They are therefore extremely numerous, and like *Bradyporus*, are vespertine in habits. Like *Bradyporus*, too, they squirt out a yellow fluid freely when handled, but I could detect no smell, nor did the fluid affect the skin.

The Portugese, who were inquisitive to see my captures, at once exclaimed, "*Grilidos!*" and "*cigarros.*" The latter name, of course, has nothing to do with tobacco, but in Portuguese the letter L of the other Latin languages becomes an R, so it is the Lusitanian form of "*cigale.*" But if they are not smokable, they are at least eatable, for the niggers relish them. I do not think I should, although I am fairly free from prejudice, but after emptying the corpulent bellies of about fifty I was able to testify to the amount of meat in them, but the operation effectively spoilt any incipient appetite for them that curiosity and philosophy may have inspired.

In handling them for stuffing, I took hold by the hard and spiny thorax; when the work was done my finger tips were stained as though with nicotine, tender from the prickles, and slightly swollen and numbed. They were so free with their yellow juice that they required drying in the sun and wind before packing, and the blotting paper put in the bottle to absorb it was saturated and the bottle inside flowing with it. They seemed to suffer no ill effect from the discharge, and it was a wet job emptying those that had not squirted. I have been informed that it is their blood; this is hard to understand, for if it performs a vital function for them, how can they afford to discharge it so freely? Besides, animal blood is based on iron, and there is no compound of iron that produces a pale yellow colour. There is some red matter inside the insect, which stained the wool and paper, and this may well be a genuine blood.

Zygaenae, Grypocera and Rhopalocera of the Cottian Alps.

By ROGER VERITY, M.D.

(Continued from page 126.)

Satyrus maera race *herdonia*, Frhst.—Oulx (males from end of June; females from July 6th to the middle of the month); Cesana (both sexes still fresh on July 24th); Clavières. The races of this species divide into two chief Groups; the *adrasta*, Hb. Group, with underside of forewing fulvous and that of hindwing of a silvery gray, on which the markings stand out sharply, and the *maera*, L. Group, with the former mahogany red and the latter of a dark brownish gray, with soft markings, visible, but not prominent; the first also has much more fulvous on upperside, on an average. The *adrasta* Group subdivides well into three lots of races: One includes nymotypical *adrasta*, Hb., with its II gen. *maja*, Fuchs, of smaller size; it inhabits the whole of France and it does not seem to vary from Vendée to the Rhine and to the Riviera; it is the most extreme form in the *adrasta* direction of variation and it differs from all the other races by the peculiar brightness of the fulvous; it probably is the oldest and less highly differentiated one of the species, because it resembles the allied species *megeva* in a striking way and because it develops the character-

istics of the female sex to their highest degree; race *neradensis*, Obth., of Spain and Morocco, is a smaller form of it. The second Subgroup consists in a series of races, which inhabit the Alps and which constitute a gradual transition from Group *adrasta* to Group *maera*, although they belong to the former rather than to the latter, as we shall see. The third Subgroup does not differ from the second except by its average lesser size; it inhabits Peninsular Italy (*apennina*, Vrtý., and *polsensis*, Stauder), Sicily (*sicula*, Stögr.), and the Balkans (*silymbria*, Frhst.). In the Alps I make out three primary races, strikingly different from each other, and these then vary locally to a lesser extent, producing some secondary races. Race *herdonia*, Frhst., described from Arcine, in Savoy, spreads from the Jura as far east as the Simplon, and southward to the Maritime Alps, besides an isolated colony of it on the Coast Range of Northern Calabria. It thus is the race of the Western Alps and it betrays its proximity to *adrasta* by the extent of fulvous on upperside and by the usually light gray tone of underside, but even individually it never reaches in either sex the brightness and the extent those features have in the French *adrasta* and most individuals are considerably less fulvous, so that Frühstorfer was quite right in distinguishing the race and in pointing out that it is a mistake to record *adrasta* from this region. In the *Ent. Rec.* of 1919, p. 127, I have proposed avoiding this mistake by calling *adrastaeformis* the extensively fulvous individuals, occurring in races other than *adrasta* and persistently recorded under this name. In the *herdonia* region there exists a form which stands opposite to the form just described by the reduced extent of fulvous and by its dark tone "of a red-brown or chestnut brown" hue, as Frühstorfer describes it from Zermatt and the Simplon; he called it *leucocinia* in the *Ent. Zeit.*, 1908, p. 123 and *leneocinia* in the *Int. Ent. Zeit. Guben*, 1909, p. 133. This form prevails in some localities and presumably in the damper ones, so that it constitutes quite a secondary race, especially in the eastern portion of the *herdonia* region; such is the case where I have collected it in the Formazza Valley, at 1500 m., and at Macugnaga, 1400 m., and at Vanzone, 700 m., in the Anzasca Valley; its first generation was on the wing at the end of June and the second one during the second half of August; the latter is considerably smaller and it has comparatively larger eye-spots, not too rarely accompanied by additional ones (form *triops*, Fuchs), whilst the androconial scales differ as described by Ball in *megea*, II gen. *filipluma*, so that it should be distinguished by the name of **postleuccocinia**, *mih*. In the same way, in the localities where form *herdonia* is prevalent there exists in some cases a second generation distinguished by the features described above; I name it **postherdonia** to avoid confusion, but it scarcely differs from *apennina*, Vrtý., of which I have specimens collected by myself on August 4th and 8th, 1912, at Acqui, 200 m., and at Ponzone, 600 m., in the hills of Central Piedmont. The second of the three primary races of the Alps inhabits the Tessin, where I have collected it from July the 2nd to the 7th at the Passo di Colle, 1400 m., above Lake Maggiore, and on the Mottarone, on the opposite side, above Stresa: it is on an average strikingly larger than any other race of the species; it is saturated in tone of colouring, the fulvous being of a bright, reddish hue and the dark scaling of a deep tone, so that the pattern stands out more sharply on both surfaces than

in the other races: the extent of the fulvous is about the same as in *leucocinia*; the underside of hindwings is of a more vivid bluish grey, on which, besides the streaks and rings, there stand out bands of diffused scaling, darker and broader than they usually are in *herdonia*: race **superlata**, mihi, with II. gen. **postsuperlata**, mihi. The third primary race is that of the Eastern Alps; I possess series of specimens collected from South Tyrol to the Julian Alps and in all this region it seems to keep perfectly constant in aspect (except for a dwarf secondary race I have found on July 21st, 1920, at the Mendola Pass, 1300 m.). This race, which I should call **orientalpina**, with its smaller II. gen. **postorientalpina**, constitutes a connecting link between Group *adrasta* and Group *maera*, both geographically and morphologically. To the north it presumably blends gradually with race *ordona*, Frhst., of southern Germany and Lower Austria. By the upperside features one would join it to the latter, because the fulvous is very limited in extent: in the male there is only a thin ring around the apical ocellus and, usually, two very small patches at the back of it; in the female the band is very narrow and it is broken on the nervures and there is no trace of the patch between it and the cell. The underside features bring it nearer to *herdonia*; the fulvous of forewing is redder than in the latter, but not at all of the mahogany red of *ordona* and nymotypical *maera*: the grey of hindwing is usually more thickly covered with dark scaling than it ever is in *herdonia*, but it never reaches the uniform dark brownish grey look it has in *ordona* and in *maera*. I take as "typical" of *orientalpina* the series of specimens I have collected in the Carnic Alps, at Sappada, 1300 m., in the Upper Cadore. I think the small (40mm. between apices instead of 45, as in preceding) Mendola Pass form, which is no doubt the same as the "very diminutive" one described from the top of the Stelvio, of July 13th, by Wheeler, quoting Rowland-Brown, is worth distinguishing as **parvorientalpina**. South of the Julian Alps the species abruptly changes aspect entirely and it turns into race *silymbria*, Frhst., which spreads over most of the Balkans. On the Carso, above Trieste, where I have collected it on August 22nd and 29th, 1926, and at Portorose, in Istria, in the first half of September, its II. generation consists chiefly in a small form **postsilymbria**, mihi, but some individuals are quite as large as the first. This race very much resembles *postherdonia* and *appennina*, but it is duller on underside and more dusted with grey and it is on an average larger than the latter in both generations, though much more variable and never as large as *herdonia*. The I. gen. of *appennina*, Vrtz., is a little larger than II. nymotypical one, but never as large as some *silymbria*, so that it is the smallest European race; I had named it *vulgaris* in the *Linnaean Soc. Journ.* XXXII., p. 186 (1913), but this is a long forgotten name of Zeller for an *aegeria* subspecies, so I replace mine by that of **anteappennina**, noting the extent of fulvous in it is considerably greater than my description of *vulgaris* conveys. The geographical variations of this species in Europe are thus seen to consist in a series of grades: *adrasta*, *herdonia*, *leucocinia*, *superlata*, *orientalpina*, *ordona*, *maera* and *montana*, Hormuz., of the high mountains of the Bukowina, with some smaller parallel races in the south: *neradensis* to *adrasta* and *appennina*, *polsensis*, *sicula* and *silymbria* to *herdonia*.

S. hiera race *hiera*, Fabr.:—Oulx (early June). My specimens of the Pyrenees, of the Baths of Valdieri, of Oulx, of Martigny, of S. Tyrol and of the Carnic Alps are all alike. Some I collected at the Passo di Colle, 1400 m., above Lake Maggiore, are, on the contrary, larger and they have much larger and paler fulvous patches on the forewing and broader rings around the ocelli of hindwings; I take them to be the same as Frübstorfer's *calidia* of the Petit-Salève. Examples I have from Hungary are still larger, but the fulvous is of a rich reddish tone and they distantly recall *maera* by the unusually elongated shape of forewing in the male and by the lighter grey underside of hindwing: race **pannonia**, mihi.

(To be continued.)

Miscellaneous Notes from Argentina. IX.

By KENNETH J. HAYWARD, F.E.S.

DESCRIPTION OF THE LARVA OF *EANTIS THRASO*, Hb., (A "SKIPPER") (Imago No. 6891).—Length 26-27 mm. Slightly tapering to either end.

Diameter greatest at first abdominal, approximately 5mm.

Head dull biscuit, roughened, moving parts blackish, the mouth shaded beneath and laterally with brown.

Dorsal area pale greyish-green, edged with pale greenish-yellow upper lateral stripe. Lateral area yellowish green, the upper half darker. The dorsal area closely covered with small greyish spots, the lateral with yellowish white spots. Beneath pale green.

Described from a larva found in the forest at Villa Ana on February 15th, 1926. This larva was lying along the mid-rib of the foodplant, head to stem, and with the opposite leaf drawn over and arranged edge to edge with the leaf on which was the larva, being fastened by a few silk threads at about its centre, and forming a very compact tent. After feeding for a few hours in the breeding cage, the larva pupated on the roof of same, attaching its pupa by means of a silk pad and girdle.

Pupa very pale emerald green, 19 mm., in length, non-angulated, suspended as stated above, and covered with a whitish bloom that comes away on contact.

Spiracles showing dark green. At the head end four tiny black spots, two just behind the antennae bases, the other pair on either side of the mouth parts.

A double pair of similar spots dorsally on the last segment. Four days before emergence two brown patches appear near the wing bases, this colour spreading the following day over the whole of the wing cases, and becoming darker steadily is almost black the day before emergence. Imago emerged the 10th day after pupation between the hours of eight and ten a.m.

Foodplant. *Fogara hyemale* (St. Hill.) Eng. (*Rutaceae*). Apparently has no local name.

Imago sent to B.M. under No. 6891.

Empty pupa case sent to B.M. under No. 6892.

LARVA AND PUPA OF *Hamearis chilensis*, Fldr. (*Rhopalocera*), No. 7066.—
Length 17 mm.

Head deep brown with fine white speckling and a few grey hairs.

First thoracic with a pair of round brown projections chocolate brown at their base and shading to light yellowish brown, crowned with several fairly long hairs, and projecting forwards. Ground colour of the segment brown with a wide yellowish stripe on either side of the brown central dorsal area. Abdominal segments 8 to 10 flattened dorsally, this flat portion being brownish. All legs blackish. Remainder of larva light green above and a somewhat dirty yellowish green beneath, the whole covered with a great number of small black specks.

A fringe of greyish hairs all round the lower lateral area commencing on the first thoracic and continuing right round the anal end. These hairs start from a row of lateral tubercles numbering five per segment, and a row of much smaller marginal tubercles. Below, especially on the legless segments are a few further hairs. Spiracles greyish buff. Tubercles other than those mentioned above are not distinguishable.

Feeds on several species of *Cytisus*.

Pupa. Length 11 mm.

Colour grey, wing-cases olive grey, a dotted dorsal stripe and a certain amount of spotting especially along the edge of the dorsal area of this same olive grey. The minute black spotting of the larval state reproduced as slightly raised spots of the ground colour. The pair of projections on the first thoracic segment reproduced and just behind each a slightly raised brown spot with a black mark immediately behind. Spiracles brownish. Tubercle markings not distinguishable.

Pupates in a very light net composed of a few strands of a fine grey silk, the cremaster attached to a silk pad, and with an almost invisible girdle.

Duration of the pupal state 12 days. (March brood).

Described from several specimens from Villa Ana. March 18th, 1926.

Larva in spirit sent to the B.M. under No. 7067.

Empty pupae cases No. 7068 and imagines No. 7066.

DESCRIPTION OF THE LARVA OF *ANTICARSIA GEMMATALIS*, Hb. (Imagines No. 6949).—Length 17-18 mm. A thin looper caterpillar somewhat variable in coloration.

Head lemon, shiny, clothed with short brown hairs, mouth parts brownish.

Body light greenish-yellow.

Two thin undulating whitish dorsal stripes, the dorsal area edged with a similarly coloured but thicker line accompanied outwardly with a much thinner whitish parallel line. On the thicker of these lines bordering the dorsal area on each segment, two pairs of white-ringed white tubercles with short brown setae, the posterior pair more widely spaced. A lower lateral line of white running obliquely downwards from front to back of each segment and broken at the segmental folds. Just above this line on the first three abdominals a small black tubercle with black seta. Spiracles light brown edged with darker brown. Prolegs blackish. Abdominal legs with light

brown pads. Underside same colour as the lateral area. A wide yellowish-white central stripe beneath on the thoracic and first three abdominal segments. Common on alfalfa, probably causing a certain percentage of the damage credited to *Colias lesbia*. Pupates in dry earth or leaves, spinning these loosely together, and becomes a dark brown slender pupa. It remains nine or ten days in this stage before emerging.

Described from specimens swept from alfalfa (*Trifolium*) at Villa Ana in February, 1926. Emergence commenced at just after six in the evening and continued till 7.20.

Imagines vary very considerably from well-marked to almost uniformly grey specimens.

Imagines sent to the B.M. under No. 6949.

Empty pupae cases to B.M. under No. 6950.

Other specimens of this larva have been examined where the head would better be described as sage green and the general body colouring as dark green, specimens of this colouring appearing at first sight to be distinct from the more typical specimens above described.

The More Local Butterflies of Switzerland.

By P. HAIG-THOMAS, F.E.S.

Having been fortunate enough to capture most of the more local Swiss butterflies, and my experiences having differed somewhat from those of the numerous entomologists, who have trodden these paths before me, must be my excuse for the publication of the following notes from my diary.

Arriving at Aigle on the morning of May 7th, I put up at the Hotel Beau Site, most conveniently situated opposite the station. This day was spent on the banks of the Gryonne and near St. Triphon, when the following insects were observed. *Papilio podalirius* (worn), *P. machaon*, *Pieris brassicae*, *P. rapae*, *P. napi*, *Leptosia sinapis*, *Euchloë cardamines*, *Colias hyale*, *Gonepteryx rhamni* (hyb.) *Heodes dorilis*, *Polyommatus icarus*, *P. semiargus*, *P. thesites*, *P. thetis* (bellargus), *Glaucopsyche cyllarus*, *Cupido sebrus*, *Hamearis lucina* (worn), *Callophrys rubi* (worn), *Brenthis euphrosyne*, *B. dia* (worn), *Issoria lathonia*, *Melitaea cinxia*, *M. aurinia*, *Pararge aegeria*, *P. megera*, *Coenonympha pamphilus* and *Erebia medusa* just emerging.

On May 8th under the cliffs at Vernayaz *Pieris mannii* was common. A series of *Cyclopides palaemon*, 18 *Scolitantides orion*, and a few ♂ *Erebia erias* were also taken. The wind becoming very bad I returned to the Gryonne and besides several more *C. palaemon* the new insects observed were *Plebeius argyrognomon* and *Augiades sylvanus*. *S. orion* was common under the cliffs at Vernayaz all through May; as there is only one record of it having been captured here in Mr. Wheeler's book, it would appear to have only just established itself in this locality. On the 9th, *E. medusa* was full out and very abundant near St. Triphon; *Melitaea parthenie* also made its first appearance. The 10th and 11th were cold and wet, but almost 2 dozen larvae of *Ruralis betulae* were beaten on blackthorn near the Gryonne. *S. baton* and *Pararge maera* appeared under the cliffs at Vernayaz on the 12th. On the 13th I took the only *Anthocharis simplonia* v. *flavicolor* (very worn), I

saw on or near the Gryonne, in spite of the abundance of its food-plant, *Bisentella*, which was in full flower. On the 14th at Sion *M. dictynna* ♂ and ♀ were well out, also *M. aurelia* and one ♂ *Polyommatus amandus* was netted. On 15th, 16th, and 17th *A. simplonia* v. *flavicolor* was not uncommon near Vernayaz and at Evionnez, and a long series was taken including a fine dark ♂ ab. on the 17th. *Parnassius mnemosyne* also emerged at Vernayaz and *Melitaea athalia* and *Plebeius medon* (*astrarche*) were out at St. Triphon. *Eucres coretas* was not rare at Sion on the 18th when I was lucky enough to take 10 females, some however past their best. *M. aurelia* and *P. amandus* were on this day quite common; three male *Polyommatus escheri* and *Aporia crataegi* were also netted. On the 21st at La Batiatz there was very little flying owing to the cold wind and want of sun, *Polyommatus hylas* however made its first appearance.

On the 22nd I moved my quarters to the Hotel Victoria at Brigue. On the 23rd in spite of the strong cold wind *Hesperia onopordi*, *H. serratulae*, *Pararge hiera*, *E. erias*, *P. icarus*, *Rumiccia phlaeas* and one ♀ *Colias phicomone* were taken near the 2nd Refuge on the Simplon Pass. I should imagine this must be almost the earliest record for this last named insect. On the 29th I went to Kandersteg for the day. There had been a fall of snow the day before but by 11 o'clock it had all melted on the low ground. I secured thirteen *Hesperia andromedae* ♂s and ♀s and a series of *Pararge hiera*; *A. simplonia* was very abundant and there were a few *P. napi* f. *bryoniae* around a marsh. I also observed *P. machaon*, *E. cardamines*, *H. serratulae*, and *Nisoniades tages*, but no Lycaenids, all over 3000 ft. altitude.

On the 25th I went to Sierre to see if the *Colutea arborescens* was in flower, but it was only just coming out. Here the first *Parnassius apollo* was taken and in the Plyn-wald *Melitaea dictynna* ♂s and ♀s and *Carcharodus lavatherae* were seen. *P. apollo* was out at the Ganter Bridge on the Simplon Pass on the 27th and *Plebeius aegon* at Sion on the 28th. This afternoon I took the train to Locarno arriving late. The morning of the 29th was spent at Reazzino and was fine until 12 o'clock when a heavy storm broke over the lake. *Melitaea britomartis* was locally common, but almost all were very worn. The species must have been on the wing nearly a month. Vorbrodts gives the end of April as the date for the emergence of the first brood. *Brenthis selene* was very common but very worn. *Argynnis niobe* f. *eris*, *Melanargia galathea* and *Epinephela jurtina* were also captured for the first time. *Brenthis dia*, 2nd brood, was common and fresh. I returned to Brigue in the afternoon and on the following day went back to Aigle, stopping at Martigny on the way and taking a fine series of *Melitaea deione* sub.-sp. *berisali* ♂s and a few ♀s; also I took a beautifully fresh ♀ of *Limenitis populi* on the way to the cliffs at Vernayaz. Here *Melitaea phoebe*, *Aphantopus hyperantus* and *Hesperia carthami* had also emerged.

On June 1st *Brenthis ino*, *Coenonympha iphis* and *P. amandus* were common near St. Triphon. On June 2nd *M. deione* sub.-sp. *berisali* ♂s were getting worn at La Batiatz, the ♀s were commoner but not abundant. *Brenthis daphne* and *Heodes alciphron* sub.-sp. *gordius* were also taken.

On June 3rd near Caux *Heodes amphidamas* was past its best. Of over thirty captured only twelve were keepable; two *Hesperia*

andromedae, male *Erebia oeme* and *M. aurinia* (the first) were also taken.

On June 5th *Coenonympha tiphon* appeared in the marshy fields below the railway between Aigle and St. Triphon. On this day only seven were taken, but a few days later it became common over a considerable area. This locality is quite two miles from the previously known Aigle locality near the golf course and as it is less than a mile from the late Mr. Fison's House at Champéry, it would appear as if the insect had only lately established itself in this spot. Curiously enough I did not observe it above the railway line, where the conditions were identical. *P. amanda* also, which, I understand, used to be somewhat restricted in this locality, was very plentiful on both sides of the line. The 6th and 7th were spent near Caux; the weather was bad and very few *H. amphidamas* were seen, all those taken being badly worn. On the 7th 4 more *H. andromedae*, a series of ♂ *E. oeme*, also a few *C. palaemon*, *E. medusa*, *Coenonympha satyrion*, *Aglais urticae*, *Pyrameis atalanta* and *Polyommatus eumedon* were captured. On the 10th and 12th I took a few *Iolana iolas* at Sierre, also *Satyrus alcyone* and *Strymon ilicis*. *M. deione* sub-sp. *berisali* was already worn although here it should have been at least a fortnight later than at La Batièze.

On June 11th *Argynnis cydippe*, *A. aglaia*, *Lycaena arion* and *Pararge aethina* were out at Aigle. June 15th was spent at Eclepens where insects were much later than in the Rhone Valley. In spite of the elder bushes being well out, none of the Theclids put in an appearance. Three *L. populi*, a few *Coenonympha arcania*, *Limenitis camilla* and *Hesperia alpeus* ab. *jurassica*, Warr., were taken.

On June 16th I took the early train to Brigue and walked up to the 2nd Refuge and up to the Ganter Bridge. *Plebeius zephyrus* sub-sp. *lycidas* was well out, many of both sexes being worn; there were also a few ♂s and one ♀ of *M. aurelia*, *Melitaea varia*, *M. phoebe*, *M. athalia*, *M. dictynna*, *P. apollo*, *Polyommatus eros*, *P. eumedon*, *P. escheri*, *P. hylas*, and a fine underside aberration of the last with white spots on the underside of the hindwings like those of *Plebeius douzellei* were all taken. *Erebia erias* was very worn even at this height. At and above Berisal *P. mnemosyne* ♂s swarmed. On the 17th I took an early train to Iselle and walked back to Brigue over the Pass, going up the Laquinthal as far as the *Erebia christi* ground. *Erebia ceto* and *C. arcania* f. *darwiniana* were common above Gondo.

At the entrance to the Laquinthal *Cupido minima* race *alsoides* was plentiful on the road. There was nothing flying in the Laquinthal except a few worn *P. hiera* and one or two fresh *E. erias* and *P. napi* f. *bryoniae*. Unfortunately after leaving Simplon village the sun went in and it began to rain and continued to do so most of the way back to Brigue.

On June 19th I took an early train to Zermatt and walked down to Stalden and *Oeneis aello*, *E. erias*, *A. simplonia*, *Polyommatus eros*, *Plebeius pheretes* and many commoner insects were taken.

(To be concluded.)

NOTES ON COLLECTING, etc.

COLIAS CROCEUS (EDUSA) AT CHICHESTER.—A solitary *Colias croceus* (*edusa*), was seen flying in the fields in front of my house early in August last. It is the only occurrence here this season (of which I have heard) of this butterfly.—JOSEPH ANDERSON, Chichester.

[Numerous solitary examples were reported in the spring and the above is possibly one of the offspring of these. Mr. L. W. Newman has a female f. *helice* sent him from which he has bred a large number of males, females and f. *helice*, in true mendelian proportions.—HY. J. T.]

CURRENT NOTES AND SHORT NOTICES.

May all concerned be urged to return proofs to me at "Latemar," West Drive, Cheam, as soon as possible after receipt; at least a day is lost in transit both ways and the publication thus may be delayed considerably, particularly when, as occasionally occurs, a second proof is required.

We hear that a further number of the *Bulletin of the Hill Museum* is in the press and will be issued in the early months of 1928 if not earlier.

A letter from another subscriber has reached me indirectly, and from the encouraging and helpful nature of its contents I venture to print the salient points of it, with my comments in brackets. It runs as follows.—"I have been carefully reading up the notes on Noctuae published at intervals in the *Entomologist's Record*, which are intended to bring Tutt's *Noctuae* up to date. Now I feel that this will be of very great value to the present and coming generation of lepidopterists and will probably hold the field for many years as the standard for reference, and in making the following suggestions, I do so, not as a critic but as a would-be helper, who being isolated in the provinces sees things from a rather different angle to the London resident.

"I think the value of the work would be greatly increased if the author would give his opinion as to the standing of some of the forms. [I am doing this now, although in many cases it is impossible to compare specimens and the B.M. probably have not the form in question.] Mark with an * those forms known to occur in Britain. [The localities are now given in all cases.] In those species which Tutt from lack of material failed to deal with adequately ask through the *Ent. Record* for the loan of extreme forms and name such. [This I shall be pleased to do. Further, I shall be pleased if those who are especially interested in certain groups will look over my notes.] Unless this is done, we shall have someone with the Verity complex take the job in hand and name almost every insect he can beg, borrow, or steal in the really variable species. [Strand went through Hampson's *Lep. Phalaenae* and every form described but not thought by the author worthy of a name duly received a cognomen.] Personally I do not think the naming of races except in very exceptional cases is warranted. It usually turns out that a race = a colony in which some form rare elsewhere occurs in greater numbers than usual, and this proportion

varies in different years. But I do think that names are required for forms, which are so different from the type description as to cause a tyro to imagine he had another species. Tutt undoubtedly depended too much on his own collection. Take, for instance, the genus *Nonagria*. He makes *geminipuncta* the most variable species and ignores Webb's statement that *sparganii* is the most variable. But *sparganii* has a distinct facies in all its localities and there are at least eight distinct forms. *Caninae* produces 6 or 7 forms but lacks the wonderful intermediates of *sparganii*. As far as I can see, *geminipuncta* is the most constant member of the genus except *neurica*." [We shall avail ourselves, most certainly, of the writer's special knowledge.]

Another correspondent writes, "Are you contemplating the issue of a complete list of the British Lepidoptera (Pt. I. Geometrae already completed) in due course? If so, may I suggest that the Butterflies, Sphingids, Bombyces and so-called Cuspidates might form the next instalment; then the Noctuae and then the Micros (so-called)." This is a tall order and I fear with what one has in hand a somewhat laborious task, particularly for one alone. The amount of research required is enormous and help is not forthcoming to anything like what is needed. Then as my friend the late G. T. Porritt pointed out the textual reference for each name should also be added in such lists; at the same time he quite appreciated the fact that the list might never then have been published. Above all comes the financial side. Our correspondent would be appalled if he knew how many (!) had purchased copies of the List of Geometers. Science is a labour of love. Nor does it pay even out-of-pocket expenses.

A meeting of the Entomological Club was held at Speldhurst Close, Sevenoaks, on Saturday, September 17th, 1927, Mr. H. Willoughby-Ellis in the Chair. Members present in addition to the Chairman:—Messrs. Robert Adkin, Horace Donisthorpe, Jas. E. Collin, W. J. Kaye. Visitors present:—Professor E. Wace Carlier, Rev. C. E. Tottenham, Dr. E. A. Cockayne, Capt. N. D. Riley, Messrs. F. W. Frohawk, G. C. Leman, E. C. Bedwell, W. G. Sheldon, W. H. T. Tams, K. G. Blair. Arrangements were made for the members and guests to arrive during the morning to allow as much time as possible for a long day, and invitations were also extended to those who could remain to spend the week-end at Speldhurst Close. Luncheon was provided at 1 o'clock, and all hopes of an Entomological Excursion in the afternoon were frustrated by the rain which had fallen heavily in the early part of the day. It was, however, possible to make a tour of the grounds and woods of Speldhurst Close soon after luncheon and on return tea was served at 4.30. Later Mr. H. Willoughby-Ellis's large collections of various orders of insects were inspected; the Geological and Oological collections were also on view. Special interest was shown in the extensive collection of British Coleoptera and the varieties of Lepidoptera, particularly the *Sesiidae*, *Sphingidae* and *Lycanidae*. Mr. Donisthorpe brought for exhibition specimens of *Atheta nidicola*, J. S. Jobansen, and *Gnathoneus buyssoni*, Anzat, two species of Coleoptera new to Britain taken by him in a hawk's nest in Windsor Forest on July 5th last, both of which species had only recently been described on the Continent. During the afternoon a business meeting of the Club was held and supper was served at 7.30. After a long and pleasant evening the guests dispersed at a late hour. On Sunday an

Excursion was made to Idle Hill Woods, but owing to weather conditions insects were extremely scarce and very little collecting could be done. It was announced that the next meeting of the Club would take place at Tring on 15th October, Lord Rothschild in the Chair.—H.W.-E.

We have in Dr. Verity's paper another instance of redundant names and naming. There are several cases where he has given names to specimens that he himself says scarcely differ from other named forms, yet he has the temerity to name them. Taking into consideration Dr. Verity's well known desire to see very minute differences there can be no doubt, from his own remarks, that the differences are insignificant, yet he gives them a name with the magnetic *mm* following. British investigators do not think this adds to the dignity of science. I refrain from saying anything stronger than this.

This however is not the main point of my criticism. I suppose through lack of knowledge of the rules of Nomenclature, he is creating pure synonyms. In the *Journ. Lin. Soc.*, May, 1913, Dr. Verity gave the name *vulgaris* to a form of *Pararge maera*; now he finds that Zeller gave the name *vulgaris* to a form of *P. aegeria*, and he therefore changes his *vulgaris* to *anteappenina*, thus creating a pure synonym. He seems to be unaware that it is correct to use the same varietal name for each species of the same genus, therefore it is correct to have *maera vulgaris*, *megea vulgaris*, *hiera vulgaris*, and so on. Thus his *anteappenina* is a pure synonym of his *vulgaris*. Dr. Verity has done this before and I have already pointed it out to him, both by letter, and in this magazine I believe. It is this sort of thing repeated that brings our science some disrepute, for Entomologists are far the greatest offenders in this particular.—G.T.B.-B.

REVIEWS AND NOTICES OF BOOKS:

THE GUESTS OF BRITISH ANTS, THEIR HABITS AND LIFE HISTORIES.—By H. St. J. K. Donisthorpe, F.E.S., F.Z.S. Published by Messrs. Routledge, 18s. net.—We are more than glad to welcome, from this talented author, another important volume which is complementary to the new and revised edition of the same writer's "British Ants."

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No student of Entomology can consider himself well equipped without this volume at hand, which in its 223 pages+12 pp. bibliography and exhaustive index, is a veritable goldmine of information, much of it new.—H.E.P.

EXCHANGES.

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Desiderata.—Back volumes of Trans. Ent. Soc. Lond., and entomological magazines, bound or unbound.—*Fredk. J. Killington, 177, Leigh Road, Eastleigh.*

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Desiderata.—Many rarer and few common species Rhopalocera. European only.—*W. G. Pether, 4, Willowbridge Road, London, N.1.*

Duplicates.—Fine bred *prunaria grossulariata* varieties and many other species.

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Mr. M. R. SMITH, A. and M. College, is anxious to know where he can obtain any of Emery's papers on North American ants; and also to know of any Europeans who would like to exchange separates and correspondence with him concerning ants.

Signor ALFREDO FAZ, Calle Bandera 714, Santiago Chili, is willing to exchange first class Chilean Coleoptera, especially *Carabus*, sps., for striking Coleoptera from all parts of the World.

Wanted.—To correspond with some Entomologist resident in Scotland, Ireland, or the Isle of Man who is interested in Noctuae and vars. with a view to exchange of species and forms.—*A. J. Wightman, "Aurago," West Chilington Common, Piltborough, Sussex.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. November 16th. December 7th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. November 24th. December 8th.—*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., J. P. HARDIMAN, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.*

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The More Local Butterflies of Switzerland.

By P. HAIG-THOMAS, F.E.S.

(Concluded from page 161.)

June 16th. At and above Bérisal *Parnassius mnemosyne* males swarmed.

June 17th. I took the early train to Iselle and walked back to Brigue over the Pass, going up the Laquinthal as far as the *Erebia christi* ground. *E. ceto* and *Coenonympha arcania* f. *darwiniana* were common above Gondo. At the entrance to the Laquinthal *Cupido minimus* f. *alsoides* was plentiful on the road. There was nothing flying in the Laquinthal except a few worn *Pararge hiera* and one or two fresh *Erebia erias* and *Pieris napi* f. *bryoniae*. Unfortunately after leaving Simplon village the sun went in and it began to rain and continued to do so most of the way back to Brigue.

On June 19th I took the early train to Zermatt and walked down to Stalden. Four *Oeneis aëlle*, *E. erias*, *Anthocharis simplonia*, *Polyommatus eros* ♂ and ♀, *Plebeius pheretes* and many commoner insects were taken.

Returning to England on June 20th I left again on July 1st arriving on July 2nd at Weesen and on this day and the following morning in spite of the indifferent weather *Lycaena arcas* and *L. euphemus* were common (the latter rather worn) flying and settling on the sanguisorba flowers, especially on the railway bank at the edge of the marsh. Very little else was observed except the most common insects and these were a good deal worn. In the afternoon of the 3rd we moved on to Pontresina.

July 4th was spent in the Rosegthal. *Melitaea maturna* f. *wolfenbergeri* was very common although many males were badly worn. *Brenthis thore* males and females were well out, some of the former being past their best. The females were never common. Among the many insects noticed this day were *Erebia gorge* ab. *triopes*, *E. lappona*, *E. tyndarus*, *E. mnestra*, *E. pharte*, and *E. epiphron* f. *nelamus* and *E. euryale* in swarms.

On the 5th, after taking a few more *B. thore* in the lower part of the Rosegthal, I climbed up to 8,900 ft. above the Tscherva Glacier. At this height I took one male *Erebia alecto* race *glacialis* just out and lower down several male and female *Oeneis aëlle* in good condition. On the way down the Rosegthal *Colias palaeno* and a fresh male *Lycaena alcon* were added to the list.

On July 6th seventeen males and one female *Erebia flavofasciata* f. *warreni*, Vrtý., were taken between 7200-7700 ft., to the left and above the Tscherva Glacier, all in perfect condition. *Melitaea merope* and *M. cynthia* were worn, *Brenthis pales*, *Melitaea varia*, *O. aëlle*, and *Plebeius orbitulus* = *glandon* occurred on the same ground.

July 7th. A fine series of males and two females of *E. flavofasciata* r. *thiemei* were taken on the Schaffberg. They were found in three separate localities 7000-7900 ft. altitude. At a later date two other localities were found on this mountain at the same level. The form *thiemei* was not as fresh here as *uarreni* was above the Tscherva Glacier, although fresh specimens were obtainable at both these localities up to July 15th, the last day I visited the ground. *Heodes virgaureae* and *E. melampus* were just emerging and a perfectly fresh male *E. erias* was

also netted. *Plebeius donzelii* appeared on the 8th, *Heodes virgaureae* and *Erebia goante* on the 9th. The weather now became more broken and there was very little seen for several days.

On the 14th, I took the train to Preda and walked up the S. Western slopes of the Piz Palpuogna. The weather was indifferent and inclined to rain. *Melitaea asteria* was found at 7,700 ft. and a fair series of males and two females were taken. Some of the males were getting worn. I also took a few *O. aello*, *M. cynthia*, *B. pales*, and one *M. varia* at 8,500 ft., but not near the *M. asteria* locality. *P. orbitulus*, *P. optilete* and *M. aurinia* f. *merope* were also common.

On the 16th, on the same ground I took two *Erebia manto* (intermediate between f. *pyrrhula* and typical) and only four *M. asteria*, but it rained all the time.

On the 18th, I walked over the Albula Pass from Preda to Ponte. Shortly after leaving Preda there was an abundance of the common Erebias. *E. alecto* race *glacialis* were fine and fresh above the Weissenstein Inn. *M. asteria* was common, but mostly worn, in the Pass and at two places on the Ponte side of the Pass above and below the little lake. In this latter locality a pair of fresh *E. manto* f. *pyrrhula* were netted and others very worn were seen. The south side of the Pass was almost bare. I was at least a week too late for this locality.

The afternoon of the 21st and the morning of the 22nd, were spent on the top of the Stelvio on the steep screes on the eastern side. There was very little seen and a very cold wind blowing. Eight *E. alecto* and seven of the race *glacialis* were captured all on the same ground, both males and females of each. *E. alecto* varied from a specimen with a single black spot to one with two large spots with white centres on the forewings. Collecting here was made more difficult by the fact that apart from the ordinary loose stones found on these screes, they were covered with old pieces of barbed wire, sardine tins, etc., which had collected here owing to the fact that the trenches, held by the Austrians from the beginning of the war till November 13th, 1918, were only a few feet higher up on the ridge.

On the 24th I arrived at Simplon Kulm Hotel and walked down to the 7th Refuge. I took a fresh but crippled male *E. christi* and a worn male, and also a nice series of females of *Erebia mnestra*, which sex I have always found scarce.

On the 25th I walked down to the 2nd Refuge on the old Roman road at the bottom of the valley and back to the Kuhn Hotel, by the main road. Insects were abundant and fresh at the junction with the Ganterthal, and the following species were taken:—*P. apollo*, *P. delius*, *Aporia crataegi*, *Pieris brassicae*, *P. rapae*, *P. napi* f. *bryoniae*, *Rumiccia phlaeas*, *Heodes virgaureae*, *H. hippothoë*, *H. alciphron* f. *gordius*, *Lycæna arion*, *Cupido minimus*, *Polygonmatus semiargus*, *P. eumedon*, *P. damon*, *P. coridon*, *Plebeius donzelii*, *P. sephyrus* sub-sp. *lycidas*, *P. argyrognomon*, *P. aegon* (*argus*), *Colias phicomone*, *C. hyale*, *Melanargia galathea*, *Erebia epiphron* sub-sp. *cassiope*, *E. melampus*, *E. mnestra*, *E. tyndarus*, *E. goante*, *E. aethiops*, *Satyrus cordula*, *S. alcyone*, *Hipparchia semele*, *Epinephela lycaon*, *E. jurtina*, *Melitaea aurelia*, *M. athalia*, *M. dictynna*, *M. phoebe*, *Brenthis pales*, *B. amathusia*, *Dryas paphia*, *Adopæa flavus*, *A. lineola*, *Powellia carthami*, *Hesperia cacaliae*, *Cyclopides palamon*.

On the way back one ♂ *Erebia pronœ* f. *pitho* below the 5th Refuge on the road.

July 30th and 31st was spent on the Rochers de Naye, *E. manto* of both sexes was very common and fresh, and ♀ *Erebia oeme* was still fresh at the top. *E. pronœ* f. *pitho* very dark was taken on the Caux side of the mountain at 4700 ft. with a few *E. ligea* still fresh at the edge of the timber.

On August 1st at Éclepens, a very hot day, I took a short series of *P. apollo* f. *pseudonomion* still in good condition. *Satyrus dryas* was just coming out, also *Epinephele tithonus*, *Lycaena arcas* and *L. euphemus* were fresh and common in the bog and one very worn *Strymon pruni* was also taken and released.

On August 4th at the Pont de Nant above Bex the same dark form of f. *pitho* was common and from 4100 ft. upwards the females were common and very fresh. *E. manto* were abundant but worn. A few *E. ligea* still fresh and many alpine insects abundant. This locality would well repay a visit earlier in the year.

This season I was fortunate enough to take 161 species of Swiss butterflies without counting subspecies or variations, in spite of missing the best ten days in June. My thanks are due to the Rev. G. Wheeler and Mr. B. C. S. Warren without whose advice I should have had but little success. The weather till the middle of July was good and the season a very early one.

Nomenclature, Dr. Verity, etc.

By P. P. GRAVES, F.E.S.

May I express my disagreement with certain of Mr. G. T. Bethune-Baker's criticisms of Dr. Verity's nomenclature published in the *Ent. Record*, Vol. XXXIX, p. 164. To begin with it appears to me that while certain criticisms may be advanced against some of Dr. Verity's names, the suggestion that he has been carried away by the "magnetic" *mihî* is not calculated to keep the discussion on the scientific and impersonal plane, where the interests of entomology demand that it should be maintained.

However, Mr. Bethune-Baker's main point of attack is the creation of 'a pure synonym' by Dr. Verity in the case of *Pararge maera*. Dr. Verity has substituted *P. maera anteappennina* for *P. maera vulgaris* on the ground that the subspecific name *vulgaris* had already been given by Zeller to a geographical race of *Pararge aegeria*. This race Dr. Verity believes, apparently with good reason, to be the Central European subspecies of *P. aegeria*, which Staudinger afterwards named *egerides*. Mr. Bethune-Baker writes "He seems to be unaware that it is correct to use the same varietal name for each species of the same genus, therefore it is correct to have *maera vulgaris*, *megea vulgaris*, *hieria vulgaris* and so on."

This pronouncement cannot be reconciled with the Report of the British National Committee on Entomological Nomenclature of which Mr. Bethune-Baker was Chairman. Art. 11 of the proposed Rules of this Report, which is based upon the International Code says "Specific and subspecific names are subject to the same rules and from a nomenclatural standpoint they are co-ordinate, that is, they are of the

same value.' Act. 14 of the same report defines a subspecies as a 'geographical . . . variation.' Article 28 lays down that a specific name is to be rejected as a homonym 'when it forms part of the same combination of generic and specific names that has been previously used in the original description of another species, (Primary homonym).' Further in the 'Recommendations' appended to the rules we read (loc. cit. p. IX R.) At Article 14.—'The name of a subspecies cannot be used in the genus either for another species or for the subspecies of another species.'

In the present case Mr. Bethune-Baker quite obviously considers *P. maera* congeneric with *P. aegeria*. Dr. Verity's 'race' names are applied to geographical varieties and therefore answer to what are termed subspecific names in the Report. Zeller's *vulgaris* is used by Verity for the northern subspecies of *P. aegeria* which Staudinger named *egerides*, not for any lower grade of variation. Dr. Verity's name *P. maera vulgaris* was originally given by him to a particular geographical 'race' or group of races of *P. maera*. The two therefore come in the same category of 'subspecies' according to Art. 14 and it inevitably follows that the two names cannot be used for two subspecies of *Pararge*. Dr. Verity places *P. maera* in another genus, but this does not affect the argument. Mr. Bethune-Baker in spite of Arts. 11, 14 and 28 and the 'Recommendation' at Art. 14 apparently refuses to admit rules and recommendations of the Report which he signed, which is, in my opinion, most regrettable.

As to Dr. Verity's nomenclature I regret that he should have given a name to a form of *P. maera* which, he admits, scarcely differs from his *appennina* and I feel that, on occasion, he has been too prone to fix transitional forms with a name instead of using the elastic formula *trans. ad.* There are dangers in this course. Again I wish he would tell us more often when he describes a 'race' to how large a proportion of individuals from the area whence the race is described his description applies.

Still, we have all of us made mistakes or are liable to make mistakes of this kind. The fact remains that Dr. Verity has made an extraordinarily valuable contribution to our knowledge of the variation of the European Rhopalocera. I do not know all the races which he has named and described, but in the case of nearly all these races, which I do know, I have found that his names correspond to facts of geographical variation. Here may I add, without I trust, hurting any susceptibilities, that it is singular that British Lepidopterists should have waited for Dr. Verity to point out the differences between certain British Rhopalocera and the Continental forms thereof and to give names to these British geographical variations. Among these are British *P. coridon insularis*, Vrt., which differs widely from *P. coridon coridon* of Styria, British *Pyronia tithonus britannicus*, which is very different from the typical *tithonus* of Germany, North British and Irish *P. napi*, and many more. I find it hard to believe that British entomologists did not recognize these differences, but I find it still harder to understand why they did not name them.

One result of their silence has been that Continental entomologists are ignorant in many cases of the existence of these geographical races. Only a few weeks ago a Viennese entomologist of distinction, to whom I had sent some British *P. thetis* and *P. icarus*, expressed

his interest and surprise that these should differ markedly from Austrian specimens of these species. I am driven to the conclusion that the 'onomatophilia' imputed to Dr. Verity is less dangerous by far than 'onomatophobia.' Over-refinement in differentiation of geographical varieties is surely less harmful than the failure to register in nomenclature the existence of such varieties.

A Note on the so-called *ab. subgothica*, Haw., of *Euxoa tritici*, L.

By A. J. WIGHTMAN, F.E.S.

On pages 138-141 ante, Mr. W. Parkinson Curtis contributes a note on *subgothica*, Haw., and points out, that Haworth's type specimen of his *subgothica* is still in existence, and is in fact a British taken specimen of the American species now known as *Feltia jaculifera*, Gn. (as noted by Sir G. F. Hampson in his *Cat. Phal. Lep.* IV., p. 345), and that the figure and description in Humphreys and Westwood's *British Moths* I., p. 123, pl. 24, fig. 1., of *subgothica* also refer to *Feltia jaculifera*, Gn., but he asserts that *subgothica*, *Brit. Noc.* p. 46, Vol. II. = a form of *Euxoa tritici*, and suggests, that to save further confusion, this form shall be renamed *pseudogothica*.

But the *subgothica* of Tutt, *Brit. Noc.* Vol. II., p. 51 (not 46) is *subgothica*, Haw., and as Mr. Parkinson Curtis has himself shown, both the descriptions quoted there refer to the American species *F. jaculifera*, Gn.

It follows then that *subgothica*, Haw., Tutt *Brit. Noc.* II., p. 51, is not a form of *E. tritici* at all, and cannot be named *pseudogothica* or anything else, the name simply requires to be removed from the list of *E. tritici* forms.

A New Genus and a New Species of Pyralidae.

By SIR G. F. HAMPSON, BART.

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[NOTE.—In view of the fact that Mr. William Fassnidge took in August, 1925, at Auzat, Ariège, two specimens of the new species here described, it was thought advisable to publish these descriptions at once. The manuscript of a partially completed revision of the Pyralid subfamily "*Auerastiana*" was left in the British Museum when Sir George Hampson retired in 1920. I should like to point out that the subfamily to which these moths belong should be called *Phycitinae*, the closely related subfamily with aborted proboscis being properly entitled to the name *Auerastinae*. Sir George Hampson made the change as a result of the application of his principle of citing as the type of a genus the first species in that genus agreeing with the generic definition. This principle is not in accordance with generally accepted views, and I therefore adhere to the old arrangement in stating that this moth belongs to the subfamily *Phycitinae*.—W. H. T. TAMS.]

Genus. *RADIESTRA*, NOV.Type *R. albistrigella*, Hmps. n.

Proboscis fully developed; palpi upturned, moderately scaled, the 2nd joint reaching to about vertex of head, the 3rd long; maxillary palpi filiform; frons smooth; eyes large, round; antennae of male somewhat laminate and almost simple; fore and mid tibiae smoothly scaled, the hind tibiae slightly fringed with hair above. Forewing long and narrow, the apex rounded, the termen evenly curved; vein 2 from long before angle of cell, oblique; 3 and 5 separate, 4 absent; 6 from below upper angle of cell; 8-9 stalked; 10-11 from cell. Hindwing with the cell more than half the length of wing; veins 3 and 5 from angle of cell, 4 absent; the discocellulars curved; 6-7 shortly stalked; 8 strongly anastomosing with 7.

RADIESTRA ALBISTRIGELLA.

Euzopherades albistrigella, Hmps. n. *J. Bomb., Nat. Hist. Soc.* xviii., p. 262, pl. E, f. 13 (1908). Ceylon.

RADIESTRA CAPRICOLA, n. sp.

♂. Head and thorax ochreous white irrorated with blackish, the antennae ochreous white, the frons tinged with brown, the palpi brown, white at base; abdomen ochreous white; pectus, legs and ventral surface of abdomen ochreous white mixed with dark brown. Forewing white irrorated with black-brown, the inner area tinged with brown, some black at base of costa; antemedial line black defined on inner side by white, slightly oblique and sinuous, less distinct on inner area; two strong black discoidal points, the lower rather elongate; a triangular patch of blackish suffusion from lower angle of cell to the subterminal line where it extends from below the costa to the submedian fold, subterminal line white defined on inner side by blackish, incurved from below costa to vein 5 whence it is slightly angled outwards, then again incurved, the terminal area mostly suffused with blackish; some black points on medial part of termen. Hindwing white faintly fringed with brown, the costal area towards apex and the termen browner; cilia white with a brown line through them.

Italy, Capri. (C. S. Brown). ♂ type. *Exp.* 30, mill.

Field Notes from Angola.

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

III. LOBITO.

(NOTE:—The previous letter referred to "Amboim"; this should be corrected to "Benguella Velha." The town of Amboim is about 80 kilometres from the coast, and the village of Benguella Velha serves as its port and is consequently frequently referred to as Porto Amboim or simply Amboim, especially by shipping people, whence the misconception).

Lobito Bay is one of the few real harbours on the great length of the western coast of Africa. It is a small bay across which the strong southerly current is building up a sandpit at the rate of a metre a year; in some twenty or thirty years it will close up the bay and

convert it into a lagoon unless dredging operations are maintained; there is thus formed a splendid harbour with deep water where ocean-going vessels can moor alongside the wharf instead of lying in the roadstead at a considerable distance from the shore. Lobito is now a port of growing importance, the terminus of the Benguella Railway, which is rapidly approaching the Congo frontier and will eventually link up with the main systems of the continent. About thirty years ago the distinguished war correspondent, Mr. H. W. Nevinson, was the first to step directly ashore from the first big ship that put in there, although in previous years Portuguese gunboats and slave-trading dhows had made use of it; the latter used to puzzle our pursuing sailors engaged in the suppression of the slave-trade, for they used to slip in through the well-concealed entrance, take down their mast, and lie perfectly hidden.

Scope for entomology was very limited during our stay at this pleasant breezy spot; formalities in connection with our weapons and clearing our extensive baggage through the Customs took up all our time. Only when sitting enjoying the refreshing sea-breeze on the verandah at night did I get any chance of collecting, and a fair variety of insects flew to light. The most conspicuous was a small, blackish hawk-moth. The sands around were humming with the chirp of crickets and it seemed to me that some must be actually below high-water mark. I took a number which closely resemble our common domestic cricket *Gryllus domesticus*, L., but the wings are abortive and the elytra somewhat reduced in both sexes. This species was common, though difficult to find in the sands, but also came into the kitchen. This tendency towards domestication is interesting, for the original home of the domestic cricket is, I believe, not definitely known, though it probably came from Africa. I took one specimen of a black species, somewhat smaller than *G. campestris*, L., and with a small head. A more interesting one which flew to light was quite new to me, remarkable for the wide reticulation of the elytra and the very small head. The only other orthopteron which I took at Lobito was an Acridian recalling *Euprepocnemis*, which had the temerity to select my chair to hop on to; it had the elytra and wings mutilated, torn off about the middle. This was probably done by a lizard when the creature was settled, for if it had been snapped by a bird upon the wing, it does not seem likely that all four organs would have been snipped off.

It was disappointing to have no opportunity of collecting in the neighbourhood, either on the coastal plain or in the Cretaceous hills behind, which looked tempting. We had some compensation in watching the northward migration of a seabird that flew like a shear-water; they are rather large, and black, with white throat and neck glistening in the morning sun, as they sped northwards in small flocks during the cool of the early morning, driven up, no doubt, by the increasing cool weather coming up from the Antarctic. One day an ibis flew past, and we used to watch the dolphins playing and the fin of an occasional shark, which taught us to keep very close inshore among the breakers when enjoying our morning and evening dip.

On the marshes outside the town, as we passed in the train on our way to the interior, we saw a big flock of flamingo; near Benguella there is a most attractive looking plain, wild, and covered with scrub, where I am sure most interesting insects are to be found. The most

prominent plant is a tall xerophyte recalling the agave; the withered stem grows up to some six or seven feet and the top is crowned by a cluster of thick, spiny leaves and the whole surmounted by a candelabra of spikes of scarlet flowers: this striking plant grows on the plain, and I am sure is accompanied by excellent material for the collector.

But we had to rush by without stopping and soon were climbing a narrow gorge of gneiss, mounting rapidly by a rack, and at dawn next morning we found ourselves crossing a lofty plateau of granite which is almost waterless. It was green enough when we passed, for the rainy season had just recently closed, but it is rapidly burnt up, and is uninhabited; there is little game, except kudu, klipspringer and such antelopes as can exist for some time without water.

(To be continued.)

Zygaenae, Grypocera and Rhopalocera of the Cottian Alps compared with other races.

By ROGER VERITY, M.D.

(Continued from page 157.)

Nytha actura exerge ferula, F. (= *cordula*,* F.) race *orsiera*, De Prunner, *Lép. Ped.*, p. 73 (1798):—Oulx (males: July 4th to 31st; females: July 23rd to August 7th). Frühstorfer has pointed out (*Int. Ent. Zeit. Guben*, 1909, p. 88) that the name of *ferula* stands before that of *cordula* in Fabricius; it must thus be substituted for it, in the same way that *jurtina* has been recognised precedence over *janira* in Linnaeus. Fabricius only gives "Italy" as habitat of his two insects, so that there is no possibility of using his names for any race in particular. De Prunner's name of *orsiera*, based on a description, which is unmistakably the male of *ferula*, from the mountains of Piedmont, seems to be the one, which should be revived and used for the broad-spread race of the Western Alps, including their French watershed, except in certain localities, mostly at the highest altitudes reached by the species, where it turns into a smaller insect, pointing by some features to nymotypical *actaea* and named *actaeina* by Oberthür (*Ét. Lép. Comp.* III., p. 280) from specimens of "Le Monétier-de-Briançon" 1500m., in the Cottian Alps (he also included the Abruzzi race, but this is quite incorrect and, anyhow, it already had the name of *calabra*, Costa). At the Baths of Valdieri, 1375m., in the Maritime Alps, individual variation is extremely broad and it includes a few *actaeina* amongst a majority of *orsiera*. In the lower and drier locality of Oulx I did not meet with a single specimen of the former, so that the average size of the race is a little greater. In both localities the females

* I have looked this up carefully in the literature cited.

Fab. *Ent. Sys. Emend.* III. (1), (1893).

p. 225, no. 705. *actaea*, Esp. pl. 85. 4 [= *cordula* var. *bryce*]. Russia.

p. 225, no. 707. *ferula*, ♂ and ♀ !! [♂ *actaea* ♂ *cordula*]. Italy.

p. 226, no. 708. *cordula*. [♀ *cordula*]. Italy.

i.e., the name *ferula* must be substituted for the name *cordula* which falls (cf. the Linnaean *jurtina* in place of *janira*).

This was pointed out by Werneburg, *Beitr. ur Schm.-kunde*, I. pp. 393, 394, 497 (1864).—H.J.T.

exhibit broad fulvous patches, more or less broken and partly veiled over with brown; extreme examples with no fulvous and rather smaller ocelli (form **mariformis**, mihi) are rare and so is the opposite form with a sharp, brighter and continuous band, usually known as *peas*, Hüb. I have never met with one in which they are as sharp and broad as in the latter's original figure (no text), but it must be noted that it is also of an unusually small size, so that probably it comes from a locality where there exists a peculiar race, such, for instance, as the one Frühstorfer has described (*Int. Ent. Zeit. Guben*, 1908, p. 351) from Täsch, near Zermatt, under the name of *milada*, of small size, recalling *actaea* in many males by the absence of the hinder ocellus, and with broadly fulvous females, very light coloured on underside. The race of the Eastern Alps is distinctly different from those of the Western ones, but no author, to my knowledge, has described it. Frühstorfer (*l.c.*, 1909, p. 88) only says 75% of the females have four white spots on forewing and that their underside is of a bright reddish brown in his specimens from Klausen; he applies to this race Hübner's name of *hippodice* (figs 718-9); these figures certainly resemble it, except on underside of hindwing, but Herrich-Schäffer (*Schmett. Eur.*, I., p. 78) had reasons to believe they were drawn from a specimen of Southern Russia, so that name had better be left alone and the new one of **orientalpinum** used to designate the following description drawn from my specimens of the Schnalsertal, of the Isarco Valley and of Tschan, in Val Venosta: size, on the whole, smaller than at Oulx; wings often more elongated, narrower, with a more pointed apex and a straighter outer margin; underside of male usually of a warmer brownish tone than in *orsiera*, with softer streaks and often with no white spaces; when they exist, the central band-like one is narrow and they are dusted with black, so that they never have the extent, the sharpness and the clear silvery-white tone of many western individuals; on upperside of female the fulvous is considerably less and reduced to rings round the two eye-spots; these rings are often very thin and even totally obliterated; on underside of hindwing the pattern is less sharp than it usually is in the West and the whole wing has a more uniform and warmer reddish-brown tone. Between the habitats of *orsiera* and of *orientalpinum*, in the Anzasca Valley, at the foot of Mt. Rosa, I have found, at Vanzone, 700m., what may well be described as the most flourishing race of the species: it is larger than any other, it is highly saturated in colour in both sexes and its ocelli are remarkably larger, giving it a handsome appearance; the fulvous on upperside of female is invariably reduced to a thin ring around the two eye-spots; the white of underside varies very little too and can be described in both sexes as about equivalent to what it is in the individuals of *orientalpinum* in which it is most developed; the tone of that surface is of a deep black in the male and of a warm chestnut in the female: race **conspicua**, mihi. I deal with *ferula* = *cordula* as an "exerge" of *actaea*, because it seems to me they afford a very typical example of that sort of relationship and, as in other similar cases, they are neither specifically distinct from each other nor simple races of the same species; this explains how it is that during over a century entomologists have disagreed about it; the reason was they had to choose between two solutions neither of which fitted facts. On the one hand they certainly exhibit constant distinguishing features

(including differences in the genitalia, shown by Fruhstorfer in *Soc. Ent.* 1910, and in *Ent. Zeit.* 1908, respectively), which must be due to different hereditary factors; on the other hand they inhabit distinct areas, excluding each other completely, and, on the boundary line between them, races have been observed (*acraeina* and *milada*) belonging to *ferula*, but pointing to *actaea* in some individuals. Wheeler (*Butt. Switz.*, p. 109) concludes they must be two species on the strength of the one record, from Digne, by Nicholson, of their having been found on the same grounds, but the importance of this remark is greatly diminished* by the fact they flew at different seasons, so that they probably are in that case "seasonal exerges," such as I have recorded from Turin in *Melitaea athalia* (or *kenteanu*) and *pseudoathalia*, and from England in *Zygæna filipendulae* and *tutti*.† I have a male *actaea* from Septèmes, near Marseilles, which has on both surfaces of forewing two ocelli, with white pupils, and, between them, two white dots, as in *ferula*: ab. **ferulaeformis**, mihi. It can, however, only be an aberration, because on underside of hindwings it has two little blind ocelli in the same internervular spaces. I must take this occasion to record the very striking race of exerge *actaea* of the Cévennes du Gard (Mt. Aigoual), which has no white on underside of hindwing; the capillary streaks, which cover them, are also unusually thick, increasing still more their dark and uniform appearance and recalling some *orientalpinum*, so that it makes one suspect the proximity of the *ferula* region may, in this case, have something to do with its origin: race *aigoualensis*, Foulgr., in Lhomm's *Cat. Lép. Fr.*, p. 36.

N. statilinus race **miconosandrus**, mihi.—Oulx (from August 12th). Similar by the large size of the eye-spots and by the underside pattern to *onosandrus*, Frhst., but much smaller in most individuals and often with a grayish suffusion over the hindwing on upperside of male; by these two features it is quite like *apennina*, Z., of the smallest description and the comparatively high altitude and the dryness of Oulx, no doubt, accounts for them. Race *onosandrus*, Frhst., is described from S. Tyrol and the Brenta Group, but the Valais is included in its habitat; it thus is broadly spread as the most usual Alpine race. On the French watershed it is replaced, at Digne, Grenoble, Arcachon (I have it also from Lyons), by the very different *evryanar*, Frhst., as figured by Esper under the name of *arachna*, which cannot, however, stand for it, because it was erected originally by

* The more I work at this subject the greater my conviction becomes that the term "exerge" is necessary to designate relationship of this sort. Mr. Turner's and Mr. Warren's definitions of "subspecies" would include it, but some of our best workers insist on using this term for the very much more frequent kind of relationship which should, in that case, be called "races," as I have done. Besides Mr. Warren himself, in practice, calls subspecies, a certain number of the most highly differentiated races, which, to my mind, do not correspond to his own definition. I think it is only carried out by a very small number of large groups, such as *malvae* and *malvoides*, which really only just fall short of being specifically distinct. As we thus do not seem able to agree on the use of the word "subspecies" and present literature is quite as confused as that of the past in this respect, I conclude we should leave things as they are and consider "subspecies" and "race" as more or less equivalent, or the former as a more highly differentiated race, and use the term "exerge" for the other phenomenon, in which hereditary factors intervene.—R.V.

† To my mind the importance is mostly due to the fact. The view expressed by Dr. Verity is to me quite incomprehensible.—G.W.

Schiffermüller for the Vienna insect. Further south, on the Riviera, there flies the handsome *fidiaeformis*, Vrtý., described from Grasse; it belongs to the same Group of races as *micromaritima*, Vrtý., and *australis*, Esp., of the coast of Peninsular Italy, whereas the two former are more closely connected with those of Central Europe. In the Po Basin one meets with a race intermediate between these two groups and precisely between *onosandrus* and *intermedia*, Vrtý., of the hinterland of Peninsular Italy: it is larger than the former and less white on underside, but its underside, variegated white and black, individual form still recalls it more than any individual of *intermedia* ever does and its *totebrunnea*, Vrtý., form is of a richer chestnut tinge than in the latter; both these forms are also more thickly suffused with dark capillary streaks: race **padi**, mihi. In its more highly characterised form I have it from Capriolo, 200m., near Brescia, but at the foot of the Susa Valley, near Turin, one meets with a similar one, mixed with transitions to *onosandrus* and I have even an *euryanax*, found amongst them.

Hipparchia semele race *cadmus*, Frhst.:—Oulx (males from July 4th; females only appeared on August 13th, and then emerged suddenly in a mass, together with a few laggard males).

(To be continued.)

NOTES ON COLLECTING. etc.

ABUNDANCE OF COMMON LARVAE.—In contrast with last autumn (1926) the present season has provided a more normal supply of larvæ. *Euplexia lucipara* has been exceptionally common and has riddled my ferns and played considerable havoc with Japanese Anemones, ably assisted by *Mamestra persicariae* and *Hadena oleracea*. *Mamestra brassicae* has, as usual, devastated my large plant of *Atropis belladonna* (a species rarely eaten by lepidopterous larvæ), and there have been a few *Spilosoma menthastri* and *Diacrisia lubricipeda*; but these "Ermines" have been comparatively scarce for several years, *S. menthastri* being rather the commoner, contrary to general experience.—C. NICHOLSON (F.E.S.), 35, The Avenue, Hale End, E.4. October 17th, 1927.

POLYGONIA C-ALBUM IN BERKS, ETC.—On October 8th I took specimens of this species a few miles W. of Reading. It seems only a question of time before it reappears in the London District. In this connection I should like to ask what, if any, is the explanation of the present rarity of *Eugonia polychloros* in Surrey. I remember that 25 years ago it was not rare in the district around Dorking. I have frequently visited this area in the last four years in May, June and August, but have never once seen a specimen fresh or hibernated.—P. P. GRAVES (F.E.S.), 5, Hereford Square, S.W.7.

A REMARKABLY LATE RECORD.—On October 9th this year my son was chamois hunting on the south side of the Brèche de Roland, above the Cirque de Gavarnie (Pyrenees, about 8,500-9,000 ft.), when he came across several freshly emerged *Erebias* flying over and settling on the shale slopes. Unfortunately he was unable to catch one in his hat. But from his description and also on account of the fact that he

caught a perfectly fresh ♂ of *E. lefebrei* rather small and very black (f. *astur*) on this identical ground in the middle of August, 1926, I have no doubt that the fresh *Erebias* seen this year in October were *E. lefebrei* f. *astur*. This must be an exceptionally late date. All the more so on account of there having been quite a heavy fall of snow in the middle of September. He saw several of the insects settled and was satisfied that they were quite fresh.—P. HAIG-THOMAS (F.E.S.), The Grange, Goring-on-Thames.

CURRENT NOTES AND SHORT NOTICES.

Will some of our subscribers give us notes on their season's captures and breeding. We hear that it has been an extraordinary year for aberrations. At the head of the list comes a very fine black *Papilio machaon* bred by Mr. S. G. Castle-Russell. Larvae of the more uncommon species have been reported in number, among them *Cucullia gnaphalii*. In the copse we searched last year unsuccessfully for *Synanthedon flavicentris*, at least a dozen larval galls have been reported by Mr. Wm. Fassnidge. To the last named has also fallen the luck to capture an example of the extremely rare *Myelois cirrigerella*, which, I believe, has not been met with in this country since Mr. Edward Meyrick discovered it at Marlborough in 1874.

The South London Entomological Society registered another great success in its Annual Exhibition held on October 27th. Two hundred and forty-one signed the attendance book, about half of whom were members, and some fifty brought exhibits. It has really become the great entomological social meeting of the year, when country members and friends renew their touch with the Society. We would like to see the refreshment fund better patronised as the cost is rather a drain on the funds of the Society. Up to the present quite a few enthusiastic friends have helped to defray the cost, but it seems hardly fair to expect this to occur year after year.

We much regret to announce the passing of our old and valued friend and correspondent Mr. D. H. Pearson of Nottingham, after two serious operations the latter of which proved unsuccessful. A man of strong physique, a lover of the mountains, one who knew the flowers and insects of the Alps and Pyrenees, we shall miss his genial converse and welcome correspondence. He was a Fellow of the Entomological Society of London, and a member of the S. London Society, to the annual exhibition of which he usually brought a drawer of choice specimens of Lepidoptera.

We regret also to record the death of Mr. Stanley Blenkarn, a well-known member of the South London Society, who was killed in a motor accident only three days after exhibiting at the Society's exhibition. He was an ardent coleopterist, and especially keen on the more local species of the British Islands.

The death is also reported of Prof. Berlese the talented Italian entomologist and the author of that great work "Gli Insetti." It will be a loss to the small band of illustrious entomologists of Italy, who have of late years brought the scientific investigations of their country to the stage of world-wide importance. Coming so soon after the tragic death of Prof. Bezzi it is most unfortunate.

THE NEWSBOY'S STORY.—The most sporting event I ever saw, writes a sportsman, was a caterpillar crossing Piccadilly.

Lumme! Listen jist a minute,
 I kin tell yer wat's the sport.
 Dogs an' 'orses isn't in it
 Wiv a grub—them 'airy sort!
 Wy, the cop in Piccadilly
 Sent the shovers inter fits
 While that caterpillar filly
 Done the crossin' at the Ritz.

Gosh! She squirmed among the buses
 Jest as dainty as could be,
 Till the cop was drahned in cusses,
 'Oldin' hup the line, yer see!
 Flyin' stunts an' Channel swimmin'!
 Sporty stuff, a bloke admits,
 But me heyes was fairly brimmin'
 Watchin' Grubby reach the Ritz!

A. W.

The above lines appeared in the *Daily Chronicle* of September 19th last following a short article in the *Evening News* a few days before. I have, however, been unable to trace the article with a view to getting into touch with the writer, to ascertain if possible what the caterpillar was. Perhaps some reader can throw light on it.—C.N.

A speaker at a Bradford Textile Society meeting said: "It used to take two sheep to clothe a woman. Now a silkworm could do it." This cutting speaks for itself!—C.N.

The following Fellows of the Entomological Society of London have been nominated by the Council as Officers and Council for the Session 1928-1929. *President*:—J. E. Collin. *Treasurer*:—W. G. Sheldon, F.Z.S. *Secretaries*:—S. A. Neave, M.A., D.Sc., F.Z.S., N. D. Riley, F.Z.S. *Librarian*:—H. J. Turner. *Council*:—R. Adkin, P. A. Buxton, M.A., E. A. Cockayne, M.A., M.D., F.R.C.P., H. M. Edelsten, H. Eltringham, M.A., D.Sc., Capt. A. F. Hemming, C.B.E., F.Z.S., R. W. Lloyd, Prof. R. Stewart MacDougall, M.A., D.Sc., F.R.S.E., G. A. K. Marshall, C.M.G., D.Sc., F.R.S., J. W. Munro, D.Sc., W. H. T. Tams, A. E. Tonge.

Major Graves has, unintentionally, entirely misrepresented me, *ante* p. 167, *et seq.* I have gone back on nothing in what I signed as Chairman of the British National Committee on Nomenclature. Art. 14 says that "a name of lower rank than that of subspecies has no status of nomenclatorial value." In the article I criticised Dr. Verity was dealing with "exerges," that is a lower rank than "subspecies," and my criticism is valid. I am far from being inappreciative of Dr. Verity's work and comparative study of the various forms of European Rhopalocera; it is a valuable analysis. What we have to guard against in his work is the quite uncertain value of what he calls "Races" and "Exerges"; they are nearly all of very varying degrees of abundance or rarity, and very few of his names can rank as of subspecific value.—G.T.B.-B.

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List of Insects of various orders taken at Aswan, Egypt, during 1919-1912, Capt. K. J. Hayward, F.E.S.	(1)-(4)
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List of the Orthoptera
of Hampshire and the
Isle of Wight.

By Fredk. J. KILLINGTON. F.E.S.

List of the Orthoptera of Hampshire and the Isle of Wight.

By FREDK. J. KILLINGTON, F.E.S.

In the following paper only such species as breed in this country, either in the open or under artificial conditions, are noticed. In a seaboard county such as Hampshire, our list of Orthoptera could be considerably extended if we included the many casual visitors that enter such a port as Southampton. Omitting these casuals, the British species at present number thirty-nine, all of which possibly exist in this county; in the present paper thirty-four are noted. The five species I have been unable to find Hampshire records for, are as follows:—

Sub-order FORFICULODEA (Earwigs).

Anisolabis annulipes, H. Lucas, which should be sought for in situations similar to those chosen by the common cockroach; *Prolabia arachidis*, Yersin, which is found under the same artificial conditions; *Apterygida albipennis*, Megerle, a wingless species, which is apparently very local in the South of England, but is sometimes taken in numbers where it occurs by beating and sweeping.

Sub-order BLATTODEA (Cockroaches).

Periplaneta americana, Linn., the largest of our cockroaches. W. J. Lucas (*Brit. Orth.*, p. 102), gives the following list of adopted haunts: houses, breweries, bakehouses, warehouses, docks, sugar-refineries, rubber and dye works, nurseries, hot-houses, etc.

Sub-order LOCUSTODEA (Long-horned Grasshoppers).

Metriopectera voeslii, Hagenbach, a brown and green species, with very vestigial wings and abbreviated elytra, that has been taken—in this country—chiefly near the coast. It appears to be very local, but should occur in Hampshire.

The orthopterous fauna of the county has been well worked out along a line running from Bournemouth, *via* Southampton, to Alton but the districts around Andover and Petersfield still need attention.

I have to thank several friends for supplying me with lists of localities, or for sending me specimens for identification: S. W. Dale, W. Fassnidge, B. M. Hobby, H. P. Jones, W. J. Lucas, G. T. Porritt, A. H. Sperring and E. A. C. Stowell.

The following abbreviations have been used:

Vict. Hist. = *The Victoria History of Hampshire*, 1900.

Nat. Hist. I. of W. = *A Guide to the Natural History of the Isle of Wight*, 1909.

Brit. Orth. = *British Orthoptera*, by W. J. Lucas, B.A., F.E.S., 1919.

Entom. = *The Entomologist*.

E.M.M. = *The Entomologist's Monthly Magazine*.

Ent. Rec. = *The Entomologist's Record and Journal of Variation*.

Suborder FORFICULOIDEA (Earwigs).

Labidura riparia, Pallas.—This fine species was first taken in England in 1808, on the beach near Christchurch, by the Rev. W. Bingley. It was then lost sight of, and, in fact, came to be regarded as extinct as far as the British Isles were concerned. It was rediscovered, however, in 1865, near Hengistbury Head, and since then has been taken by a number of entomologists in the same locality,* sometimes in fair numbers. Except for a locality in the Isle of Wight, the neighbourhood of Bournemouth appears to be the only place in the British Isles, where the insect has been taken†. Most of the captures have been made in the summer months, but it seems likely that the species persists through the winter in both the adult and nymphal stages; adults and nymphs of various sizes are to be found in August. Writing of the species in France, Chopard (*Orthoptères et Dermaptères*, Paris, 1922) records it as occurring "Sous les débris et les pierres, au bord de la mer. Toute l'année." W. J. Lucas (*Brit. Orth.*, p. 23), describing its habits, writes: "In the British habitat the requisite condition for the presence of *L. riparia* seems to be a slide of loose soft sand with some stones, preferably flat ones (some 4 or 5 inches across), lying on its surface."

Burr (*Vict. Hist.*) states that *L. riparia* is found at "Christchurch, Bonchurch and Hengistbury Head, and very likely is far less rare than generally supposed."

Labia minor, Leach.—This interesting little earwig is undoubtedly more widely distributed in Hampshire than the records indicate. It flies readily, especially on warm evenings, over dung-heaps, in gardens, etc., sometimes occurring in considerable swarms. It may be taken from April to November, and almost certainly passes the winter as an adult.

Brockenhurst (W. J. Lucas); Southampton (B. M. Hobby); Bitterne Park, Southampton, Eastleigh‡, one in a ride in a wood at Baddesley (F. J. Killington). Common in early summer (*Vict. Hist.*).

I. of Wight: Newport, in May; also beneath heaps of garden refuse in Sept. Probably common throughout the island (*Nat. Hist. I. of W.*).

Forficula auricularia, Linn.—This very abundant insect is, without doubt, to be found everywhere in the county in every month of the year. A list of all the localities in which it has been taken is unnecessary: I have noted it in the New Forest, at Southampton, Eastleigh, Romsey, Hayling Island, Winchester and Odiham.

I. of Wight: Abundant everywhere (*Nat. Hist. I. of W.*).

*W. J. Lucas gives details of the captures of this insect from the year 1808 to 1918 in his *British Orthoptera*, and since the publication of this work in 1919, has kept our knowledge of the insect up to date in his annual notes on the Orthoptera in the *Entomologist*.

†Casuals have appeared elsewhere (e.g., Liverpool), introduced, no doubt, from abroad.

‡*L. minor* swarmed in my garden in Eastleigh in July, 1926, flying over the flower-beds on warm evenings (F.J.K.).

♂ *Var. forcipata*, Steph.—Found occasionally with the type. I have seen this form in the New Forest, and at Eastleigh.

I. of Wight: On the cliffs at Freshwater (P. M. Bright).

Forficula lesnei, Finot.—A local species that will probably be discovered in a number of Hampshire localities, although I have at present only one record for the mainland. Burr (*Vict. Hist.*) states that it is "much rarer than the Common Earwig, but probably more widely distributed than generally supposed." It is to be obtained by sweeping and beating, while Porritt found it on "sugared posts" (*Brit. Orth.*, pp. 56, 57).

Bournemouth (*Entom.*, XXXIII., p. 76).

I. of Wight: Bonchurch (*Entom.*, XXXIII., p. 76); Freshwater Bay, Undercliff and Blackgang, Niton and St. Catherine's Point (*Nat. Hist. I. of W.*); Ventnor and Compton (*Brit. Orth.*). The species appears to be fairly common and well-distributed in the island.

Suborder BLATTODEA (Cockroaches).

Ectobius lapponicus, Linn.—A common little cockroach that may be found in low vegetation, or that may sometimes be beaten from bushes and trees. I have also, on one or two occasions taken it on the wing in the New Forest. It has often, also, been taken at night on "sugar." Adults are to be found throughout the summer months; immature specimens are common in winter amongst dead leaves, under clumps of heather, etc.

New Forest, very common; Baddesley, in woods, and at Emer Bog; in woods at Chandler's Ford; Fisher's Pond, amongst vegetation fringing the water (F. J. Killington); Lord's Wood, Southampton, four nymphs on Feb. 9th, 1924 (W. Fassnidge); Pamber Forest (*Brit. Orth.*).

I. of Wight: Parkhurst Forest (*Nat. Hist. I of W.*).

E. perspicillaris, Herbst. (= *livida*, Fabr.).—A less common insect than our other two native cockroaches. It is considered by some authors to be only a pale variety of the preceding species.

Bournemouth (*E.M.M.*, 1911, p. 137); New Forest (*Vict. Hist.*)

Var. pallidus, Steph.—New Forest (Stephens).

E. pauxeri, Steph.—This little cockroach appears to favour localities near the sea, although it is sometimes found inland. It has been taken by sweeping and beating; under stones, seaweed, etc.; under bark and in rotten wood; it is also a visitor to the lepidopterist's "sugar patch." Adults seem to be taken most frequently in August.

Parley Heath and near Bournemouth (*Brit. Orth.*); Boscombe (*Vict. Hist.*); Christchurch (G. T. Porritt); New Forest, common (F. J. Killington); Hayling Island (*Vict. Hist.*).

I. of Wight: Blackgang Chine, Alum Bay, Totland Bay, Yarmouth, Compton Bay, St. Catherine's Point and Parkhurst Forest (*Nat. Hist. I. of W.*).

Var. nigripes, Steph.—This variety has been recorded from Bournemouth, Boscombe, near Christchurch, and the New Forest.

Blattella germanica, Linn.—An imported species that will probably

be found well-distributed throughout the county, living under artificial conditions of warmth. In the *Vict. Hist.*, the species is spoken of as very abundant in many hotels and restaurants, but published records of definite localities seem rare. I have had adults in the winter, and no doubt breeding is continuous.

Portsmouth, Central Hotel (*Brit. Orth.*); Southampton, large numbers of the cockroach in all stages were brought to me from a house a few years ago (F. J. Killington).

I. of Wight: Shanklin, one in a house, another in a grocery store (*Nat. Hist. I. of W.*).

Blatta orientalis, Linn.—The common cockroach undoubtedly exists in houses, shops, bakehouses, etc., throughout the county. The adult may be found throughout the year. At the end of the eighteenth century it was probably still an uncommon insect in Hampshire, as Gilbert White (1790) refers to it as an unusual insect at Selborne. In the same district it is now very common, and Mr. E. A. C. Stowell informs me that it continues in his house at Alton in spite of his efforts.

Eastleigh and Southampton, common (F. J. Killington); Alton, very common (E. A. C. Stowell); numerous in kitchens and cellars throughout county (*Vict. Hist.*).

I. of Wight: Plentiful at Newport and elsewhere (*Nat. Hist. I. of W.*).

Periplaneta australasiae, Fabr.—This insect is most likely to be found in heated greenhouses in this county.

Brockenhurst, 1906, a nymph amongst bananas; Bishop's Waltham, at Swanmore Park Gardens, established and numerous (*Brit. Orth.*); one found in a greenhouse in Meon Valley (E. A. C. Stowell).

Leucophaea surinamensis, Linn.—Found in similar situations to preceding species. The only record for the county that I can find is of a specimen taken on Christmas Day, 1908, in a hothouse at Bishopstoke, by Mr. G. T. Lyle (*Brit. Orth.*).

Suborder GRYLLODEA (Crickets).

Gryllotalpa gryllotalpa, Linn.—The mole-cricket is probably well distributed throughout the county, and more common than it appears to be from the records. It favours moist meadows, river and canal banks, and damp spots generally. There is an interesting account of its habits in Gilbert White's famous letters (No. XLVIII.), and the insect appears to have been common at Selborne in his time.

Brockenhurst (*Entom.*, XXXV., p. 223); New Forest, common when searched for (G. T. Porritt); not uncommon in the New Forest, but difficult to obtain, in their special localities, by digging (H. P. Jones)*; Beaulieu Heath, one in 1919 (B. M. Hobby); Southampton and Netley (*Brit. Orth.*); Southampton, a specimen taken in 1925 was shown to me (F. J. Killington); Calsbot, one in 1905 (S. W. Dale); Twyford, one seen on a chalky road leading to the downs, August, 1923 (F. J. Killington); Winchester, occasionally seen in the district (G. M. A. Hewitt).

*See also *Brit. Orth.*, p. 128.

I. of Wight: Newport, in gardens; specimens obtained by digging on banks of Medina at Shide (*Nat. Hist. I. of W.*).

Nemobius sylvestris, Fabr.—This species was first discovered as British by J. C. Dale, who took it amongst dead leaves in a gravel-pit near Lyndhurst. It seems to have a preference for dry banks, and may be taken in numbers in such situations in August. Nymphs may be found in winter and in spring and early summer, while it seems likely that some adults, if not all, can survive the winter. A careful lookout should be kept for this species in our other mixed woods as it seems unreasonable to suppose that the insect is confined to the New Forest on the mainland.

New Forest, common (H. P. Jones, F. J. Killington, G. T. Porritt). See also *Brit. Orth.*, p. 132.

I. of Wight: "Has occurred commonly for the last ten years or more at Bordwood, near Sandown; also noticed in Parkhurst Forest (Poole); swept in Parkhurst Forest, August, 1907; also on previous occasions (Morey). These are the first authentic records of the wood-cricket from any British locality outside the New Forest" (*Nat. Hist. I. of W.*).

Gryllus campestris, Linn.—The field-cricket is apparently a rare and local insect at the present time. In Gilbert White's time the species was frequent in the neighbourhood of Selborne (see letter xlvi.). He states at the beginning of his letter: "There is a steep abrupt pasture field interspersed with furze close to the back of this village, well known by the name of the Short Lithe, consisting of a rocky dry soil, and inclining to the afternoon sun. This spot abounds with the *Gryllus campestris*, or field-cricket; which, though frequent in these parts, is by no means a common insect in many other counties." Mr. E. A. C. Stowell informs me that the spot described by Gilbert White appears to be a wood at the present time.

Christchurch (*E.M.M.*, 1911, p. 138); Pokesdown, a nymph taken by Major Robertson (W. J. Lucas); recorded from the New Forest by Stephens (*Vict. Hist.*).

Gryllus domesticus, Linn.—The well-known house-cricket is probably much less common to-day than in the past, a decrease that is undoubtedly due to improved construction of bakehouses and such-like places. They are, however, still to be found in numbers in certain old dwelling houses, and in the less up-to-date bakehouses, in stables, and sometimes in rubbish dumps out of doors. Occasionally they are found on the wing during the summer months. Gilbert White (*Nat. Hist. of Selborne*, letter xlvi.), "observed them to fly, when it became dusk, out of the windows, and over the neighbouring roofs." He adds: "When they increase to a great degree, as they did once in the house where I am now writing, they become noisome pests, flying into the candles, and dashing into people's faces." Mr. W. Fassnidge has given me two interesting Hampshire records of house-crickets found out of doors: he took a specimen at the foot of a street-lamp in Southampton, evidently attracted by the light; and another in early July, 1924, at Baddesley, at his "sugar patch," where its activity was such that he experienced great difficulty in effecting a capture.

Common in the older bakehouses and in stables, Southampton and Eastleigh (F. J. Killington); Baddesley, one at "sugar" (W. Fassnidge); Winchester (*Brit. Orth.*); Alton, common in 1923 (E. A. C. Stowell); Selborne, common in Gilbert White's time.

I. of Wight: "Frequent in bakehouses, but less common than formerly, owing to the improved ovens which have been introduced (Poole); occasionally in houses at Newport (Morey)." (*Nat. Hist. I. of W.*).

Suborder LOCUSTODEA (Long-horned Grasshoppers).

Pholidoptera griseoaptera, De Geer.—A common grasshopper, probably well distributed throughout the county, to be taken amongst coarse vegetation, low brambles, etc., in wood-clearings and hedges. It has been taken at "sugar" in the New Forest (W. J. Lucas). Imagines occur from July to October.

New Forest, common (H. P. Jones); Fordingbridge (W. J. Lucas); Southampton, Eastleigh, and Winchester, common (F. J. Killington); Aldershot (*Brit. Orth.*).

I. of Wight: Yarmouth (E. A. C. Stowell); Sandown, and abundant at Freshwater, Compton Farm, Blackgang, Undercliff (*Nat. Hist., I. of W.*); Parkhurst Forest (*Brit. Orth.*).

Metrioptera albopunctata, Goeze.—Found almost entirely near the coast, where it may be taken amongst tall grass, brambles, and in clumps of such plants as rest-harrow. It has been taken at "sugar" (*Brit. Orth.*, p. 160). Imagines occur from late July to October.

Coast near Milton, and near Mundeford, Barton, Hayling Island, Southsea and Southampton (*Brit. Orth.*).

I. of Wight: Numerous at Compton Bay, Blackgang, and the Undercliff (*Nat. Hist. I. of W.*).

M. brachyptera, Linn.—A common species in favourable localities, moist heathy ground such as is common around the bogs in the New Forest. The adults are to be found from late July to October.

Bournemouth (G. T. Porritt); in numbers (1903) at St. Catherine's Hill at the back of Christchurch (*Brit. Orth.*); New Forest, common in boggy spots, near ponds on Southampton Common, and at Chandler's Ford (F. J. Killington); near Hurn (W. J. Lucas).

I can find no records of the species for the Isle of Wight.

Tettigonia verrucicora, Linn.—A very rare species that favours clearings in woods, and dry barren places. Imagines occur from early July to October. The brown variety, *bingleii*, Curtis, is said to have been first taken at Goodwin's Croft, near Christchurch, and given to the Rev. W. Bingley. A female in J. C. Dale's collection was captured by the side of a barley field near Christchurch, 30.VII.1818, and a male in the same place, 14.VIII.1818 (Curtis, *British Entomology*). A female (colour not mentioned) was taken by J. C. Dale in the New Forest, 3.VII.1844, and a specimen of var. *bingleii*, taken in the Forest in Sept. 1891, is mentioned by H. Bath (*Brit. Orth.*).

Phasgonura viridissima, Linn.—Apparently well distributed in the southern part of the county, where it is to be found in coarse vegetation,

brambles and bushes in open sunny spots, such as cliff-sides, clearings in woods, hedgerows, etc. It has occurred at "sugar." Imagines from late July to October.

Pokesdown, Christchurch and Lymington (*Brit. Orth.*); Southampton Common and Eastleigh, occasional specimens (F. J. Killington); South Stoneham, a male in long grass (*Entom.*, LIII., p. 128); Portsmouth, in bushes near the shore, in numbers in 1925 (A. H. Sperring).

I. of Wight: Sandown, several in 1922 (S. W. Dale); Parkhurst Forest, Freshwater, cliffs at Compton Bay and inland, Blackgang and the Undercliff, White Cliff Bay, Ventnor (*Brit. Orth.*); abundant in the Island (*Nat. Hist. I. of W.*). There is a specimen in the Dale Collection at Oxford, taken at Freshwater in 1865 (*E.M.M.*, LXI., p. 247).

Conocephalus dorsalis, Latr.—A marsh-loving species, found both on the coast (salt-marshes and sandhills), and inland. It appears to be a local and uncommon insect. Adults are found chiefly in August and in September.

Denny Bog in the New Forest, and near Hengistbury Head (W. J. Lucas); Baddesley, one in a swampy spot in a wood, in 1924 (W. Fassnidge).

I. of Wight: Numerous in the marsh extending from Yarmouth to Freshwater, and Rookley Wilderness (*Nat. Hist. I. of W.*); Freshwater, 1865 (*E.M.M.*, LXI., p. 247).

Mecanema thalassinum, De Geer.—A very common species that can usually be obtained in numbers by beating trees in woods. Imagines occur from early August to November, and frequently are found at "sugar."

Common in the New Forest and in woods around Eastleigh (F. J. Killington); Alton, common, visits the "sugar patch" (E. A. C. Stowell).

I. of Wight: Common at Bordwood, near Sandown; also on street lamps in Shanklin; Newport and Marvel Copse (*Nat. Hist. I. of W.*).

Leptophyes punctatissima, Bosc.—A common woodland insect that may be taken in numbers from the end of July to November by beating. It sometimes visits "sugar."

New Forest, common (H. P. Jones); one at foot of cliffs near Mudeford (*Entom.* LIII., p. 129); in woods at Baddesley, Bishopstoke, and around Winchester (F. J. Killington); Hayling Island, Lords Wood, Southampton, and Aldershot (*Brit. Orth.*).

I. of Wight: Common: Freshwater, Freshwater Bay, Compton Bay, Blackgang, Undercliff, Parkhurst Forest and Yarmouth (*Nat. Hist. I. of W.*).

Suborder ACRIDIODEA (Short-horned Grasshoppers.)

Tetrix subulatus, Linn.—This little species is probably far more common than it has appeared to be. It should be looked for in marshy spots, by the sides of ponds and streams, from August until May (this and the next species are the only two hibernating British grasshoppers).

It may be taken by searching amongst reeds and moss, or may be swept; in sunshine it will give itself away by flying.

Coast near Milton; Marlborough Deeps in the New Forest (W. J. Lucas); Holmsley and Barton (*Brit. Orth.*); New Forest, local (H. P. Jones); by Fisher's Pond near Eastleigh, margins of ponds at Chandler's Ford, in a marsh at Bishopstoke (F. J. Killington).

Var. *stylifer*, Lucas.—Taken with the type in the New Forest (W. J. Lucas); Fisher's Pond (F. J. Killington).

T. bipunctatus, Linn.—Much more common than its congener, and found in drier spots. Clearings and rides in woods, hillsides and heaths are favoured places. Imagines from August to May.

Near Christchurch, and coast near Milford (W. J. Lucas); New Forest, common (H. P. Jones); common in many spots around Southampton, Eastleigh and Winchester (F. J. Killington); Hayling Island, Barton, Aldershot, Pamber (*Brit. Orth.*); on Parley Heath, in 1820 (*E.M.M. LXI.*, p. 250).

I. of Wight: Parkhurst Forest, Marvel, Undercliff (*Nat. Hist. I. of W.*); Compton Bay (*Brit. Orth.*).

Gomphocerus rufus, Linn.—Not a common species, but probably will be discovered in various parts of the county. It should be looked for in clearings in woods, on the slopes of the downs, and dry places generally. The mature insect is usually obtained in August and September. The only record I have been able to find is an old one, and refers to specimens taken by J. C. Dale in the New Forest (*Brit. Orth.*). Some of these specimens are now in the Dale Collection in the Hope Department of the Natural History Museum at Oxford, and are dated 1827 and 1830 (*E.M.M. LXI.*, p. 248).

G. maculatus, Thunb.—A well-distributed and common insect to be found on heaths, downs, waste ground, and in rides and clearings in woods. Imagines are found in June and continue until the end of October.

Bournemouth, Need's Ore, near Christchurch, Southsea and Hayling Island (*Brit. Orth.*); Brockenhurst, New Forest, Southampton Common, Netley, Chandler's Ford, Bishopstoke, Farley Mount, and on the downs at Shawford and Winchester (F. J. Killington); Dur Hill Down (W. J. Lucas); on the heaths around Bordon and Headley (E. A. C. Stowell).

I. of Wight: Yarmouth and Parkhurst (*Brit. Orth.*); Afton Down, Undercliff, Blackgang, St. Catherine's Point (*Nat. Hist. I. of W.*); Freshwater, 1824 (*E.M.M. LXI.*, p. 247).

Mecostethus grossus, Linn.—This fine species is not uncommon in a large number of the bogs in the New Forest. Mature specimens may be taken at the end of July, but are more common in August and September. The species flies readily and is difficult to capture without a net. I can find no record of its capture in the county outside the New Forest, unless J. C. Dale's Parley Heath specimens (*Brit. Orth.*), were taken in Hampshire.

Stenobothrus lineatus, Panzer.—This is one of the less common species. It appears to prefer dry grassy spots, slopes of downs (a favourite habitat), clearings in woods and cliffsides. Imagines are taken from the middle of July until the end of October, but it is at its best in August and September. There are very few localities recorded for the county, and none, apparently, for the Isle of Wight.

Bournemouth (*Brit. Orth.*); New Forest (Burr records it in the *Vict. Hist.*, but I have not heard of its being taken there by anyone else); one taken in a clearing in Hiltingbury Wood, Chandler's Ford; not uncommon on Farley Mount; and in numbers on the downs near Winchester and Twyford (F. J. Killington).

Omocestus rufipes, Zett.—This species is probably to be found in dry spots throughout the county, although it is not so common as the next species. Heaths, rides and clearings in woods, and downs, are the places favoured by the insect. It occurs from June to October.

Bournemouth (*Vict. Hist.*); New Forest, in many places (W. J. Lucas), common (H. P. Jones); not uncommon in Bishopstoke Woods, and woods at Chandler's Ford, and occasionally on the Winchester Downs and on Farley Mount (F. J. Killington).

O. viridulus, Linn.—This is one of our common grasshoppers, and occurs in both dry and moist spots. Imagines are found from June until October.

New Forest and Hengistbury Head (W. J. Lucas); Brockenhurst, Southampton, Eastleigh (in woods, and in wet meadows by the R. Itchen); Winchester (F. J. Killington); Alton (E. A. C. Stowell).

I. of Wight: Yarmouth (W. J. Lucas); Parkhurst Forest, Haven Street Woods, and Newport (*Nat. Hist. I. of W.*).

Stauroderus bicolor, Charp. The commonest British grasshopper. It is to be found in gardens and parks in towns, on waste ground, heaths, downs, in meadows, woods, etc., but appears to favour dry situations. It occurs as an imago from June until November.

Bournemouth, New Forest, Hurst Castle, near Lymington, coast near Milton and Mundeford, Whale Island Portsmouth, Hayling Island (*Brit. Orth.*); Southampton, Eastleigh, Winchester, abundant (F. J. Killington); Alton (E. A. C. Stowell). There are many other records, but it is unnecessary to give them as the species is undoubtedly common everywhere.

I. of Wight; Yarmouth and Sandown (*Brit. Orth.*). Burr (*Nat. Hist. I. of W.*), merely states: "Our commonest British grasshopper," evidently considering it widely distributed and common in the island.

Chorthippus elegans, Charp.—This is a somewhat local species, and has been found in swampy places, salt marshes, on sandhills, etc. August and September are the best months for the adult grasshoppers.

New Forest, rather local (H. P. Jones); Holmsley (W. J. Lucas); Cracknore Hard, Southampton Water (W. Fassnidge); Aldershot (*Brit. Orth.*).

I. of Wight: Freshwater, Freshwater Bay (in dry grass near the front), Parkhurst Forest, and Ventnor (*Nat. Hist. I. of W.*).

C. parallelus, Zett.—A common species which may be taken in dry and moist situations from the beginning of July to the end of October.

Bournemouth and Hengistbury Head (*Brit. Orth.*); New Forest (H. P. Jones); Brockenhurst, Southampton, Eastleigh, Farley Mount, Shawford and Winchester (F. J. Killington); Alton (E. A. C. Stowell).

1. of Wight: Yarmouth and Cowes (W. J. Lucas); a very common grasshopper (*Nat. Hist. I. of W.*).

Var. *montanus*, Charp.—This is a macropterous form and is exceedingly rare in this country. A specimen was taken in the New Forest, 17th October, 1924, by W. J. Lucas, who describes and figures it in the *Entomologist*, LVIII., p. 86. Mr. Lucas' specimen is only the second recorded British var. *montanus*.

ORIG. DESCIP.—“Collar and prothorax ruddy brown; patagia crested grey, edged with dark brown; posterior portion of thorax grey; abdomen smoky brown; base of legs clothed with rosy hairs; primaries, ground colour light purple brown, suffused at base and terminal portion of the wing with light whitish green and crossed by a broad median band of the same colour; the basal green portion of the wing is bordered by an indistinct geminate, outwardly oblique, subbasal line angled inwardly on submedian fold and filled with light green; at a short distance beyond a geminate t.a. line filled with ruddy brown runs parallel to subbasal line, outer line of the two being broadly black; median area with small round black spot in cell and wavy black median shade exterior to spot; t.p. line geminate almost perpendicular, slightly outcurved opposite cell, incurved on submedian fold; inner line deep black, space between ruddy brown; at a point beyond t.p. line equal to distance between subbasal and t.a. lines, a perpendicular, lunulate, pale green line, the area beyond this being almost entirely whitish green; below apex of wing a slight black curved line, continued indistinctly as a greenish shade edged with dusky to anal angle, often entirely absent; terminal black line slightly lunulate; fringes rosy grey. Secondaries dark smoky grey, lighter along outer margin, with traces of black subbasal line and lighter median band.” Vancouver Island.

Barnes says in *Contrib.*, I. iv. (1912), “green basal area of *improrisa* is more limited than in *fasciata* and of a decided apple green shade; the broad suffusion of greenish in outer portion of wing bordered inwardly by geminate line is almost lacking in *improrisa*, being confined to an apical patch continued as a waved line.” “The t.a. line in *fasciata* is much less oblique and the angle is not prominent as in *improrisa*.”

In *Contrib.*, *L.c.*, B. and McD. say.—“We would call attention to the differences in the course of the t.a. line as well as the markings of the terminal area between this and the preceding species [*improrisa*]. The green of the latter species is grey-green, not apple green as in *improrisa*.”

The figure of *fasciata* (*Contrib.*), has the forewing much lighter than that of *improrisa*, especially the terminal area. It is somewhat larger and broader winged, and the central fascia is very light uniformly throughout, not shaded on the costa as in *improrisa*. The thorax is also much lighter.

An examination of the B.M. series of *tearli*, *improrisa*, and *fasciata* shows the first of medium size, the second the smallest and the last the largest; this last is also of the brightest green shade quite light green unclouded by dark marking across the middle of the central band, but scarcely apparent in *tearli*. The marking and colour are the same practically in all three, varying slightly in emphasis and contour in the one and depth in the other.

ab. *undosa*, Wile., *Trans. Ent. S. Lond.* 282 (1911). Japan.

FIGURE.—*L.c.*, plt. 30.

ab. *basalis*, Wile., *Trans. Ent. S. Lond.* 282 (1911). Japan.

FIGURE.—*L.c.*, plt. 30.

In looking over the B.M. collection I note that *C. basalis*, Wilem. from Formosa appears to be a small derived form of *C. or*, with all

the usual markings of that species clearly cut and generally light ground, the sharp markings in strong contrast. A pretty form.

C. undosa, Willem., is in the same category. Both were described from single females.

ab. *marginata*, Warnk., *Int. Ent. Zeit.* V. 241 (1911).

FIGURE.—Hasebk. *Int. Ent. Zeit.*, VII., pl. 8, fig. 3 (1914).

ORIG. DESCRIP.—“The basal and median areas are of the black coloration characteristic of ab. *albingensis*, Warnk., with light spots. The black colour extends out somewhat beyond the median area, but it ceases just before the black arrowheads and from there the colour of the outer area is pale grey as in the type form. The grey and black colorations are sharply separated from one another, and do not extend into one another; the black colour is much more pronounced on the margin than in the median and basal areas.

“The aberration is a very striking one and deserves a name.

“Bred from larva at Hamburg.”

ab. *albingoradiata*, Bunge., *Int. Ent. Zeit.*, V. 287 (1911).

FIGURE.—Hasebrk., *Int. Ent. Zeit.* VII., pl. 8, f. 4 (1914).

ORIG. DESCRIP.—“The thorax and the base of the wing are deep black. From here to the outer margin the colour is a little paler. The spots are pure white. Between the veins which lead to the outer margin are found seven white longitudinal streaks; the lowest between the submedian and the median veins, is the longest and broadest, and begins 4mm. from the thorax; from this one upwards to the costa the streaks are always shorter and narrower; the third begins under the reniform and the 4th to the 6th close behind this. The body and hindwings are dark grey. This form differs very distinctly from the forms known up to the present.” Near Hamburg.

ab. *discolor*, Warr., *l.c.*, II. 327 (1912).

FIGURE.—*l.c.*, pl. 56a.

ORIG. DESCRIP.—“Has both wings dull brown grey, with the markings blurred, the stigmata usually plain.”

ab. *roberti*, A. Ruhm., *Ent. Zeit.* XXVII. 80 (1912).

ORIG. DESCRIP.—“From a pupa of Hamburg origin of *C. or.*, ab. *albingensis*, Warnk. I bred on 14.IV.1913, a remarkably aberrant specimen. It measures 30mm. there is wanting the reniform stigma as well as the orbicular, so that the specimen appears completely black. Since this aberration has up to now not been recognised, I name it in honour of Herr Robert Ruhmann, ab. *roberti*.”

ab. *suffusa* (of *ampliata*), Warr., *l.c.* II. 329 (1912).

FIGURE.—*l.c.*, pl. 56a.

ORIG. DESCRIP.—“The whole forewing is clouded with dark grey Japan only.”

ab. *angustimedia* (of *ampliata*), Warr., *l.c.*

FIGURE.—*l.c.*, pl. 56b.

ORIG. DESCRIP.—“Smaller than typical *ampliata*.”

ab. *albingosubcaeca*, Bunge., *Int. Ent. Zeit.* VII. 85, 306 (1913).

FIGURE.—*l.c.*, pl. 8. f. 5.

ORIG. DESCIP.—“With no trace of the white spot on the forewing. Taken near Hamburg on May 16th and May 18th, 1911.”

ab. *permarginata*, Hasebk., *Int. Ent. Zeit.* VIII. 53 (1914).

FIGURE.—Hasebk., *l.c.*

ORIG. DESCIP.—“At the first glance one thinks that it is the melanic ab. *marginata*, but in that form only the upperside of the forewing has the pale outer margin, whereas in this form the underside of all four wings also has a sharply defined pale outermarginal banding. It is remarkable that in this underside aberration the veins are in no way darkened. It was bred from a larva at Hamburg by Herr Lilienthal.”

ab. *albingoflavimaculata*, Hasebk., *Int. Ent. Zeit.* X., 97 (1916).

ORIG. DESCIP.—“With brown yellow instead of the usual white spots. Bred at Hamburg.” *i.e.*, an *albingensis* with yellow stigmata.

ab. *costaenigrata*, Kujan., *Int. Ent. Zeit.* X. 141, 148 (1917).

ORIG. DESCIP.—“This belongs to the typical form, with the usual well-known ashy-grey ground colour, the normal transverse markings and pale spots, in which the veins of the forewing show black powdering, which are not everywhere equally broad and contrasting with the interneural spaces which are alongside the veins. Thus is formed an impression of pale longitudinal zones between the veins, similar to a ground colour of white longitudinal streaks which are the characteristic of the form *albingoradiata*, Bunge. This form is an initial stage of the *albingensis* form. Bred at Hamburg.

“The *albingoradiata* form is a further development towards the *albingensis* form.”

ab. *confluens*, Closs., *Int. Ent. Zeit.* XI. 84 (1917).

ORIG. DESCIP.—“The pale spots run together.”

race **hibernica**, nov. r.

ORIG. DESCIP.—Kane states, *Ent.* XXVII., 125 (1894). “All Irish specimens are characterised by (a) absence of rose or purplish tint, (b) ground colour of a paler grey than the generality of British specimens, (c) stigmata inconspicuous not being thrown into relief by a fuscous ground colour as in most Scotch and English specimens, (d) the fasciae on either side of the stigmata are strongly marked.”

This seems a well characterised geographical race, hence I am naming it.

race *norvegica*, Strand., *Arch. Math. Naturv.* V. 25, Nr. 9, p. 22 (1903).

ORIG. DESCIP.—“The Norwegian examples of this species appear to afford a constant difference from those of the central European area. The hindwings are paler, unicolorous, or with extremely indistinct darker border area. The reniform is mostly accompanied its whole length by a black streak. Both stigmata usually very indistinct, seldom yellowish, mostly filled in with pale grayish. The markings as a rule

less distinct. The size does not differ in the Norwegian examples, they mostly measure 37-39mm." The author considers it a geographical variety, *i.e.*, a race (or subspecies.)

ab. *tangens*, Strand. [I have been unable to get the original description of this form of which I have only just recently known.—H.J.T.]

4. Genus: *Asphalia*, Hb. (1822) = *Polyphoca*, Hb. (1822) = *Palimpsestis*, Hb. (1822) = *Cymatophora*, Treit. (1825) = *Ceratopacha*, Steph. (1829).

Butler says "The genus *Polyphoca* was founded by Hübner for the reception of the single species *P. xanthoceros* = *videns*, Fb.; it only differs from *Palimpsestis*, subsequently described by the same author, in the narrower primaries of all the species."

Polyphoca, Hb. (1822), seems to be the accepted genus name at the present time for *diluta*, Schiff., *flavicornis*, L., and *videns*, Fb.

Asphalia diluta, Schiff.

ORIG. DESCRIP.—Schiff. *Sys. Verz. Wien*. 87 (1776).

The watered grey ("graugewasserte") Noctua.

Tutt gave the expanded description of Fabricius, *Mant.* II. p. 165 (1787), and cited Fab. as the author. Fab. himself cites Schiff. in *Ent. Sys. emend.* III. (2). 86 (1894).

The species has been variously named—Ernst. *abietis* (1785); Fabricius, *undata* (1787); Borkhausen, *bistrigata* (1790) and *fasciculosa* (1790).

The *bipuncta* of Duponchel, *Hist. Nat.* VI. 171. pl. 84 (1826) has been frequently cited as *diluta*. But D. himself expressly states that it is not *diluta* and in his *Cat.* 101 (1840) makes it synonymous with *duplavis*.

Tutt. *Br. Noct.* I. 5 (1891); Barrett (*Lep. B.I.* III. 204. pl. 118 (1896); *Stdgr. Cat.* ed. 3. no. 2849 (1901); *Spuler. Schm. Eur.* I. 335 pl. 78 (1908); *South. M.B.I.* II. 91. pl. 39 (1907); *Warr. (Seitz). Mac. Lep. Pal. Bomb.* II. 329. pl. 49b. 56b (1912).

The forms to be considered are:—

ab. *nubilata*, Rob. & Gard. *List of Br. Lep.* 13 (1885).

ab. *variegata*, Splr. *Schm.-Eur.* I. 335 (1908).

ab. *latimedia*, Warr. (Seitz). *Gr.-Schm. Pal.* II. 330. pl. 56b (1912).

Tutt deals with ab. *nubilata*, R. & G. *Brit. Noct.* I. 5.

Barrett (*l.c.*) points out the crest of black scales on the back of the 3rd segment of the abdomen and also the fascicles of white hair-scales projecting backwards from the last segment of the thorax.

ab. *variegata*, Splr. *l.c.*

ORIG. DESCRIP.—"Examples of those with grey ground colour, may also have narrow brown transverse lines, of which also the outer and inner margins are bordered yellowish white, the inner of which expands in the middle of the basal area to a large spot."

ab. *latimedia*, Warr. *l.c.*

FIGURES.—*l.c.* plt. 56b (1912).

ORIG. DESCRIP.—“In the darker grey examples the narrow pale median area becomes as dark as the bands, which are not filled in with brown, forming a broad dark median fascia edged by pale lines.” Herculesbad. In the figure there are traces of the normal light area remaining around the discoidal and on the inner marginal area below.

The next forms were omitted from the list.

ab. *asemata*, Dann., *Ent. Zeit.* XXXIX. 12 (1925).

ORIG. DESCRIP.—“A dark grey specimen without markings,” rare in S. Tyrol among other forms.

While the last part was in the press Herr Reisser of Vienna described another form of this species which has occurred in some numbers in Brunswick and Schleswig-Holstein.

form *hartwiegi*, Reiss., *Zeit. Öster. Ent. Ver.* III. 15 (1927).

FIGURES.—*l.c.*, plt. III., figs. 1-2 ♂ ♀.

ORIG. DESCRIP.—“The males of this form are slightly larger and are in general of a paler grey, mostly slightly tinged with yellowish, very seldom somewhat darker. The two dark brown transverse bands stand out sharp and distinct, the basal one on the outer side, from the costa to the inner margin, is defined by a firm black or dark brown line, the inner margin of the outer transverse band is also mostly clearly defined in a similar manner. The latter band, equally as strong, is also very well defined towards the marginal area, the outer, slightly toothed, yellowish marginal line in most specimens is well defined and distinctly emphasised. The white central dot at the end of the cell is wanting as a rule or is poorly developed. The grey ground colour of the forewings of the females as a rule makes a greater contrast than in other female forms, so that the transverse bands stand out more firmly and sharply from the ground colour. The ground colour of the hindwing has also a somewhat yellowish tinge; the basal blackish scaling of the pale middle fascia is usually more clearly and sharply emphasised, and appears as a direct continuation of the broad red-brown first transverse band of the forewing. The fringes of the latter are mostly yellow-grey, in a few specimens running to ochreous; the grey transverse band is more distinctly emphasised than in ordinary females.”

The figures show the distinctions very well.

Asphalia (Polyploca) flavicornis, L.

ORIG. DESCRIP.—Linn. *Sys. Nat.* ed. X., 518 (1758).

Tutt gave *Sys. Nat.* ed. XII. (1767). The description is a verbatim copy of ed. X. (1758).

The name *cinerea* was used by Hüfnagel, Rottensburg, Aurivillius and Spuler; *luteicornis*, by Haworth; and *sulphureo-maculata* by Retzius and Villers.

The name *cinerea*, Hüf. 1766 was advocated by Aurivillius and others for *flavicornis*, L., because the XIIth. ed. of *Sys. Nat.*, 1767, was cited as the original, instead of the Xth. ed. 1758.

Tutt. *Br. Noct.* I. 5 (1891), IV. 82 (1892): Barrett, *Lep. Br. Isles.* III. 207, pl. 118 (1896): Stögr. *Cat.* ed. 3, no. 2852 (1901); Splr. *Schn. Eur.* I. 335, pl. 78 (1903): South, *Moths B.I.* I. 92, pl. 39 (1907): Warr. (Seitz.) *Mac.-lep. Pal. Bomb.* II. 330, pl. 49h (1902): Houlbert *Lép. comp.* XVIII. (2), 2140, figs. 56-57 (1921).

Barrett's figures on pl. 118 are:—fig. 2, S. of England, greenish grey: fig. 2a Yorkshire, pale slate grey: 2b. 2c, Cannock Chase, mixed Yorkshire and Scotch form with long orbicular stigma: 2d, Scotland, darker and more sbaggy.

Of the variation.

Scriba, *Beitr.* III. 210 (1793) says that the orbicular stigma is either "pale yellow, dense yellow, greenish or whitish."

Barrett, *Lep. Br. I.* III. says, "Variable in ground colour, and in depth of markings. In the S. of England the ground colour is usually greenish grey; pale slate grey in the eastern counties; in Scotland more sbaggy in appearance with dark greenish-grey or blackish-grey ground colour, and the markings greatly intensified; in the Midlands all these characters become mixed together, except that of the distinct orbicular stigma."

Houlbert notes *Lép. comp.* XVIII (2), 214, that, "This species, in England, is subject to certain variations as much in its coloration, which goes from grey to olive green, as in the details of the designs on its wings."

The following is a list of the described forms, which do, or may, belong to this species.

race *finmarchica*, Schöyen., *Ent. Tidsk.* II. 121, pl. 1 (1881) Lapland.

race *scotica*, Tutt., *Ent.* XXI. 47 (1888) Scotland.

race *galbanus*, Tutt., *Br. Noct.* I. 6 (1891) S. England.

ab. *rosea*, Tutt., *Br. Noct.* I. 6 (1891).

ab. *haverkampii*, Lamb., *Ann. S. ent. Belg.* XLVIII. 187, pl. 1 (1904).

ab. *fuscomaculata*, Closs., *Int. Ent. Zeit.* XI. 84 (1917).

race *anglica*, Houlb., *Lép. comp.* XVIII (2), 214, fig. 57 (1921)

Britain (?)

ab. *interrupta*, Houlb., *l.c.*, p. 215.

ab. *nigrescens*, Houlb., *l.c.*

ab. *mediounigra*, Höf., *Verh. z.-b. Wien.* LXXIII. (193) (1923).

ab. *obsoleta*, Masl., *Pol. Pism. Ent.* II. 131. fig. (1923).

ab. *confluens*, Masl. *l.c.*

Tutt treats of four forms (1) The pale yellow-green southern form *galbanus*: (2) The dark grey form with strongly emphasised markings, *scotica*: (3) The forewings richly suffused with purplish, *rosea*: and (4) The Scandinavian race, *finmarchica*.

Browne *Cat. Dobr. Coll.* 4, treats *finmarchica*, Schöy. and *scotica*, Tutt, as the same.

Schöyen's figures of *finmarchica* shew ♂ and ♀. The male is darker than the Scottish form and has only the orbicular stigma marked, and most of the markings other than the transverse ones are

not in evidence. The female is slightly lighter than the male with no traces of stigmata and the minor markings quite suppressed.

ab. *haverkampfi*, Lamb., *Ann. S. ent. Belg.* XLVIII. 187 (1904).

FIGURE.—*l.c.*, plt. 1.

ORIG. DESCRIP.—“Forewings of a silvery grey, uniform, very bright, with the costa whitish. In typical specimens the forewings are of a deep cinereous grey, powdered with yellowish and greenish: of all the typical markings there remains only the black subterminal line. Stigmata very distinct, especially the orbicular, which is small, whitish, and absolutely circular, finely bordered with black and with a black central dot. Lowerwings of a pale grey with the marginal border deeper; the median lines are quite wanting. Below, the wings of a uniform pale grey, without trace of lines.” Forest of Soignes.

The figure is that of a large specimen; the only markings on the forewings are the orbicular and reniform, the latter smaller than usual and the former larger and more conspicuous, and a very black waved submarginal line, very conspicuous. The remaining portion of the wing quite uniform in coloration with the veining indicated.

ab. *fuscomaculata*, Closs., *Int. Ent. Zeit.* XI. 84 (1917)

ORIG. DESCRIP.—“Smoky suffused. The transverse band very prominent. The spots filled in with dark brown. Strasburg.”

race *anglica*, Houlb., *Lép. comp.* XVIII (2), 214 (1921) Britain.

FIGURE.—*l.c.*, f. 57.

ORIG. DESCRIP.—“The forewings are narrow, elongate, with their outer margin regularly curved, but very oblique; the coloration, on the whole, is grey or of a greenish grey, with five sinuous transverse lines; the first of these lines near the base of the wing is incomplete and bent back at its two ends; the three which come next are entire, but the two outer of them unite into one before reaching the costa; finally the fifth, sometimes doubled, divergent and approaching the apical angle, is well marked very nearly to two thirds of the disc. Two other sinuous bands, but much less clear, follow the outer margin, the darkest terminates exactly in the apical angle. In the middle area, the costal margin, as far as half the disc, is of a greenish grey more or less marked and sometimes even forms a spot which crosses the transverse lines of the first group.”

“The hindwings are of a fallow grey, duller along the outer margin, the fringe is uniformly of a clear fallow. Below the coloration is greyish fallow, with brown double bands but incomplete on both wings. Head, thorax and abdomen of a dull grey.”

“The eight examples were from the Goldthwaite coll. only one bearing the label Perth.”

This would appear to be the *scotica* of Staudinger except that it has not the yellowish stigmata, but has yellowish grey hindwings and clear yellow fringes.

ab. *interrupta*, Houlb., *l.c.*

ORIG. DESCRIP.—“The wings are of a greenish grey with a small prolongation of the discoidal orbicular spot cutting through the two outer lines of the first group.”

This seems a very trivial aberration, which may occur in all the forms.

ab. *nigrescens*, Houb., *l.c.*, p. 215 (1921).

FIGURE.—*l.c.*, pl. CDLXXXIX., f. 4031.

ORIG. DESCRIP.—“This curious aberration is distinguished at the first glance by the three wide bands which cross the forewings; one can see that the three bands correspond to the three groups of sinuous lines mentioned in the description of *anglica* and which are also existent in *flavicornis*. If we suppose these lines, enlarged and becoming fused, we readily conceive the origin of the three bands.”

“The basal colour of the forewings otherwise is chocolate brown; the white rectangular band is apparent on nearly half the costal margin, the fringe is of a reddish grey, crossed by brown lines formed by the prolongation of the veins. The lowerwings are of a uniform brown with a plain fringe. Similarly below the coloration is uniform with vague indications of doubled but very incomplete brown bands, as in race *anglica*.” This is a unique specimen from the Harper sale. “Perthshire.”

According to the figure this is a most remarkable aberration.

ab. *medionigra*, Höf., *Verh. z.-b. Wien.* LXXIII. (193) (1923).

ORIG. DESCRIP.—“Has the central area of the fore-wing broadly black darkened, so that the greenish orbicular and reniform stigmata stand out from it sharply.” Near Vienna.

ab. *obsoleta*, Maslow.; *Pols. Pism. Ent.* II. 131 (1923).

FIGURE.—*l.c.*, f. 13 (a very poor one).

ORIG. DESCRIP.—“Alae anticae maculis obsolescentibus.” The two stigmata almost wholly obsolete.

ab. *confluens*, Maslow.; *l.c.*, p. 128 (1923).

FIGURE.—*l.c.*, f. 5 (a very poor one).

ORIG. DESCRIP.—“Alarum maculae in unam oblongam confluentes.” The two stigmata united with one another.

Asphalia (Polyploca) videns, F.

Houbert, *Lép. comp.* XVIII (2), 199 (1921) creates a new genus, *Parmelina*, for *videns* and a form *singularis* which he describes as a new species from Digne.

He points out that the position of *videns* has always constituted a difficulty and says that “(Given the character of the eyes, of which the cornea is quite visibly ciliated, it belongs, undoubtedly, to the *Polyplocini*. In this group it represents such a special stem that it seemed necessary to make it the type of a new genus. We have chosen the name *Parmacina* on account of the resemblance of the forewings to certain lichens.”

This species is the *chrysoceas* of Beckwith (*Lin. Trans.* 1793); the *flavicornis* of Schiffermüller (1775); the *putris* of Rottemberg (1776) and “La tête rouge” of Ernst. and Ingram. (1788).

Tutt *Brit. No.* I. 6 (1891): Barrett. *Lep. B.I.* III. 211, pl. 119 (1896): Stögr. *Cat.* ed. 3, 260, no. 2853 (1901): Spuler. *Schm. Eur.*

I. 336, pl. 78 (1908): South. *M.B.I.* II. 93, pls. 38-39 (1907): Warren (Seitz.) *Pal. Bomb.* II. 330, pls. 49, 56c (1912): Houlb. (Obthr.) *Lép. Comp.* XVIII (2), 201, figs. (1921).

Of the variation Barrett says, "Always variable in ground colour and markings, but especially the latter, which, changing from their general sharpness and distinctness, become, in some specimens altogether softened and obscured." "This variation appears to be normal and constant and by no means local or climatal, the same extreme or medium being found in the most widely distant localities."

The following is a list of the forms to be considered.

- ab. *erythrocephala*, Esp., *Schm. Abld.* IV. (1), 309, pl. 121 (1786).
- r. *xanthoceros*, Hb., *Samm. Noct.* 205 (1802).
- ab. *interrupta*, Tutt, *Ent.* XXI., 47 (1888).
- ab. *interrupta-ochrea*. Tutt, *Brit. Noct.* I., 7 (1891).
- ab. *interrupta-alba*, Tutt, *l.c.*
- ab. *nigricans*, Splr., *Schm. Eur.* I., 336 (1908).
- ab. *variegata*, Splr., *l.c.*
- ab. *concinna*, Warr. (Seitz.), *Pal. Bomb.* II. 330, pl. 56c (1912).
- ab. *serenoides* (Gn.) Houlb., *Lép. comp.* XVIII. (2), 204, pl. CDLXXXIX., fig. 4030 (1921).
- r. (ab.) *singularis*, Houlb., *l.c.* 206, pl. CDLXXXIX., fig. 4029 (1921).

Tutt deals with *erythrocephala*, Esp., *xanthoceros*, Hb., *interrupta*, *interrupta-ochrea* and *interrupta-alba*.

Houlbert says "As for the variety *erythrocephala*, Esp., most authors do not distinguish it from the type *ridens*, F., and we think that it is a prudent opinion." *Lép. comp.* XVIII. (2), 203.

Houlbert also notes that the ab. *interrupta*, Tutt, appears to him "as an ordinary *ridens* in which the dark central band of the forewing is interrupted by a greyish space more accentuated than usual." *Lép. comp.* XVIII. (2), 204.

Houlbert remarks that the form *xanthoceros*, Hb., "appears to be the most emphasised melanistic variation which one knows to-day." *l.c.*

Browne (Cat. Dobrée-Fox) makes *xanthoceros*, Hb., as a synonym of *ridens*, F., but this cannot be as the former gives a general brown impression while *ridens* gives an impression of blackness. The former is uniformly dark with a minimum of lighter clouding.

ab. *nigricans*, Splr., *Schm. Eur.* I., 336 (1908).

ORIG. DESCRIP.—"Examples suffused with black up to the whitish remainders of the transverse and basal lines."

ab. *variegata*, Splr., *Schm. Eur.* I., 336 (1908).

ORIG. DESCRIP.—"Similarly dark specimens, but with whitish stigmata and very broad whitish markings spotted over the middle area."

ab. *concinna*, Warr. (Seitz.), *Pal. Bomb.* II. 330 (1912).

FIGURE.—*l.c.*, pl. 56c.

ORIG. DESCRIP.—"The basal area and the whole space beyond the median fascia to termen is pale bluish green: the extreme base with

some olive and fuscous scales; the median area olive fuscous, with the two lines and the veins black, the stigmata marked with pale green scales; the subterminal line sagittate, interrupted on vein 5; the terminal line lunulate and the fringe white intersected by black wedge-shaped marks beyond the veins; hindwing white with termen narrowly grey."

An English aberration.

ab. *sereuoides* (Gn.), Houlb., *Lép. comp.* XVIII. (2), 204. (1921).

FIGURE.—plt. CDLXXXIX., fig. 4030.

ORIG. DESCRIP.—"This form is distinguished from typical *ridens* by the more extended coloration of the white spots on the forewings; as a result the brown transverse bands across the middle of the wings, and the two spots of the discoidal area are much more pronounced than in the type."

A specimen obtained by Guenée from Doubleday and labelled in his collection as *sereuoides* (M.S.) without a published description.

ab. (race) *singularis*, Houlb., *Lép. comp.* XVIII. (2), 206 (1921).

FIGURE.—plt. CDLXXXIX., fig. 4029.

ORIG. DESCRIP.—"General size and facies of *ridens*, but it is distinguished very clearly by its coloration which is of an ashy-grey and not an olivaceous green. The markings on the whole appear to be the same as those of *ridens*, but much more simplified; one does not find the brown and white transverse lines, and only that portion of the wing near fringes show any well-marked spots. At the base of the fringes there exists a series of very small spots ocellated with white which are never seen in *ridens*." Taken near Digne by M. Culot.

The description and the figure are certainly of a form of *ridens*, which we have assumed it to be.

2. Family:—*Bryophilidae*, Gn. = Sub-family *Metachrostinae*, Warr.

Genus:—*Bryophila*, Tr. (1825) = *Metachrostis*, Hb. (1822).

Warren in Seitz says, *Pal. Gr.-sch.* III. 18. "Until quite recently the genus has gone by the name of *Bryophila*, Tr.; but the older name of *Metachrostis*, Hb., revived by Meyrick in his *Handbook*, appears quite unassailable and I have therefore called the subfamily *Metachrostinae*."

Hampson (*Lep. Phal.* VII.) did not accept *Metachrostis*, Hb., as he assumed the date of the *Verz.* to be 1827. But this date has now been shown to be most improbable.

Bryophila, Tr. = *Metachrostis*, Hb., *perla*, Schiff.

ORIG. DESCRIP.—Schiff. *Wien. Verz.*, p. 70 (1775).

There is no real description. The "Perlenfarbene Eulen (the pearl coloured Noctua) *N. perla*" is placed in the group of "Noctuae variegatae" with *glandifera*, *degener* (= *algae*), *aprilina* and *lignstri*.

Tutt gave Fabricius (*Mant.* II. 173) as the original describer (1789) no doubt because his was the first description.

Both Borkhausen (*Eur. Schm.* IV.) and Ernst (*Pap. d'Eur.* VI.)

called it *glandifera* in error, and Scriba (*Beitr.* III., 262) gave it the name of *lithophila* (1793) when he described the larva.

Hufnagel, "Berl. Mag." 1766, called the species *domestica* and this name was used by several authors. Its use was discussed by Rottemburg (*Naturf.* 1776), Zeller (*Isis* 1844) and Werneberg (*Beitr.* 1864).

Tutt *Brit. Noct.* I. 7 (1891): Barrett *Lep. Br. Isles.* VI. 210, pl. 250 (1900): Stdgr. *Cat. ed. 3, no. 1600* (1901): South *Moths. B.I. I.* 200, pl. 103 (1907): Hamps. *Lep. Phal.* VII. 625 (1908): Splr. *Schm. Eur.* I. 184, pl. 31 (1908): Warr. (Seitz.) *Pal. Noct.* III. 21, plts. 4f, 4g (1909).

Tutt gave three forms ab. *distincta*, ab. *suffusa*, and ab. *flavescens*, which he had described and named in 1888 (*Entomologist* XXI. 49), and in *Brit. Noct.* IV. addenda, also dealt with race *pyrenaea*, Obthr.

It is generally agreed that the *lutescens*, Fuchs, is the *flavescens*, Tutt. It has been overlooked that Tutt published his description in 1888 prior to Fuchs; hence his name must take precedence.

sub-sp. *perloides*, Gn., *Noct.* V. 29 (1852).

form *pyrenaea*, Obthr., *Ét. Ent.* VIII. 48, pl. I., fig. 13 (1884).

Pyrenees.

ab. *flavescens*, Tutt, *Ent.* XXI. 49 (1888).

ab. *suffusa*, Tutt, *Ent. l.c.*

ab. *distincta*, Tutt, *Ent. l.c.*

ab. *lutescens*, Fuchs, *Jahr. Nass.* XLII. 208 (1889).

ab. *robusta*, Favre, *Mac.-lep. Valais.* 127 (1899).

form *perlina*, Stdgr., *Cat. Lep. Pal.* 167 (1901). Aragon, Castile.

race *rosina*, Culot., *Noc. et G. I.* 133, pl. 24, f. 17 (1909).

ab. *grisea*, Vrbrdt., *Mitt. Schw. e. Gess.* V. 12, 458 (1917).

form *grisea*, Dufren., *Lamb. (Rev. Mens.)* XXV. 32 (1925).

race *confinis*, Dannehl., *Ent. Zeit.* XXXIX. 148 (1926).

"The variation of ground colour is from pale yellowish white to bright red yellow" (Spuler). "The Pyrenean race is still darker than any British specimens and the hindwings are wholly dark also" (Warren in Seitz).

I should have said, varies from a slightly soiled white (very rarely pure white) to bright red yellow.

subsp. *perloides*, Gn., *Noct.* V. 29 (1852).

FIGURES.—Ramb. *Cat. Lep. And.*, pl. 7, f. 4 (small dark brown *perla*): pl. 13, f. 1 (similar, lighter ground, contrast of grey-brown and dark brown) (1858): Warr. (Seitz.) *Pal. Noct.* III, pl. 4g.

ORIG. DESCRIP.—"Intermediate between *par* of *glandifera* and *perla*, but nearer to the last. A little larger than *perla*, 23mm. Forewings proportionately longer and less prolonged at the apex, strongly powdered, either with yellowish or grey, but then rather greenish than bluish. Lines well marked. The extra basal unites below to the half-line, the elbowed line curved above as in *glandifera*. The two ordinary stigmata contiguous and the reniform smaller and duller as in the last named. Fringes marked with a double series of black dots. Lowerwings duller, not being divided at the marginal line by white spots as

in *perla*; below whitish, with the discal spot, the subterminal line and the margin clearly marked. Base of the pterygodes marked with a black dot. Palpi more curved and more ascending than in *perla*." Andalusia.

Guenée distinctly says that it differs from *perla*, the markings being almost those of *glandifera*, and from *glandifera* by its smaller size, its shape and facies, which are undoubtedly those of *perla*.

Warren (Seitz) suggests that *pyrenaea*, Obthr., is dark *perloides* and *perlina*, Stdgr., a pale *perloides*.

ab. *lutescens*, Fuchs, *Jahrb. Nass.* XLII. 208 (1889).

FIGURES.—Warr. (Seitz.) *Pal. Noct.* III., pl. 4g. Millière gave an excellent figure in *Ann. Soc. Camm.* 1879, pl. 7, fig. 13.

ORIG. DESCRIP.—"The forewings bright clay-yellow or clay-brownish suffused. Not always of equally dense suffusion. Sometimes only portions suffused with yellow. Sometimes head and thorax also suffused yellow." A long dissertation on the various abs. under this name then follows.

This, as stated above, is the *flavescens*, Tutt (1888).

ab. *robusta*, Favre, *Mac.-lep. Valais.* 127 (1899).

ORIG. DESCRIP.—"Larger and more robust, lines stronger marked, above all the elbowed line which is very complete and distinctly more toothed. The two median stigmata are covered with blackish. Hindwings discolored with blackish, with a blackish terminal band, only marked with two whitish points at the anal angle." Here and there with the type in the high Alps of Valais.

perlina, Stdgr., *Cat. Lep. Pal.* ed. III. 167 (1901).

ORIG. DESCRIP.—"Minor, al. ant. saepius lutescenti-vel rufo-inspersis, nonnunquam multo pallidioribus."

Warren (Seitz.) says that *perlina* is a pale *perloides* (III. 21). Spuler identifies it with *perloides* (l. 184).

rosina (Obthr.) Culot. *Noct. e. G.* I. (1), 134 (1909).

FIGURE.—*l.c.*, pl. 24, f. 17.

ORIG. DESCRIP.—"A beautiful rosy form; an extreme of the British delicate rosy race." Montlouis.

Warren (Seitz.) suggests that *perlina* and *pyrenaea* are pale and dark forms respectively of *perloides*, Gn., which is a *perla* and not a *glandifera*.

ab. *grisea*, Vorbrod., *Mitt. schw. ent. Gess.* V. 12, p. 458 (1917).

ORIG. DESCRIP.—"The forewings darkened dusky grey brown, so that only a part of the pale ground towards the basal spot and on the outer third of the marginal area is all that remains; the hindwing is also marking-less grey-brown with darker discoidal and a few marginal dots." Switzerland.

form. *grisea*, Dufren., *Lambillionea (Rev. Meus.)* XXV. 32 (1925).

ORIG. DESCRIP.—"Characterised by the upper side of the hindwings being entirely deep grey, to such an extent that the external lines have disappeared. The cellular point alone is only slightly visible. The

fine cream white edge is crossed by very deep grey nervures. Fringes cream-white. The markings on the forewings are strongly emphasised and extended; ordinary lines black, wings not powdered with black as in the ab. *suffusa*, Tutt. Below, all the wings are greyer than in the type, ordinary markings well emphasised." Frameries, Belgium.

The name *grisea* having been used for a quite different form by Vorbrodtt cannot stand for this form, which may aptly be called **subgrisea**.

race *confinis*, Dann., *Ent. Zeit.* XXXIX. 148 (1926).

ORIG. DESCRIP.—"Ground colour pale grey-green, rarely with a trace of yellowish, marking very fine and mostly somewhat washed-out grey, not black; usually mostly with a delicate pale grey zone area. Hindwings with a wide marginal darkening, base pale grey, the discoidal spot lunular, standing out strongly. Much the appearance of a small *muralis-par.*" Hanover.

It is quite impossible to comment on some of these forms without specimens or figures.

Bryophila (Metachrostis) algae, Fb.

Only two specimens of this species were reported to have been taken many years ago and the species has never been noted since, so that it seems unnecessary to go into its variation here.

Bryophila (Metachrostis) muralis, Forster.

ORIG. DESCRIP.—Forster *Novae Species Insectorum*, p. 74 (1771).

For many years known by Schiffermüller's name *glandifera*, in *W.V.* 70 (1775), under which Hübner figured it. It was also called *lichenes* by Fabricius, Donovan and Duponchel, and *lichenis* by Esper, Borkhausen, De Villers and Haworth.

Tutt. *Ent.* XXI. 48 (1887) and *B.N.* I. 9-10 (1891): Barr. *Lep. Br.* I. VI. 207 (1900): *Stdgr. Cat.* III. ed. 167 (1901): *Splr. Schm. Eur.* I. 184 (1905): *South M.B.I.* I. 200 (1907): *Hamp. Lep. Phal.* VII. 624 (1908): Warr. (Seitz.) *Pal.* III. 21 (1912).

The following is a list of the described forms.

ab. *par.* Hb., *Noct.* 516 (1808-18).

ab. *liguris*, Mill., *Ann. Soc. Sci. nat. etc., Cannes.* VII. 8, pl. 3 (1878) Liguria.

race *impar*, Warr. *Ent. Mo. Mag.* XXI. 22 (1884) Cambridgeshire.

ab. *viridis*, Tutt, *Ent.* XXI. 48 (1887) and *Brit. Noct.* I. 9-10.

ab. *flavescens*, Tutt, *l.c.*

ab. *pallida*, Tutt, *l.c.*

ab. *obscura*, Tutt, *l.c.*

ab. *dispar*, Vrty., *Bull. Soc. ent. It.* XXXI. 74, pl. I. 27 (1904).

ab. *ghilliani*, Perlini., *Faun. Lep. exclu. It.* I. 4 (1906).

ab. *aurolichenea* (Obthr.) Culot., *Noct. et. Geom.* I. (1) 132, pl. IV., f. 10 (1909) England.

ab. *argillucea* (Obthr.) Culot., *l.c.*, f. 11, Genoa Museum.

ab. *scoriatula*, Trti., *Nat. Sic.* XXIII. 266 (1919) Sicily.

ab. *brunnea*, Porritt., *E.M.M.* LIX. 87 (1923) S. Devon.

Tutt treats of six forms. (1) The grey scarcely green, without dark markings, *par*. (2) The very rich green, *viridis*. (3) With yellowish shade instead of green, like fading, *flavescens*. (4) The pale whitish grey, *pallida*. (5) The dull brownish grey with markings obscure, *obscura*. (6) Thickly covered with black scales and with displaced and obscured, or absent markings, *impar*. This last form Tutt discusses at length in *Brit. Noct. IV.*, Supp. p. 83, after consultation with Warren and inspection of dozens of the form. In Mr. Warren's communication to Tutt he points out no less than 5 sub-vars. of this form. See *l.c.*, p. 87. (a) nearly like *muralis*. (b) corresponding to *muralis*, ab. *pallida*. (c) dark blue-grey, thickly covered with black scales. (d) grassy green ground. (e) dull brownish green. Kane, in his plate in the *Ent. 1901*, figures two forms of the Cork race of *impar* with very different ground, one very dark and the other very light.

Barrett says (*l.c.*, VI. 206) "Variation very great in the shade of ground colour . . . complicated by a tendency to fading, even during life." "There is also irregularity in the distinctness of the black markings." These markings may be "thick," "changed to olive-brown," "slender or partially suppressed," etc. "It is difficult to do justice to the endless variations of a species like this."

ab. *liguris*, Mill. *Ann. Soc. Sci. nat. etc.*, Cannes, VII. 8, pl. 3 (1878)

FIGURE.—*l.c.*, fig. 8.

ORIG. DESCRIPT.—"The forewings are not so wide at the outer margin as in ordinary *glandifera*, and its colour is generally more (accusée) definite. The green of the forewings is dull and almost black on the costa; the ordinary reniform and orbicular spots, on this obscure ground, would not be distinguished, if they were not emphasised on the margins by a fine and very black marginal line. The lowerwings (festonnées) on the fringes, are uniformly obscure. The thorax and abdomen are of a dull green, which recalls the colour of the forewings. Below, all four wings are obscure and the discal spot is present on each of them." Liguria.

"This new aberration of *glandifera* is possibly not a simple variety of the type, both by reason of its large expanse, and on account of its time of appearance at the beginning of July, when the type *glandifera* and its variety *par* do not show themselves on our littoral before the first days of August. I have taken here on a wall, the var. *par*, on August 16th, in quite good condition."

Warren (Seitz. III. 21) treats this form as typical. The figure of Millière is no doubt of an aberrant form.

race *dispar*, Vrty., *Bull. Soc. ent. It.* XXXI. 74 (1904).

FIGS.—*l.c.*, *Alc. Lep. ined. o non anc. fig.*, pl. I. 27.

ORIG. DESCRIPT.—"There already exist two forms of *B. muralis* called by their authors *par*, Hüb., and *impar*, Warr.; I propose the name of *dispar* for a third form hitherto unknown, but quite distinct, which I collected at Migliorini. It has the inner surface of the forewings covered by a thick shading of green scales, whilst the numerous little black lines of the type have (except the central undulated line) completely disappeared, or been replaced by green a little darker than

the ground. The hindwings are lighter than in the majority of typical specimens."

The figure, uncolored, is not clear enough to comment upon.

ab. *ghilliani*, Perlini., *Fn. Lep. exclu. It.* I. 4 (1906).

FIG.—*l.c.*

ORIG. DESCRIPT.—"Differs from the type form by the reddish colouring instead of the green; the black patterns are very marked as in the best characterised specimens of the species. Only one of the few specimens observed by me at Palazzolo in Brescia shows a slight reddish suffusion on the hindwings, while the bands at the edges are much more marked than in the type; the tone of the wings is darker. At first sight this ab. seems a different species, and the accomplished entomologist Count Turati, to whom I submitted the first specimen, held it to be such, had not the capture of a ♀ *in cop.* with a normal male dissipated all doubt." Italy.

Vorbrott, *Schm. Schw.* I. 309 says "A normally marked specimen of whitish ground colour from Sion (Valais) quite agrees with the figures of *ghilliani*, Perl."

ab. *anrolichenea*, (Obthr.) Culot. *N. et G.* I (1). 132 (1909).

FIGURE.—*l.c.*, pl. 24, f. 10.

ORIG. DESCRIPT.—"The general tone of the upper side of the forewings is of a golden-yellow slightly ochraceous, with the ordinary markings well marked, the fine clear white markings stand out against the black markings which lie below. The hindwings, above are blackish, more intensified towards the margin." England.

Tutt's ab. *flavescens* is of a "yellowish shade" comparable to "faded specimens," quite different from the beautiful rich "jaune d'or" of the Dawlish bred specimens.

ab. *argillacea* (Obthr.) Culot. *N. et G.* I. (1). 132 (1909).

FIGURE.—*l.c.*, pl. 24, f. 11.

ORIG. DESCRIPT.—"It is very remarkable for its reddish coloration and I thought it well to give it a name to distinguish it for that reason; I have chosen the name *argillacea* which well characterises its coloration." Museum at Genoa.

ab. *scoriatula*, Trti., *Nat. Sci.* XXIII. 266 (sep. 66) (1919).

FIGURE.—*l.c.*, p. 65 (very indistinct, evidently very suffused dark).

ORIG. DESCRIPT.—"This is really a smoky black form of *par*, but in a way resembles *impar*; the black markings are emphasised on a dark ground and there is also a dusky area at the base which is not noticeable in the forms from Cambridge and Cork." Catania, Sicily.

Turati (*l.c.*) also calls attention to "A form of *muralis* with well marked black spots, but of a bright green colour, by Costa in pl. XIII., fig. 2. *Fn. del Regno di Nap.*, attributing it to *par*, Hb. Guenée thinks that this form might be kept separate, because according to the figure of the larva also given by Costa (*l.c.*) he would regard it as rather different from our *glandifera* = *muralis* (*Noct.* V. 30) and so while he indicates under A the var. *par*, he notes this one of Costa's under B without a special name. If the ground were not so bright a green, it might almost be identified with the present *scoriatula* were the

markings more suffused together generally, but this is on the contrary quite covered with small black scales on a smoky grey ground almost imperceptibly tending to olive." Da Costa says it is from Spain.

The figure of Da Costa's is a good one and the markings and abundant speckling are quite clear and distinct and in no way suffused. It cannot be identified in any way with the figure of *scoriatula*.

ab. *brunnea*, Porritt., *Ent. Mo. Mag.* LIX. 87 (1923).

ORIG. DESCIP.—"Ground-colour deep orange brown to dark olive-brown, with the markings typical." "These brown forms have only been found at Starcross on the S. Devon coast." "The shade and depth of brown colour varies considerably in different specimens, but the name *brunnea* may well include them all."

Years ago the late Mr. Jäger and I took numbers of this and other forms at Star Cross and Dawlish.

6. Genus:—*Diphthera*, Hb. (1806) = *Moma*, Hb. (1822): *Daseochaeta*, Warr. 1909 (Hamp. for *alpium*, 1909).

In the *Tent.* of Hübner *orion* is given as sole type of *Diphthera*, Hübner changed this to *Moma* in the *Verz.*, 1922. The genus was not described in the former but a short diagnosis of *Moma* was in the *Verz.*, hence the use of the latter genus-name, added to the fact that the *Tent.* has not been universally accepted. Warren (Seitz.) described the genus *Daseochaeta* for *viridis*, and Hampson, *Lep. Phal.*, included *alpium* and other species closely allied to *viridis* in it. Several authors, including Guenée, Duponchel, South and Culot spell it *Diphthera*, citing Tr., Hb., etc., in error.

Moma, Hb., *orion*, Esp. (1786) = *Diphthera*, Hb. (1806), *alpium*, Osbeck (1778).

ORIG. DESCIP.—In the Appendix to *Brit. Noct.* IV. 88, Tutt points out that Sven Lampa, in an article in *Ent. Tidskr.* (1885), uses the prior name *alpium*, Osbeck., *Götheb. Wet. Sam. Handl. West. Afd.* I. 52, pl. 1 (larva and imago), in which obscure magazine that author described and illustrated this species under that name (1778). I have made an exhaustive search as to this and it is one of the most intricate investigations one could undertake. Owing to the remarkable similarity of several species of green coloration and variegated markings, added to the fact of the green fading to yellow, and also in ignorance of the early stages, the earlier authorities were hopelessly in confusion, even Linnaeus citing wrong authorities and mixing species and Hübner figuring *orion* over the name *aprilina*. The quite distinct species, *ludijica*, *orion* (*alpium*), *aprilina*, *lichenis* (*muralis*), and *ligustri* are in the tangle.

The following is a very good sample of the tangle:—Sepp. *Besch. Wond. Gods.* Vol. I., in 1762, described the whole life-history of this species and gave excellent figures, calling it the "Vlinder de Orion," but in the list of species identified it with the *ludijica* of Linnaeus, *Sys. Nat.* X. 514. In the text he refers to Rosel., *Ins. Belust.* III. 238, pl. 39, which is a figure of *aprilina*, L. Subsequently in the corrigenda to Vol. IV., Sepp corrects *orion* to *aprilina*. His larva is hairy (*orion*)

while that of true *aprilina* is naked. His larva was that of the spring species, his name that of the autumn species.

Goeze called it *ludifica-minor*, *Ent. Beitr.* III. (3). 145.

There seems no doubt that the early writers more or less confused *orion* and *aprilina* until it was definitely recognised that *orion* was a spring emergence and *aprilina* an autumn one.

Tutt goes on to remark, "This change well illustrates the futility of agitating at present for a fixed specific nomenclature. In the present condition of our knowledge, and whilst the order of priority is to be maintained, the works of authors, which are practically unknown outside their own country, must be, and will have in future to be taken into account, and this will necessitate constant change, which will be gradually lessened as years go on until a fixed specific nomenclature can be successfully dealt with." After more than a quarter of a century since these words were written we can still say much the same, but with the end nearer in view, and even quite within the life-time of the present generation.

Tutt *Brit. Noct.* I. 11 (1891): Barrett *Lep. Br. Is.* III. 214, pl. 119 (1896): *Stdgr. Cat.* ed. 3, no. 1069 (1901): *Splr. Schm. Eur.* I. 135, pl. 31, f. 32 (1903): *South Moths Br. Is.* I. 189, pl. 100 (1907): *Hamp. Lep. Ph.* VIII. 30, fig. 7 (1909): Warr. (Seitz.) *Pal. Gr.-S.* III. 11, pl. 2c (1909).

Of the variation Barrett says, "very constant in colour and markings, except that in some specimens the black sections of the central stripe of the forewings are more slender and rather more widely separated from each other" . . . "while in others small additional black streaks present themselves in series representing two more transverse lines."

Warren (S.) says, "The examples of *alpium* from Japan are as large as European, those from Corea decidedly smaller."

List of described forms which do, or may, belong to this species.

race *rnica*, Haw., *Lep. Brit.* 200 (1806) [? Schiff. *Verz.* 70 (1775)].

race *murrhina*, Graes., *Berl. ent. Zt.* 314 (1888).

ab. *rosea*, Tutt, *Brit. Noct.* I. 11 (1891).

ab. *glauca*, Trti., *Ann. Mus. Un. Nap.* III. sep., p. 25 (1911).

ab. *designata*, Trti., *Att. Soc. It. Sc. Nat.* LVIII. 45 (1919).

To this list may be added the following varieties, subspecies or species.

fallax, H.-S., *Aussereur. Schm.* 80, f. 211 (1853), Canada, Atlantic States: *Hamp. Lep. Phal.* VIII. 38, fig. 9.

vigens,* Walk., *Cat. Noct.* XXXII. 616 (1865), Sikkim.

pallida,* Moore, *P. Zool. S.* 46, pl. VI. 6 (1867), W. China: *Hamp., l.c.* 24, fig. 4: Warr. (Seitz.) *Pal.* III. 11, pl. 26.

laevis, Warr. (Seitz.), *Pal. Gr. Schm.* III. 11 (1909).

minor, Warr. (Seitz.) *l.c.*

viridis, Leech, *P. Zool. S.* 502, pl. LI. 6 (1889), Japan: Warr. *l.c.*, pl. 26.

virida,* Leech, *Trans. Ent. S.* 137, pl. CXXIII. 20 (1900), W. China: Warr. *l.c.*, pl. 26.

metaphaea, *Hamp., l.c.*, p. 23, pl. CXXIII. 19 (1909), W. China.

brevipennis, Hamp., *l.c.*, p. 27, pl. CXXIII. 21 (1909), Thibet, Sikkim.

fasciata,* Moore, *P.Z.S.* 408 (1888), Sikkim: Butlr. *Ill. Het.* VII., pl. 122.

For those marked * Warren has created the genus *Diphtherocone*.

Agriopodes (Moma) (Diphthera) fallax is a representative species in the near Nearctic region, which in general colour and disposition of markings suggests *alpinum* as a near connection.

All the others listed are S. Eastern Palearctic representatives, which in varying degrees very closely resemble *alpinum*. An examination of Warr. (Seitz) and Hamp. figures will suggest to students that they must all be geographical races of that species. They have the same general arrangement of marking with slight alteration in position, differences in emphasis, slight suppression of or addition to marking, paling of ground colour, variation in amount of white and in the shade of green: they form a very close association.

All are placed by Hampson in his genus *Daseochaeta* including also *alpinum*, but Warren splits this genus into three, *Daseochaeta*, *Diphtherocone* and *Diphthera*.

Tutt considered three forms (1) The type of Esper with two longitudinal streaks of white, and a double zigzag transverse line through the stigmata. (2) The much lighter British form with a single transverse zigzag line *runica*. (3) The form *rosea* with rosy, not white, longitudinal lines.

race *murrhina*, Graes., *Berl. ent. Zeit.* 314 (1888).

FIGURE.—Warr. (Seitz) *Ill.* pl. II. 2c.

ORIG. DESCRIPT.—“Expanse of wing only 30 mm. It is also somewhat smaller than the type form, the green ground is also paler than the latter. The white longitudinal streaks of the forewings are broader and run together more closely to the outer black transverse streak, by which the green ground colour appears very compact. But these longitudinal streaks are never so pure white as in *orion* but always and particularly on the disc tinted with pale blue. All the black markings are delicately laid on; the two black spots on the marginal area, which stand between veins 1 and 2 and 4 and 5 and which are always present in *orion*, are wanting. In their place are found two large brown spots which extend from the outer transverse streak to the margin, and the ground colour, which on the outer portion usually there exists numerous white-grey spots, very uniform. The marginal area has therefore in *r. murrhina* a quite different appearance.

“The hindwings are not dark grey as in *orion*, but pale yellow-grey and margined with a darker marginal area. Bred from oak in numbers.” Chabarofka, Amur.

ab. *glauca*, Trti., *Ann. Mus. Un. Nap.* III. (1911) sep. p. 25.

ORIG. DESCRIPT.—“An interesting aberrational form of *alpinum*, Osbeck, in which the black transverse lines almost entirely disappear; the antimarginal markings are wanting, both those in the fringes and those at the base, the green (a little rubbed from the condition of the specimen) is extended in rays on both sides forming a narrow antimarginal and a median band. The intercostal areas remain white as do the fringes of all four wings entirely. The hindwings are of an

almost uniform light grey with a single black line in the anal angle." Camaldoli, Italy.

ab. *designata*, Trti., *Att. Soc. It. Sc. Nat.* LVIII. 45 (1919).

FIGURE.—*l.c.*, pl. 8, fig. 7.

ORIG. DESCRIP.—"It has a large green space on the disc of the forewings, streaked with white without being interrupted by the black dots and stigmata, which are here limited to a simple hieroglyphic between the orbicular and reniform. From that point all the black markings along the costa are entirely wanting, as well as the little lines and dots, which together with the marks interior to the orbicular and reniform form the transverse median band. The next transverse line and the distal one remain well accentuated, and thus enclose a large green area, striped and spotted with white, in the middle of which there is nothing but the above mentioned black hieroglyphic in the cell, between the stigmata." Sestola, Modena, Italy.

A very fine form. All the transverse black markings absent except those touching the cell and an indefinite small smear below the white elongate band. Only the well developed black submarginal marking and the basal band remain on the beautiful green, white-streaked ground.

7. Genus: *Diloba*, Bdv. 1840 = *Episema*, Och. 1816 (1825).

In 1816 Ochsenheimer (*Schm. Eur.* IV. 65) placed *caeruleocephala* and other species in the genus *Episema*, which he fully described in 1825 (*l.c.*, V (1). III.) In 1822? Hübner placed it with another species in *Disphragis* (*Verz.* 194). In 1840 Boisduval (*Ind. Meth.* 88) took out *caeruleocephala* and erected the genus *Diloba* for it alone.

Warren (Seitz. *Pal. Grs.-schm.* II. 332) says of the Genus *Diloba*, "This genus, which repeatedly has been thrown about between *Bombycidae* and *Noctuidae*, does not with certainty belong here," *i.e.*, united with the *Cymatophoridae*. "After having for some time been referred to the *Acrionictinae* and placed close to *Bryophila* by Staudinger and Rebel, we do not find it among the *Acrionictinae* in Hampson's new Catalogue." "Its whole habitus is Bombycoid, the body heavy, head large, frons heavily clothed with hair and adorned in the middle by a crest of hair; palpi strong and porrect, antennae of ♂ very long and strongly bipectinate, provided at base with two tufts of hair as in *Notodontidae*; thorax long, smooth hair; abdomen of ♀ very thick and heavy."

Diloba, Bdv., *caeruleocephala*, L.

Tutt *Brit. Noct.* I. 12 (1891): Barr. *Lep. Br. Is.* III. 175, pl. 115, 2 (1896): *Stdgr. Cat.* ed. 3. 168 (1901): *Splr. Schm. Eur.* I. 185, pl. 31 (1905): *South Moths Br. Is.* I. 265, pl. 127 (1907): Warr. (Seitz.) *Pal. Gr. Sch.* II. 332, pl. 491 (1912): *Hamp. Cat. Phal.* XIII. 594 (1913).

Tutt says (*B.N. I.*), "remarkable for the endless variation exhibited by the stigmata."

The forms to be considered as belonging to this species are:—

race *armena*, Stdgr., *Cat. ed.* 2, 76 (1871), Armenia, Syria.
 ab. *bipartita*, Strand., *Arch. Math. Naturr.* XXV., nr. 9, p. 13
 (1903).

ab. *orbimaculata*, Strnd., *l.c.*

ab. *separata*, Schultz., *Soc. Ent.* XXII. 51 (1907).

ab. *infumata*, Schwng. *Verh. z.-b. Ges.* LXVIII. (150) (1915).

Tutt only treats of the Syrian race *armena*.

ab. *bipartita*, Strnd. *Arch. Math. Naturr.* XXV. no. 9, p. 13(1903).
 ORIG. DESCRIP.—“The two large 8-like spots, which as a rule run together are distinctly separate.”

ab. *orbimaculata*, Strnd. *l.c.*

ORIG. DESCRIP.—“The two large stigmata as usual run together but towards the base, between them and the transverse line, there is a third stigma, round and small, but coloured as the others and sharply defined.”

ab. *separata*, Schultz., *Soc. Ent.* XXII., 51 (1907)

ORIG. DESCRIP.—“With the locality label “Scharud Persiens,” I obtained a form of *D. caeruleocephala*, which differs from the typical form by the singular appearance of the greenish-white inner dark powdered stigmata on the forewings. While in typical specimens of this species the stigmata run together into a large blotch, in this specimen the reniform and orbicular are clearly separated from each other by the ground colour, standing quite isolated on the dark ground and are very reduced in size compared with typically marked examples. This separation of the stigmata occurs commonly among European *D. caeruleocephala*, and similar specimens have been bred by myself and by other collectors as well as captured. Whether this form be a constant variety in Persia or only an aberration must be left for future investigation. I diagnose it as ab. et var. *separata*, al. ant. maculis distincta.”

This form appears to be the *bipartita* of Strand with a difference of colour of the stigmata.

ab. *infumata*, Schwng. *Verh. z.-b. Ges.* LXVIII. (150) (1915).

ORIG. DESCRIP.—“Has the fore- and hindwings, thorax and abdomen darkened brown-black and the usual grey-white spots of the forewings yellowish.”

8. Genus: *Demas*, Steph. (1828) = *Colocasia*, Ochs. (1816). [Hb. (1822 ?)].

Demas was introduced by Stephens to avoid *Colocasia* which was used in botany.

Demas (Colocasia) coryli, L.

Tutt did not deal with this species.

ORIG. DESCRIP.—Linn. *Sys. Nat.* ed. X., 503 (1788).

“P.B. elinguis, alis antice griseo nebulosis; postice caernulescenti glaucis, thorace variegato, antennis flavis.” The figures referred to

are Albin *Ins.* pl. 90: Röscl. *Ins. belust*, I(2), pl. 58: Wilk. *Butt.*, 31, pl. 3.

Barr. *Lep. Brit. Is.* II. 323, pl. 82 (1895): *Stdgr. Cat.* ed. III. 131 (1901): *Splr. Schm. Eur.* I. 136, pl. 31. 8 (1903): *South. Moths. Br. Is.* I. 190, pl. 100. 2 (1907): Warr. (Seitz) *Pal. Gr. Schm.* III. 11, pl. 2c (1909).

Barrett says of the variation (*l.c.*) "Variable in ground colour, the grey or whitish often tinged with brown or purplish; more so in the colour and intensity of the broad central band, which occasionally is no darker than the rest of the forewings, and indeed hardly indicated, but varies through every shade of brown or purplish-brown to deep dark chocolate, and in the darker specimens spreads so towards the base as to give the effect of forewings half red-brown, half whitish-grey."

Huene says (*Berl. ent. Zt.*, 309 (1901)) "This species has but little tendency to vary; but when such a tendency does occur, it mostly only affects the ashy-grey outer half of the forewings, in which case the usually distinct, sharply toothed elbow-line darkly shaded on the inner side, becomes especially obsolescent, only a few pale spots remaining over as traces. But the dark nut-brown colour of the basal half remains almost always constant, and is, as Esper III. 254, says, in the male of a darker brown than in the female. Further the right-hand figures, Plt. 50, figs. 4 and 5, show this distinction clearly."

The following is a list of the forms of this species.

race *mus*, Obthr. *Ét.* X. 17, pl. II. 4 (1884), E. Asia.

race , Graes., *Berl. ent. Zt.* 310 (1888), Amur.

ab. *arellanae*, Huene, *Berl. ent. Zt.* 309 (1901).

ab. *medionigra*, Vrbdt., *Schm. Schw.* I. 237 (1911).

ab. *uniformis*, Trti., *Nouv. forme Lep.* IV. 63 (1918).

ab. *nubrosissima*, Trti., *l.c.*

ab. *wanters*, Dufn., *Lamb.=Rev. mens.* XXV. 31 (1925).

ab. *alba*, Derenne., *Lamb.=Rev. mens.* XXVI. 42 (1926).

There is a form in the B.M. coll. named *bistriga*, much smaller, of uniform ground mouse colour with numerous incomplete and irregular strigae.

Demas propinquila, Grote. This species at once reminds us of *D. coryli*, although it is larger; it has similar facies, texture and shape; it is common in the Atlantic States.

FIG.—Holland. *Moth Book*, pl. XIX. 3.

Smith and Dyar *Contrib. N. Am. Noct. Aconicta* (1898), say of *Demas propinquila*. "This larva presents no good distinguishing characters from the European *D. coryli*."

race *mus*, Obthr. *Ét.* X. 17 (1884).

FIGURE.—*l.c.*, pl. II. 4.

ORIG. DESCRIp.—"Size of *caerulocephala*; entirely grey, the forewings with a more silvery tone than the hindwings, the latter with a slightly browner appearance. The forewings are crossed by three waved lines, of which one, the subterminal, is rather a continued shade than a line properly so called. Adjoining the first, in the cell there

lies the orbicular spot only indicated by a blackish contour mark; the cell is closed by a double mark. The thorax is the same grey colour as the wings." E. Asia, Sidemi.

Ernst and Engramelle, *Pap. d'Eur.* IV. 178, f. 210e, give a female form, in which the usually dark basal and central area of the forewing is of a lighter clear grey than the rest of the wing, which is normally coloured. This figure probably falls under *mus*, Obthr.

In the *Berl. ent. Zeit.* 1888, p. 310, Graeser describes, but does not name, series which were bred from the Amur. They would seem to fall under *mus* by the description, except that they are described as "unicolorous blue-gray," while *mus* is described as "more silvery-grey."

"The specimens differ from those of Europe by their bluish-grey colour: for the marginal half of the forewing is not whitish as in the usual form, but suffused with bluish-grey, by which the elbowed line becomes very indistinct, and in many particularly dark specimens is almost wholly obsolete, in such examples the basal area is not as usual brownish, but grey colour, whereby the wing appears almost unicolorous blue-grey."

ab. *avellanae*, Huene., *Berl. ent. Zeit.* XLVI. 309 (1901).

ORIG. DESCRIP.—"A male from Estland, which is lying before me now, not only has this distinction (*i.e.*, dark basal half and light outer half of forewing) a very striking and normal one, obsolescent, but it is coloured uniformly grey from the base to the outer margin. The nut-brown of the basal half is completely absent."

From the description this appears to be uncommonly like *mus* of Obthr.

ab. *medionigra*, Vorbrodts., *Schm.-Schw.* I. 237 (1911).

ORIG. DESCRIP.—"In Dombresson with the typical form there occur specimens, which have a dark black brown central area."

ab. *umbrosissima*, Trti., *Nuor. forme Lep.* IV. 63 (1918).

ORIG. DESCRIP.—"The species assumes another form in Sardinia with examples of almost a centimetre more from apex to apex. This form, which I name *umbrosissima*, has a great increase of the median brown fascia, which takes the shape of a very dark triangle, and yet leaving a little of the ashy-grey of the base and of the proximal part of the costa, cutting off with its distal side almost half the wing with a straight line which constitutes a prolongation of the proximal brown edge of the reniform, going from the costa direct to end near the inner margin at the brown point which lies between the waved submarginal line and the end of transverse distal line."

ab. *uniformis*, Trti., *Nuor. forme Lep.* IV. 63 (1918).

ORIG. DESCRIP.—"This form has no more light colour than a little white mark represented by the distal part of the reniform spot, which appears inside the outer transverse line, the line which almost envelops the brown proximal edge of the stigma itself, continuing sufficiently distinctly to its termination on the inner margin. There stands out, however, the little brown circle of the orbicular stigma with the little black dot in the centre. The undulated submarginal line is

scarcely represented. It recalls also to some extent, by the uniformity of its colour the *mus*, Obthr., from the Amur, but its colour is different, since in *mus* it is blue-grey." Italy.

ab. *wanters*, Dufn. *Rev. Mens.* XXV. 31 (1925).

ORIG. DESCRIPT.—“Much smaller than the type, almost one-third less in expanse. The light parts are not pearl-grey tinted with brown, but very reddish beyond the elbowed line up to the fringes. The median area is light brown, very limited, the lines and spots as in the typical form.” Anvers (Antwerp.)

ab. *alba*, Derenne. *Rev. Mens.* XXVI. 42 (1926).

ORIG. DESCRIPT.—“Capite et abdomine griseo albis. Alis quatuor cum fimbriâ griseo albidoque divisâ. Anticis insuper areâ mediâ ad basim griseo albâ nec rufobrunneâ, plagâ vero marginali fuscogriseâ. Posticis autem pallidioribus nec subrufis.”

“In this aberrant example there still exists a trace of the red-brown at the base of the wings, but the band does not exist and is replaced by a grey-white tint leaving the sinuous lines bordering the typical band as well as the orbicular in black, the terminal space is deep grey not brownish; the fringe is chequered grey and whitish. The forewings are sensibly lighter than in the type and show no trace of reddish. Head and abdomen are greyish-white.” Forêt de Soignes, Belgium.

9. Genus: *Acrionicta*, Ochs. (1816) = *Apatela*, Hb. (1806): *Arctomyscis*, Hb. (1822): *Phaetrea*, Hb. (1822), *Hyboma*, Hb. (1822): *Triæna*, Hb. (1822): *Jocheæra*, Hb. (1822): *Acrionicta* Tr. (1825) [= *Craniophora*, Snell. (1872)].

The species of *Acrionicta* are all so nearly related, that it is only on more or less superficial characters that they can be classified. Hampson, *Lep. Phal.* 1909, places 123 species in *Acrionicta*, including all but one of our British representatives, and that one, *ligustri*, he places with 8 others in *Craniophora*. Of these, 37 and 5 species, are Palearctic, 7 and 3 are Indo-Malayan, 79 are American and 1 Ethiopian respectively.

Staudinger, *Cat.* 1901, numbers 36 Palearctic species, 33 in *Acrionicta* and 3 in *Craniophora*, with *ligustri* in the latter.

Warren (Seitz.) 1909, has 49 Palearctic species, 43 including *ligustri* in *Acrionicta* and *auricoma*, *euphorbiae*, *rumicis* and *menyanthidis* in *Chamaepora*.

So far back as 1836 Curtis, *Brit. Ent.* 136, remarked, “It is a curious fact that in the present genus [*Acrionicta* sens. lat.] the larvae are of more value in separating than in uniting the species.” “There is not perhaps a more natural genus than *Acrionicta* of Ochsenheimer if we look at the perfect insects; yet when we refer to the larvae we shall not find more than two that have any affinity beyond the number of their feet.”

Chapman (*The Genus Acrionicta*, 4, 1893) placed *auricoma*, *myricæ* (*euphorbiae*), *menyanthidis*, *rumicis* and *venosa* in the genus *Viminia*, remarking that they “are very closely related and hardly admit of subdivision, although *venosa*, on the ground of the coloration of the

imago, may be so separated for convenience." Subsequent authors have definitely separated *venosa* from this group.

Chapman's second group *Cuspidia* contains *psi*, *tridens*, *strigosa*, *alni*, *megacephala*, *leporina* and *aceris*. Of this he notes that it is "not so homogeneous as the first and may be subdivided," if fancy so dictates, into subgenera, of which each species, except the first two, will represent one. Such division might be desirable if one were dealing with the *Acronyctidae* of the whole world.

Chapman's third group contains *ligustri* only, *Bisulcia*, which cannot stand as Snellen in 1872 had erected the genus *Craniophora* for *ligustri* alone.

Subsequently in 1895 W. Caspari II. (*Jahrb. Nass. Ver.* 48, p. 129) comes to practically the same results, making 7 groups. (1) *alni*, (2) *leporina*, (3) *strigosa*, *psi*, *tridens*, *cuspidis*, (4) *menyanthidis*, *auricoma*, *euphorbiae*, *abscondita*, *rumicis*, (5) *megacephala*, (6) *aceris*, (7) *ligustri*. *Venosa* he omits. His investigations were based on the larva, the larval habits, food plant, pupal habits, oviposition, etc.

In 1898 in one of a series of admirable essays on the *Noctuidae*, Smith and Dyar, *Contrib. Acronieta*, divided the American species into five groups. A. Gp. *americana* to which our *aceris* and *leporina* belong. B. Gp. *lobetiae* to which our *psi*, *tridens*, *strigosa* and *alni* belong. C. Gp. *persuasiva*. D. Gp. *hamamelis*. E. Gp. *auricoma* to which our *auricoma*, *rumicis*, *euphorbiae* (*myricae*) and *menyanthidis* belong.

Of *A. leporina*, they say, *Contrib.*, 41. "This is the only species of *Acronieta* common to Europe and N. America, and our larvae are absolutely like those compared from Europe." Further they say, "In its pattern of maculation *alni* resembles *superans* and *connecta* at least as much as, if not more than, it does our *funeralis*. It has not only the longitudinal shade of *superans*, but also the broad shade bands extending from the costa behind the orbicular to meet it. So the vestiture of *alni* is much more roughened than it is in the American species, and in this particular it is also much closer to our *connecta*."

Of the genital structure Sm. and Dyar., *Contrib. Acronieta*, say "While at first sight there may seem a close resemblance between these European (*psi*, *tridens*, *cuspidis*, *strigosa* and *alni*) and some American forms, yet they are really quite remote from each other. Variation has been much greater, and specialization more active in America; hence our species have diverged more and in a greater number of directions."

In structure "*tridens* is most nearly like *lithospila*; *psi*, and *tridens* do not lack the superior process, but do not have the scoop-shaped clasper distinctively developed; *strigosa* is the European representative of our *connecta*, but is smaller, more slightly built, and more brightly coloured. The ♂ claspers are those of *connecta*, but on a much smaller, more compact plan; *euphorbiae* in sexual structure is almost identical with *sperrata*, and the species resemble each other very closely; *auricoma* and *rumicis* represent the form found in *impressa*, our species standing almost midway between the two European forms in structure and resembling both superficially; "We have nothing resembling *menyanthidis*, in which both finger and thumb are long, slender and curved, the thumb distinctly longer and a little upcurved."

They conclude by pointing out that, "*ligustri* has sexual structures totally unlike anything else in the genus and should be excluded from it even on superficial characters"; and that "*megacephala* is also unique and utterly unlike anything represented in the American fauna. There is nothing to contradict its reference to *Aronicta*, however, though I am at a loss as to how the structure could have been derived from anything known to me."

Pierce in 1909, *Genitalia of Brit. Noctuidae*, p. 24, said, "As a whole the group are clearly generic, with the exception of *megacephala* and *ligustri*. *ligustri* belongs to a separate genus, *megacephala* is entirely different, and I should be inclined to make a separate genus for it, were it not for the fact that Dr. Chapman considers in other respects it belongs here. We are therefore bound to conclude that it is a strong example of one of those curious sports that will be met with throughout the Order Lepidoptera."

Aronicta, Ochs. (1816) [= *Bisulcia*, Chap. (1893)] = *Craniophora*, Snell. (1872) *ligustri*, Schiff.-Fab.

Tutt gave Fabricius, *Mant.* II., 172 (1787) as the author, but Schiffermüller, *Verz.* 70 (1775), sufficiently indicated the species by the name *ligustri*; larva on *Ligustrum vulgare*, belonging to a group of 5 species with pubescent larvae, with few hairs almost long, the imagines with crests, greenish or silvery-grey wings, with black lines or streaks and white spots. The other four are *glandifera* (*murialis*), *perla*, *aprilina* and *degener* (*alni*) all quite distinctive from *ligustri*. Hence it should be *ligustri*, Schiff. Fab. himself gives Schiff. as the author. *Ent. Sys.* III. (2) 102 (1794).

Some early writers confused *ligustri* (*atropos minor* as it was named by some) with larvae on *Ligustrum*, with *Hadena brassicae* with larvae on *Lactuca*. Hence Herrich-Schäffer. *Sys. Bearb.* IV., 182, places *ligustri* in *Aronicta* (for reference) because it has always been so placed, but says it is a Hadenid, and on p. 278, treats of it in the genus *Phlogophora* with *lucipara*, etc.

Tutt *Br. Noct.* I. 12 (1891): Barr. *Lep. Br.* I. III. 270, pl. 123 (1896): Stdgr. *Cat.* 134 (1901): Splr. *Schm. Eur.* I. 140, pl. 31 (1903): South *Moths. Br. I.* I. 198, pl. 103 (1907): Hamp. *Lep. Ph.* VIII. 57, fig. 16 (1909): Warr.-Seitz. *Pal. Noct.* III. 14, pl. 36, 4d (1909): Tutt *Ent.* XXI. 81 (1888): *Ent. Record* I. 34 (1890).

Hübner's figure, *Noct.* 21, is very dark olive-brown with very little white, apical patch light but mottled with dark colour, orbicular not marked out white, markings usually white are dark but lighter than the ground.

Freyer's figure, *Beitr.* III. 142, has the area from anal angle to apex and one third of costa greenish-white variegated with brown lines and spots; the light narrow transverse band from one third of costa to middle of inner margin slightly green.

Duponchel's figure, *Hist. Nat.* VI., pl. 89, is a very good typical figure slightly green.

Of the variation Barrett says, "Appears to be in a great degree climatal; the more northern and western districts [Brit. Isles] produc-

ing forms in which the ground colour is of a deeper olive-green, or deep olive-brown, or even almost purplish black; the transverse lines double and the other dark markings intensified; broken black clouds lying between the nervures; the white markings obliterated, or only existing as faint dashes between the double transverse lines, at the edge of the stigmata, and in small scallops along the hind margin, and the usual large ovate blotch obliterated; the hindwings and underside also darker. Almost every intermediate shade of variation also occurs, or the white markings are replaced by yellow, and in many the white ring of the orbicular stigma is very distinct."

Treitschke says, *Schn. Eur.* V. (1) 22. "Aberrations occur so commonly, that almost no specimen is like another."

In the Dobrée Coll. there is a specimen in which the stigmata are almost entirely obliterated.

Ernst. and Engramelle, *Pap. d'Eur.*, pl. 225, f. 320f, figure a fine light aberration, the only dark portions being a narrow fascia across the disc between the stigmata, the transverse lines and a dark clouding from the inner margin near the inner angle to a point below the apex.

The forms to be considered are:—

ligustri, Schiff., *Verz.* 70 (1775): *Fab. Mant.* II. 172 (1787).

form *coronula*, Haw., *Lep. Brit.* 179 (1809).

form *sunderalli*, Lampa., *Ent. Tidsk.* 50 (1885).

ab. *olivacea* (Dobr.) Tutt, *Ent.* XXI. 81 (1888): *Br. Noct.* I. 13 (1890).

ab. *nigra*, Tutt, *l.c.*

ab. *troni*, Huene., *Berl. e. Zeit.* 310 (1901).

ab. *effusior*, Dann., *Ent. Zeit.* XXIX. 6 (1925).

ab. *roseoradiata*, Dann., *l.c.*, 120.

ab. *riburni*, Dann., *l.c.*

Tutt discussed *coronula* with only a white lunule, *sunderalli* the olive-brown form, *olivacea* the dark olive-green form and *nigra* the wholly black form. He said *B.N.* IV., 89, that *sunderalli* was the same as *coronula*.

Brown, *Descr. Cat. Dobr. Coll.* 1909 says, ab. *sunderalli*, Lamp. (1885) = *olivacea*, Dobrée.-Tutt (1891). "A form in which the white markings are replaced by olive-green, and which is equally common with the type in East Yorkshire." (Dobrée) See Barr., pl. 123, f. 3.

Curiously Hampson says that *sunderalli* is olive-brown while Warren-Seitz says it is entirely dark olive-green."

ab. *troni*, Huene., *Berl. e. Zeit.* 310 (1901).

ORIG. DESCRIP.—"I have obtained from the neighbourhood of Reval a specimen caught in June, which is not only a handsome aberration, but also affords me an evidence of the probability, that very pale *ligustri* can have in reality a transitory similarity with dark *ludifica*, but that also only on the forewings. The ground colour of this aberration is not even brown, but white, with the normal black markings. The spots of the ground colour in the typical *ligustri* coloured the deepest and darkest brown are in this specimen marked only with light grey-brown. These are, that of the area between the stigmata and a little downwards from here, then that of the inner

angle and that of the underpart of the apex of the wing resting on the marginal line sending out a tooth towards the reniform. There are also present grey-brown scales scattered here and there and indeed particularly at the base of the forewing. The hindwings are uniform gray-brown."

The figure in Ernst and Engram. (*ante*) is suggested by the above description.

form *effusior*, Dann. *Ent. Zeit.* XXXIX. 6 (1925).

ORIG. DESCRIP.—"The examples marked as ab. and v. *sunderalli*, Lampa, include in size and general appearance all the forms differing from the typical ones by darkening of the white areas and suffusion of olive tone over the black. But there are found to be included specimens, in which pronounced rose and pale green tones are developed, the deep black in the typical form is varied to pale grey and olive grey, and the white markings, especially towards the apex of the forewings are intensified. In some way an extreme *sunderalli*-form, but which in many years is the prevalent form in the South Tyrol, and especially on account of its strong white appears extraordinarily variegated; it is a local race, which should not be included in the wide significance of v. *sunderalli*, and for which I propose the name *effusior*."

The orig. descrip. of form *sunderalli*, Lampa, is a comprehensive one, *viz.*, "Forewings devoid of white scales," and thus would include all green, brown and black forms without white coloration.

ab. *roseoradiata*, Dann., *Ent. Zeit.*, XXXIX. 120 (1925).

ORIG. DESCRIP.—"Very noticeable the form appears, in which the rose suffusion is changed in colour to a rose-brown or violet, but also intensified in such a way, that there are along the veins three strongly coloured streaks, lying lengthways from the wing base to the outer margin. This very conspicuous form of such an extraordinarily variable species is very rare, and out of the many hundreds captured and bred examples I have met with only one male example. I name it *roseoradiata*."

ab. *viburni*, Dann., *Ent. Zeit.*, XXXIX. 120 (1925).

ORIG. DESCRIP.—"There are examples in the *sunderalli* group, which are also unicolorous mouse-grey. A smaller amount of olive-green and rose-red infusion becomes unrecognisable in this smooth ground and only a narrow dark transverse band is apparent. The large white spot lying in the outer area is only noticeable as a little paler than the ground. The thorax and abdomen are mouse-grey; the usual strongly marked black and white streaks and marks are absent. This form, which is not rare among the generally very variegated summer form, I call ab. *viburni*; it is obviously an extreme, the opposite of *effusior*."

Acrionicta, Ochs. (1816) = *Apatela*, Hb. (1806) [= *Arctomyzicis*, Hb. (1822) = *Cuspidia*, Chap. (1893)] *aceris*, L.

Tutt quotes the Linn. description in *Sys. Nat.* XII. ed. The original description is in the X. ed. and is the same but not amplified as in the former.

Tutt. *Brit. Noct.* I. 13 (1891): *Barr. Lep. Br. I.* III. 231, pl. 120 (1896): *Stdgr. Cat.* 131 (1901): *Splr. Schm. Eur.* I. 136, pl. 31, 10 (1903): *South M. Br. I.* I. 192, pl. 100, 5 (1907): *Ilamp. Lep. Ph.* VIII. 116 (1909): *Warr.-Seitz. Pal. Noct.* III. 13, pl. 2fg (1909): *Tutt Ent.* XXI. 52 (1888).

Hübner's figs. *Noct.* 13-14, in my copy are dark, probably from deterioration; *leporina* on the same plate is utterly spoiled.

Of the variation Barrett says, III. 230, "Usually rather constant in colour and markings, varying only a little in tint of the grey mottling; the hind marginal space is, however, often darker or paler than the rest, and a dark grey band outside the second line is not unfrequent."

"A rare variety is nearly unicolorous blackish-grey, or dark brown-grey, and in this the white second line is sometimes obscured." = *infusata*, *Haw. Lep. Brit.* 177: *Hb. Noct.* f. 14.

The forms to be considered are:—

aceris, Linn., *Sys. Nat.* X. ed. 514 (1758).

f. *candelisequa*, Esp., *Schm. Abbild.* IV. (2), 39, pl. 191 (1795).

f. *infusata*, *Haw., Lep. Brit.* 177 (1809): *Warr.-Seitz.* III., pl. 2f.

f. *candelisequa*, Gn., *Noct.* V. 48 (1853).

r. *intermedia*, *Tutt, Brit. Noct.* I. 14 (1891): *South M.B.I.* I., pl. 100.

r. *judaea*, *Stdgr., Cat.* III. ed. 131 (1901), Palestine.

ab. *assignata*, *Hirschke., Verh. Gess. Wien.* LX. 413 (1910).

ab. *elineata*, *Dufr., Rev. Mens.* XXV. 32 (1925).

Tutt considered *aceris* the grey form; *candelisequa*, Esp, the suffused brown form and *candelisequa*, Gn. (nec. Esp.) = *intermedia* the grey form with yellow infusion.

race *judaea*, *Stgr., Cat. Lep. Pal.* 131 (1901).

ORIG. DESCRIP.—"Pallidior, al. ant. griseo-albicantibus." This is the palest form.

ab. *assignata*, *Hirschke, Verh. Gess. Wien.* LX. 413 (1910).

ORIG. DESCRIP.—"A female collected at Luzerdorf near Vienna. On the upperside of the forewing any trace of marking is wanting, and on the upperside of the hindwing the curved line is absent. The curved lines on the underside of all the wings only slightly marked."

ab. *elineata*, *Dufr., Rev. Mens.*, XXV. 32 (1925).

ORIG. DESCRIP.—"The disappearance of the black mark under the sub-median fold which crosses the outer line: the usual lines and markings are thinner than in the type. The wings finely powdered with blackish." Frameries, Belgium.

Acronicta, *Ochs.* (1816) = *Apatela*, *Hb.* (1806) [= *Cnspidia*, *Chap.* (1893)] *leporina*, L.

ORIG. DESCRIP.—Tutt gives the *F'n. Suec.*, 1761, of Linn. for the original description. It should have been *Sys. Nat.*, X. ed., 510-11

1758, which after "Noctua" has "seticornis" in the description Tutt quotes.

Tutt. *Ent.* XXI. 51 (1888); *Brit. Noct.* I. 14 (1891); Dyar. *Cat. Lep. N. Am.* 100 (1893); Barr. *Lép. Br. I.* III. 224. pl. 120 (1896); *Stdgr. Cat.* III. ed. 131 (1901); *Splr. Schm. Eur.* I. 136. pl. 31 (1903); *South. Moth. Br. I.* I. 191. pl. 100 (1907); *Hamp. Lep. Phal.* VIII. 161. fig. (1909); Warr. (Seitz) *Pal. Noct.* III. 14. pl. 3a (1909).

VARIATION.—According to Barrett, *l.c.*, the typical white form is usually found in the southern counties only, while the form more or less suffused with grey atoms occurs chiefly in the east, west and north. "In the Eastern counties the darker forms appear almost to exclude the type." "Along with the darkening of the ground colour the transverse lines are usually blacker, more distinct and more complete."

Treit. says, *Schm.* V. (1), 7, that Hb. fig. 16 is a ♀ *bradyporina*. Really it is a typical ♀ *leporina*, white not grey in my copy of Hübner's *Noctuae*.

Hübner's figure 570 571 named *bradyporina* is a white form, *i.e.*, the type *leporina*.

The figure of Stephens, *Ill.* III., pl. 26, is of a very darkly suffused form with the markings much further intensified. Outside the outer line the ground is darkest, the outer line being emphasised by wide black edging. It differs from all figures of *bradyporina* = *grisea* which I have examined.

The figure of *bradyporina* = *grisea* in H.S., 636, is white partially suffused with grey atoms; a bandlike area inside the outer line and an irregular area along the outer margin remaining pure white.

Newman, *Brit. Moths*, 251, figures *leporina*, white; *bradyporina*, dark uniform grey; *semirirga*, with an exterior band.

The List of forms to be considered are:—

- leporina*, L., *Sys. Nat.* X. ed. 510-11 (1758).
- f. *bradyporina*, Hb., *Noct.* 570-1 (1818).
- f. *bradyporina*, Tr., *Schm. Eur.* V. (1), 9 (1825).
- ab. *rosea* (Engr.), (Gn.), *Tutt Brit. Noct.* I. 15 (1891).
- ab. *bimacula*, Maas., *Stett. ent. Zeit.* XXXII. 27 (1871).
- r. *vulpina*, Grote., *Can. Ent.* XV. 8 (1883).
- ab. *sanctae*, H. Edw., *Ent. Ann.* III. 185 (1888).
- race *cineracea*, Graes., *Berl. ent. Zt.* XXXII. 310 (1888).
- race *leporella*, *Stdgr.*, *Stett. e. Zt.* XLIX. 245 (1888).
- ab. *semirirga*, *Tutt.*, *Brit. Noct.* I. 15 (1891); *Ent.* XXI. 51 (1888).
- race *canadensis*, Sm. and Dyr., *Pr. U.S. Nat. M.* XXI. 57 (1898). (?)
- ab. *moesta*, Dyar, *Can. Ent.* XXXVI. 29 (1904).
- ab. *melanocephala*, Mansb., *Ent.* XXXVIII. 289. figs. (1905).
- f. *grisea*, Cochr., *Ent. Record.* XVIII. 101 (1906).
- ab. *nigra*, *Tutt.*, *Ent. Record.* XVIII. 149 (1906).
- ab. *melaleuca*, *Culot. Noct. e. G.* I. (1). 18. pl. 1. figs. 5-6; pl. 2. f. 2 (1909).
- ab. *leucoglaea*, *Stich. Zt. Wiss. Ins.* XIII. 290. pl. 1. fig. 7 (1917).

Hampson considers, *l.c.*, that the American forms *sanctae*, *vulpina* and *moesta* are all *leporina* forms.

Tutt treated of *bradyporina*, Tr., the grey powdered form; *semivirga* the banded white form; *rosea* the rosy form; and *bradyporina*, Hb. 570 571 = *leporina* type.

Considerable confusion existed as to the significance of these and other names and Prout, *Ent. Record*, XVIII. 147 (1906), revised Tutt's account of the variation in *leporina*.

He pointed out (1) that the name *bradyporina*, Hb. figs 570, 571 was a synonym of *leporina* for the figures were of pure white examples like figs. 15 and ? 16, and not grey. (2) Hence the name *bradyporina* was not available for Treitschke* and that the name *grisea*, Coch., might well be used for the grey form described by that author. (3) That Mansbridge's ab. *melanocephala* is an extreme of the *bradyporina*, Tr. = *grisea*, Coch., particularly characterised by its black thorax.

(4) That the description of Treitschke's form emphasised the darker dusting behind the second line in numerous examples, suggesting Tutt's *semivirga* form of the white *leporina*.

ab. *bimacula*, Maas., *Stett. e. Zt.* XXXII. 27 (1871).

FIG.—Hampson's figure of *leporina*, *Lep. Phal.* VIII. 161, is really that of the extreme markingless form *bimacula*, Maas.

ORIG. DESCRIP.—“Wholly white, with two black spots in the middle of the forewing.”

Prout says, *l.c.*, ab. *bimacula*, Maas., is only “slightly more extreme than the type.” (*tota alba, punctis duobus nigris*).

race *culpina*, Grote., *Cau. Ent.* XV. 8 (1883).

FIG.—Sm. and Dyar, *Pr. U.S. Nat. Mus.* XXI., pl. XI., figs. 1-2. *leporina* (American).

ORIG. DESCRIP.—“The wings are not ‘d'un blanc grisâtre saupoudré de fins atomes noirs,’ but of a creamy yellowish-white not irrorate. The secondaries are not of a ‘blanc sale,’ but pure immaculate white. The markings are as in *leporina*; a black basal dash, the t. a. line consisting of three black spots, a small ringed orbicular sometimes wanting; a small lunate black reniform. T. p. line fragmentary but without the dash at internal angle, ‘en T.’ of *lepusculina*, or at most the smallest remnant of it. The markings of these three are alike, but *culpina* is slight.” New York.

Hampson, Dyar and others identify this as *leporina*. There is complete identity of the larvae.

race *sanctae*, H. Edw., *Ent. Amer.* III. 185 (1888).

ORIG. DESCRIP.—“Pure clean white, with all the markings reduced to mere spots or dashes. There is a very minute black dash at the base of the primaries, hardly visible without a lens, three black spots on costa, one at basal third, the other two near together beyond the middle-one in middle of wing, and a faint one behind the cell. The submarginal line is indicated by three spots, one on internal margin, one near the middle of vein 3, and a smaller one near the apex, close to which are two very indistinct dots. The marginal line is composed of minute black dots, and there is also a black dot in the middle of the internal margin. Fringe clear glossy white. Secondaries silvery

*Invalid, as “not containing the type of the conception.”—(Wlsm. and Drnt.)

white, glossy, shining, the marginal line barely visible. Fringe clear white. Head, thorax, breast, palpi, outer side of coxae, femora and tibiae clear white, as is also the underside of the abdomen. Shaft of antennae white, pectinations black. Tarsi white banded with black. Interior of legs blackish. Upperside of abdomen black, covered with long white hairs, and with white band, indicating the separation of the segments.

"It has at first sight a good deal of the appearance of the European *A. leporina*."

Hampson, Dyar, etc., recognise this as the American *leporina*.

race *leporella*, Stdgr., *Stett. v. Zt.* XLIX. 245 (1888).

FIG.—Warr.-Seitz. *Pal. Noct.* III. pl. 3. a. ♂ ♀.

ORIG. DESCRIP.—"The specimens measure 40mm., and have white, wholly light grey suffused forewings, without markings anywhere standing out sharply black such as they always do more or less in *leporina*. In the basal part stands a dusky brown longitudinal streak and the first cross line is only indicated by a pair of brownish crochets. Beyond is the outer cross line, bent almost completely S-shaped, dull black-brown, without forming sharp teeth as is always the case with var. *bradyporina* (where it usually stands out clearly). *Bradyporina* is mostly much darker, more coarsely powdered black gray, than *leporella*. The discal spot at the end of the cell is only indicated by extremely dull brownish. On the white underside only this with the black marginal spots before the fringes are indicated blackish." E. Siberia. Thibet, Japan.

Prout says, *Ent. Record.* XVIII. 147, that *cineracea*, Graes., is synonymous with *leporella*. But in *cineracea* the wavy line is continuous the whole width of the wing whereas in the present form it is only represented by obsolescent fragments.

race *cineracea*, Graes. *Bevl. v. Zt.* XXXII. 310. (1888.)

ORIG. DESCRIP.—"The ground colour of the forewing is a dull grey-white, but without the dark powdering of the var. *bradyporina*, Tr. The very distinct black markings in the typical form are in var. *cineracea* only indicated by fine, brownish spots and streaks, and the wavy line of the marginal area, which in *leporina* is usually indicated by a few black spots only, is visible in *cineracea* the whole width of the wing and forms a continuous brownish line. The outer portion of the marginal area forming the wavy line is coloured somewhat darker. The short black band of spots, which in the typical form reach to the middle cell at the closure, is not present in the form from Amur-land, it is indicated here by an almost invisible yellowish tinge, while the cross-veins become indicated by a fine, brown, wavy streak. The black spots of the border are much less distinct and almost wholly obliterated in many specimens." Amur.

Prout says, that *leporella*, Stgr. and *cineracea*, Graes. are synonyms. (alis anticis cinereo-albidis, indistincte signatis.)

race *canadensis*, Sm. and Dyr., *Pr. U.S. Nat. Mus.* XXI. 57 (1898).

FIG.—Hamp. *lep. Phal.* VIII., pl. 126, 10.

ORIG. DESCRIP.—"Ground colour very much darker and having the secondaries more powdery. The maculation is the same, as both my specimens are ♀s. The difference is very decided." British Columbia.

race *moesta*, Dyar, *Can. Ent.* XXXVI. 29 (1904).

ORIG. DESCRIP.—“Dark grey fully as dark as *canadensis*, Smith and Dyar, which it much resembles, but the basal line is broken and the transverse posterior line is dentate as in *leporina*.” British Columbia.

Hampson treats this as a *leporina*, but *canadensis* as a separate species and far removed from *leporina*.

ab. *melanocephala*, Mansbr. *Ent.* XXXVIII. 289. (1905).

FIG.—*l.c.*, f. 1.

ORIG. DESCRIP.—Differs from the type as follows:—“Forewings in both sexes strikingly suffused with fuscous, and with all the normal markings intensified. Thorax black; abdomen blackish, not so dark as the thorax; hindwings as in the type.” The Liverpool district, North Cheshire and S. Lancashire.

Herr Gillmer remarks, *Soc. Ent.* XXX. 43. (1906), on the above aberration as follows.

“ab. *melanocephala* has a completely black coloured thorax and blackish, abdomen, ab. *bradyporina* a smutty white mixed with black grey thorax, and a deeper grey abdomen.

ab. *melanocephala* has strongly dark brown powdered forewings and sharply emphasised noctuid markings, in ab. *bradyporina* the forewings are the same but the markings are variable.

ab. *melanocephala* is not darkly powdered in the marginal area of the forewings, ab. *bradyporina* is furnished with dark band-like powdering.

In ab. *melanocephala* the hindwings are pure white (usually with darkened veins, the hindwings in ab. *bradyporina* have emphasised, mostly brown powdered veins.)

The ab. *melanocephala* agrees well with Tutt's *semivirga*, the grey form.”

This last remark is quite incorrect. Even a cursory glance at the figure of *melanocephala* and the figure of *semivirga* no. 3 in Newman will show complete dissimilarity.

ab. *nigra*, Tutt. (Willsdon) *Ent. Record.* XVIII. 149 (1906) [*Ent.* XXXIX. 97. (1906).]

FIG.—*Ent. l.c.*

ORIG. DESCRIP.—“The forewings of the insect are glossy black, with white fringes. The black markings of the typical insect are for the most part discernable, and they are partly relieved by a faint white edging. The hindwings are somewhat suffused towards the inner and outer margins, and the nervures are strong and dark. The thorax is quite black, the abdomen decidedly dark.” Bred from an Essex larva.

f. *grisea*, Cochr. *Ent. Rec.* XVIII. 101. (1906.)

FIG.—*Ent.* XXXVIII. 289. fig. 2.

ORIG. DESCRIP.—“A grey form very much suffused with scarcely any trace of the white colour which characterises the type, the colour of the anterior wings of a dark uniform grey, the black markings of necessity less pronounced.”

This, as pointed out by Prout, *Ent. Record.* XVIII. 147, is the *bradyporina* of Treit. But the name *bradyporina* was first published by Hübner for the white form *leporina*. *Noctuae*, 16, and therefore could not be used as it was a synonym of *leporina*. Hence Miss Cochrane's name *grisea* must replace Treitschke's name *bradyporina*.

ab. *melaleuca*, (Obthr) Culot. *Noct. et G.d' Eur.* I(1). 19. (1909.)

FIGS.—*l.c.* pl. 2. f. 2.

ORIG. DESCRIP.—“An exaggeration of ab. *bradyporina*, Tr., the ground of the upper wings above is entirely of a very deep grey, with the ordinary black markings unmodified; the fringes and the interior wavy line contiguous to the black submarginal line are the only parts remaining white.” Osnabrück.

A very conspicuous form by its white wavy line.

Sub-sp. *leucogaea*, Stich., *Zt. wiss. Insek.* XIII. 290 (1917).

FIGS.—*l.c.*, pl. 1, f. 7.

ORIG. DESCRIP.—“Closest to *bradyporina*, both zigzag lines of the forewings, but particularly the distal one, very sharp and continuous; basal and distal areas greyer, central area of almost whiter ground colour, so that it forms a broad white band. Claviform extended backwards.” Sweden.

To those interested the following references might be useful.

Apatela leporina, L.—Smith and Dyar *Contrib. Acron.* (*Proc. U.S. Nat. Mus.* 1898), 59, pl. XI. 1, 2.

Apatela cretica, S. and D.—*l.c.* 58, pl. XI. 3, 4.

Apatela populi, Riley.—*l.c.* 61, pl. XI. 7.

Apatela lepusculina, Gn.—*l.c.* 63, plts. I. 1, XI. 8.

These appear to be very gradual steps in the degree of amount of marking; their separation as species is mainly on slight differences of degree in genitalia as in the marking.

Aronicta, Ochs. (1816) [*Apatela*, Hb. (1806): *Arctomyziscis*, Hb. (1822): *Unspidia*, Chap. (1893)] *megacephala*, Schiff.

The authority is given by Tutt as Fabricius, *Mant.* 1787. There is no doubt that this is the *megacephala* of Schiffermüller, *Verz.* 67. See the older authors up to Illiger's revision of the *Verz.* 1801. Tutt used the first displayed description.

Tutt *Brit. Noct.* I. 15 (1891): Barr. *Lep. Br. Is.* III. 233, pl. 120 (1896): Stdgr. *Cat.* 131 (1901): Splr. *Schm. Eur.* I. 137, pl. 31 (1903): South *Moth. Br. Is.* I. 193, pl. 101 (1907): Hamp. *Lep. Phal.* VIII. 149 (1909): Warr.-Seitz. *Pal. Noct.* III. 15, pl. 36 (1909).

Of the variation Barrett says, *l.c.* 234, “Usually very constant in colour and markings, but there is occasional variation in the intensity of the dark colouring of the forewings, and in the size and distinctness of the large ovate pale blotch.” Chapman reported, “I have them of three tints, (1) black and white, (2) ochreous, (3) tending to pink.” (Tutt *l.c.* 15).

The following is a list of the named forms.—

megacephala, Schiff., *Verz.* 67 (1775).

(?) race *tunica*, Stdgr. *Stett. e. Zt.* 88 (1888).

f. *ochrea*, Tutt., *Brit. Noct.* I. 15 (1891).

f. *rosea*, Tutt, *l.c.*

ab. *grumi*, Alph., *Rom. Mem.* IX. 3-4 (1897).

ab. *igdyrensis*, Teich., *Korrespond.-blatt Nat.-f. Ver. Riga*. 44, p. 17 (1901).

ab. *nigra*, Shaw., *Ent. Record* XIV. 103 (1902).

race *pulla*, Strud., *Arch. Nat.-r. Christ*. XXV. no. 9, p. 9 (1903).

ab. *aethiopa*, Krul., *Soc. Ent.* XXI. 49 (1906).

ab. *warpachowskyi*, Krul., *Soc. Ent.* XXIII. 123 (1908).

ab. *albidiior*, Wagn., *Zeit. Oestr. Ent. Ver.* VIII. 21 (1923).

Tutt treats of (1) the black and white *megacephala*, (2) the pale *turanica*, (3) the ochreous tinged *ochrea*, and (4) the pinkish tinged *rosea*.

Brown considering the form *turanica*, *Des. Cat. Dobrée Coll.*, p. 9, says, "Formerly considered by Dr. Staudinger to be a distinct species. Mr. Dobrée pointed out that it was nothing more than a light coloured form of this species, suffused with pale brownish-grey. In Dr. Staudinger's 1901 *Cat.*, however, it appears as a variety of *A. rumicis*." Hampson and Warr.-Seitz also treat it as a form of *rumicis*.

ab. *grumi*, Alph., *Rom. Mem.* IX. 3-4 (1897).

ORIG. DESCRIP.—Differt alis anticis angustioribus, spatio inter strigem postbasalem et umbram medianam albo alisque posticis ubique candidis.

"The only ♂ which I have before me and which has just come from north of the Thian-Chan is perhaps only a var. of *megacephala*, but it may turn out a separate species. In the arrangement of the markings and in the coloration of the forewings *grumi* shows only a slight difference, except that the light space inside the elbow is absent (which rarely happens in *megacephala*) the wing being here of the same coloration as the rest of the ground, while a long lighter shade traverses the whole wing between the extrabasal and the transverse median shade. This clear space contains almost in the middle, but nearer the extrabasal, the small very round orbicular, very clearly circled with grey and never soiled with grayish in the centre, which is always the case (more or less) in *megacephala*. What is still more characteristic is that the posterior wings are entirely white on both sides without any markings. Also the general appearance of the insect appears, on account of the more elongated forewings and less wide on the posterior margin, than in *megacephala*, to be a true species, the cut of the wings being rather that of *A. psi*. Finally as a last distinctive character I will note the 2nd joint of the palpi, is, seen from below, of a pure white and that its hairiness almost completely hides the terminal joint. Dr. Staudinger says that he believes it is only a variety of the very variable *megacephala*."

ab. *igdyrensis*, Teich., *Korrespond.-blatt Nat. f. Ver. Riga*. XLIV. 17 (1901).

ORIG. DESCRIP.—"This very remarkable variety I caught and bred in Igdyr near Ararat. The larva is extraordinarily like that of *megacephala* and lives with *Smerinthus kindermanni* on willow. While our typical *megacephala* is very dark, the var. *igdyrensis* has the pale colour of *aceris* with a trace of yellowish. The marking is the same only obsolescent, whereby the outer transverse line is sharply expressed and shows fine, clear, black teeth. The hindwings are almost white with

nearly clear marginal area. The underside is nearly without marking. The forewings show only a very slight central mark and the hindwings have black discal points."

ab. *nigra*, Shaw., *Ent. Record*. XIV. 103 (1902).

ORIG. DESCRIP.—"A fine form of this insect is found at Manchester together with the type. The forewings are totally black, with exception of the outer margin which has a slight white fringe, and the orbicular stigma which is slightly paler than the ground colour. Body black; hindwings as in the type."

Rebel points out, *Berge's Schm.-buch*. Ed. 9 (1909), that *aethiopa*, Krul., and *nigra*, Shaw, are synonymous.

race *pulla*, Strnd., *Arch. Naturr. Christ*. XXV. no. 9, p. 9 (1903).

ORIG. DESCRIP.—"The Norwegian examples before me are all very consistently dark coloured; most of the markings are only exceptionally of definite white, and of reddish suffusion there is not a trace present. In the darkest specimens the head, neck and thorax are black with a little mixture of grey; the whole forewings are so suffused with black, that the pale markings, which are not white, but grayish, either have wholly disappeared, or are only indistinctly present. The first transverse line is only slightly represented on the costa, while the second only in its upper half as well as on the inner margin is recognisable by a grayish wisp. Of the stigmata only the orbicular is distinctly visible. The black marginal area with a few indeterminate, grayish, unconnected wisps represent the elbowed line." This form I name *pulla*; it occurred near Christiania.

ab. *aethiopa*, Krul., *Soc. Ent.* XXI. 50 (1906).

ORIG. DESCRIP.—"Forewings are coal-black with slight traces of the usual markings. The light place between the reniform and the outer transverse line is not emphasised. The thorax is black; the abdomen much darker than usual." Wiatka and Moscow. (See ab. *nigra*, ante).

race *warpachowskyi*, Krul., *Soc. Ent.* XXIII. 123 (1908).

ORIG. DESCRIP.—"The examples of *A. megacephala* from E. Russia diverge much from the forms of Central Europe. It well deserves an individual name as a distinct local race, which, as it appears, stands nearer to the var. *igdyvensis*, Teich, than to the typical form.

"The forewings are more white-gray with finer black markings broken up raggedly in places. The spot between the reniform stigma and the outer transverse line is very much fainter, often almost wholly white. Sometimes the whole of the central area is distinctly paler than the general ground colour, and only the hindmargin appears more dusky coloured. Thus the transverse lines show up more distinctly on the whitish ground than in the case of typical examples. The body parts are also much paler than in German examples. The larva ordinarily lives in July and August on the willow and poplar and the not uncommon imago flies from mid-May to July.

"I name this variety after the renowned well-known Russian ichthyologist Herrn. N. A. Warpachowsky—var. *warpachowskyi*."

ab. *albidior*, Wagn., *Zeit. Oestr. Ent. Ver.* VIII. 21 (1923).

FIG.—*l.c.*

ORIG. DESCRIP.—“The specimen tends in its appearance strongly towards *aceris*, L.: the early date of appearance so characteristic of *megacephala*, the abdomen laterally somewhat compressed, and compared with *aceris* much more slender, and extending out farther beyond the anal angle of the hindwing, and also the clearly emphasised irregular blotch at the inner angle of the forewing form an indubitable feature for the attachment to *megacephala*. Also the very well-marked large, spot-like pale area beyond the end of the middle cell, well concealed in the pale whitish gray ground, but always recognisable in *megacephala*. Further in confirmation of this there lies before me copious material of both species from the Schwingen collection of Vienna wherein is an intermediate to this form, thus the attachment of this form to *megacephala* requires no further documentary evidence. In the books it is stated that the black basal streak is a characteristic of *aceris* as well as of *megacephala*, only in the latter normally it is hidden more or less in the much darker ground colour.”

Aconicta, Ochs. (1816) [*Apatela*, Hb. (1806) : *Hyboma*, Hb. (1822) : *Cuspidia*, Chap. (1893)] *strigosa*, Schiff.

Tutt gave *Fabricius* as his was the first displayed description, *Mantissa*, 142 (1787). Most of the older authors are agreed that this is the species denoted in Schiff. *W. Verz.* 88 (1775). Esper, *Schm. Abb.* IV.(2), pl. 127, 4 (1786), figured the species under the name *farillarea*, which name Borkhausen used, IV. 217 (1792), and later, IV. 652, copies Fab. species *strigosa* as unknown to him. Engramelle, *Pap. d'Eur.* VI. 5, fig. 285 (1788), describes and figures it under Esper's name. Esper's figure is poor and too large. Hubner's fig. 2, *farillarea* fully emphasises this name by its olivaceous colour.

Tutt, *Brit. Noct.* I. 16 (1891), IV. 89 (1892) : Barr., *Lep. Br. Is.* III. 241, pl. 121 (1896) : *Stdgr. Cat.* ed. 3, 132 (1901) : *Splr. Schm. Eur.* I. 137, pl. 31 (1903) : *South Moth. Br. I.* I. 194, pl. 100 (1907) : *Hamp. Lep. Phal.* VIII. 64 (1909) : *Warr.-Seitz. Pal. Noct.* III. 16, pl. 3e (1909).

There is very little variation and that small in this very local species. Barrett reports a nearly black example.

The forms to be considered are :—

strigosa, Schiff., *W. Verz.* 88 (1775).

race *bryophiloides*, Horn., *Ent. Nacht.* XVII. 115 (1891).

ab. *casparii*, Stein., *Iris.* X. 398 (1897).

race *adaucta*, Warr.-Seitz., *Pal. Noct.* III. 16, pl. 3e (1909).

ab. *nigrescens* (Barr.), *l.c.*

Tutt dealt with the form *bryophiloides*, smaller, more slender, narrower wings. Warr.-Seitz figures it pl. 3e.

ab. *casparii*, Stein., *Iris.* X. 398 (1897).

FIG.—*l.c.*, pl. 2, f. 6.

ORIG. DESCRIP.—“While this species has a ground colour for the

most part ashy-gray, these three bred specimens are of a dark slatey-gray. This colour is found in normal examples only on the inner margin, in the neighbourhood of the three, deep black, arrow-like streaks, in a very restricted area, but in these abnormal examples this is distributed equally over the whole wing. The specimens thereby have a quite distinctive appearance." Wiesbaden.

Warren says that this is only a *bryophiloides* form.

In the figure the black basal streak and the *psi* mark stand out very strongly.

race *adaucta*, Warr.-Seitz., *Pal. Noct.* III. 16 (1909).

FIG.—*l.c.* pl. 3e.

ORIG. DESCRIP.—“Japanese specimens are considerably larger than European and much darker; the stigmata more strongly indicated, and the black dashes thicker.”

ab. **nigrescens** (Barr.), *Lep. Brit. Is.* III. 24 (1896).

ORIG. DESCRIP.—“Nearly black except the reniform stigma, which is yellow.” Of this specimen Dr. Cockayne writes me, “This was worthy of a name; nearly black with the exception of whitish orbicular and reniform.” I have named it *nigrescens*.

Aeronicta, Ochs. (1816) [*Apatela*, Hb. (1806); *Jocheaera*, Hb. (1822); *Cuspidia*, Chap. (1893)] *alni*, L.

Esper, Fabricius, Gmelin, Hübner (*Verz.*) cite Schiff. *W. Verz.* 70. E.A. *degener* to *alni*. But, as Illiger points out, *Verz. n. ausg.* I. 189 (1801), had Schiff. known the species he would assuredly have placed it with *psi*, etc., in Fam. B. from both its larva and its imago.

Tutt, *Br. Noct.* I. 16 (1891): Barr. *Lep. Br. I.* III. 236. pl. 12 (1896): *Stdgr. Cat.* IIIed. 132 (1901): *Splr. Schm. Eur.* I. 137. pl. 31 (1903): South, *Moth B.I.* I. 193. pl. 100 (1907): Hamp. *Lep. Phal.* VIII. 123 (1909): Warr.-Seitz. *Pal. Noct.* III. 13. pl. 2g. (1909).

Barrett sums up the variation, *l.c.*, “Hardly variable except in an occasional extension of the blackish clouding to the hind margin, and in some degree over the pale portions of the forewings.”

Tutt points out that the hindwings of this species are very variable, from pure white to banded, with dark nervures, with outer angle patch, a row of transverse spots on the nervures, discoidal lunule, fringes marked with fuscous, etc.

Since writing the above I have met with, in *Illiger's Mag.* I. 225. (1802), an extract from a letter of Schiffermüller to Illiger commenting on the new edition of the *Verzeichniss* which he (Illiger) had recently (1802) published. Schiffermüller states that, while the *Verz.* (1775) was in the press, he received the cast skin of a larva from Linz, and a figure of it from Saxony with the imago. It was inserted in haste and its position was not checked, hence the error.

Culot's figure is very brown; Esper's is too hard and wooden; Ingranelle has the lighter figure brown, the darker figure with contrast of black and white; Hübner, 3, has a delicate olive shade in the apical area; South, the ♀ is slightly whiter on forewing, and hindwing too.

The forms to note are :—

alni, L., *Sys. Nat.* XIIed. 845 (1767).

ab. *suffusa*, Tutt, *B. Noct.* I. 16 (1891).

ab. *obsoleta*, Tutt, *l.c.*

ab. *steinerti*, Casp., *Soc. Ent.* XIII. 3 (1898).

ab. *carola*, Phil., *Soc. Ent.* XIII. 50 (1898).

ab. *eothina*, Dann., *Ent. Zt.* XXXIX. 119 (1925).

Tutt deals with 1. *suffusa* the two pale patches suffused with dark blackish grey; 2. *obsoleta* in which the orbicular stigma is entirely obliterated.

ab. *steinerti*, Caspari, *Soc. Ent.* XIII. 3. (1898).

FIG.—Warr.-Seitz, *Pal. Noct.* III. pl. 2g.

ORIG. DESCRIP.—“The ground colour of the forewing, is of a rough brown, never as in other *alni*, does it shew white. The black parts, the arrow spots, which are in *alni* conspicuously deep black and lie in a surrounding of dark brown scaling, run into one another extending a little into the rough brown ground. The distorted reniform stigma is quite indistinct, almost unrecognisable, the orbicular is the same. The fringes of the forewing alternately black and white, are here brown and black. The thorax above is almost earth-brown, while it is usually especially snow-white. The lower wings are almost snow-white” Wiesbaden.

Rebel, *Berge Schm. buch*, says that *steinerti*, Casp., = *suffusa*, Tutt. Warren keeps them distinct.

ab. *carola*, Philipps. *Soc. Ent.* XIII. 50 (1898).

FIGS.—Warr.-Seitz. *Pal. Noct.* III. pl. 2g.

ORIG. DESCRIP.—“From my friend Herr W. Caspari II, in Wiesbaden, I obtained, with a number of typical *A. alni*, a male and a female with remarkably black forewings. The arrow marks, which in *alni* are sharply emphasised are here almost wholly obliterated by the black markings. The reniform is very indistinct and the orbicular black. The thorax is equally strongly black shaded. The hindwings are normal with black margins. The specimens came from one brood.”

Apparently the nearly black specimen mentioned by Barrett would be this form. Dr. Cockayne has a black specimen which agrees with this description.

ab. *eothina*, Dann. *Ent. Zeit.* XXXIX. 119. (1925).

ORIG. DESCRIP.—“Among a great number (of *alni*) caught in the Drautal, etc., a few were distinguished by a rosy tone, otherwise pretty dark specimens, too much so to be considered as being designated by the name *carola*, Phil. On numerous occasions, by examining many of the typical forms I obtained a number of examples in which so much of this colour develops to a dark rose, as to encroach upon the amount of the darkened portion of the wing. The black markings become more concentrated and stand out; in all examples the orbicular is wanting. Only a small percentage (about 5) of these extreme specimens are from the bred material; there are intermediates.”

NOTE :—To differentiate the imagines of *psi* and *tridens* has always

been a difficulty with unsatisfactory results on all attempts. Tutt in *B. Noct.* I 17-19, states all the points but refrains from summing up.

In 1906, however, Dr. Chapman, in a paper read before the City of London Entomological Society and published in their *Transactions* for that year with two plates, rediscussed the differentiation, and asserted, "There is no one character that always holds good, although it may furnish a correct conclusion in a large proportion of cases. A combination of characters, no doubt, will fail less frequently; nevertheless, it will fail sufficiently often to prevent entire dependence on it."

He continues, "It is, notwithstanding, unquestionable that if the specimen be a male, an examination of the ancillary appendages leaves no shadow of doubt as to which species the specimen belongs." "In these ancillary appendages *tridens* has 3 branches to the inner spine of the clasps, while *psi* has only 2." He expresses hesitancy in the determination of all females, particularly in the case of dark examples.

In 1918 I summed up, *Ent. Record.* p. 93-95, what had hitherto been done, after consultation with Dr. Chapman, who added that "males with dark hindwings are always *psi*, white males with white hindwings are sure to be *tridens*. Also that the *bidens* form of *psi* never occurs in *tridens*, nor does the pink form of *tridens* ever occur in *psi*."

Of course it is well known that the larvae are easily separable.

Acronicta, Ochs. (1816): [*Apatela*, Hb. (1806): *Triaena*, Hb. (1822): *Cuspidia*, Chap. (1893)] *tridens*, Schiff.

Tutt gives Fab. *Mant.* II. (1787), as the author. Schiffermüller *Verz.* (1775), differentiated the larvae of *psi* and *tridens* introducing the latter name and should be cited at the author.

Tutt *Ent.* 50 (1888): *Br. Noct.* I. 19 (1891): Barr. *Lep. Br. Is.* III. 265, pl. 122 (1896): *Stdgr. Cat.* III ed. 132 (1901): *Splr. Schm. Eur.* I. 137, pl. 31 (1903): *South Moth. Br. Is.* I. 195, pl. 100 (1907): *Hamp. Lep. Ph.* VIII. 108 (1909): Warr.-Seitz. *Pal. Noct.* III. 16, pl. 3f (1909).

Of the variation Barrett says, "Not very variable. Freshly reared specimens often have almost a pinkish hue, which usually fades leaving merely the warm yellowish under-shade."

The forms to be considered are:—

tridens, Schiff., *Verz.* 67 (1775).

virga, Tutt, *Ent.* 50 (1888): *Brit. Noct.* I. 20 (1891).

bidens, Tutt, *Brit. Noct.* I. 20 (1891).

quinquedentata, Tutt, *l.c.*

rosea, Tutt, *l.c.*

juncta, Tutt, *l.c.*

incretata, Btlr., *Ann. M.N.H.* 5(1), 78 (1878).

karjalika, Moore, *Ann. M.N.H.* 5(1), 232 (1878).

assignata, Splr., *Schm. Eur.* I. 137 (1910).

intermedia, Warr.-Seitz., *Pal. Noct.* III. 16 (1909).

variegata (Hamp.), Strand., *Arch. Naturg.* LXXXI. A. 11, p. 157 (1915).

Tutt deals with—1. The slightly banded form figured by Newman, *Brit. Moths*, 218, ab. *virga*; 2. The rosy tinged form, ab. *rosea*; 3. The form with the curtailed *psi* mark, *bidens*; 4. With the basal mark produced with two bifurcations, *quinquedentata*; 5. With the orbicular and reniform united, *juncta*.

race *increta*, Btlr. *Ann. M.N.H.* 5 (1). 78 (1878).

ORIG. DESCIP.—“♂. closely allied to *A. tridens*, but noticeably larger, the primaries much darker and shining, the fringe shorter, less distinctly black-spotted; secondaries similar.” Expanse 1 in. 10 lines. Yokohama.

race *kargalika*, Moore., *Ann. M.N.H.* 5 (1). 232. (1878).

ORIG. DESCIP.—“Female. Forewing pale silvery brownish grey; reniform and orbicular marks whitish, contiguous, brown-bordered; a contiguous subbasal transverse recurved line, a discal transverse lunular line crossed near posterior angle by a short streak; some short costal marks and a streak on cilia between each vein brown; hindwing glossy grayish white, outer borders and veins pale grayish brown. Thorax and abdomen dark gray. Antennae gray. Underside grayish white: forewing with grayish brown costal streaks and hind margin, hindwing with brown basal streak and discocellular spot. Palpi brown at sides. Legs gray, femora tipped with black; tibiae longitudinally streaked and tarsi banded with black.” Kargalika, Yarkund.

“Most nearly allied to *A. tridens* but differs in being darker; the markings are somewhat similar; but the basal longitudinal streak is shorter, thus giving a wider interspace between the two transverselines.”

ab. *assignata*, Splr. *Schm. Eur.* I. 137. (1910).

ORIG. DESCIP.—“The black longitudinal arrow in the marginal area absent.”

race *intermedia*, Warr.—Seitz, *Pal. Noct.* III. 16. (1909).

ORIG. DESCIP.—“Like *tridens*, but consistently larger, with more uniformly dark grey forewings; the stigmata united by a black dash; the tibiae and anal segments of abdomen laterally streaked with black.” “Japan, Corea and W. China, and is surely distinct from *tridens*.”

Warr. describes this as a species, but refers it to Butler's *increta* (*praeocc.*). He subsequently refers the large Japanese *tridens* to *intermedia* (= *increta*).

ab. *variegata* (Hamp.), Strand, *Lep. Ph.* VIII. 108 (1909): *Arch. naturg.* LXXXI. A. 11, p. 157 (1915).

ORIG. DESCIP.—“Forewing more variegated with white; hindwing of male white, the veins slightly tinged with brown towards termen.” Britain.

Hampson described this form but refrained from naming it. Strand subsequently went through the *Lep. Phal.* and named all the descriptions which had no name attached.

Acrionicta, Ochs. (1816) : *Apatela*, Hb. (1806) : *Triæna*, Hb. (1822) : *Cuspidia*, Chap. (1893) *psi*, L.

Tutt *Ent.* 50 (1888) : *Ent. Rec.* I. 20 (1891) : Barr. *Lep. Br. Is.* III. 250, pl. 122 (1896) : Stdgr. *Cat.* IIIed. 132 (1901) : Splr. *Schm. Eur.* I. 138, pl. 131 (1903) : South *Moths Br. Is.* I. 195, pl. 100 (1907) : Hamp. *Lep. Ph.* VIII. 106, fig. (1909) : Warr.-Seitz. *Pal. Noct.* III. 15, pl. 3d (1909).

Barrett remarks that this species is "very much more variable in ground colour than the last, from a whiter-grey to a deep slate-grey or grey-black, but the markings are always distinctly deeper black, and in the vast majority of instances, the ground colour, whether darker or paler, is uniform." "The blackest specimens are obtainable in the outskirts of London."

The forms to be dealt with are :—

psi, L., *Sys. Nat.* Xed. 514 (1758).

ab. *cuspis*, Steph., *Ill.* III. 39 (1829).

A. Guen., *Noct.* V. 43 (1854).

B. Guen., *l.c.*

ab. *birirgae*, Tutt, *Ent.* XXI. 50 (1888).

ab. *suffusa*, Tutt, *l.c.*

ab. *virga*, Tutt, *Brit. Noct.* I. 21 (1891).

ab. *juncta*, Tutt, *l.c.*

ab. *rosea*, Tutt, *l.c.*

ab. *bidens*, Chap., *B.N.*, *l.c.*

race *altaica*, Stdgr., *Cat.* IIIed. 132 (1901).

ab. ? Bndrmn., *Soc. Ent.* XXI. 64 (1916).

Tutt considers the forms—1. the slightly banded form, *virga* ; 2. the orbicular and reniform joined, *juncta* ; 3. dark submarginal and basal bands, *birirgae* ; 4. the whole ground darkened, *suffusa* ; 5. Stephens' form *cuspis* ; 6. suffused with rose, *rosea* ; 7. the basal dagger with only two wings, *bidens* ; 8. Guenée's var. A ; 9. Guenée's var. B (he does not discuss the last two).

race *altaica*, Stdgr., *Cat.* IIIed. 132 (1901).

ORIG. DESCR.—"Multo pallidior al. ant. cinereo albis." Altai, E. Siberia. Much paler ; forewings white tinged with fuscous grey.

ab. ? Bindermann, *Soc. Ent.* XXI. 64 (1916).

ORIG. DESCR.—"A 2mm. wide dark brown band passes before the hind margin of the forewings from the costa, goes through the strongly emphasised arrow mark and goes to the hind margin. The orbicular and reniform stigmata are also crossed by a 1mm. wide band, which begins on the costa and goes as far as the middle of the wing. The black arrow mark at the base is broader and points out two black dots in the middle area which extend toward the outer margin. The pale grey colour of the forewing is supplanted by clear white grey colour. Hindwings and underside normal, I found 14 larvae in October on birch trees in Hohenweiden not far from Röpzig near Halle. I could

find no different characteristics either in the full fed larva or in the pupa."

Whether this has been named I do not know.

Tutt quotes the two descriptions A and B, given by Guenée (*Noct.* V. 43), but makes no comment. The form "A" is the form in the Guenée coll. from the centre of France, and would appear to be characterised by much whiter less powdered ground. "B" is a form from the United States and is recognised by Smith (*Cat. Noct.* 36) in 1893 as the *occidentalis*, G. and R. This Smith and Dyar (*Contrib. Mon. Noct.* 79) in 1898 confirm, and figure it pl. II., fig. 8.

Acronieta, Ochs. (1816) : *Apatela*, Hb. (1806) : *Phaëtra*, Hb. (1822) : *Viminia*, Chap. (1893) : *Chamaepora*, Warr.-Seitz (1909) *auricoma*, Schiff.

Tutt gives Fab., *Mant.* II. 174, as the author. Fab. himself gives Schiff. *Verz.* 67. Illiger, Borkhausen, Brahm and Esper all concur.

Tutt *Brit. Noct.* I. 22 (1891) : Smith *Cat. Noct. B. Am.* 41 (1893) ; Barr. *Lep. Br. Is.* III. 257, pl. 121 (1896) : Stdgr. *Cat. III* ed. 133 (1901) : Spr. *Schm. Eur.* I. 138, pl. 31 (1903) : South, *Moths Br. Is.* I. 196, pl. 103 (1907) : Hamp. *Lep. Phal.* VIII. 132 (1909) : Warr.-Seitz. *Pal. Noct.* III. 16, pl. 3f. (1909).

Of the variation Barrett says, "Slightly variable in the depth of ground colour and in the distinctness of the markings, some specimen being pale and sharply marked, others much obscured with dark grey."

He also says that the species is an "exceedingly local species in the extreme south of England." "Found throughout Central Europe." "Also widely distributed in North America, extending to the Hudson's Bay Territory, and bearing the names *impressa*, *fasciata* and *verrillii*." Hampson, *l.c.* VIII. 141, identifies these three as one and the same, the species *Acronieta impressa*, Walk.

The forms for consideration are :—

auricoma, Schiff., *Verz.* 67 (1775).

ab. *lapathi*, Schrank. *Pn. Boica.* II(2). 308 (1802).

ab. *similis*, Haw., *Lep. Brit.* 180 (1806).

ab. *menyanthidis*, Haw., *l.c.*

ab. *pepli*, Hb., *Noct.* 614 (1818).

race *alpina*, Frr., *Neu. Beitr.* VII. 42, pl. 623 (1851).

sub-sp. *impressa*, Walk., *Cat. B.M.* IX. 61 (1856).

f. *fasciata*, Walk., *l.c.* 62.

f. *verrillii*, Grote & Rob., *Tr. Am. Ent. Soc.* III. 178, pl. II. (1870).

race *pyhaevaarae*, Hoffm., *Stett. Ent. Zeit.* 126 (1893).

vern. gen. *renalis*, Frings., *Soc. Ent.* XX. 73 (1905).

Tutt deals with the forms—1. with darker forewings, *similis* ; 2. paler with a strongly developed *psi*-mark, *menyanthidis* ; and 3. more obscure dusted with black atoms, *pepli*.

Smith and Dyar, *Contributions* : *Acronieta*, p. 159 (1898), Plts. I.

VIII. XIII. XIV. XVIII. XXII., treat *impressa*, Walk., *brumosa*, Grote (nec. Walk., nec. Gn.), *fasciata*, Walk., *verrillii*, Grote, *inotata*, Morrison, as one and the same species. They say that in structure *impressa* stands almost midway between *auricoma* and *rumicis*, and superficially resembles both.

Butler definitely says that *fasciata* (1856) is *impressa* (1856), and Grote identifies *fasciata* (1856) as his *brumosa* (1852).

Grote, *Jr. N. Yrk. Ent. S.*, 1896, IV. 81, says that *auricoma*, European, and *impressa*, American, are representative species.

It is curious that Spuler describes Tutt's *similis* as "Paler, purer grey."

race *lapathi*, Schrank., *Fn. Boica*, II(2). 308 (1802).

ORIG. DESCRIP.—"The upper wing ashy grey, clouded with a light brown shade; a black shaded longitudinal streak on the surface ending in a lunule."

Larva = Röscl (*Ins. Belust.* I. et. 2, pap. noct.) tab. 44.

race *alpina*, Fr., *Neu. Beitr.* VII. 42, pl. 623 (1851).

FIGS.—*l.c.*

ORIG. DESCRIP.—"Larva. It has quite the ground colour and shape of *A. auricoma*, only it is distinctly plumper and larger. The chief difference is this, that this larva has on the surface of the back of each of segments 1-4 two rust-red warts and on segments 5-10 two bluish white ones, then on the two last segments rust-red spots again. The warts on the sides are however red. *A. auricoma* has on the surface of the back only rust-red warts, and in the other species there occur twelve white warts never seen in any *auricoma* larva in our neighbourhood. I found these larvae at the same time as that of *euphrasiae* on *Gentiana asclepiadea*. The larvae were found in August."

"The imagines appeared in April and May of the next year. The insect is so like *auricoma*, that it might easily be taken for it, but it is somewhat larger, and the practised eye of the expert finds the ground colour somewhat duller, the markings not so sharp, and best of all the stigmata somewhat duller and more indistinctly formed, than is usual in *auricoma*. The underside is also much whiter and paler, and on the hindwings lacks the dark shaded band, which in *auricoma* shows clearly." The Alps.

Sub-sp. *impressa*, Walk., *Cat. B.M.* IX. 61 (1856).

FIGS.—Smith and Dyar *Contrib. Noct.*, pl. I., fig. 12, pl. XIII., figs. 4 and 5.

ORIG. DESCRIP.—"Whitish. Thorax speckled with black. Forewings rather narrow, thickly speckled with black; the specks in some parts confluent, and forming three large diffused black spots. Hindwings cinereous, whitish towards the base."

f. *fasciata*, Walk., *l.c.* 62 (1856).

ORIG. DESCRIP.—"Cinereous varied with black. Abdomen hairy. Forewing with some broad short black streaks in the disc, with some slightly undulating black bands, and with two incomplete black discal ringlets; ciliae with black dots. Hindwings pale brown, sometimes whitish towards the base."

Both these occurred in the same locality St. Martin's Falls, Albany River, Hudson's Bay.

f. *vervillii*, Grote and Rob., *Tr. Am. Ent. Soc.* III. 78 (1870).

FIGS.—*l.c.*, pl. II., fig. 82.

ORIG. DESCRIP.—“Primaries pure grey, all the markings black and distinct. Transverse anterior widely geminate. Inferiorly between the basal and transverse anterior line is a black shaded streak. Above the submedian vein across the median space the wing is rather broadly shaded with black to the median shade. Orbicular small spherical, distinct and neatly ringed with black, with a black central dot. Reniform well sized, of the normal shape, clouded with blackish. Transverse posterior of the usual shape, rather deeply scalloped between the nervules. A regular subterminal series of black marks preceded by white scales. A neat terminal series of black dots. Fringes interrupted with black opposite the terminal black dots and subterminal marks.”

Smaller and darker than *auricoma*, without the black dash at the internal angle.

See what is said of these three above.

race *pyhaevaerae*, Hoffm., *Stett. ent. Zeit.* 126 (1893).

ORIG. DESCRIP.—“N. Finland. It is in colour in comparison with *auricoma* as is the var. *montiraga* to *euphorbiae*, but is much smaller than the typical form. 27-30mm. in expanse, against 30-35mm. in German examples. While all the latter show a brownish-grey as ground colour, which Heinemann gave especially as the distinguishing characteristic of *menyanthidis* the var. *pyhaevaerae* has a decided ashy-grey ground of upperwing, as well as the hairing of the thorax. The black cross and longitudinal lines of the forewing, which in the typical *auricoma* are always sharp and distinct, are in this var. obliterated and expanded cloud-like, in a few examples covering so far almost the whole wing, so that it appears then deep black-grey and looks very like the dark *menyanthidis* var. *salicis*, Curt.”

Warr.-Seitz identifies *pyhaevaerae* as Hübner's *pepli*.

f. *vernalis*, Frings, *Soc. Ent.* XX. 73 (1905).

ORIG. DESCRIP.—“Here in Bonn *Acrionicta auricoma* flies in two generations. The first emerges from hibernating pupae in April and May, the second towards the end of July. Most likely the species would occur so in the whole of central Europe, at least in warmer land areas. While in this second generation here agrees with the descriptions and figures in entomological works, the spring generation constantly differs in quite a marked way. The ground colour of this insect is dark and uniform brown grey, the toothed-line on the inside not lined pale or scarcely lined, whereas the imagines of the summer generation show a pale clear grey as ground colour, like that of *psi*, mostly with a quite broad and distinctly white margined toothed line, of which the points are far stronger emphasised than in the spring generation. Of the darker browner suffusion, which covers the whole of the wing in the last named imagines, one finds here only a trace which lies on the basal side of the waved line. The colour distinction of the two generations is quite apparent at a glance, far more than it is with the two species *psi* and *tridens*.”

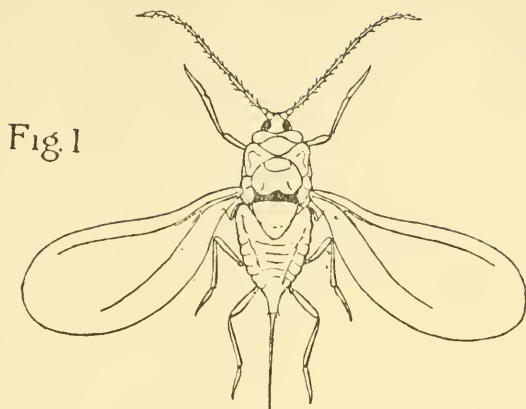


Fig. 1

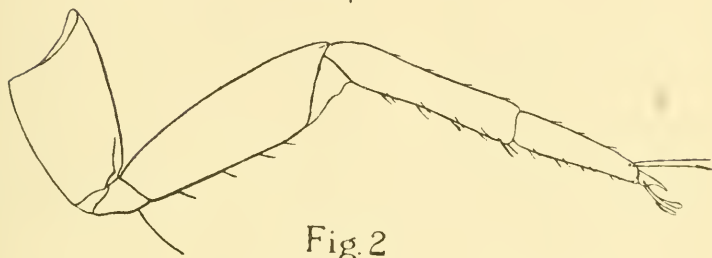


Fig. 2

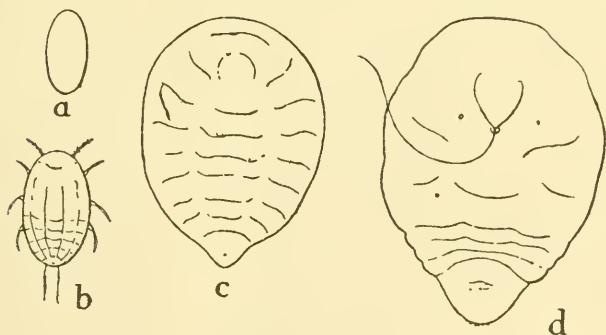


Fig. 3

The Entomologist's Record.

del. E. E. Green

FIG. 1. *Aspidiotus zonatus*, adult male, $\times 75$.

„ 2. Leg of *Lecanium hesperidum*, $\times 220$.

„ 3. Stages of a female Diaspid:—(a) egg; (b) newly hatched larva; (c) nymph, dorsal view; (d) adult female, ventral view. All considerably enlarged.

A List of Insects of various orders taken at Reservoir Aswan, Egypt, During 1919-1922.

By K. J. HAYWARD, F.E.S.

On my return to my duties at Reservoir near Aswan after the war, I devoted myself to the study of the Lepidoptera of that district, the results of which have appeared under the title of "Notes on Egyptian Lepidoptera observed at Reservoir Aswan between October 1919 and April 1922," published as a supplement to the *Entomologist's Record and Journal of Variation* during 1925 and 1926.

As latterly I began to exhaust the possibilities of this Order, I commenced a general collection of insects, accumulating roughly something over 300 species in the small area at my disposal.

This collection, no longer existing in its entirety, and some of the species being Egyptian records, it appears profitable to publish a list of those species which were identified.

For most of the identifications I have to thank the Staff of the Entomological Section of the Ministry of Agriculture, Cairo, especially the late Mr. G. Storey, whilst Mr. W. E. China and the late Mr. H. Champion of the B.M. Staff examined respectively certain of the Rhynchota and Odonata, and Mr. B. P. Uvarov many of the Orthoptera.

Specimens of many of the species enumerated went to the collection of the Ministry of Agriculture, Cairo, but my personal collection was brought back to England in 1922, and unfortunately suffered very great damage in transit. The residue of the wreck was handed over to the British Museum, and the specimens are now in that collection. The following lists have been compiled from my notebooks.

The area from which the collection was made was described in the opening pages of my notes on the Lepidoptera (see above), and it will suffice to say here that the total cultivated or plant-bearing area would not have exceeded 70 acres, this small "oasis" being completely surrounded by sandy or rocky desert on the East, West, and South, and having a narrow belt of similar desert dividing it on the North from the tail end of Egyptian cultivation at Aswan. The Nile with its numerous islands borders it on the East, and the presence of these islands coupled with the prevailing wind from the North provides practically the only path for insect life into the colony.

Cultivation consists almost entirely of "berseen" (afalfa), with the usual garden products, whilst the uncultivated parts are covered sparsely with a coarse grass, with patches of Colocynth (*Citrullus colocynthus*), and a most valuable plant from the point of view of the Entomologist—*Calotropus procera*, R.Br. (dead sea fruit). Palms, sycamore, fig, acaciae, a little tamarisk, nerium, and lebbak (*Albizzia lebbek*) with a few other common Egyptian bushes and one or two eucalyptus form the tree life, and there are now a fair number of citrus. Cotton was not grown except for one small experimental patch during the period of these notes.

Temperatures, which run high, were given fully in the above mentioned notes on the Lepidoptera and need not be repeated.

COLLEMBOLA.— several species were taken but were not identified.

ORTHOPTERA.—Out of about 25 species taken, most were identified. *Blattidae*.—*Blatta orientalis*, L., and *Periplaneta americana*, L. Common in houses everywhere.

Mantidae.—*Sphodromantis viridis*, Forsk. (*bioculata*, Burm.). Common all the year. Two unidentified Mantids were also taken.

Gryllidae.—*Gryllotalpa vulgaris*, Latr., and *Gryllus domesticus*, L.

Tettigidae.—*Paratettix meridionalis*, Ramb. Common.

Acridiidae.—*Acridella nasuta*, L., *Tryxalis unguiculata*, Ramb., *Oryzoryphus compressicornis*, Latr., *Acrotylus insubricus*, Scop., *A. patruelis*, Sturm., *Sphingonotus pubescens*, Walk., and *S. caeruleus*, L., *Thisoicetrus littoralis*, Ramb., common, *Chrotogonus lugubris*, Blanch., very common, *Pyrgomorpha grylloides*, Latr., *Acridium aegyptium*, L., uncommon, *Schistocerca peregrina*, Oliv., occasionally in swarms, *Pachytylus danicus*, L., *Epacromia thalassina*, F., and *Euprepocnemis plorans*, Chapp. One or two unidentified species.

For an interesting note on the occurrence of *S. peregrina* in Egypt, see the "Report of the great invasion of locusts in Egypt in 1915," Egypt. Govt. press, Cairo, 1916.

NEUROPTERA. [s.l.]—Whilst Odonata did not run to many species, they were very numerous, and one of my pleasantest memories is the sight of hundreds of these insects chasing up and down the small irrigation channels at sunset, their wings and bodies glinting in the golden half-light. In all, about 25-30 species were captured, and the following were those determined.

Mallophaga.—None were preserved, though occasionally observed. Preservation of these insects with careful record of their hosts would have been of great interest, since Reservoir is one of the halting place of birds on migration to and from more Northern climes.

Termitidae.—*Psammotermes hybostoma*, Desn.

Gomphidae.—*Mesogomphus pumilio*, Ramb.

Aeschnidae.—*Hemianaes ephippiger*, Burm., common.

Libellulidae.—*Orthetrum trinacria*, Selys., *Crocothemis erythraea*, Brullé, *Brachythemis leucosticta*, Burm., and *Trithemis annulata*, Beauv.

Ephemeraidae.—Several not identified.

Myrmeleonidae.—*Creagriss cinerascens*, Navas., *Myrmeleon tenellus*, Klug., and *Myrmeleon* sp. (numbered H572).

Chrysopidae.—*Chrysopa vulgaris*, Schn., abundant.

HEMIPTERA.—Most of the Heteroptera captured have been identified.

Pentatomidae.—*Eusarcocoris inconspicuus*, H.-S., *Nezara heegeri*, Fieb., *N. viridula*, L., *N. viridula* var. *torquata*, Fabr., *Asponyopus viduatus*, F., *A. viduatus* var. *unicolor*, H.-S., *Geotomus elongatus*, H.-S., and *Cydnus nilosulus*, Klug.

Coreidae.—*Liorhyssus hyalinus*, Fabr.

Lygaeidae.—*Lygaeus pandarus*, Scop., *L. pandarus* var. *militaris*, Fabr., *L.* (sub-gen. *Cosmopleurus*) *fulripes*, Dall., *Oryzocarenum hyalinipennis*, Costa., Sp. near *Dincella* and pb. nov. (No. H671), and a *Lygaeid* sp. (No. H636).

Reduviidae.—*Ploiaria grassator*, Puton, *Coranus aegyptius*, Fabr., *Nabis capsiformes*, Germ.

Capsidae.—*Taponia hippophaes*, Fieb., *Tyraquellus reuteri*, Pop., and a *Capsid* sp. (No. H690).

Membracidae.—Sp. incert. (No. H738).

Aphididae.—*Aphis gossypii*, Glov., and several unidentified species.

Coccidae.—*Aspidiotus aurantii*, Maskell., *Asterolecanium pustulans*, Ckrl., *Uncarya purchasi*, Maskell., and unidentified species.

IXODOIDEA.—*Rhipicephalus sanguineus*, specimens from the domestic cat.

TRICHOPTERA.—Six unidentified species numbered H300, H579 (1726 in the coll. Ent. Sect. Min. Agric. Cairo) H580 (occurs in February) H581 (occurs in March) H687, and H735.

LEPIDOPTERA.—These, with the exception of the Pyrales, which it is hoped to deal with later, have been already enumerated in previous notes (see above). I took 16 species of Rhopalocera and 168 moths, of which latter about 60 were *Pyralidae*.

COLEOPTERA.—About 100 species were taken but unfortunately only a small percentage were dealt with, and many of the remainder were destroyed.

Carabidae.—*Bembidium varium*, Oliv.

Dytiscidae.—*Eumectus sticticus*, L.

Staphylinidae.—*Oxytelus nitidulus*, Grav.

Hydrophilidae.—*Ochthebius sericeus*, Muls.

Coccinellidae.—*Scymnus syriacus*, Mars., *Coccinella II-punctata*, L., *Epilachna chrysomelina*, F., *Exochomus nigromaculatus*, Goeze., *E. nigromaculatus* var. *nigripennis*, Er., *Chilomenes vicina*, Muls., *C. vicina* var. *signata*, Pic., *C. vicina* var. *nilotica*, Muls.

Mycetophagidae.—*Typhaea fumata*.

Dermostidae.—*Attageus dispar*, and another unidentified sp.

Buprestidae.—*Sphenoptera trispinosa*, Klug., *Acmaeodera polita*, Klug., *Steraspis squamosa*, Klug., common on rose bushes.

Anthicidae.—*Anthicus crinitus*, Laf.

Meloidae.—*Zonabris apicipennis*, Reiche., *Z. sanguinolenta*, Ol.

Tenebrionidae.—*Pimelia grandis*, Klug., *P. nilotica*, Sén., *P. angulata*, F., *Zophosis complanata*, Sol., *Z. plana*, F., *Z. abbreviata*, Sol., *Erodium puncticollis*, Sol., *Himatismus variegatus*, F., *Ocuera hispida*, Forsk., *Blaps polychresta*, Forsk., *Prianotheca coronata*, Ol., *Tribolium confusum*, Jacq., *T. ferrugineum*, common in dry farinaceous foodstuffs, *Opatroides punctulatus*, Brullé., *Alphitobius piceus*, Ol.

Curculionidae.—*Hypera variabilis*, Herbst., *Coniatus tamarisci*, F., *Calandra oryzae*, L.

Aphodiidae.—*Rhyssenus orientalis*, Muls.

Copridae.—*Scarabaeus sacer*, L., common, *Catharsius pithecius*, F., *Onthophagus* sp. (No. H618).

Dynastidae.—*Pentodon dispar*, Baudi., *P. variolosa* var. *punctatus*, Fairm.

Cetoniidae.—*Tropinota squalida*, Scop.

DIPTERA.—Of about forty to fifty species taken of the larger flies, only the following were determined.

Tipulidae.—*Trimiera pilipes*, F., April.

Psychodidae.—*Phlebotomus papatassi*, Scop.

Culicidae.—*Theobaldia spathipalpis*, Rond., *Culex pipiens*, L., common most of the year, *C. pallidocephalus*, Theo.

Tabanidae.—*Tabanus ditacniatus*, Macq.

Bombyliidae.—*Anthrax circe*, Klug.

Syrphidae.—*Eristalis taeniops*, Wied., *E. tenax*, L., *Syritta spinigera*,

Lw., *Syrphus corollae*, F., *Sphaerophoria menthrasti*, L., *S.* sp. (No. H538), *Tropida* sp. (No. H540).

Phoridae.—One bred but not identified (No. H629).

Trypetidae.—*Ceratitis capitata*, Wied., *Dacus longistylus*, abundant on *Calotropis procera*.

Drosophilidae.—*Drosophila melanogaster*, Mg.

Anthomyiidae.—Three Anthomyiid species bearing my numbers H549 (2243 coll. Min. Agric.), H550 (777 coll. Min. Agric.), and H551.

Muscidae.—*Musca domestica*, only too abundant, *Lucilia sericata*, Mg., *Muscina stabulans*, Flin.

Tachinidae.—Two species not determined numbered H547 and H548.

Sarcophagidae.—*Sarcophaga faculuta*, Pand., three *Sarcophaga* spp. numbered H327, H544, and H545.

Hippoboscidae.—*Hippoboscia camelina*, Leach., *H. equina*, L.

HYMENOPTERA.—66 species, mainly bees, were taken. Ants were not searched for to any great extent, but many species occur. The following were identified.

Chalcididae.—*Chalcis brevicornis*, Klug., bred freely from *Danaïs chrysippus*, L., (Lep.), *Chalcis* sp. (No. H319).

On *Calotropis procera* in February I took sparsely an insect that the late G. Storey thought warranted the erection of a new family lying between *Chalcididae* and *Braconidae*. These specimens were numbered H521. The species was taken from the flower heads of the "Dead Sea fruit." The insect would undoubtedly be found again by search in the Aswan district. Whether any of my specimens survive in either of the collections previously named, I cannot say. I fear they were amongst the insects destroyed in transit.

Ichneumonidae.—*Bassus laetatorius*, F., February.

Chrysididae.—*Philoctetes deflexus*, Abeille., *Hedychrum coelestinum*, Spin., *Chrysis stilboides*, Spin., *C. albipilis*, Spin., *Stilbum splendidum*, F.

Formicidae.—*Camponotus maculatus*, F., *Myrmecocystus riaticus*, F., *Aphaenogaster arenaria*, F.

Mutillidae.—*Mutilla interrupta*, Ol., *Dasylabris arabica*, Ol.

Scoliidae.—*Myzine zonata*, Guér., *Dielis collaris*, F., *Scolia maura*, F., *S. erythrocephala*, F., *S. mendica*, Klug.

Pompilidae.—*Pompilus dispar*, Dahlb., *P. fuscus*, L.

Sphegidae.—*Ammophila tydei*, Guill., *Sphex aegyptius*, Lep., *Philanthus triangulum*, F., *Cerceris capito*, Lef., *Bembex mediterranea*, Hdl.

Eumenidae.—*Eumenes maxillosa*, F., *E. esuriens*, F., *E. pomiformis*, Rossi.

Vespidae.—*Polistes gallica*, L., *Vespa orientalis*, F.

Colletidae.—*Colletes* sp. (No. H525 and No. 862 in coll. Min. Agric.)

Apidae.—*Sphecodes spinulosus*, v. Hagens., *Nylocopa aestuans*, L., common, *Megachile nasidens*, Fr., *M. flavipes*, Spin., *M. argentata*, F., *Andrena* sp. (No. H507), *A. bipartita*, Lep., *Anthophora byssina*, Klug., *Melitta leporina*, Klug., *Halictus tumulorum*, L., *Halictus* sp. (No. H515), *Nomioides variegata*, Oliv., *Ceratina callosa*, F., *Apis mellifica*, L. var. *fasciata*, Latr., the Egyptian Honey-bee.

A Brief Review of the Indigenous Coccidae of the British Islands, with Emendations and Additions.

By E. ERNEST GREEN, F.E.S., F.Z.S.

[Since the earlier publication of this review (*Proc. S. Lond. Ent. and N.H.S.*, 1922) so many species have been added to the British list that it has been thought advisable to republish the original article, together with such emendations and additions as have been rendered necessary.]

It is not my intention to give a detailed account of our British *Coccidae*. Such an account is already available in Newstead's admirable Monograph, in two volumes, published by the Ray Society. My present object is, rather, to attract the attention of our field naturalists to this interesting but relatively neglected family of insects. That the subject is by no means exhausted is evidenced by the fact that within the past eight years, I have been able to add approximately thirty species to the British list, more than half of which were new to science.

Newstead's "Monograph of the British *Coccidae*" describes 90 distinct species, to which there have since been added another 37, so that the list now stands at 127. Rather more than half of these (to be exact, 67) have been found only in glass-houses and must be regarded as aliens introduced with foreign plants. In the present paper I propose to ignore these aliens and to review (very briefly) the superficial characters of such species as are to be found in the open.

But, first, I will attempt to explain how you may recognise a Coccid when you have found it. This is not quite so simple as, at first sight, it might appear to be. To the uninitiated, the employment of a compound microscope will be necessary for the purpose.

It would be difficult to mention any single superficial character that would be applicable to all the different subfamilies and genera of *Coccidae*. Their external form and appearance are so diverse that they would never be supposed to bear any close relationship to each other. What, for instance could be more different than *Aspidiotus hederæ*—a minute, limbless, yellow speck, covered by a separate scale, and *Orthezia urticae*—an active species with conspicuous cushions and lamellae of compact white wax. But discussion of the various modifications of form must be deferred until we come to a consideration of the individual species.

Coccidae may be distinguished from their nearest allies (the *Aphididae* and *Aleurodidae*) by the following characters:—

The females are invariably apterous. The body is not sharply divided into the three usual divisions—head, thorax, and abdomen. In fact, it is often difficult exactly to determine the line of division between these parts. The eyes, when present, are simple, never compound. The external mouth parts consist of a short tubular labium

functioning as a guide for the four long slender filaments which represent the maxillae and mandibles.

The adult males may be apterous or provided with a single pair of wings, usually supplemented by a pair of hooked halteres which engage with the wings (fig. 1). The alate condition is by far the more usual. The wings have two simple nervures only. The head is more or less clearly differentiated from the rest of the body, but is devoid of any vestige of mouth parts. The eyes may be either compound or simple (usually the latter).

In both sexes the limbs (when present) terminate in a single claw and the tarsi are, normally, one jointed (fig. 2).

The females pass through from four to five stages, and the males from five to six, *viz.*:—*Female*. Egg: 1st stage nymph (or larva); 2nd stage nymph; [3rd stage nymph]; adult. *Male*. Egg; 1st stage nymph; [2nd stage nymph]; pre-pupa; pupa; adult. (The stage included in square brackets is the one that is suppressed in the degenerate forms in which the number of moults is restricted. A few species are ovoviviparous, in which case the egg stage is passed within the body of the parent insect).

Coccidae are to be found in every conceivable situation; on the foliage, stems and roots of plants. There are many gall-making species, but none of these have been recorded from the British Isles.

It will be convenient to adopt the arrangement given in Newstead's Monograph, commencing with the subfamily *Diaspinae*. Four genera only come within our category. They all agree with each other, and are distinguished from members of other subfamilies, in the possession of a separate covering scale composed partly of cast skins (exuviae) of the previous moults, supplemented by a secretory appendix. The females undergo three moults only; the first, from the egg stage (fig. 3 *a*), disclosing the young larva; the second disclosing the nymph; the third, the adult insect. The males undergo an additional moult, a pre-pupal and a pupal stage being interposed between the larval and adult stages. The adult female is without either limbs or antennae, and the anal orifice is without a setiferous ring. The larva (3 *b*), as in all *Coccidae*, is active, possessing well developed limbs and antennae; but, having once settled down to feed it remains on the same spot for the "term of its natural life." After the next moult it loses its limbs (3 *c*), remaining attached to the plant by the rostral filaments only. It is, at first, completely covered by the larval exuviae; but, as the nymph increases in size, this covering becomes inadequate and is supplemented by an extension (the appendix) secreted from special organs on the compound terminal segment (the pygidium) of the body. Similarly, at the next moult, the adult female (3 *d*) is sufficiently protected, for the time, by the exuviae of the previous two stages. Accompanying the subsequent growth of the insect the covering is completed by a further extension of the secretory appendix. The eggs are deposited beneath this composite scale. The adult male (fig. 1) is provided with four large ocelli, two on the upper and two on the undersurface of the head. Its abdomen ends in a long, slender point, the penial sheath. There are no caudal filaments. The four genera of *Diaspinae*, represented in this country, are *Aspidiotus*, *Lepidosaphes* (= *Mytilaspis*), *Diaspis*, and *Chionaspis*. They may be distinguished by the following characters of the covering scales:—

Aspidiotus.—Scale of female (fig. 4 a) more or less circular; the larval and nymphal exuviae superimposed and completely surrounded by the secretory appendix. Scale of male similarly constructed, but including the larval exuviae only (fig. 4 b).

Lepidosaphes.—Scale of female (fig. 4 f) elongate, mussel-shaped; the larval and nymphal exuviae overlapping, situated at or beyond the anterior extremity of the secretory appendix. Male scale similarly constructed (fig. 4 e).

Diaspis.—Scale of female (fig. 4 c) more or less circular; the exuviae usually overlapping, surrounded by the secretory appendix. Male scale (fig. 4 d) of a different character; elongate and more or less distinctly tricarinate, the larval exuviae situated at the anterior extremity.

Chionaspis.—Scale of female (fig. 4 h) elongate or pyriform: the exuviae overlapping, situated at or beyond the anterior extremity of the secretory appendix. Male scale (fig. 4 g) elongate, tricarinate.

We have five species of *Aspidiotus* occurring in the open:—

- A. ostreaeformis*, Curtis. The so-called "oyster-shell scale," on the stems and branches of birch, horse-chestnut, poplar, apple, plum, and various fruit trees. Scale very inconspicuous, blackish or dull brown, assimilated in colour to the bark upon which it rests, often with the superficial fibres of the bark incorporated into the surface of the scale.
- A. bararicus*, Lindinger. On *Calluna vulgaris* and *Erica cinerea*. Scale brown, of the exact tint of the bark of the heather.
- A. zonatus*, Frauenfeldt. On oak. Scale dull greyish ochreous, on the terminal branches of the tree. Male scales pale, translucent ochreous; on the undersurface of the leaves.
- A. britannicus*, Newstead. On holly, bay and box. Male and female scales brown or brownish ochreous: on the twigs and foliage.
- A. hederæ* (Vallot). On *Aucuba*. Scale conspicuous, white, the exuviae pale yellow; on both surfaces of the foliage. This is an alien that has, within recent years, adapted itself to our climate. I have records of considerable damage to *Aucuba* plants in Devonshire and the Isle of Wight.

The genus *Diaspis* provides two species only:—

- D. rosæ* (Bouché). On cultivated and wild roses and on brambles (*Rubus* spp.). Female scale conspicuous, white, exuviae reddish. Male scales white, strongly tricarinate. Often very abundant on the stems of cultivated roses, especially those in sheltered positions, against walls, etc.
- D. carueli*, Targ. On *Juniperus* sp. (Royal Gardens Kew) and upon a variety of *Cupressus lawsoniana* (in a nursery garden at Ottershaw, Surrey). Scale inconspicuous, whitish, concealed amongst the crowded leaflets of the plant. Though the species has not yet been recorded from the wild *Juniperus communis*, it very probably occurs upon our native plant. The inconspicuous chaff-like scales are so well concealed that they might be overlooked very easily.

The genus *Chionaspis* is represented by a single species:—

C. salicis (Linn.). Principally on willow, ash, and alder, but occurring, not uncommonly, upon broom, dogwood, lilac, elm, and several other trees. Scale of female white, but often obscured by a superficial deposit of algae from the bark of the trees to which it is attached. The tricarinata male scales are sometimes clustered so thickly upon the stems as to give the tree the appearance of having been whitewashed.

The genus *Lepidosaphes*, which has precedence of the better known name *Mytilaspis*, is similarly represented by the single species—

L. ulmi, (Linn.). A pest of orchard and other trees, well known to gardeners and fruit growers as the "mussel scale," and generally referred to, in text books, by the name of *Mytilaspis pomorum*. Its popular name is a good description of its appearance, for the scale is very like a miniature mussel shell, of a reddish brown colour.

L. ulmi-candidus, Newstead, is a variety with a milk white scale, occurring on *Crataegus*.

We now come to the subfamily *Lecanidae* with numerous genera, of which nine occur wild in this country. They are of very diverse appearance, but may be distinguished by the following characters. Females with the posterior extremity more or less deeply cleft, with a definite setiferous anal ring; anal orifice covered dorsally by a pair of triangular binged plates. Adult males with from four to eight ocelli; halteres often wanting; penial sheath moderately long and slender; usually with a pair of long caudal filaments. The male pupa is covered by a characteristic puparium, usually composed of translucent wax, and symmetrically divided into definite plates (fig. 5 *d*). Limbs and antennae generally present in all stages of the female insect, but sometimes vestigial or (rarely) absent in the adult.

Genus *Lecanium*. Adult female naked. Most of our British species are strongly convex and the skin of the dorsum becomes densely chitinous and rigid, to form a protective covering for the eggs. Seven species come within our category.

L. persicae (Fab.) (fig. 5 *b*). This is one of our commonest species and infests a large number of garden and wild plants, amongst which may be mentioned peach, rose, *Cotoneaster*, *Robinia*, *Ribes*, broom, hawthorn, etc. The adult female is of a reddish brown colour, strongly convex, slightly longer than broad, with rugose sides, from 3 mm. to 5 mm. in diameter. The old females are mere shells, covering a mass of pale pink eggs. They are sometimes densely crowded upon the stems and branches of plants grown in sheltered situations, such as peach and rose trees trained against the wall. Newstead distinguishes two forms—typical *persicae* and var. *savothamni*; but I must confess that I find it difficult to separate them. There is, however, a question whether typical *persicae* occurs in this country. If a varietal name is necessary, it seems to me that *robiniae* of Douglas has preference over *savothamni* of the same author.

SPECIAL INDEX.

By H. 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.

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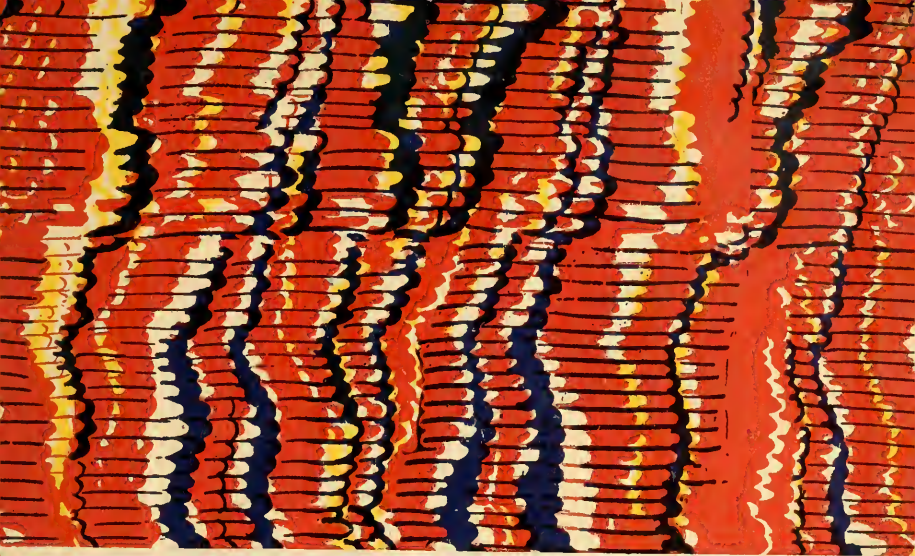




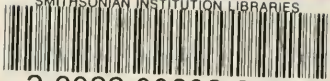








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