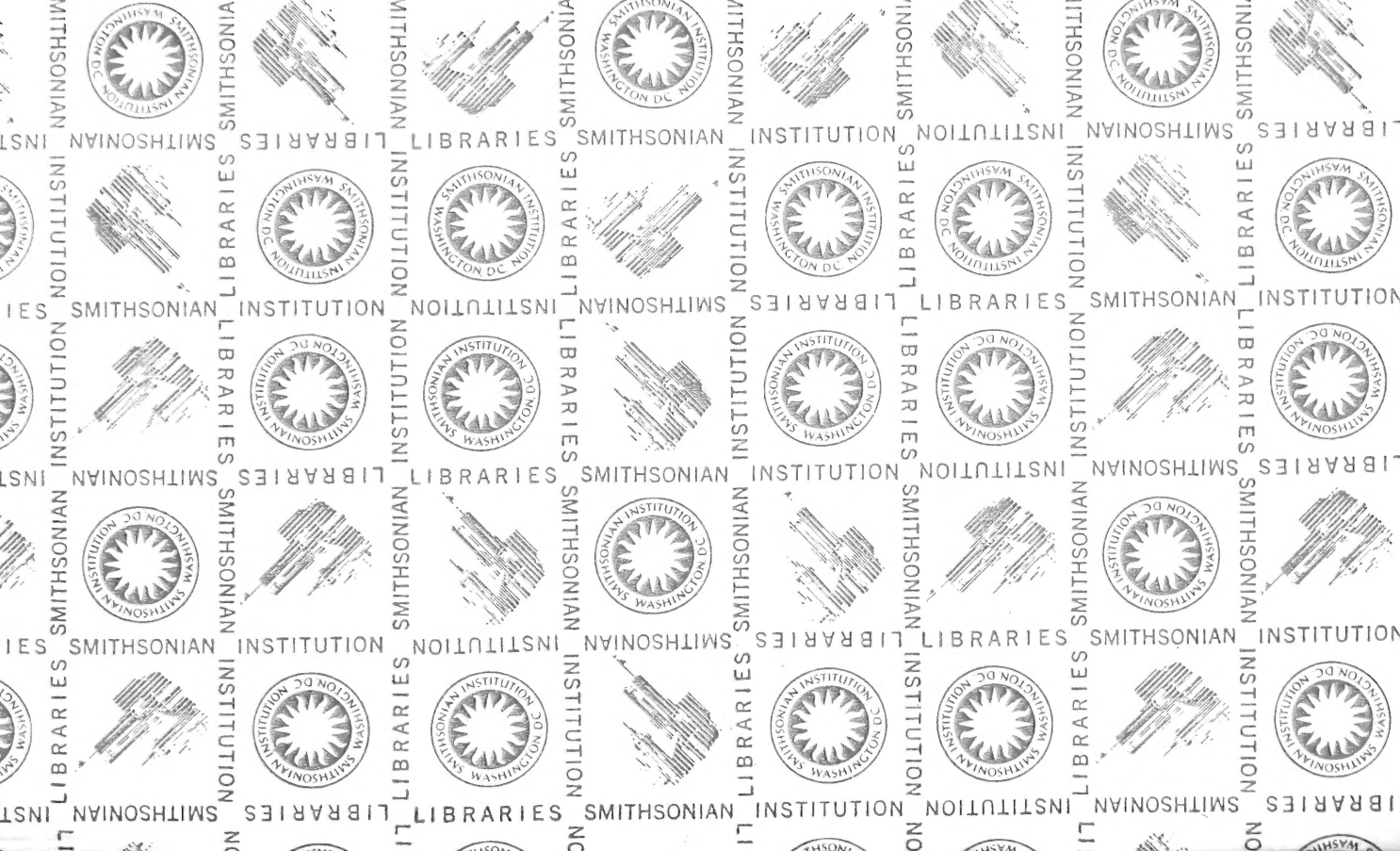
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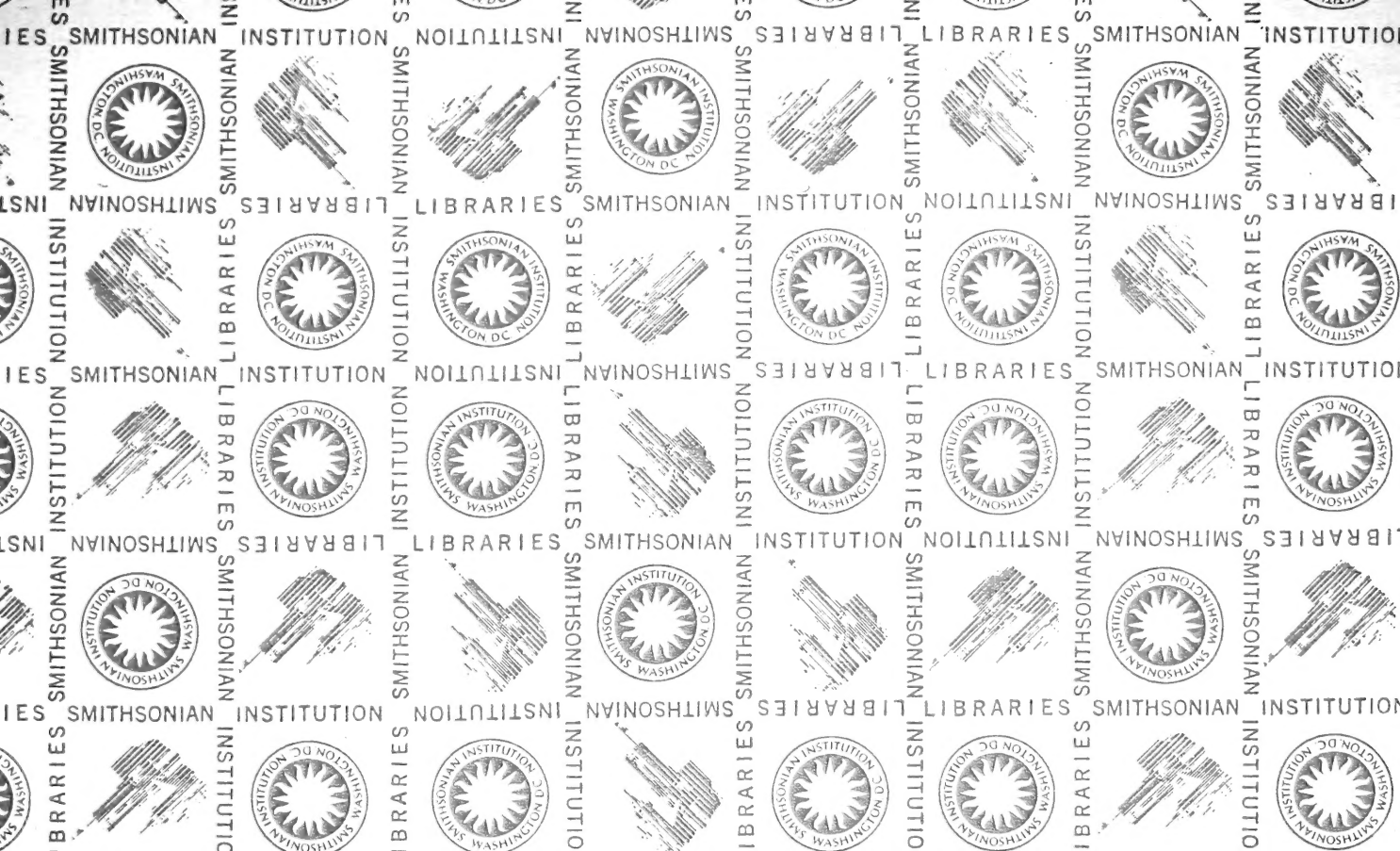
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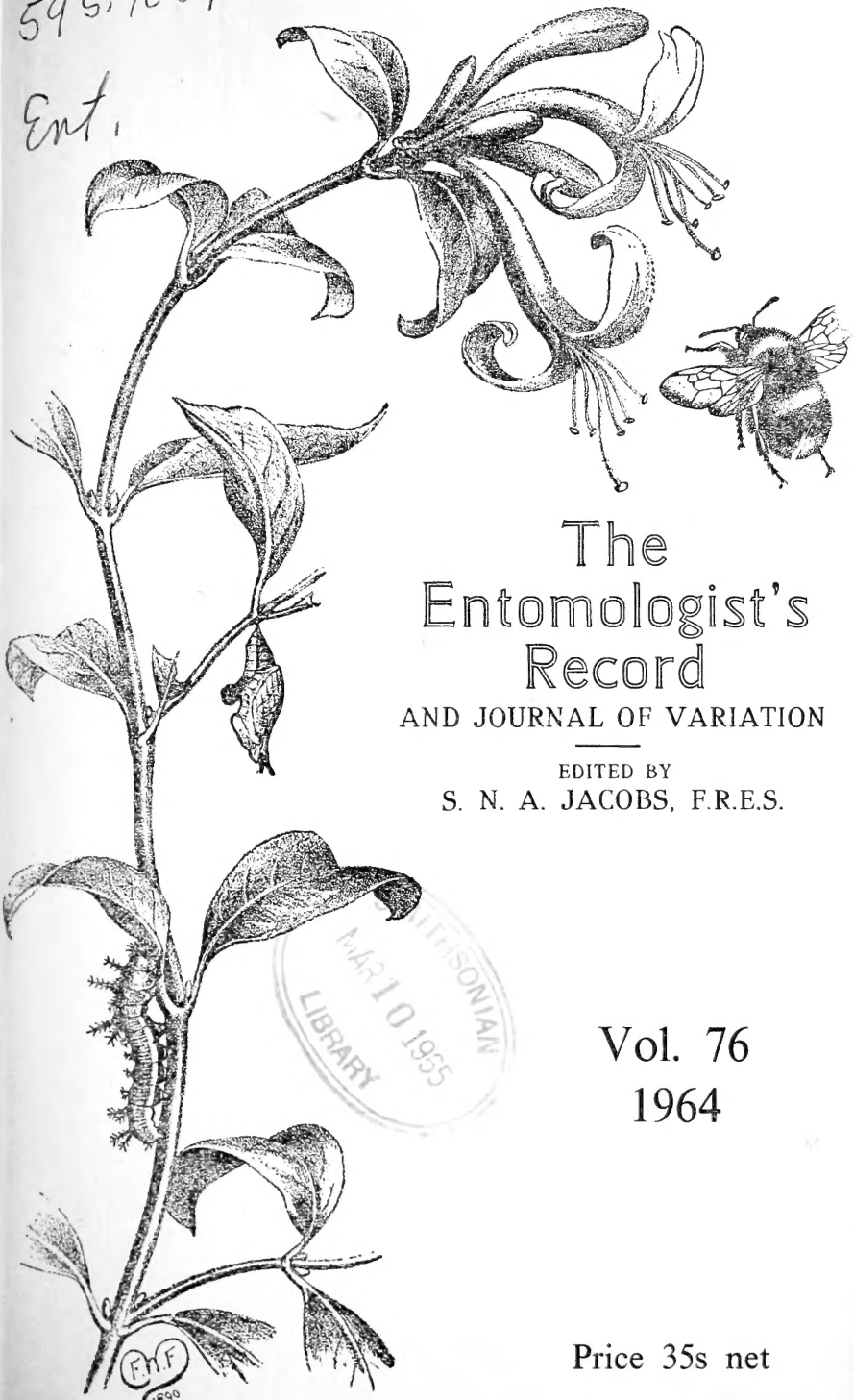

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GENERAL INDEX

Abisko Revisited. 259.
Acherontia atropos L. in Northamptonshire. 34.
Acherontia atropos L. in Suffolk. 296.
Acherontia atropos L., *Laphygma exigua*, *Rhodometra sacraria* and other migrants in Surrey, 1963. 29.
Aglais urticae L. at light. 246.
Anabolia (*Phaeopteryx*) *brevipennis* (Curtis) and *Ironoquia* (*Caborius*) *dubia* (Stephens) (Trichoptera, Limnephilidae). 289.
Andalusia, April 1964. Some wayside collecting in. 177.
Ant records and observations. 139.
Ant records and observations for 1964. 287.
Apatele leporina L. overwintering a third time. 297.
Apatele leporina L. overwintering two years. 29, 86.
Apatele tridens Schiff. 21.
Apatele tridens Schiff. Delayed emergence of. 199.
Apatele tridens Schiff. in Derbyshire. 264.
Apeira syringaria L. A disproportionate ratio of sexes. 297.
Aporophila luneburgensis Frr. An unusual flight of. 210.
Arran 1964. The Isle of. 229, 296.
Aviemore in August 1964. 234.

Butterflies at Gibraltar, March 1964. 153.
Butterfly. A very early. 87.

Charaxes jasius L. and other species in Elba. Collecting. 159.
Chazara (*Satyrus*) *briseis* L. in Sweden. 148.
Chlorops (*Cetema*) *myopina* Loew. (Dipt., Chloropidae). Deletion from British list and the addition of *neglecta*. 199.
Chlorops (*Cetema*) *neglecta* Tonn. in Hunts. 246.
Coleman? Who was. 255, 297.
Coleoptera of a suburban garden. 6—Brachelytra (Pt. 2). 237, 261.
Coleoptera of sand martin (*Riparia riparia riparia* (L.) burrows in Ireland. 292.
Colias croceus Fourc. (clouded yellow) in Devonshire. 267.
Colias croceus Fourc. in Anglesey. 243.
Colias hyale L. in Essex. 243.
Conservation of insect life in the New Forest. 169.
Continental holiday, 1963. A. 102, 126.
Continued existence of certain butterflies. Some considerations on some present-day conditions as they affect the. 63.
Cornwall. Reminiscences of. 232.
Correction. 203, 286.
Cossus cossus Linn. (Lep., Cossidae). Hibernation and pupation of. 227, 294, 295.
Cranleigh butterflies, 1963. 72.
Cucullia absinthii L., etc., in a London garden. 22.
Cucullia absinthii L. moves north. 17.
Cucullia verbasci Linn. Foodplant of. 297.
Cucullia verbasci Linn. on Buddleia. 267.

Dagger are you? Which. 215.
Dingle 1963. 18.
Diptera in Galloway and Central Wales. 44.

Emus hirtus L. A postscript on. 145.
Enargia paleacea Esp., a correction. 267.
Enargia paleacea Esp. in Wiltshire. The occurrence of. 268.
Enargia paleacea Esp. in Surrey. 266.
Enargia paleacea Esp. new to Suffolk. 244.
Erebia ligea (Linnaeus) (Lep., Satyridae). Comments on the supposed occurrence in Scotland of. 121.
Eremobia ochroleuca (Schiff.) the dusky sallow in Wiltshire—a further report. 115.
Eriogaster lanestris L. second year. 118.
Eromene ocellea Haw. in Hampshire. 243.
Eucosma pupillana Clerck in Kent. 214.
Euphydryas aurinia larvae in second winter. 88.
Euphyia luctuata Schiff. and *Rhodometra sacraria* L. in 1963. 60.
Eupithecia insigniata Hübn. and *Hadena compta* in North Bucks. 60.
Eurois occulta L. in 1964. 296.
Eurois occulta L. in August. Widespread immigration of. 244.
Eurois occulta L. in Middlesex. 267.
Eurois occulta L. in Suffolk. 245.

Formica sanguinea Latreille (Hym., Formicidae) in Southern England. 107.
France and North Italy in June 1964. A trip through. 211.

Gavarnie to Digne, August 1963. From. 11.
Greatstone, Kent—July 1936. Holiday at. 91.
Greece in April 1964. 187.

Hadena barrettii Dbld. the hard way. 275.
Hadena compta (Fabr.) and *Cucullia absinthii* (L.). The spread of. 142.
Hadena compta Fabr. in Norfolk. 267.
Hadena lepida Esp. ssp. *capsophila* Dup. on the East Coast. 28.
Hampshire migrants. 216.
Heliothis peltigera Schiff. (bordered straw) in Wessex. 256.
Heliothis peltigera Schiff. More about. 278.
Herse convolvuli L. in Shanklin. 266.
Hod Hill. 270.
Hyloicus pinastri in Portsmouth. 236.
Hyponomeuta Latr. at Blackheath. A note on two species of. 117.

Idaea lineata Scop. (the black veined moth). 115.
Idiocerus (Hem.-Hom., Cicadellidae) in suburban North West Kent. The genus. 55.
Inverness-shire in 1963. 36.
Ireland 1964. 223.
Ireland 1963. Western. 40.
Isle of Wight, 1963. Lepidoptera in the. 68.

Jersey tiger—a third attempt. 249.

Lampides boeticus L. on Ascension Island. 268.
Latin. More about. 100.
Leto venus Stoll. (Lep., Hepialicae). A note on. 189.
Leucania loreyi Dup. in Cornwall. 233.
Leucania obsoleta Hübn. Foodplant of. 268.
Leucania unipuncta Haw. in Kent. 243.
Linnaeus a bighead? Was. 100.
Literature, Current. 29, 30, 57, 58, 89, 90, 120, 146, 175, 200, 217, 269, 298.
Lithacodia deceptoria Scop. in Gloucestershire. 214.
Lithophane leautieri and other notable records of moths at Arundel. 296.
Lithophane leautieri in Somerset. 264.
Lithosia quadra in Wales and Bristol. 236.
Looking back over 1963. 95.
Lycaenidae. Gynandromorphism in British. 89.
Lysandra bellargus Rott. A scale defect in. 236.

Macroglossa stellatarum L. in Sussex and Kent. 215.
Madeira in the spring, April 1964. 252.
Malacosoma neustria. Unusual appearance of. 245.
Melanism in Bournemouth. 199.
Melanism in Lepidoptera in the west of Ireland. 155.
Melanism in the New Forest. 216.
Meliana flammea Curtis at Arundel, Sussex. 193.
Microlepidoptera. Notes on the. 16, 158, 230.
Microlepidoptera. The. 258.
Micro-Psychids. Looking for. 31.
Migrant moths at Weston-super-Mare. 297.
Migrant Lepidoptera in 1964. Early. 193.
Migrant Lepidoptera in Hampshire. 200.
Migration of butterflies in Malaya. A prolonged. 142.
Monopis rusticella in early January. Emergence of. 87.
Myiolia caesio Harris in Surrey. 142.

Nephopteryx hostilis Steph. and *Brachimis inornatella* Dougl. new to Suffolk. 215.
New Forest. More migrants in the. 245.
New Forest M.V. Records. More. 25.
Nola tritubercula Bose (*centonalis* Hübn.). 215.
Notes. 1964. 245.
Nymphalis antiopa L. in Surrey. 119.

Odontaeus armiger (Col., Scarabaeidae) in Northamptonshire. 296.
Orthoptera notes for South West Britain, 1963. 136.

Patrick Buxton Memorial Prize. 260.
Pelosia obtusa H.-S. (Lep., Arctiidae), a species overlooked in Britain? 181.
Phlyctaenia citialis Hübn. (Lep., Pyraustidae) new to Kent. 228.
Phytomyza scolopendrii Rob. Desv. (Dip., Agromyzidae). 118.
Platytes alpinellus Hübn. at Blackheath. 116.
Polymorphism in north east Derbyshire. 282.
Pontia daplidice L. in Wiltshire in 1945. An occurrence of. 119.
Procris statices L. (the forester). A new aberration of. 147.
Prodenia litura Fabr. 118.
Prodenia litura Fabr.: The Mediterranean Brocade (Lep., Noctuidae). Additional records of. 199.
Prodenia litura Fabricius: The Mediterranean Brocade (Lep., Noctuidae) in England, 1963. 59.
Psychophagus omnivorus (Wlk.) and its attacks on the pupae of Lepidoptera. Some notes and observations on the Life history and habits of the parasite. 165.

Records for 1963. Some late. 60.
Red admirals. An apparent migration of. 296.
Rhodometra sacraria L. 258, 267.

Salad days. 83.
Scientific names. 99.
Season. The 1963. 28.
Solenobia triquetrella Hübn. 209.

Sphecia bembeciformis Hübn. in Derbyshire. 264.
Staphilinus stercorarius Oliv. (Col., Staphilinidae). A note on. 246.
Stauropus fagi L. (the lobster moth). Thoughts on rearing. 185.
Stigmella aeneella (Hein.)—A species new to Britain. 23.
Stigmella ulmifoliae Hering in Kent. 243.

Teichobia filicivora Meyrick in Devon. 20.
Thestor ballus Fabr. 214.
Thumatta senex Hübn. in Scotland. 235.
Trichius fasciatus L. A correction and a warning. British range of. 144.
Trichoptera. The larval taxonomy of the British. 194.

Utetheisa pulchella L. in the New Forest. 200.

Vanessa atalanta in central London. 200.
Venilia maculata L. in September. 244.

Welsh hills. In the. 247.
Wild life tape recording competition. 148.
Willow warbler, *Phylloscopus trochilus* L., fly catching. 143.
Wiltshire. Entomological records from. 86.

Xylocampa areola Esp. A new aberration of. 286.

Yugoslavia. A visit to. 279.

Zygaena algira Boisduval, 1834 (Lep., Zygaenidae). The identity of. 35.
Zygaena Fabricius (Lep., Zygaenidae) in Scotland in 1963. Collecting. 149.
Zygaena Fabricius (Lep., Zygaenidae). New synonymy in the genus. 129.
Zygaena Fabricius (Lep., Zygaenidae). The *silvicola* Burgeff group of the genus. 1, 46, 74.

OBITUARY NOTICES

Burras (1871-1963). A. E. 61.

Clark. Gowan C. 173.

Easton. Nigel Typherleigh. 27.

Hammond, F.R.E.S., an appreciation. H. E. 62.
Kershaw, D.S.O. Colonel Sidney Hardinge. 265.
Watson. Nora. 265.

AUTHORS

Ainley, R. G. 255.
Allan, P. B. M. 265, 297.
Allen, A. A. 55, 87, 116, 117, 144, 145, 237, 246, 261.
Amsel, H. G. 200.
Aston, Alasdair. 244, 245.
Atkins, F. B. 268.

Barrett, K. E. J. 107, 139, 287.
Birkett, N. L. 102, 126, 236, 279.
Blathwayt, C. S. H. 297.
Bretherton, R. F. 29, 177.
Brindle, A. 194, 289.
Brown, S. C. S. 23.
Bruce, C. G., 258, 267.
Burton, J. F. 136.
Byers, F. W. 232.

Cadbury, C. J. 181.
Carolsfeld-Krausé, A. G. 209.
Chalmers-Hunt, J. M. 17, 59, 91, 193, 214, 215, 228.
Chappell, A. M. 264.
Chatelain, R. G. 234.
Chipperfield, H. E. 142.
Claassens, A. J. M. 292.
Collier, A. E. 72.
Collingwood, C. A. 58.
Cook, R. R. 243.
Craufurd, C. 115.
Cue, Percy. 28.

Davey, A. R. 27.
Dickson, C. G. C. 173, 214.
Dixon, C. H. 243.
Duke, A. J. 189.

Eagles, T. R. 120.
Ellerton, J. 60.

Fearnehough, T. D., 68, 215, 266, 267.
Freebrey, A. M. 243.

Gardner, A. E. 146.
Gent, P. J. 34.
Greenwood, J. A. C. 159, 243.

Haggett, G. M. 62, 193, 296.
Harman, T. W. 95.
Harper, G. W. 36, 227, 244.
Haynes, R. F. 268.
Hayward, R. 236, 243.
Heslop, I. R. P. 119, 246.
Howarth, T. G. 176.
Huggins, H. C. 16, 18, 155, 158, 223, 230, 286, 294.

Irvin, A. D. 83.

Jackson, R. A. 63, 115.
Jacobs, S. N. A. 29, 30, 89, 100, 146, 207, 211, 217, 243, 269, 298.
Johnson, E. E. 244.
Johnson, J. H. 264, 282.
Johnson, Sir George. 153, 187, 259.

Leech, M. J. 21, 29, 229, 296, 297.
Lempke, B. J. 31.
Lipscomb, C. G. 63, 275.

Manley, W. R. L. 149.
Mason, M. G. 267.
Mere, Robin M. 28.
Messenger, J. L. 266.
More, David. 245.
Muggleton, J. 267.
Myers, A. A. 267.

Newton, J. 214.

Old Moth Hunter, An. 247.

Parmenter, L. 57, 58, 89, 90, 118, 142, 144, 146, 175, 198, 246.
Payne, J. H. 88.
Payne, R. M. 44.
Pelham-Clinton, E. C. 121.
Postans, A. T. 165.

Reid, W. 296.
Reiss, H. 129.
Reisser, H. 99.
Rossell, H. G. 233, 235.
Rutherford, C. I. 17.

Saundby, Sir Robert. 267.
Sevastopulo, D. G. 118.
Shipp, T. M. 296.
Siggs, L. W. 25, 200, 216, 245.
Skinner, B. F. 234.
Stafford, A. E. 87.
Sutton, F. R. 200, 245.
Symes, H. 86, 87, 118, 185, 199, 256, 278.

Taylor, J. S. 189.
Todd, R. G. 268.
Torlesse, A. D. 40.
Tremewan, W. G. 1, 35, 46, 74, 129, 149.

Vaux, R. M. C. 40.

Waddington, L. G. F. 100, 249.
Wakely, S. 20, 22, 91, 172, 271.
Weddell, B. W. 86, 258.
West, B. K. 142.
Wightman, A. N. 210, 295.
Worms, Baron C. G. M. de. 11, 60, 61, 215, 252, 286, 296.

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The *Silvicola* Burgeff Group of the genus *Zygaena* Fabricius (Lep., Zygaenidae)

By W. Gerald Tremewan

Department of Entomology, British Museum (Natural History)
and Hugo Reiss, Stuttgart

The recent separation by Alberti (1958: 314) of *Zygaena romeo* Duponchel and *osterodensis* Reiss (=*scabiosae auctorum*) has made a study of the genitalia of the various subspecies necessary. In the following paper, the subspecies are now grouped under two species according to their genital characters and the remaining species of the group have also been studied The terminology of the genitalia follows that of Alberti (*loc. cit.*).

In addition to difficulties in separating the species, a considerable amount of confusion has existed in the nomenclature. The name *osterodensis* Reiss is here considered to be the name of the species formerly known as *scabiosae* Scheven while the latter is placed as a subspecies of *purpuralis* Brünnich. This was first suggested by Reiss (1933: 252) who considered that the specimens figured by Schäffer (1766: pl. 16, figs. 4, 5), and named *scabiosae* by Scheven (1777: 97), were true *purpuralis*. The latter species is still found in the neighbourhood of Regensburg but the species *osterodensis* (=*scabiosae auctorum*) does not occur there and, even if it were found there in the time of Schäffer, it must have been so rare that it could not have predominated. Therefore, it is reasonable to assume that, if both species occurred at Regensburg, Schäffer took the commoner species (*purpuralis*) for his illustrations. On the basis of this argument, Reiss (*loc. cit.*) considered *romeo* Duponchel to be the species name. However, as stated above, *romeo* has recently been separated by Alberti (*loc. cit.*) as a species distinct from *scabiosae auct.* and, the next available name for the latter is *osterodensis* Reiss. This has already been suggested by Bernardi & Viette (1960: 245). The name *minos* Denis & Schiffermüller, which was considered by Dujardin (1952: 246) to be the species name of *osterodensis*, should, in our opinion, be used to represent the subspecies of *purpuralis* which occurs in the Vienna district of Austria. This opinion is also held by Bernardi & Viette (*loc. cit.*).

The examination of a *Zygaena* specimen, which was accepted as the type of *dalmatina* Boisduval, led to a further change in the name of the species (Tremewan, 1961b: 283). The name *romeo* was then returned to subspecific rank and *dalmatina* was taken as the species name. The study of the genitalia of this group has revealed that the species *romeo* probably does not occur in Dalmatia. It was originally thought that the subspecies *goriziana* Koch from Görz, Istria and *koricnensis* Reiss from Korična, Bosnia, were conspecific with *romeo*. An examination of the genitalia of the type of *koricnensis* and of genitalia drawings of two paratypes (♂, ♀) of *goriziana* showed these to be subspecies of *osterodensis* (=*scabiosae auct.*). The distribution (fig. 1) suggests that *romeo* does not occur in Dalmatia. After the publication of the *Zygaena* type catalogue (Tremewan, 1961b), Holik (1961: 51) published an article on the problem and maintained his earlier opinion (Holik, 1935: 60) that *dalmatina* is a subspecies of *punctum* Ochsenheimer, and that the specimen in the Bois-

duval collection was not the true type. In reply to Holik's paper, an article was published by Reiss & Tremewan (1962: 39) when an attempt was made to confirm the validity of the type.

In the original description of *dalmatina*, Boisduval (1834: 45) stated that the specimen was found in Dalmatia, in the nieghbourhood of Ragusa (Dubrovnik). Boisduval compared the specimen with examples of "*scabiosae*" (*romeo* Duponchel) from Italy and the Alps and stated that many of the Italian and Alpine specimens were referable to *dalmatina*. The specimen which was illustrated as the type (Tremewan, 1961b: 283, pl. 54, fig. 18) is conspecific with *romeo* Duponchel and is, in fact, probably one of the Italian or Alpine specimens mentioned by Boisduval. Holik, who has examined a photograph of the specimen, stated (*in lit.*) that it is an example of *romeo orion* Herrich-Schäffer. The additional evidence shows that it can no longer be regarded as the genuine type of *dalmatina*. Neither the species *romeo* nor *osterodensis* are known to occur at Ragusa while *punctum* is found abundantly in this locality (Holik, *in lit.*). It is therefore logical to follow Holik's opinion that the true *dalmatina* is the subspecies of *punctum* occurring in the Ragusa district of Dalmatia.

The distribution (fig. 1) of *romeo* and *osterodensis* overlaps in Istria, the west Alps through southern France to the East Pyrenees. It is possible that, in these localities, hybridization occurs as many specimens from these areas have what appear to be intermediate characters in the genitalia. Such intermediate characters have been noted in *romeo parvorion* Holik, *romeo freyeri* Lederer, *romeo orionides* Burgeff, *romeo lozerica* Holik, *romeo urania* Marten and *osterodensis eupyrenaea* Burgeff.

Acknowledgment is due to Dr. P. Viette, Muséum national d'Histoire naturelle, Paris, for the loan of material from the Le Charles collection. We also thank Mr. M. Koch, Dresden, for supplying drawings of the genitalia of male and female paratypes of *osterodensis goriziana* Koch in his collection. Also to Mr. G. Pardo Gonzalez for the loan of a paratype of *nevadensis picos* Agenjo, and to Lt.-Col. W. B. L. Manley for making the loan possible.

Z. gallica Oberthür

♂ genitalia. Horns of uncus short, broad and flat, variable. In the aedeagus, the lamina dorsalis is triangular in shape, shorter and broader than that in *nevadensis* Rambur, laterally edged with strong spines. Near the base a transverse row of strong and fairly well developed spines, rather variable in length but usually longer than those in *nevadensis*. Central part of lamina dorsalis spiculate, anterior to basal spines, scobinate. Lamina ventralis rather narrow but broader at the base, comprised of a field of short, strong spines, latter stronger and larger at the base and towards the centre. A portion of the vesica spiculate, cornuti hardly evident. Vesical pad or "Blase" present.

♀ genitalia. "Schildchen" very broad, triangular in shape. A slight development of the lamella postvaginalis, lamella antevaginalis ovoid, elongate. Ductus bursae weakly sclerotized on one side, anteriorly. Bursa copulatrix spherical, signum vestigial or absent.

First pair of tibial spurs present or absent.

Superficially, *gallica* may be distinguished from *giesekingiana* Reiss by the narrower forewings and rather denser scaling. The middle forewing streak is rarely broken in *gallica* and, when this does occur, is found only in aberrant specimens.

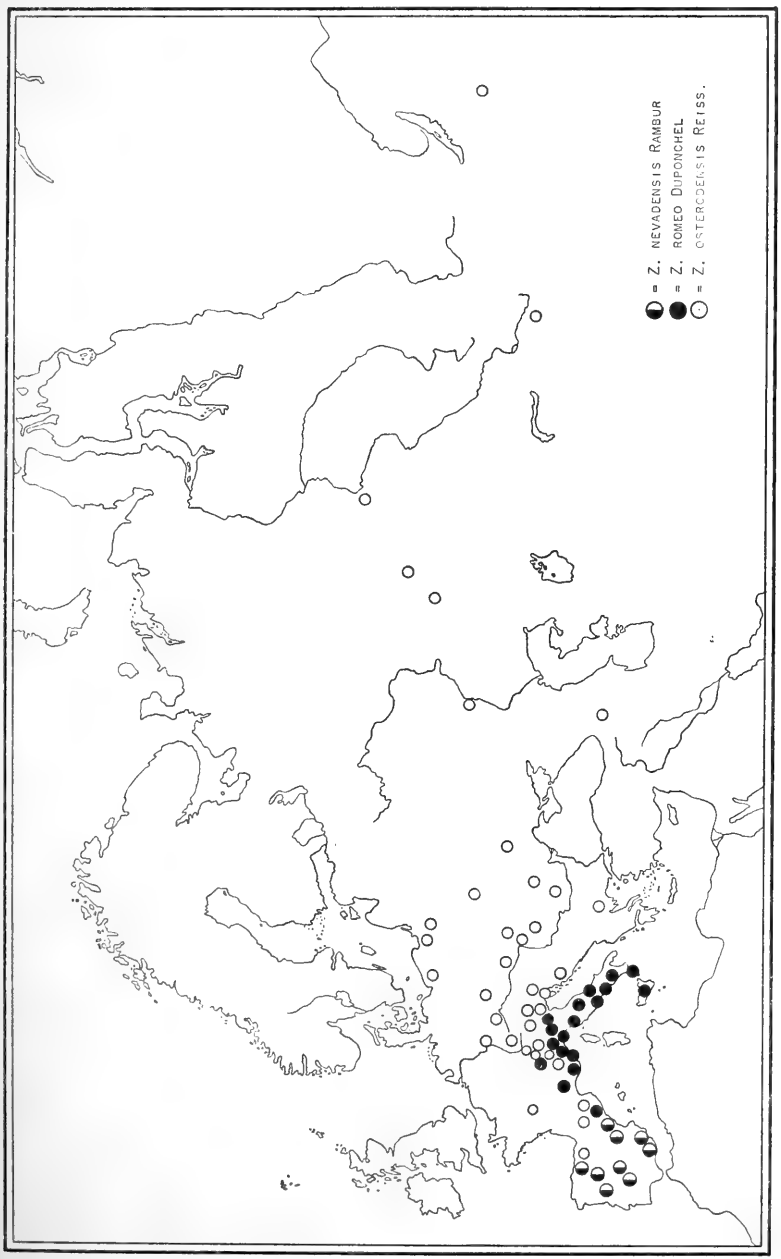


Fig. 1.—Distribution of *Zygaena nevadensis* Rambur, *Z. romeo* Duponchel, and *Z. osterodensis* Reiss.

Z. gallica gallica Oberthür

Z. gallica Oberthür, 1898, *Bull. Soc. ent. Fr.*, p. 21.

Type locality: Neighbourhood of Digne, Basses-Alpes, France, 1000 m.
Material examined: Lectotype ♂, 25 ♂♂, 3♀♀, Digne, Basses-Alpes.

♂ genitalia. As above. The differences in the genitalia of *gallica* and *giesekingiana* are slight and possibly do not justify their separation into two distinct species. The two lateral spines at the base of the lamina dorsalis are more strongly developed in *giesekingiana*.

♀ genitalia. Ductus bursae weakly sclerotized compared with that in *giesekingiana*, signum vestigial or absent in *gallica*, vestigial in *giesekingiana*.

The genitalia of *gallica* are figured by Le Charles (1935:15) and Alberti (1958: 314). The latter author has placed *gallica* as a subspecies of *nevadensis* Rambur but we see no justification for this. The genital differences, although small, remain constant. The lamina dorsalis of *gallica* is longer, while the lateral spines are longer and more strongly developed. In the females, the lamella antevaginalis in *gallica* is broader than that in *nevadensis* and the ductus bursae is broader and more heavily sclerotized. In *nevadensis* the signum is well developed but is vestigial or absent in *gallica*.

Reiss (1953: 141, pl. 9, figs. 10, 11) illustrates the nominate subspecies in colour.

Z. gallica frigidagallica Dujardin

Z. gallica frigidagallica Dujardin, 1956, *Bull. mens. Soc. linn. Lyon*, **25**: 254.

Type locality: Céuze, environs de Gap, Hautes-Alpes, France, 1500 m.
Material examined: 1♂, Céuze (coll. H. Reiss).

♂ genitalia. As in *gallica gallica*.

Z. gallica ssp.

A series of 60 ♂ and 4 ♀ from Mt. Ventoux, Perrache, Vaucluse, represents a new subspecies. The specimens differ from those of the nominate subspecies in having less rounded forewings. The red coloration is brighter and the hindwing border is narrower.

♂♀ genitalia. As in *gallica gallica*.

Z. giesekingiana Reiss

♂ genitalia. Horns of uncus short, broad and flat, variable. In the aedeagus, the lamina dorsalis is broad, triangular, laterally edged with strong spines, a larger and stronger spine on each side at the base, between these two large spines a transverse row of spines decreasing in length towards the middle. Central part of lamina dorsalis spiculate. Anterior to basal spines the lamina dorsalis is scobinate. Lamina ventralis broad at the base, narrowing anteriorly, comprised of a field of short, strong spines, latter thicker and shorter at base and towards the middle. Part of vesica spiculate, cornuti hardly evident, vesical pad or "Blase" present.

♀ genitalia. "Schildchen" very broad, triangular in shape. Lamella postvaginalis moderately developed, lamella antevaginalis curved but narrower than that in *gallica*. Ductus bursae moderately sclerotized on one side, bursa copulatrix spherical, signum vestigial.

First pair of tibial spurs present or absent.

Z. giesekingiana Reiss

Z. giesekingiana Reiss, 1930, in Seitz, Die Gross-schmetterlinge der Erde, Supplement, **2**: 9, pl. 1h.

Z. gallica f. *interrupta* Boursin, 1923, *Bull. Soc. ent. Fr.*, p. 68, fig. 1 (infraspecific).

Type locality: St. Barnabé (Vence to Coursegoules), Alpes-Maritimes, France, 1000 m.

Material examined: 11 ♂♂, 2 ♀♀, St. Barnabé; Grasse, Alpes-Maritimes.

♂♀ genitalia. As above, see also under *gallica gallica.*

The genitalia are figured by Le Charles (1953: 13) and Alberti (1958: 314). This species was originally described as a form of *gallica* by Boursin. It was later raised to specific rank by Reiss who renamed it *giesekingiana.* The name *interrupta* Boursin is infraspecific and, having no status in nomenclature, is not available. The name *giesekingiana* is therefore valid. Verity (1953: 51) incorrectly gave priority to the name *interrupta* Boursin. Le Charles (1953: 14) was of the same opinion and, in addition, considered *giesekingiana* and *gallica* to be conspecific. Alberti (*loc. cit.*) considered *giesekingiana* to be conspecific with *nevadensis* but we see no justification for this conclusion. The genital differences between *nevadensis* and *giesekingiana* remain constant. It is, however, difficult to decide whether *giesekingiana* and *gallica* are specifically distinct as the genital differences are small. It is interesting to note that they fall into two groups: (1) *gallica*, which has a wider distribution than *giesekingiana* and which at present can be separated into three geographical races or subspecies as follows: (a) *gallica gallica* from Digne, Basses-Alpes; (b) *gallica frigidagallica* from Céuze, Hautes-Alpes; (c) *gallica* ssp. from Mt. Ventoux, Vaucluse; (2) *giesekingiana* which is known from four localities, all closely situated in the Alpes-Maritimes, and which cannot be separated into various subspecies. The localities are St. Barnabé (type locality), Grasse, Coursegoules and Thorenc. The larvae of *giesekingiana* feed on *Lathyrus filiformis* Gay which is also the foodplant of *gallica* (Reiss, 1953: 135).

Reiss (1953: 141, pl. 9, figs. 1-8) illustrates *giesekingiana* in colour.

Z. nevadensis Rambur

♂ genitalia. Horns of uncus short, broad and flat, rather variable. In the aedeagus, the lamina dorsalis is rather long, triangular in shape, laterally edged with strong spines, a longer and more strongly developed spine on each side at the base. Between these two basal spines a transverse row of spines which vary in length and which become shorter towards the centre. Central part of lamina dorsalis spiculate, basal part anterior to large spines, scobinate. Lamina ventralis narrow, comprised of a field of short, strong spines which become smaller posteriorly. Part of the vesica spiculate, a single group of cornuti composed of a field of minute spines. Vesical pad or "Blase" present.

♀ genitalia. "Schildchen" broadly triangular but variable in shape. Lamella postvaginalis moderately developed, unsclerotized, lamella antevaginalis rather broad, elongate. Ductus bursae moderately sclerotized, especially on one side. Bursa copulatrix spherical, signum present, fairly strong, comprised of approximately 18-34 spines.

First pair of tibial spurs present or absent.

Z. nevadensis nevadensis Rambur

Z. nevadensis Rambur, 1866, Catalogue systématique des Lépidoptères de l'Andalousie, p. 166, pl. 1, fig. 10.

Z. nevadensis atlantica Le Charles, 1957, *Rev. franç. Lépid.*, **16**: 21, pl. 5, figs. 37, 38 (*nomen nudum*).

Type locality: central parts of the Sierra Nevada, south Spain.

Material examined: A series of both sexes from the Sierra Nevada and the Sierra de Alfacar, Granada.

♂ genitalia. Spines at base of the lamina dorsalis variable in length, usually short and reduced. A single group of minute cornuti, vesical pad or "Blase" present.

♀ genitalia. Lamella postvaginalis moderately developed, lamella antevaginalis broadly elongate, ductus bursae moderately sclerotized, signum present.

Le Charles (1957: 21) applied the name *atlantica* to two specimens of *nevadensis* which are purported to have been taken at Ifrane and Douala in Morocco. As no description accompanied the publication of the name *atlantica* Le Charles, it can only be treated as a *nomen nudum* and, for convenience, is placed here under the nominate subspecies of *nevadensis*. In the text, Le Charles stated that the specimens were referable to the species *romeo* Duponchel but in the legend to plate 5 refers them to *nevadensis*! The figures 37 and 38 on plate 5 undoubtedly represent two examples of *nevadensis*. It would be of interest to verify whether *nevadensis* does actually occur in Morocco.

Z. nevadensis dumalis Marten

Z. nevadensis dumalis Marten, 1957, *Ent. Z.*, **67**: 14.

Type locality: Sierra de los Filabres, upper half of Baza, south Spain, 1400 m.

We have been unable to examine material of this subspecies.

Z. nevadensis kricheldorffi Reiss

Z. nevadensis kricheldorffi Reiss, 1933, in Seitz, Die Gross-schmetterlinge der Erde, Supplement, 2: 252; 1931, *Int. ent. Z.*, **25**: 114, figs.

Type locality: Neighbourhood of Guarda, Portugal, 800 m.

The genitalia of this subspecies have not been examined.

Z. nevadensis guadalupei Koch

Z. nevadensis guadalupei Koch, 1948, *Eos, Madr.*, **24**: 326.

Type locality: Guadalupe, Prov. Caceres, Spain, 654 m.

We have been unable to examine material of this subspecies.

Z. nevadensis schmidti Reiss

Z. scabiosae schmidti Reiss, 1931, *Int. ent. Z.*, **25**: 112, figs.

Type locality: Neighbourhood of Arenas St. Pedro, Prov. Avila (Sierra de Gredos), Spain.

Material examined: 1♂, paratype, Arenas St. Pedro; 18 ♂♂, 9 ♀♀, San Ildefonso, Segovia and La Granja, Spain.

♂ genitalia. Lateral spines of lamina dorsalis rather shorter and thicker than those in ssp. *nevadensis*. Vesical pad or "Blase" present.

♀ genitalia. A slight development of the lamella postvaginalis, lamella antevaginalis elongate, ductus bursae moderately sclerotized, signum present.

Originally described as a subspecies of *scabiosae auct.* but later transferred by Reiss (1933: 252) to *nevadensis* which was then separated as a distinct species. The paratype examined is figured by Tremewan (1961b: 308, pl. 57, fig. 25).

Z. nevadensis muda Marten

Z. nevadensis muda Marten, 1957, *Ent. Z.*, **67**: 15.

Type locality: Upper half of the Tera valley, between Laguna de Yengua and Laguna de Villachica, east of Mt. Moncalvo, Prov. Zamorra, Spain, 1300 m.

We have been unable to examine material of this subspecies.

Z. nevadensis falleriana Reiss

Z. scabiosae falleriana Reiss, 1931, *Int. ent. Z.*, **25**: 111, figs.

Type locality: Albarracin, Sierra Noguera and Sierra Alta, Aragon, Spain, 1400-1700 m.

Material examined: 17 ♂♂, 11 ♀♀, Orihuela, Aragon, 1700 m.

♂ genitalia. Spines at the base of lamina dorsalis rather short but becoming longer laterally. A single group of cornuti, vesical pad or "Blase" present.

♀ genitalia. Lamella postvaginalis moderately developed, lamella antevaginalis elongate, ductus bursae moderately sclerotized, signum present.

This subspecies was originally described under *scabiosae auct.* but was subsequently transferred to *nevadensis* by Reiss (1933: 252).

Z. nevadensis picos Agenjo

A. scabiosae picos Agenjo, 1953, *Graellsia,* **11**: 1.

Type locality: Fuente Dé, Camaleño, Santander (Picos de Europa), Spain, 1001 m.

Material examined: 1 ♂, paratype, Fuenté Dé, Camaleño (G. Pardo coll.); 3 ♂♂, 10 ♀♀, Riano, Leon (W. B. L. Manley coll.).

This was originally described as a subspecies of *scabiosae* auct. but an examination of a paratype ♂ has shown it to be a subspecies of *nevadensis.* Agenjo, in the original description, also referred to specimens recorded by Reiss (1931: 113) and Koch (1948: 322) but these specimens are *osterodensis* (*scabiosae auct.*) and are referable to ssp. *cantabrica* Marten.

In addition to the paratype, a short series of *nevadensis* (3 ♂♂, 10 ♀♀) from Riano, Leon has been examined. These specimens were previously placed as ssp. *picos* which was then transferred to *nevadensis* (Tremewan, 1961a: 6; 1963: 8).

Z. nevadensis timida Marten

Z. nevadensis timida Marten, 1956, *Ent. Z.*, **66**: 287.

Z. agenjoi Le Charles, 1957, *Rev. franç. Lépid.*, **16**: 21, pl. 6, figs. 39, 40 (**syn. nov.**).

Type locality: Neighbourhood of Vallibona, mountains between Castellon and Tortosa, east Spain, 900 m.

Material examined: 1 ♂, Tortosa (*Z. agenjoi* Le Charles, lectotype ♂ [Paris Museum coll.]).

♂ genitalia. As in *nevadensis nevadensis.*

We have been unable to examine the type material of *timida* Marten which was described as a subspecies of *nevadensis.* An examination of the lectotype ♂ of *Z. agenjoi* Le Charles, which was described as a species, shows it to be conspecific with *nevadensis.* The lectotype of *agenjoi* originated from Tortosa (leg. Marten) and was probably captured in the same locality as the type specimens of ssp. *timida,* under which the name is now placed as a synonym.

The lectotype ♂ of *agenjoi* was selected by Le Charles (1960: 103).

Z. nevadensis ssp.

A short series of *nevadensis* (6 ♂♂) from Sta. Fe, Sre. Montseny, Catalonia, probably represent a new subspecies. The most noticeable character in these specimens is the wide hindwing border. One specimen is strongly aberrant and has the forewing spots confluent and suffused with red scaling.

♂ genitalia. Spines at the base of the lamina dorsalis short but well developed, vesical pad or "Blase" present.

Z. mana Kirby

♂ genitalia. Horns of the uncus short, flat, variable. In the aedeagus, the lamina dorsalis is elongate and triangular in shape, laterally edged with short, strong spines. Near the base, a transverse row of strong spines, variable in length, often decreasing in size towards the centre. Central portion of lamina dorsalis spiculate, anterior to basal spines, scobinate. Lamina ventralis narrow, comprised of a field of strong, short spines, latter decreasing in size posteriorly. Portion of vesica spiculate, cornuti hardly evident. "Blase" absent.

♀ genitalia. "Schildchen" very broad, variable, triangular in shape. Lamella postvaginalis developed, weakly sclerotized, bursa copulatrix spherical, signum absent.

In superficial characters *mana* may be separated from *osterodensis* (=*scabiosae auct.*) by its smaller size, broader forewings with rounded apex and generally broader hindwing border. Forewing streaks rather thicker than those in *osterodensis.* Antennae of *mana* shorter and rather more heavily clubbed than the antennae of *osterodensis.*

First pair of tibial spurs absent.

Z. mana mana Kirby

Z. mana Kirby, 1892, A synonymic Catalogue of Lepidoptera Heterocera (Moths), p. 64 (nomen novum for *erebus* Staudinger).

Z. erebus Staudinger, 1867, *Stettin. ent. Ztg.,* **28**: 101 (preoccupied).

Z. erebaea Burgeff, 1926, *Mitt. münch. ent. Ges.,* **16**: 15.

Type locality: Adshara region, Georgia, Transcaucasia.

Material examined: 5 ♂♂, 2 ♀♀, Achalzych, Adshara region.

♂♀ genitalia. As above.

A considerable amount of confusion has existed in the synonymy of this species which was originally described as *erebus* by Staudinger. The name *erebus* Staudinger, 1867, is a secondary homonym of *erebus* Meigen, 1830, which is a synonym of *anthyllidis* Boisduval, 1829. Kirby (1892: 64) proposed the name *mana* to replace *erebus* Staudinger. In 1926, Burgeff proposed the name *erebaea*, apparently not aware of the name *mana*

Kirby. The name *erebaea* Burgeff is therefore a synonym of *mana* Kirby. This synonymy was correctly published by Verity (1953: 50) and has been accepted by Holik & Sheljuzhko (1955: 112) and Alberti (1958: 315).

The species has been confused with *adsharica* Reiss with which, superficially, it is very similar. However, the two species may be readily separated on genital characters. *Z. adsharica*, which flies in the same region as *mana mana*, is not closely allied and belongs to the *brizae* Esper group of species (*Cirsiphaga* Holik). In superficial characters, *adsharica* may be separated from *mana* by the lower forewing streak which is broader and occupies the whole of the area between veins 1b, 1c, and the median vein. In *mana*, the lower forewing streak is narrow and constricted in the middle and does not extend in breadth to vein 1b. The first pair of tibial spurs are present in *adsharica* but are absent in *mana*.

Z. mana chaos Burgeff

Z. chaos Burgeff, 1926, *Mitt. munch. ent. Ges.*, **16**: 15.

Z. erebus ab. *interrupta* Burgeff, 1914, *Mitt. münch. ent. Ges.*, **5**: 45, pl. 5, fig. 18 (infrasubspecific).

Type locality: Bethania near Tiflis, Georgia, Transcaucasia.

Material examined: 1 ♂, paratype, Bethania, Tiflis.

♂ genitalia. As in *mana mana*.

Verity (1953: 51) placed the names *interrupta* Burgeff and *chaos* Burgeff as synonyms of *mana*. This is incorrect as *chaos* is a distinct subspecies. The name *interrupta* is infrasubspecific and, although published earlier than *chaos*, is not available. Burgeff originally described *chaos* as a distinct species but Holik & Sheljuzhko (1955: 116) have correctly placed it as a subspecies of *mana*. The paratype examined is figured by Tremewan (1961b: 308, pl. 57, fig. 25).

Z. mana tarkiensis Holik & Sheljuzhko

Z. mana tarkiensis Holik & Sheljuzhko, 1955, *Mitt. münch. ent. Ges.*, **44/45**: 115.

Type locality: Berg Tarki near Petrovsk (Machatsh-Kala), Dagestan, Ciscaucasus.

Material examined: 2 ♂♂, 1 ♀, Kurush, Dagestan.

♂ ♀ genitalia. As in *mana mana*.

Holik & Sheljuzhko (1955: 116) placed the population of *mana* from Kurush under ssp. *tarkiensis*.

Z. rjabovi Holik

♂ genitalia. Horns of uncus short, flat and variable in shape. Lamina dorsalis triangular in shape, laterally edged with strong spines, a transverse row of strong spines, variable in length, near the base, central area spiculate, anterior to basal spines, scobinate. Lamina ventralis narrow, comprised of a field of short, strong spines, larger and more strongly developed at the base. A portion of the vesica spiculate, cornuti comprised of a field of minute spines. "Blase" absent.

First pair of tibial spurs present.

Z. rjabovi Holik

Z. mana rjabovi Holik, 1939, *Ent. Rdsch.*, **56**: 115.

Type locality: Daratshitshag, Armenia, 2000 m.

Material examined: 2 ♂♂, Daratshitshag (coll. H. Reiss), prep. Nos. 24154A, 24154B, F. Dujardin.

♂ genitalia. As above.

Holik originally described *rjabovi* as a subspecies of *mana* Kirby. Koch (1939: 403; 1940: 199) placed *rjabovi* as a distinct species. Holik (1940/41: 213) referred to Koch's opinions but still maintained that *rjabovi* should be considered a subspecies of *mana*. Reiss (1953: 141, pl. 9, figs. 15-18) placed *rjabovi* as a separate species and illustrated four specimens in colour. Holik & Sheljuzhko (1955: 117) placed *rjabovi* as a distinct species following the opinions of Koch (*loc. cit.*). Alberti (1958: 316) placed *rjabovi* as a subspecies of *mana*.

Z. rjabovi is closely related to *mana* and is very similar in genitalia but may be separated by the longer and more elongate lamina dorsalis. The spines at the base are shorter although this may be a variable character. The uncus horns of *mana* are rather larger and broader than those of *rjabovi*.

Superficially, it may be distinguished from *mana* by the broken, middle streak in the forewings.

Z. teberdica Reiss

♂ genitalia. Horns of uncus short, flat. In the aedeagus, the lamina dorsalis is triangular in shape, laterally edged with short, strong spines. Near the base a transverse row of strong spines, moderate in length. Central area of lamina dorsalis spiculate, anterior to basal spines, scobinate. Lamina ventralis narrow, comprised of a field of strong, short spines, latter decreasing in size posteriorly. Cornuti of vesica hardly evident, "Blase" present, well developed.

First pair of tibial spurs absent.

Z. teberdica Reiss

Z. erebaea teberdica Reiss, 1939, *Ent. Z.*, **53**: 113.

Type locality: Teberda region, north Caucasus.

Material examined: Holotype ♂, Teberda region (coll. H. Reiss), prep. no. 29154, F. Dujardin.

♂ genitalia. As above.

Z. teberdica was originally described as a subspecies of *erebaea* Burgeff (=*mana* Kirby) by Reiss who subsequently raised it to specific status (Reiss, 1953: 141, pl. 9, fig. 14). The type is figured in colour by Reiss (*loc. cit.*). Holik & Sheljuzhko (1955: 114) placed *teberdica* as a subspecies of *mana* Kirby. Alberti (1958: 315) placed the name *teberdica* as a synonym of *mana*. However, in our opinion, *teberdica* should be considered as a distinct species and may be separated from *mana* by the shape of the lamina dorsalis which, in the latter species, is more elongate than that in the former. The lateral and basal spines are longer in *mana*. The absence of the "Blase" in *mana* may, if constant, be a further character for separating the two species.

Superficially, *teberdica* differs from *mana* in its smaller size, rather broader hindwing border and the middle streak of the forewing. In *teberdica*, the middle streak is constricted but in *mana* is usually of equal width throughout.

(To be continued.)

From Gavarnie to Digne, August 1963

By C. G. M. de Worms, M.A., Ph.D., F.R.E.S.

Much was written in the early part of this century about these two classic localities situated in the Hautes Pyrenées and Basses Alpes respectively, but, though they have been visited regularly by collectors, little seems to have appeared in our literature about them in recent years.

I have therefore thought it of interest to give an account of my sojourn in both these famous resorts at a rather later period of the season than most people have been to them for their rich lepidopterous fauna. Mr R. F. Bretherton and I were much encouraged by an article written by the late Brig.-Gen. B. H. Cooke (1925, *Entomologist*, **58**: 87) describing a whole summer in 1924, which he spent from May to August, based on Argelès. In it he gave a complete list of the butterflies he noted in the main part of the Central Pyrenees as well as those on its northern fringe together with their respective localities, though he did not describe their terrain and the countryside in detail. We, therefore, decided to join forces at Gavarnie early in August. I set out by the orthodox route on the 1st August by train to Paris and then took the very fast Pyrenées Express which landed me at Pierrefitte-Nestolas, just south of Lourdes, at 8.30 a.m. next morning. But a very wet welcome awaited me, in fact it was the heaviest rain of the summer in that region. A bus took me the 20 miles steadily ascending to Garvarnie at 4500 ft. where my haven was the well-known Hotel des Voyageurs run by the Viergez-Bellou family since well into the last century.

In spite of the deluge I managed to sally forth during this first afternoon to see if there were many changes in these surroundings since my two previous brief visits to them in 1949 and as far back as 1928. I found the village of Gavarnie had been greatly enlarged with many new hotels and shops, but what was more interesting was a metalled road which had been recently constructed up the Gave d'Ossoue towards the Pic du Vignemale where a rough path had only existed before. This made accessible one of the best collecting grounds, since it proved to be one of the few that had not been grazed flat by cattle and sheep. But it was not till the morning of the 3rd that I was able to sample it to advantage. Fortunately the sun broke through after 24 hours of continuous rain with much flooding. I made my way slowly for 2 miles up the winding road from the Hotel and was soon able to appreciate the wealth of butterflies still on the wing.

It was on the ungrazed slopes just after crossing the torrent that I came across the biggest concentration, for here *Parnassius apollo pyrenaica* H.-B. and *Papilio machaon* L. were sailing about in numbers, though many were past their best, while no less plentiful were *Aporia crataegi* L. and *Colias croceus* Fourc. *Gonepteryx rhamni* L. and *Aglais urticae* L. were both numerous, also *Argynnis aglaia* L. and *Lysandra coridon* Poda in the form *minutepunctata* Vty. with very pale underside. There were a few *Melitaea didyma* Esp. and *M. dictynna* Esp. still on the wing, the former with very dark females. The Satyrids were mainly represented by the very small and bright form of *Hipparchia alcyone* W.V. But of the two Erebias seen in this rich locality one flitting round tufts of long waving grass turned out to be *E. manto* Esp. in the spotless form *constans* Eiffel, while a smaller species in the more rocky parts proved to be *E. gorgone* Bdv., which is confined to the Pyrenees. Coppers in-

cluded *Lycaena virgaureae pyrenemontana* Vty. and *L. alciphron veronius* Frhst. I only saw one *Maculinea arion* Rott. and two of the local small form of *Polyommatus escheri* Hbn., while the inevitable *Melanargia galatea* L. was in abundance everywhere. That fine afternoon I spent in a walk towards the famous Cirque with its towering sheer rock faces over which several waterfalls descend from the huge glaciers of Mont Perdu and other large peaks. But most of the meadows had been cut in this region. There were still a few worn *Erebia meolans gavarnica* Obth. (=*stygne* Ochs.) and I saw another *M. arion* Rott. In the evening Mr. and Mrs. Bretherton and their younger son arrived by car, having spent nearly a week travelling across France. We made a late walk up the lower part of the Gave d'Ossoue, and among many of the butterflies already mentioned, we added the Skipper *Pyrgus accreta* Verity.

A glorious morning, still and sunny, greeted us on the 4th when we all set out at an early hour on foot for the Cirque in order to reach it before the hordes of tourists who invaded it daily by foot or on the backs of horses or mules. The three miles along the main river took us just over an hour and it was not till we began to ascend during the final mile that we started to see a number of insects on the wing. The first was a small *Erebia* of the complex *tyndarus* group which that eminent authority, Mr B. S. C. Warren has designated as *E. neleus murina* Reverdin. Another butterfly of especial interest was *Boloria pales* L. of the form *pyrenemiscens* Verity which from its anatomical characters some authors regard as a separate species. It was flitting about in numbers low over the herbage at the entrance to the Cirque and more plentifully on a higher slope which was covered with a fine growth of the tall blue Pyrenean Iris, a grand sight. A further attractive insect to welcome us early in the day were several *Pontia callidice* Esp., mainly females, careering over the steep slopes. There were still a few *Colias phicomene pyrenaica* H.-S. to join them. The screes high above the pinewood at the western end of the Cirque were alive with Erebias, particularly *E. epiphron* Knoch, as well as *E. neleus murina* Rev., but the most interesting insect in this region was *E. gorgone* Bdv. of which the males varied greatly in size and spotting, but we only took a single female on this occasion. This sex has a most striking chequered underside to the hindwings. This species seemed only to affect the rough grass on the edge of the screes. I noticed a larger *Erebia* settled on a small rock bordering the scree slope. It turned out to be a male *E. lefebvrei* Scop. with a ring of large spots all lanceolate. This species, too, which is a denizen like the previous one of the Pyrenees, was most fascinating and extremely variable not only in ground colour, but in markings. Russell Bretherton who ventured near the big cascade on the floor of the Cirque after crossing a large snowfield took several of this insect, including some fine females. Most were velvety black referable to f. *rowlandi* Warren, while others had large red patches both on the upper- and undersides of the forewings. The spotting, too, was most variable with specimens having only a few on all the wings compared with others with a complete ring of large spots. But this form of *E. lefebvrei* Scop. is much more heavily marked than its subspecies *astur* from the Eastern Pyrenees and Northern Spain.

James Bretherton who had ascended the heights above the cliff wall brought back among other captures a single *Erebia lappona* Esp. f. *sthennyo* Graslin. The Blues were mainly represented by a very bright form of *Plebeius idas alsophila* Verity, also by *P. argus pyrenaica* Tutt,

Cupido minimus Fuessl., *Cyaniris semiargus* Rott. and the Coppers *Lycaena dorilis* and *L. hippothoë* L. The Skippers noted included *Pyrgus serratulae* Ramb., *P. accreta* Verity, *Spialia sao* Hübn., and *Adopaea lineola* Ochs. The only Burnets seen were *Zygaena filipendulae* L. and a single *Z. hippocrepidis* Hbn. The nettles in the whole region seemed to have been devoured by legions of larvae of *Aglais urticae* L. of all sizes. We estimated we had seen at least 30 species of butterflies in the ideal conditions prevailing during the day.

The next day, the 5th, we motored down the valley to Gèdre, then up the adjoining Vallée d'Héas ascending some five miles to the end of the road, but it became somewhat overcast when we surveyed the local slopes. As we were returning by a steep path, we came across a bank of long grass alive with *Erebia manto* Esp. which rose in dozens as we walked through it, but many were already past their best. We retraced some of our route down the main valley and then walked up the side Vallée d'Estaubé where a large reservoir has recently been built with a very high barrage, which we crossed and then skirted the western side of the lake where there was plenty to keep us busy. *Lysandra coridon* Poda was in abundance as also was *L. bellargus* Rott. A number of *Issoria lathonia* L. were flitting along the narrow path which was also patronised by several *Spilothyrus lavaterae* Esp. of a very small form. *Hesperia comma* L. was well to the fore and we also took *Argynnis niobe* L., but probably the most interesting capture was an example of the small Burnet, *Zygaena contaminei* Bdv., a very local species confined to the Pyrenees and Northern Spain.

The next morning we further explored up the Gave d'Ossoue motoring up the very narrow and steep road to the upper pastures which had been very heavily grazed and it was only when we found an unimpaired slope did we see much on the wing, mainly *Melitaea didyma* Esp., *M. parthenie* Borkh. and some much fresher *E. manto* Esp. as well as the first *Turanana baton* Bgstr. A heavy thunderstorm cut short our collecting for the rest of that day and a dull morning broke on the 7th when we set out once more by car down the valley past Luz and then up to Cauterets which I had last visited in 1949. But it was still very wet and misty when we drove up the tortuous road to the Pont d'Espagne at some 1500 ft. above the town where a huge car park now exists and also a téléférique to take the hundreds of tourists up to the famous Lac de Gaube at just over 5000 ft. But we elected to ascend to this beauty spot by foot up the steep path through the pinewoods, taking nearly an hour, but fortunately when we did reach the lake, the clouds parted, though not enough to see the great Pic du Vignemale towering above it. However, for a short time butterflies began to appear, especially *Parnassius apollo* L., *Issoria lathonia* L., *Adopaea lineola* Ochs. and *Erebia neleus murina* Rev. We motored back to Gavarnie late that evening and next day at an early hour Russell Bretherton and I set out on foot towards the Cirque, then up a winding path to the west till we came out on an open plateau, very bare of herbage due to grazing. A most surprising capture in this barren area were two examples of *Thecla spini* W.V. with a large orange patch on the forewing similar to the Spanish form. *Pontia callidice* Esp. was also flying at this altitude, but we soon came on some rough hillsides where Erebias were in plenty, mainly *E. gorgone* Bdv. with a few *E. manto* Esp. We then ascended to the Port d'Espagne at some 7000 ft. where there is only a large stone to mark the Spanish frontier. At this point, on a

stretch of very steep scree, *E. lefebvrei* Scop. was flying in plenty, though as usual very difficult to net and with many somewhat worn. We returned in dull weather by a long and winding route over much grazed ground till we almost reached the Gave d'Ossoue near which by a torrent we came on a rough patch where numbers of butterflies were resting, mainly *Plebeius argus* L. with a good many *E. manto* Esp., while clumps of figwort were smothered with larvae of a *Cucullia* which may prove to be *C. scrophulariae* Cap., but a disappointment was the absence of *Polyommatus pyrenaica* Bdv. which had been reported from that region. It was probably already over.

The morning of 10th August we once more set out down the valley to Luz, then up the big motor road through Barèges, to the very steep ascent to the summit of the Col de Tourmalet at 7250 ft., well above the clouds, but only a few *Erebia epiphron* Knoch. and *E. meolans* Schweiz. were flying at this level. However in the afternoon we walked up the toll road leading to the Observatory on top of the Pic du Midi at 9000 ft. The south-facing slopes were bathed in sunshine with the screes abounding with *Erebia lefebvrei* Scop. which were flitting up near the edge of the road, but most of them kept tantalisingly out of reach of the net, though a few which ventured across the road were captured. They were accompanied by a good many of the black geometer *Gnophos septaria* Guen. Russell Bretherton who ascended to the Observatory came across a small colony of the very local Burnet *Zygaena anthyllidis* Bdv. which only occurs just beneath the summits of the highest Pyrenean peaks. But when we returned to the Col the clouds had descended making the drive down very slow and quite hazardous.

Unfortunately the Brethertons had to start back to England early on the 10th which proved to be the finest day of our stay. I once more set out on foot for the Cirque where butterflies were even more plentiful than on our previous visit a week earlier. *Boloria pales* L. was skimming everywhere over the slopes, while the scree harboured many more Erebias, particularly *E. gorgone* Bdv. including several females. When I surveyed the rough ground below the high waterfall *E. lefebvrei* Scop. was in numbers and mostly in much better condition than those seen in other parts, in fact there seemed a fresh emergence of this insect which I found quite easy to catch on a patch of ground covered with a brightly-coloured anemone to which they were attracted. Among them I was surprised to take a solitary female *E. evias* Godt. *E. neleus* Warren was also extremely plentiful. It was altogether an ideal day for collecting and seeing the full scale of insects on the wing. I spent my last day, the 11th, up the Gave d'Ossoue where most of the species I had previously observed were flying in increased numbers, especially *Hipparchia alcyone* W.V. An unexpected visitor to this area was *Limenitis rivularis*, not usually seen at these altitudes. This insect brought the total to just 60 species of butterflies noted in this Gavarnie region and its vicinity in the ten days of our visit.

I set out from Gavarnie at an early hour by bus on the 12th for Lourdes where I caught a through express via Toulouse and Narbonne to Marseilles and thence, after a short wait, I travelled north again to St Auban and on to Digne which I reached about 10 p.m. after a journey of some 450 miles. My headquarters was the spacious Hotel Mistre in the main street of this very pleasant and comparatively large town situated on the

River Bléonne. Mr. Stoughton Harris, who had spent a profitable week's collecting there in June 1963, had told me of some of the best localities for lepidoptera, as also had Col. H. Bridges who was there in 1962. I was soon to appreciate the wealth of this region when I set out on foot the next morning in brilliant sunshine to some wooded slopes on the outskirts of the town just to the north. The feature of these famous surroundings in this late part of the season is the abundance of the large Satyrids which were my chief quest. In a flowery clearing I met them in force. The scabious heads were well patronised by both sexes of *Hipparchia actaea* Fab., the males a superb glossy black. They were accompanied by a few *H. cordula* Fab. which could be readily distinguished by their more rounded forewings, while huge females of *H. circe* Fab. were to be flushed almost at every step in the long grass. *H. arethusa* W.V. was just starting to appear as also was *H. statilinus* Hbn., though only the males. This favoured spot seemed to attract all the butterflies of the region. *Lysandra coridon* Poda was swarming together with a good proportion of *L. bellargus* Rott. The hedges were alive with *Maniola tithonus* L. and *Melanargia galatea* L. and among others of the 27 kinds of butterflies I saw that first morning were several *Gonepteryx cleopatra* L., many *Colias australis* Verity, *C. croceus* Fourc., and *Papilio podalirius* L., also *P. machaon* L., *Argynnis cydippe* L., *M. cinxia* L., *M. didyma* Esp. and a single female *Pieris manni* Meyer. As is often usual in such mountainous parts, a thunderstorm in the afternoon precluded further collecting for the day, but when I revisited this rich spot the following morning besides the species already mentioned I was able to add *Melitaea phoebe* Knoch, *Polyommatus escheri* Hbn., *Argynnis aglaia* L., *Hesperia comma* L. and a large speckled Skipper which turned out to be *Pyrgus foulquieri* Oberthür.

On 15th August I set out on foot up one of the valleys towards the south-east of Digne to cover the 3½ miles to the Thermal Hotel situated under a rocky cliff in a small gorge. The whole river is lined with thick scrub, mainly sallows, poplars and sea buckthorn, but it soon clouded over so that very little was seen on the wing en route. However, it cleared sufficiently near the hotel for me to see quite a number of species flying in a small meadow by the river. These included *Argynnis daphne* W.V., *A. dia* L., *A. paphia* L. and *Agrodiaetus damon* W.V., all somewhat past their best, as well as *Limenitis rivularis* near the hotel, while a very dark form of *Melanargia galatea* L. was in abundance. On the outskirts of Digne on the way home I came across some long grass smothered with Blues at rest, the most interesting of which was *Plebeius idas* with large females flushed with blue of the form *calliopis* which feeds exclusively on the *rhamnoides* and may well be a separate species. *Hipparchia dryas* Scop. was flying on this ground with several males still in good order. The next morning I once more paid my usual visits to the wooded slopes where *Hipparchia arethusa* W.V. and *H. statilinus* Fab. were much more numerous. In the afternoon I got a lift up the five miles of winding road to the foot of the long and steep escarpment of the Dourbes at 4500 ft. Here a grassy plateau was alive with butterflies, mainly *Lysandra coridon* Poda swarming together with numbers of *Colias australis* Verity. I walked the three miles downhill collecting all the way. Round some bushes I saw some large Satyrids flying which turned out to be *Hipparchia hermione* L. and a single *H. fidia* L. In another stretch

where the ground is very much eroded into bare channels, there were a few *Maniola lycaon* Rott. and *Coenonympha dorus* Esp. Lower down I took several *Leptidea* which turned out to be both *L. sinapis* L. and *L. duponcheli* Staud. which are not readily distinguishable in their summer broods except by their respective antennae, since *L. duponcheli* lacks the white fleck on the underside so prominent in *L. sinapis* L. August 17th proved a thoroughly wet day which made any collecting impossible, but on the 18th the sun was out again in all its strength. I paid another afternoon to the Dourbes by taxi, going somewhat higher than before. In a lavender field in full bloom butterflies were again in plenty, in particular *Papilio podalirius* L. and *P. machaon* L. While waiting for the taxi to pick me up at the lower level after walking down again, I happened to spot two full-fed larvae of *P. podalirius* L. on a small plum tree. But there was no sign of *Erebia neoridas* Bdv. reported from this region. My last morning at Digne on 19th August was very fine and warm and I put it once more to good use in the usual clearing on the outskirts when the big Satyrids were at their height in this spot. I saw no less than nine species all flying together. In addition to those already mentioned from this locality, I saw *Hipparchia dryas* Scop., *H. hermione* L., *H. fidia* L. and *H. briseis* L., also *Issoria lathonia* L. and *Thecla spini* W.V. Burnets, too, were common in this area. They have been identified by Mr. W. Tremewan of the British Museum (Natural History) as mainly *Zygaena fausta apocrypha* Le Charles and *Z. occitanica arida* Dujardin. *Callimorpha hera* L. was abundant on flowers, while *Eilema caniola* Hbn. was very numerous at rest on buildings. I had noted a total of 55 species of butterflies during my week at Digne.

I left that afternoon by train over the very picturesque mountain route via Veynes to Grenoble and on to Paris and London the next day, thus ending a very pleasant and profitable three weeks in these two delightful regions of France.

Three Oaks, Woking. 24.xi.63.

Notes on the Microlepidoptera

by H. C. Huggins, F.R.E.S.

Heterographis oblitella Zell. On September 18th, 1963, my son took his wife and myself to Tollesbury on the Blackwater estuary. When we had walked along the sea wall for over a mile we noticed a large number of Crambids in the grass. The great majority of these proved to be late, worn specimens of *Crambus tristellus* Fabr., but amongst these I saw a different smaller insect, which on capture proved to be a slightly worn male of the light form of *H. oblitella*. On our return I flushed another of what appeared to be the same species, but unfortunately it flew out over the mud to a clump of *Aster tripolium*, and as I was wearing light shoes, I could not follow it.

I have not as yet heard of any other captures this year and Mr. A. J. Dewick, whose trap is only half-a-dozen miles away from Tollesbury as the crow flies, has seen none.

It is curious how this moth always turns up within a few miles of the sea. So far as I can recollect, the only inland records are those of Captain Marsh in the Canterbury district, and that of Mr. Fairclough in mid-Surrey.

Crambus margaritellus Hübn. With reference to Mr. Kennard's note on this moth (antea: 260) I suspect it would be found to be more widely distributed in Devon if looked for. I spotted a single specimen in Tuke's collection, taken at light, and my wife and I then worked the two or three boggy meadows on his estate until we found it; it was quite common in a wet meadow, which meadow also contained Tuke's private colony of *Euphydryas aurinia* Rott., of which no one was allowed to take more than four.

Margaritellus was easily disturbed in the sunlight, and some of the females were very tiny and whitish. All my Honiton specimens are smaller and duller than those I have from Cannock Chase, which are decidedly redder, and two specimens, not of my own taking, labelled "Perth" are still larger and redder.

The reference to Devon in Beirne is due to me, not a mere repetition of Meyrick; as it says in the preface, I read the book in typescript and made additions, and Dr. Beirne also called on me and saw my collection before going to Canada.

Anthophila pariana Clerck Early in October I saw two specimens of this pretty and variable little moth on the window here, attracted by the light.

I had not seen it locally for some years, though as an apple feeder, it is more likely to appear in gardens and small orchards to-day than elsewhere. When I lived near Sittingbourne I used to find it in great numbers by scratching the thatch of a barn near the bottom of my garden. I was then living in a cottage surrounded by orchards, which explains the abundance of *pariana*, which used to retire to the thatch directly the nights turned cold.

I doubt whether it could be so easily obtained to-day, I could easily see fifty in half-an-hour then, as barns to-day are usually roofed with corrugated iron or asbestos. I am also afraid that modern intensive washing will have greatly reduced its numbers.

The larva, which feeds on apple leaves, is not very easy to find, but L. T. Ford, W. G Sheldon and myself all bred it in small numbers.

I wonder whether *Laspeyresia prunivorana* Rag., of which I took two specimens in 1922, just before leaving the house, is still there, or *Tortrix diversana* Hübn. which was abundant in an old orchard near? I expect that modern "improvements" have put paid to both.

Cucullia absinthii L. Moves North.—Another example of the rapid way this species is extending its range comes from Yorkshire. A couple of years ago larvae were taken at Leeds and shown at the Y.N.U. meeting. This autumn I took a number of larvae from the foodplant near Broughbridge. The foodplant flourishes on the ground laid bare by the construction of new roads, in this case the recently opened Broughbridge bypass on the A1 road.

The chamomile daisy growing on the same ground has proved a good pasture for the closely related *Cucullia chamomillae* Schiff.

It will be interesting to see how long it will take *C. absinthii* to reach Tees-Side, where its foodplant is very abundant and towards which disused railway lines may well provide a route along which to spread.—C. I. Rutherford, 24 Oakdale, Harrogate, Yorks. 8.xii.1963.

Dingle 1963

By H. C. Huggins, F.R.E.S.

As I have already mentioned (antea 219) I decided to join forces with Mr. E. S. A. Baynes at Dingle in 1963 to go further into the distribution of *Platyptilia calodactyla* Hübn. of which my wife had taken the first authenticated Irish specimen in 1962. I also wished to try for some more of the coastal species, whose erratic coloration as regards melanism has occupied my mind for some time, so I proposed a month's stay. Incidentally, I like the place for a holiday also, and my wife loved it.

When we arrived on June 26th, the general topic of conversation was a basking shark which had become entangled in a trawler's nets and was lying on the shore by the pier. It was said to have done over £100 worth of damage to the nets and was 27 feet long and stated to weigh two tons. Whether this was the case or not I cannot say, but it was, at any rate, like Mr. Jingle's mythical luggage, "Heavy, damned heavy". Several attempts were made to sell it for fish meal, for which purpose the large skates, often weighing over 150 pounds are sold, but it proved too unwieldy for the lorry that came to collect it. After five days, it began to "hum" a little, and to avoid causing a nuisance, the fishermen had to tow it out of the harbour to sea. I do not know whether its remains washed up anywhere else, it may possibly have arrived in a mutilated condition like the celebrated Oronsay monster to add to the sea serpent legend.

The winter had been very hard at Dingle as elsewhere, and the harbour had been frozen over for the first time in human memory. The fuchsias, excepting in very sheltered places, had been cut to within a few feet of the ground, but on the other hand *Silene maritima,* which of late years has been quite rare, and usually unapproachable, had very greatly increased in the whole Slea Head area.

The local birds had altered their status in several cases. Shortly after our arrival, my old friend Sylvester Nolan introduced us to Mr. Frank King, the well-known Irish ornithologist, who has recently opened a practice at Dingle. Mr. King accompanied me on the one day the weather was fit for a trip to Inishvickilaun, and I was able to check what I saw of the birds by his much greater knowledge.

The first thing I noticed was that the stonechat, usually common, had entirely disappeared; whilst Mr. Baynes was with us we covered most of the peninsula, and did not see one. It is to be hoped that it still survives in a few sheltered places and will re-colonise, as the Kerry stonechat is said to be of the Hebridean subspecies. The chough on the contrary, was more numerous than ever. On the last day of my stay, my son took me in a car for a last run round, and near Sybil Head we saw a flock of over forty. To make certain, we stalked them behind some rocks and got within fifteen yards, and he filmed the last four or five as they rose.

The puffins were also much commoner. In 1961 they were very common on Inishvickilaun; in 1962 there was not more than one tenth of their previous number, but in 1963 they were more numerous than ever. There appeared, so far as I could tell, to be more storm petrels there also. When I was rattling the rocks for *Euphyia bilineata* ssp. *isolata* Kane I heard far more protesting in their nesting holes than ever before. The noise is usually described as purring, but to my mind it is more like a cat with asthma, of which I knew a good example on Tresco.

One last thing I should mention before reaching the lepidoptera (get forrard Ego, get forrard!) and that is that certain northern birds remained behind. There was an immature glaucous gull in the harbour which Mr. King tells me is still there, and he pointed out a bridled guillemot on our Blasket trip. He also told me he had seen a dark fulmar, which is again, an arctic race.

As mentioned, the weather was only once safe to make the trip to Inishvickilaun, but on that day it was good. As usual, I took two nets, and got a friend to use one. We saw in all, eight *bilineata* ssp. *isolata*, unfortunately all males, and succeeded in obtaining five. Of these, Mr. King caught one, and when he surrendered the spare net as he was digging out a storm petrel's burrow to check its identity (incidentally, it contained a bird, an egg and a rabbit!) Mr. Bernard Goggin, a young local botanist, took it up and succeeded in getting another. This moth is disappointing; when first caught it has a fine jetty sheen, but after a year this disappears as I have seen in my 1962 specimens, and I fear they will soon be brown-black like Kane's Tearaght ones.

I also took a number of larvae of *Eupithecia venosata* Fabr. ssp. *plumbea* Huggins which I originally described from Inishvickilaun specimens. I am pleased to say that the three pupae from 1962 larvae all produced *plumbea*, which is evidently the only form on the island and a good subspecies. As I do not think that any have yet been shown, I might mention that *plumbea* is nearly black, much darker compared with ssp. *fumosae* Gregson than *fumosae* is compared with the type.

Mr. Baynes and I, in 1963, at last, succeeded in getting some *venosata* larvae from the coast of the mainland. These have been isolated, and it will be interesting to see whether they too produce *plumbea* or the smoky form taken by Donovan on the Cork coast. There appears to be no consistency about these coastal insects. *Hadena caesia* Bork. and *H. lepida* ssp. *capsophila* Dup. are identical from the west Cork and Kerry cliffs and the Blaskets, whereas mainland *bilineata* vary enormously from cliff to cliff and *isolata* seems to be confined to Inishvickilaun and Tearaght, where it possibly survives; on either rock it is the sole form.

My list of captures of any general interest is as follows:—

Notodonta ziczac L. Amongst the numerous specimens that came to light were two very thinly scaled dilute specimens, new to me.

Eilema complana L. A footman larva found just above sea level on the cliffs at Slea Head was carefully reared but proved to be only a typical specimen of this species.

Cryphia muralis Först. I worked this moth more than any other and got three more each of ab. *nigra* Huggins and the similar aberration in which the ground is greenish black. I also took a most interesting light buff insect, but unfortunately it knocked itself to pieces on the way home. I have now, in all, seen about 70 Dingle *muralis* (the result of about 30 days' searching) and can confidently say that the typical form is not found there.

Agrotis trux Hübn. and *Ammagrotis lucernea* L. Both these come some distance inland; I took them at light in the hotel garden.

Mamestra brassicae L. There were several specimens of a very small form, no larger than *Euxoa tritici* L. in the trap. As I was busy with setting, I left them, until one morning Mr. Alan Wheeler, who was looking at my catch, thought they were odd, so we took one each. After

that I only saw bad specimens; the one I kept I am sure is only *brassicae* although of a more buff tint than usual, but I have kept one of the poor ones to be dissected in due course.

Hadena caesia Borkh. I have now bred this from Slea Head, the Blaskets, and Adrigole, Co. Cork, and they are all alike, the so-called black form. I have also bred a couple of this form amongst a long series bred from the Burren.

Hadena conspersa Esp. For the first time I took several of this insect, mostly bad, but a perfect one was just like one from Kent.

Petilampa minima Haw. Several in a trap set at Milltown, just outside Dingle. Donovan has no records for the south of Ireland except Cappagh, Co. Waterford.

Plusia bractea Fab. I saw over thirty on this trip; the ground colour varied from orange brown to blackish brown as in *Diarsia brunnea* Fab. and the spangle varied greatly in size.

Zanclognatha tarsipennalis Treits. Amongst numerous specimens I saw several of a yellowish clay colour in tint like *Paracolax derivalis* Hübn. These were new to me.

Perizoma blandiata Schiff. I netted one at Dunquin, so it is well distributed in Kerry.

Eupithecia pulchellata Steph. All seen were ssp. *hebridium* Sheldon, evidently the only Kerry form.

Eupithecia fraxinata Crewe. One in the trap, the same small size as the ash ones I occasionally take in my garden.

Lomaspilis marginata L. I took another like the one last year, with the black replaced by a pale rust-red.

Ellopia fasciaria L. Three in the trap. I could find no pine in the town, and Mr. King tells me the nearest is on the former Ventry estate, two miles as the crow flies, and most of the way over the water.

Eudoria resinea Haw. Several in the trap, rather large, and black and white.

Scoparia basistrigalis Knaggs. One only, the first I have seen at Dingle.

Teichobia filicivora Meyrick in Devon

By S. Wakely

On the 11th September 1963 Mr. T. R. Eagles kindly gave me a Tineid moth which had just emerged and a tin containing some fern leaves on which the larvae had fed. Among the debris at the bottom of the tin were three cocoons, one of which showed the extruded pupa-case of the moth which he had given me. Two other moths emerged on the 16th September from the remaining cocoons, and the species was recognised as *Teichobia filicivora* Meyr.

Mr. Eagles said he found the larvae near Clovelly, North Devon, and that the name of the fern was *Polystichum setiferum* (Forsk.) Woynar (soft-shield fern), quite a local species of fern but common in Devon. As this was the first record of the occurrence of this moth in Devon I thought it should be recorded.

T. filicivora was first described in 1937 by Mr. E. Meyrick as a species new to science under the name *Mnesipatris filicivora* from specimens taken near Dublin by Dr. Bryan Beirne. They were found flying round a bed of the male fern (*Dryopteris filis-mas*) in mid-May and were reported as being quite common. To quote Meyrick: "The larvae feed in June and July on sporagia and fronds of *D. filis-mas*, living under a mass of excrement held together by silk, which makes them easily discovered".

On examining lepidoptera collections in the National Museum, Dublin, more specimens were found which had remained unidentified until Meyrick's determination. Some of the data labels on these went back to 1909 (*Entom.*, **70**: 194-6).

In 1940, Mr. S. C. S. Brown discovered the species to be well established in his garden at Bournemouth, Hants. This was the first record for Britain, and they were seen in numbers flying around clumps of male fern (*Entom. Record*, **52**: 105).

In a recent letter to me Mr. Brown mentioned the fact that it has also been taken in Dorset, where Mr. Parkinson Curtis found the moth flying over ferns at Poole.

In 1960 Mr. L. Price sent me a specimen for identification which he had taken at light in his garden at Stroud, Gloucestershire. He had another which had been taken in 1955 but which had not been previously identified—also taken in his garden.

In the same year Dr. E. Scott reported finding larvae common on the male fern in gardens at Ashford, Kent (*Ent. Rec.*, **73**: 95).

The Devon imagines emerged in September but this could be due to the fact that the tin in which the larvae had pupated had been kept indoors.

I might mention that a few years ago Mr. Brown sent me a parcel containing soil collected round the ferns growing in his garden at Bournemouth. This was placed in a large flower pot and a nice series of the moth emerged a few weeks later during May.

It will be gathered from the foregoing that *T. filicivora* is now known to occur in Hampshire, Dorset, Gloucestershire, Kent and Devon, as well as in Ireland. No doubt by examining the undersides of the leaves of the male fern in July it would be found to have an even wider distribution. The characteristic little round bunches of frass held together by silk are quite conspicuous and could not be missed.

The moth is quite small with a wing expanse of 10 to 11 mm., and is dark fuscous-purple in colour with small whitish tornal spot. It is unknown in any other part of the world.

26 Finsen Road, Camberwell, S.E.5.

Late Emergence of Apatele tridens Schiff.—In June of this year Mr. H. Symes kindly gave me a few pupae of the Dark Dagger. These pupae were part of a brood which was being cared for by Mr. Symes owing to the indisposition of the Rev. Carr. As a postscript to the observations made by Mr. Symes I should like to add that the last of the pupae he gave to me emerged as late as 18th October. The total emergence period, therefore, for this particular brood, extended over a period of 37 weeks.—M. J. Leech, The Cottage, Hallgates, Cropston, Leicestershire. 28.xi.1963.

Cucullia absinthii L., etc., in a London Garden

S. WAKELY

For some years now I have grown a few plants of *Artemisia absinthium* in my garden at Camberwell, and an occasional specimen of *Cucullia absinthii* L. has turned up in the moth trap. My earliest records of this species date back to 1953, when I found a larva of *absinthii* in the garden and bred the moth in July, 1954. At this time odd *absinthii* were being reported from time to time at various districts in London. A few years later, larvae were found feeding on *A. vulgaris* at West Norwood, a mile or two from Camberwell.

This year (1963) I had some extra large plants of *absinthium* flourishing in my small garden, and on 12th August I found half-a-dozen *absinthii* larvae feeding on the flowers. This was after dark when the larvae come up to feed. Almost every evening after that date I searched the plants and took all the larvae seen, as several friends had said they would like to rear this local species. It was surprising to find as many as 10 or 12 one night—all that were visible with the aid of a torch—and yet the next night there would be about the same number taken.

Towards the end of the month I was taking only 1 or 2 a night—sometimes none at all. Some of the earlier larvae had spun up by this time, but by the beginning of September smaller larvae began to appear with the larger ones. They all fed up rapidly and the last date on which a larva was found was 28th September, by which time there were very few flowers left, only the dry seedheads. My total bag up to then was 120—an amazingly large number for such a small garden in London.

Some of the larvae sent to friends lived only a few days and apparently did not take to *A. vulgaris* which was offered to them. I found myself that the larvae fed in a peculiar manner. They were kept in transparent plastic boxes—6½ in. by 4½ in. by 2 in. The foodplant was placed on Kleenex tissue paper, and as many as a dozen or more larvae were often in one box, which was thoroughly cleaned out each day and fresh tissue used. The larvae ignored the leaves, the flowers only being eaten, chiefly at night. Judging by the way the flowers were shredded to pieces nightly leaving a mass of powdered fragments, it appeared to me that only special portions of the flowers were eaten, probably the juicy base of the petals. Giving the larvae fresh food daily, they fed up at a terrific rate and even the smallest ones were full-fed in about a fortnight. They spun up in a cocoon made of silk mixed with a quantity of the powdered material from their feeding habit. If placed in another container with earth or peat they spun a similar cocoon mixed with the material available.

I think that fresh food given daily is the secret of being successful when trying to rear this species, and in my opinion freshly picked food given daily would help in rearing many other species reputed to be difficult. Of course, this is not always practicable, but it is a point to be kept in mind. I also find that tissue paper in the container is as important as having the right food. It probably takes the place of dry grass, etc., on which the larvae often rest in the wild when not feeding. Of course this tissue absorbs a certain amount of moisture and should be changed when required—often daily. Juicy foodplants require more frequent tissue-changing than dryer ones.

When searching the *absinthium* after dark, a number of other species of lepidoptera were seen, all actually feeding on this strong-smelling plant. Among those recognised were: *Melanchra persicariae* L. (which seemed to me to be particularly common on many plants this autumn), *Scotogramma trifolii* Hufn., *Caradrina clavipalpis* Scop., *Euplexia lucipara* L., *Plusia gamma* L., *Eurrhypara hortulata* L. and *Cacoecimorpha pronubana* Hb.

There is a small bush of Dutch honeysuckle in the garden and in the previous year, larvae of *Ypsolophus xylostellus* L. were common in spun leaves. This year (1963) the spinnings looked different and contained the larvae of *Epithectis mouffetella* Schiff., and I was pleased to breed a small series of the moth from these in mid-June.

Owing to the fact that I use my light trap only at week-ends and then only when the weather looks favourable, few species were taken at light. However, as usual, there were several surprise visitors. On 2nd August a finely marked light grey and nearly black tortrix appeared which puzzled me. Fortunately, the next night a typical *Zeiraphera diniana* Guen. turned up, and I realised that the previous one was a fine variety of the same species, not previously seen by me in the garden.

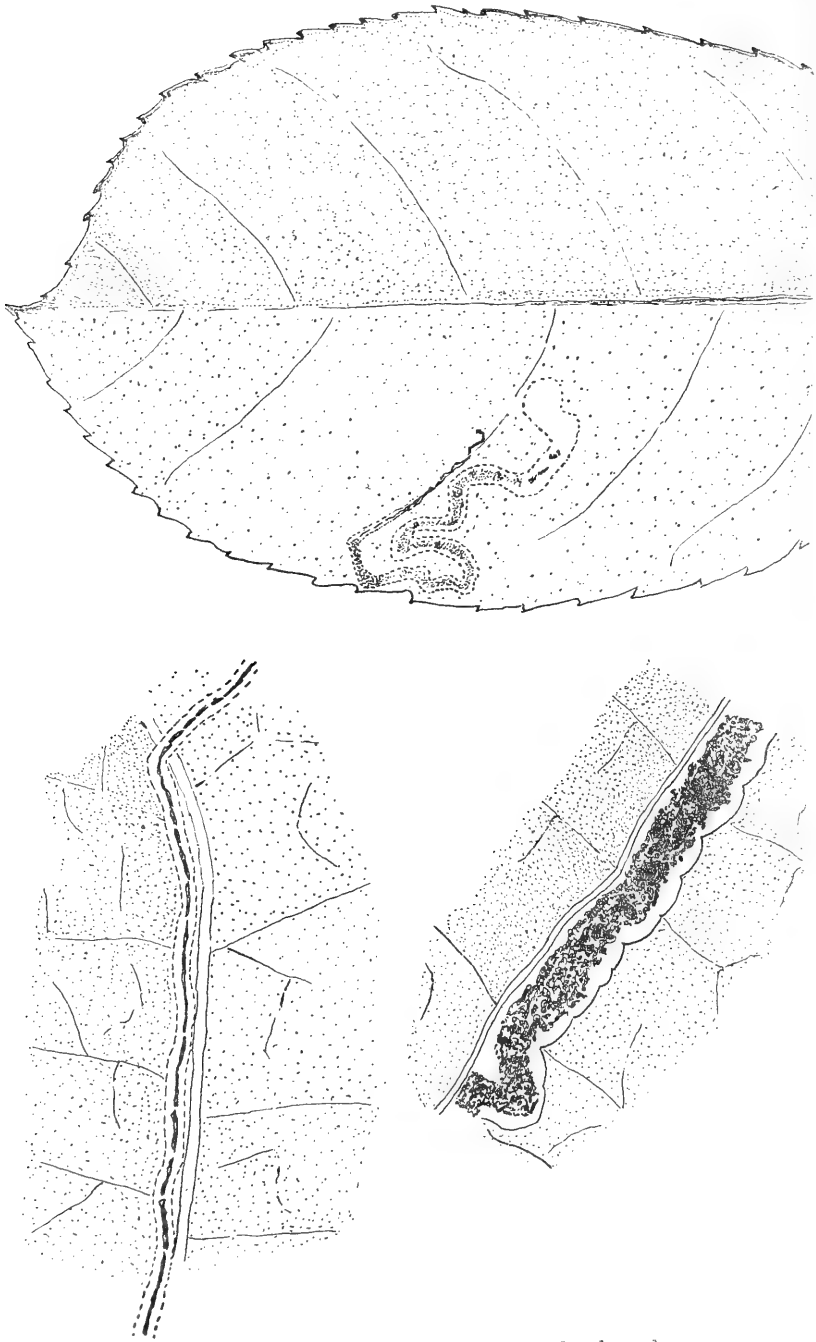
Other species of note, considering the district, were *Drepana binaria* Hufn., *Phalonia rubigana* Treits., *Blastobasis lignea* Wals. and *Borkhausenia unitella* Hübn.

26 Finsen Road, Camberwell, S.E.5.

Stigmella aëneella (Hein.)—A Species New to Britain

By S. C. S. Brown

In September 1953 I found at Parley, Dorset, an empty Nepticulid mine on *Sorbus*. As the mine was unfamiliar to me I sent it to Prof. Hering of Berlin. He identified it as *Stigmella aëneella* (Hein. 1862) a species new to Britain. In the autumn of 1961 and again in 1962 I found similar mines, containing green larvae, commonly on apple in my garden in Bournemouth. I sent some of these mines to Mr. Carolsfeld-Krausé of Denmark, who determined them as belonging to *aëneella*. It is probable that this species has long been an inhabitant of this country, for Wood in 1893 gave the foodplant of *oxycanthella* (Stt.) as apple, pear and hawthorn. Mr. Krausé informs me that on the continent *aëneella* is only found on *Malus* and is single-brooded, the larvae being found in September and October. *Oxycanthella* on the other hand is not found on *Malus* and is double-brooded. Recently I had the opportunity of examining the collection of Nepticulid mines made by Prof. Waters which is in the Hope Department, University Museum, Oxford. Under *oxycanthella* I found several mines on *Malus* from the Oxford district which would thus be referable to *aëneella*. The ova are laid singly on the underside of a leaf, frequently on the edge. In the commencement the mine follows the edge of the leaf or runs along a vein. At this stage the frass is black and threadlike and does not fill the gallery. The mine then abruptly widens and becomes serpentine. The frass is now dark brown, abundant, and nearly fills the gallery. Finally, a small blotch is formed. I am indebted to Prof. E. M. Hering and Mr. Carolsfeld-Krausé for their assistance in the determination.



Stigmella aëneella Hein. Mine. ×2 and enlarged.

REFERENCES

Wood, John H. 1893. *Notes on the earlier stages of the Nepticulae. Ent. Mo. Mag. XXIX* 199 and sub.

Hering, Prof. E. M. 1957. *Blattminen von Europa.*
Band II *662 31 3176*
Band III *Tafel 47 408C (Figure of mine)*

Early Emergence of Poecilocampa populi L.—It is, I think, worth recording that whilst working for *Tiliacea citrago* L. on 29th September near the village of King's Cliffe, Northamptonshire, a single male specimen of *P. populi* flew into m.v. light. Early November is, in the Midlands, the normal time of emergence of this insect.—M. J. Leech, The Cottage, Hallgates, Cropston, Leicestershire. 28.xi.1963.

More New Forest M.V. Records

By L. W. Siggs

When I reported (*Ent. Rec.*, **75**: 119-122) that during 1962 I took 30 species in my m.v. trap which I had not previously taken in Minstead, I was tempted to add that I could hardly expect to have any appreciable number of new records in future years. However, in 1963 I took 22 species not previously recorded. They were:—

C. curtula L.
A. prasina Fabr. (2)
O. populeti Fabr.
C. leucostigma Hübn.
M. alpium Osbeck.
C. asteris Schiff. (2)
S. costaestrigalis Steph.
C. pendularia Clerck. (2)
M. albicillata L.
P. flavofasciata Thunb.
E. picata Hübn.
H. reticulata Vill.
E. subnotata Hübn.
E. venosata Fabr.
E. assimilata Doubl.
E. succenturiata L.
D. ribeata Clerck
E. consonaria Hübn.
G. obscurata Schiff.
S. brunnearia Vill. (3)
I. wauaria L.
P. strigillaria Hübn.

The total number of species recorded in 1963 was 357 as compared with 320 in 1962. In view of the poor weather, and particularly the lack of warm nights, this is remarkable. Moreover, 20 of the 30 new species recorded in 1962 turned up again, some in increased numbers.

The total number of specimens taken fell considerably, as the following figures show:—

	1962			1963		
	No. of nights	Total catch	Average	No. of nights	Total catch	Average
Mar.	7	159	23	15	286	19
April	27	2779	103	26	3657	141
May	26	934	36	26	760	29
June	28	4177	149	28	5420	194
July	29	12342	457	25	6850	274
Aug.	28	8516	304	29	5188	179
Sept.	8	2475	309	22	3339	152
Oct.	10	1059	106	23	1184	51
Nov.	13	537	41	17	394	23
Total	176	32978	187	211	27078	128

Such a fall in specimens coupled with an increase in species seems odd, but I find that there was a considerable drop in the numbers of some "abundant" species, as the following examples of reduction in numbers from 1962 to 1963 will show:—

	1962	1963		1962	1963
A. exclamationis L.	7244	2274	*N. pronuba* L.	4168	981
L. varia Vill.	872	577	*P. meticulosa* L.	214	48
D. rubi View.	731	331	*L. pallens* L.	384	167
O. plecta L.	822	365	*A. monoglypha* Hufn.	1374	678
A. xanthographa Fabr.	357	215	*A. secalis* L.	1424	551

I have been pleased with the results of the past two "poor" seasons, and wonder what would happen if only we had a "good" one.

I was most interested in the list of New Forest lepidoptera given by Mr. C. M. R. Pitman (*Ent. Rec.*, **75**: 187-199), especially as the only other list I have seen is that by "Mr. Baker revised by F. Bond, Esq., F.Z.S." in the 5th edition of "The New Forest" by John R. Wise, 1895.

To avoid the repetition involved in listing all the species I have recorded, I will indicate those taken by Mr. Pitman which have not yet appeared in my trap.

Mr. Pitman's list contains the following day-flying moths which I would not expect in the trap:—*H. fuciformis, H. tityus, Z. trifolii, Z. lonicerae, Z. filipendulae, P. statices, A. myrtilli, P. tenebrata, E. mi, E. glyphica, R. hastata, P. macularia.*

I was surprised to see the following chalk insects recorded as I know of no chalk or limestone in the New Forest. Could Mr. Pitman have taken them *en route* from Salisbury? *A. sublustris, E. rubidata, M. procellata, M. virgata, E. rivata, E. galiata, H. vitalbata, H. tersata.*

The others which I have not recorded are:—*C. livornica, H. bifida, P. plumigera, T. or, T. crategi, E. lanestris, N. mundana, C. senex, P. plantaginis, A. avellana, H. asella, S. apiformis, A. flaviventris, A. vespiformis, A. culiciformis, A. sphegiformis, H. hecta, H. fusconebulosa, C. augur, A. agathina, A. ditrapezium, A. stigmatica, E. orbona, H. suasa, H. lepida, C. graminis, L. straminea, M. turca, D. oo, A. affinis, Z. retusa, Z. subtusa, X. exsoleta, E. adusta, I. croceago, T. citrago, C. sponsa, U. triplasia* L., *A. luctuosa, H. rostralis, H. barbalis, H. immaculata, C. annulata, S. imitaria, S. emutaria, S. seriata, X. quadrifasciata, P. affinata, L. suffumata, L. prunata, T. dubitata, R. cervinalis, L. halterata, O. fagata, M. murinata, H. flammeolaria, H. testaceata, E. nebulata, A. sparsata, E. haworthiata, E. goosensiata, E. satyrata, E. indigata, E. dodoneata, E. lariciata, L. adustata, A. prunaria, S. notata, A. pulveraria, E. quercinaria.*

On the other hand, I have taken the following which are not included in Mr. Pitman's list and are in addition to the 16 he mentions on page 199 of his article.

**N. cucullatella* L., *L. obsoleta* Hübn., **A. pygmina* Haw., *C. ambigua* Fabr., *A. epomidion* Haw., *A. unanimis* Hübn., **P. minima* Haw., *C. leucostigma* Hübn., **R. tenebrosa* Hübn., **C. promissa* Esp., *S. costraestrigalis* Steph., *S. sylvestraria* Hübn., *S. trigeminata* Haw., *P. albulata* Schiff., *E. picata* Hübn., *E. exiguata* Hübn., *H. tripunctaria* H.-S., *G. obscurata* Schiff. Those species marked with an asterisk, though not in Mr. Pitman's list, must, I think, have been seen by him in the Forest.

In connection with his remarks on some of the 16 which he had not recorded, I would point out that I live 11 miles from the nearest point on

the coast and, according to South *A. vestigialis, S. promutata, D. fascelina* and *C. chamomillae* are not confined to the coast. I know that *D. fascelina* has been taken in recent years in other parts of the Forest and I have taken a larva on heather near Fritham. It is interesting to see that *S. promutata, D. fascelina* and *C. chamomillae* were included in the 1895 list.

Sungate, Football Green, Minstead, Lyndhurst, Hants.

Obituary

NIGEL TYPHERLEIGH EASTON

On Friday, 6th December 1963, Nigel Typherleigh Easton of Castle Hill, Reading, passed away peacefully, and there can be few in the world of Entomology who were not in some way aquainted with him and cannot mourn his passing.

Born in Norwich on 2nd August 1902, he was educated at Oundle College, and went on to study at Faraday House in London, where he obtained his Diploma in electrical engineering.

His love of Natural History was equalled only by his deep appreciation of music, and on leaving Faraday House he combined this interest with his qualifications and entered the relatively new field of the recording industry. But his active mind and consuming energy was of the kind that never allowed him to remain still. Ever anxious to seek new fields of interest, always more absorbed with to-morrow than to-day, he cheerfully denied himself the rewards his undoubted talents could have brought him in a settled career.

By the end of the War he had worked for many of the recording companies, but the ten years prior to 1945, when he was with the B.B.C. at Daventry and later in North Wales, were to be the happiest as well as the most settled years of his life. After the War he turned to the teaching profession, taking as his subjects, English, Geography ,French, Latin, and Games. But after many changes of School he returned to Radio in 1955 and joined the firm of Herbert and Lascelles in Reading. His marriage in January of that year was not to prove a success, and five years later it was dissolved.

But as far back as 1947, after he had moved to the damper air of Reading, the first long shadow of his last illness had reached out to him, and almost imperceptably each succeeding winter began to take its toll of him. By 1960 he was forced to find a more sedentary occupation, but his age and declining health were by now against him, and he was forced to accept only temporary positions. In 1962 he took up his last employment, with the Inland Revenue at Whiteknights in Reading, a few yards from the home of his childhood, and began the final bitter struggle to keep working until the last day of his life.

Throughout his long illness his cheerful optimism and love of living never deserted him. While seriously ill in Peppards hospital, Henley, in June 1963, he was planning his summer holiday, and achieved the impossible by driving to Portland four weeks later to fulfil his plans.

His interest in Lepidoptera, first inspired by his Preparatory School Headmaster, was but the nucleus of a much wider interest that extended to nearly every corner of the field of Natural History. His magnificent private collection contains nearly every Macro known to occur in this country, as well as an interesting sample of insects brought home from his

holidays on the Continent.

Yet he was not just a collector. Indeed, for many years he took very little, and a page or two of notes after a day out would probably have meant more to him than a dead *iole*. Nothing missed his eye, and nothing was too insignificant to merit a record in his diaries. Breeding, and in particular the study of genetics, formed his main interest, and many years were spent studying the genetic variations in *P. dominula*, and his experiments on the hybrid *napi-brione* are well known.

His enthusiasm for his subject and his tireless attention to detail were infectious, and it is almost certainly a loss to Entomology that fate ordained he should leave no family.— A. R. Davey.

Notes and Observations

Hadena lepida Esp. Subspecies capsophila Dup. (The Podlover) on the East Coast.—I took a specimen of the above subspecies at mercury vapour light at Brancaster, Norfolk, on the 27th June 1959. According to "South" this moth is confined to the west of England and to Ireland.—Percy Cue, Ashford, Kent.

The 1963 Season.—After the exceptional cold and near ten weeks of snow cover of last winter, it was hoped that 1963 would be another memorable year like 1947, but this was not to be and until late October migrants were exceptionally scarce.

So far as our native lepidoptera were concerned, it was in general an excellent season here in Chiddingfold, many species appearing in the trap in record numbers. Thus well over 100 *Biston strataria* Hufn. (oak beauty) were recorded in the garden trap in one night. Throughout the season large numbers of the commoner insects came to the trap, and many of the less common ones were seen in more than ordinary profusion.

A few species were less common than usual, notably *Amathes c-nigrum* L. (setaceous Hebrew character), the second brood of which was far from common, and *Noctua xanthographa* Schf. (square-spot rustic), which was rather uncommon.

For the first time *Cucullia absinthii* L. (wormwood) was seen in this district, though not by me. Clearly its remarkable colonisation of new areas is still continuing. *Ptycholoma aeriferana* H.-S. was more abundant than ever before, but *Lozotaenioides formosana* Fröl. was unusually scarce.

It was lovely to watch *Apatura iris* L. (purple emperor) flying in and around the garden and *Limenitis camilla* L. (white admiral) also visited us.

Plusia gamma L. (silver-y) was never common, and the total of *Nomophila noctuella* Schiff. seen during the season was about a score. The first excitement in the way of migrants came after I had given up all hope of seeing any unusual ones. After returning home on the evening of 26th October from the South London Entomological and Natural History Society exhibition, 2 ♂ and 1 ♀ *Rhodometra sacraria* L. (vestal) were found in the trap; the female failed to lay.

The season ended in a real blaze of glory. On the night of 6/7th November two *Hippotion celerio* L. (silver-striped hawk), two *Nicterosea obstipata* Fab. (gem) and one *N. noctuella*, as well as nearly a dozen *P.*

gamma were in the trap. How glad I am that I did not pack up the trap in disgust early in October.—Robin M. Mere, Mill House, Chiddingfold, Surrey. 8.xii.1963.

Acherontia atropos L., Laphygma exigua Hübn., Rhodometra sacraria L. and Other Migrants in Surrey, 1963.—My light trap at Ottershaw yielded a single very worn *L. exigua* on the night of 23rd/24th July and a good female *A. atropos* on 17th/18th September; and at Bramley I had a female *R. sacraria,* from which fertile eggs were obtained on 25th/26th October. For the commoner migrant it was a very poor year. Of *Peridroma porphyrea* Schiff. and *Hapalia martialis* Guen. there were only singles, on 28th July and 10th September; of *Nomophila noctuella* Schiff. I had only three in late July and one on 23rd October; of *Agrotis ipsilon* Rott. there were 18, the first on 28th July and the last on 24th November, with four as companions to the *R. sacraria* on 25th October. *Plusia gamma* L. was recorded twice at the end of May, and fairly regularly from 10th June to 23rd November. But it was only abundant in late September, with 66 on 21st and 81 on 23rd, and the total for the year was much below average. The only migratory butterflies seen in Surrey were two or three *Vanessa atalanta* L. at Bramley in early October.—R. F. Bretherton, Folly Hill, Birtley Green, Bramley, Surrey. 8.xii.63.

Apatele leporina L. Overwintering Two Years.—On one of my visits to Bedford Purlieus, Northamptonshire, last year, two female *A. leporina* arrived at the sheet. Both were in good condition and knowing that one of my friends was short of this species I decided to keep one for ova. Approximately 80 eggs were laid during the next two nights and there was no difficulty in getting the newly hatched larvae to take to birch as their pabulum. When the larvae had developed to their second or third instar a number of them were duly passed on to the friend in need. He did well with them; they nearly all pupated and he was looking forward to a bred series during this year. On making enquiries about the emergence of the pupae in June I was most surprised to learn that he had not had a single specimen out in his breeding cages. This state of affairs continued throughout the summer. The pupae, except for one, were perfectly healthy and are now going over for a second winter. What happened to the remainder of the brood will never be known as they were liberated in another part of the country. I have reared this moth many times in the past from larvae beaten in the late summer but apart from the above account have never known it to go over for a second winter.—M. J. Leech, The Cottage, Hallgates, Cropston, Leicestershire. 28.xi.1963.

Current Literature

Catalogue des Lepidopteres de France et de Belgique, Vol. II, Fasc. VII, Microlepidoptera, Leon Lhomme. 20 francs.

At long last, after many troubles, commencing with the fall which killed Leon Lhomme, the untimely death of M. le Marchand, who took over the work from Lhomme, and the death at a ripe age of Louis le Charles, who took over from Le Marchand, and countless printing

troubles, we have the completion of this catalogue after so many years of waiting. This is thanks to the collaboration of M. J. Bourgogne and M. Pierre Viette of the Entomological department of the French Natural History Museum.

The style of the previous parts (which stopped in the middle of *Bucculatrix*) has been maintained, but certain slight alterations have been made in the systematic order, to bring it into line with recent work done. This makes the first stepping-stone since the Staudinger List of 1901 which had been the basis of European collections for so long.

We take this opportunity of thanking the two gentlemen concerned, and congratulate them on their work.—S. N. A. J.

Proceedings and Transactions of the South London Entomological and Natural History Society, 1962, 8vo., 27/6.

The scientific portion of the President's Address is entitled *Report on the insects collected by the E. W. Classey and A. E. Gardner Expedition to Madeira in December 1957,* which includes a very full account of the life history of *Sympetrum nigrifemur* (Selys) with many drawings and eight half-tone plates of the insect and its habitat. Interesting accounts of the many field meetings are followed by a paper by F. V. L. Jarvis entitled *The Genetic Relationship between Aricia agestis (Schiff.) and its ssp.* artaxerxes *(F.).* This has two half-tone plates of series of imagines to illustrate it.

Part II of The *Hemiptera-Heteroptera* of Kent, by Dr. A. M. Massee, is followed by a paper entitled *Notes on Rare Spiders and Courtship as a Clue to Relationships,* by W. S. Bristowe, with six drawings by A. Smith. Part VII of G. M. Haggett's *Larvae of the British Lepidoptera not figured by Buckler* has two coloured plates figuring larvae of *Euplagia quadripunctata* Poda, *Leucania vitellina* Hübn., *L. albipuncta* Schiff., and *L. unipuncta* Haw. The Editor mentions some changes in the accepted nomenclature and species added to the British List. We regret that two misprints occur here (p. 199) for *alnifoliella* one should read *ulmifoliella* and for *rossensis* one should read *vossensis.* Book reviews complete the volume.—S. N. A. J.

Beautiful Butterflies: illustrations by F. Prochàzka, text by J. Moucha; translated by Alice Denesovà. Spring Books Ltd., 4to., 12/6.

Ten pages of introduction give a cursory picture of the place of Lepidoptera in the world, and of the butterflies in the Lepidoptera. There follow 57 plates, illustrating 80 species, each with descriptive text on the opposite page. These plates are a joy to behold; the artist is truly a master of colour and its use; his handling of the difficult sheen of *Morpho cypris* Westwood, for instance, has to be seen to be believed. The reproduction is excellent, and although this may only be regarded as an entomological picture book, the figures are all hand done, not photographs as is the practice nowadays, and give one something really beautiful to browse over, both in the subject and its handling.—S. N. A. J.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

THE *SILVICOLA* BURGEFF GROUP OF THE GENUS *ZYGAENA* FABRICIUS (LEP., ZYGAENIDAE). W. GERALD TREMEWAN 1

FROM GAVARNIE TO DIGNE, AUGUST 1963. C. G. M. DE WORMS, M.A., Ph.D., F.R.E.S. 11

NOTES ON THE MICROLEPIDOPTERA. H. C. HUGGINS, F.R.E.S. 16

DINGLE 1963. H. C. HUGGINS, F.R.E.S. 18

TEICHOBIA FILICIVORA MEYRICK IN DEVON. S. WAKELY 20

CUCULLIA ABSINTHII L., ETC., IN A LONDON GARDEN. S. WAKELY 22

STIGMELLA AENEELLA (HEIN.)—A SPECIES NEW TO BRITAIN. S. C. S. BROWN 23

MORE NEW FOREST M.V. RECORDS. L. W. SIGGS 25

OBITUARY—NIGEL TYPHERLEIGH EASTON 27

NOTES AND OBSERVATIONS 28

CURRENT LITERATURE 29

TO OUR CONTRIBUTORS

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Looking for Micro-Psychids

By B. J. Lempke

The two volumes of South's "Moths of the British Isles" are without any doubt the best to be got at such a price. It is, however, strange that the original author did not include the Psychidae in his work in contrast with the opinion of his contemporaries on the Continent who all included them in the "Macrolepidoptera", following the well-known Catalogue of Staudinger-Rebel. This is the more strange, because South did include some families which stand much lower in the system, viz. the Cossidae and the Hepialidae.

The regrettable result of this is, that the great majority of the present English lepidopterists is not interested in Psychids. After the death of Tutt (who published an excellent monograph of the British species in vol. 2 of his British Moths in 1900), Chapman and Burrows, there is practically complete silence in the English entomological magazines on this group. There is only one exception: the article of L. T. Ford in the Proc. Trans. South London ent. nat. Hist. Soc. 1945-1946, p. 103-110, plate XI (1946). It is a very good summary of the knowledge of the British species at that moment.

For the present I should like to draw the attention of my English colleagues on two genera, which have had my special preference the last few years, viz. *Bankesia* and *Solenobia*, two genera of small but beautiful and very interesting moths. I hope that the results obtained by a few enthusiastic collectors in the Netherlands will stimulate them also to pay more attention to these insects in the British Isles.

As regards *Bankesia staintoni* Walsingham, the only species of the genus that occurs in both our countries (apart from the mysterious *B. douglasi*), the history of it in Holland is the following. The first specimen was caught in 1926, in a woody locality in the centre of the province of Gelderland. In August 1930 the late Lycklama à Nijeholt, a surgeon at Nijmegen (also in Gelderland) found a great number of caterpillars on the trunks of beeches some kilometres from that town. He fed them for some weeks on grass which they ate very eagerly and then they spun up their cases for hibernation. He overwintered them in the open and in the spring of 1931 Lycklama bred a nice series of moths which have long been the only representatives of the species in Dutch collections. In 1960 a caterpillar was found in the north of Dutch Limburg from which the moth was bred. That was our whole knowledge of *staintoni* till 1963.

In February of that year I discussed the question with my friend Mr. B. van Aartsen and asked him to look out for *staintoni* when he happened to come with his car near the locality of Lycklama. Already a few weeks later he showed me some cases which he had found on the underside of thick roots of old beeches standing along a sunken road. Beeches often have roots which project a little above the ground near the foot of the trunk. With the aid of an electric torch he discovered the cases in their dark hiding places. After comparison with cases in the collection of the Amsterdam Zoological Museum (where Lycklama's material is preserved) it was clear that they belonged to *staintoni*.

Thinking that they were old cases, I glued them on a small piece of cardboard and put them away in the drawer. A few weeks later I looked by chance in it and saw to my surprise a living female sitting on one of

the cases, the first I had ever seen in my life. Of course I informed Mr. van Aartsen. As he now knew where he had to look for the species, not on the trunks of trees, but in dark hidden places, he tried to find it not only in the neighbourhood of Nijmegen, but in every locality where he thought he might have success. Happily he is a collector with imagination. For few would have had the idea to look in the crevices of old palings or behind loose pieces of bark of fir trees. He even found them spun up on the roots of grass growing on the ridge of a sunken sandy path crossing a wood. Only in localities where the species abounds we found a few cases on the outside of the bark of a tree. In one locality Mr. van Aartsen saw a good number of males flying in the sunshine, near the foot of a beech. Very probably there were one or more virgin females in the vicinity. But notwithstanding his careful searching no trace of them or of the cases from which the males had resulted could be found. It is no doubt this hidden life which is the principal reason why so little is known about the species.

Tutt writes (l.c.: 207) that the case is made of whitish silk and is thickly covered with coarse sand. This gives the impression that the cases have a pale colour. But all cases found behind bark or in crevices were dark. Only those of the path in the wood had a sandy colour. Tutt's statement that the cases are rather soft in texture is quite correct.

Now that I knew the cases well, I saw that a few I had collected in 1962 and which I thought belonged to a *Solenobia* species also were *staintoni*. But the greatest surprise was an old case in the Museum collected in Gelderland about 1850. There was not the slightest doubt about its identity: *staintoni*. All these cases were dark, covered with grains of sand and sometimes with small pieces of moss.

Mr. van Aartsen also succeeded in breeding the species from the egg. He must still publish his account, so I only mention that the caterpillar is full fed in the autumn. It then crawls round searching for a suitable place to spin up the case. Now is the best time to look for them and to collect them! See the experience of Lycklama who found them in numbers in the second half of August, whereas Mr. van Aartsen saw dozens of them in September and the beginning of October 1963. The caterpillar pupates in the autumn and the chrysalis overwinters.

To sum up the Dutch results: before 1963 we only knew three localities for the species now we know 29! They are scattered over a considerable part of the country, but always in woody districts. As to the known distribution in England, Tutt mentioned only one locality: Southhampton Water in Hants. When Ford published his article 45 years later, it was still the only locality and I think it has remained so up till now. I need not give further comment.

And now *Solenobia*! The cases of this genus are much easier to find. As soon as the temperature has risen enough in the spring the caterpillars crawl up the trunks of trees and fasten their cases on the bark at a height varying from low down to about two metres above the ground. They look like blackish grains of corn and can best be collected by loosing them with the point of a pocket-knife and holding with the other hand a tube below them. Collect as many as possible, for only a small part, as a rule, produces moths. As the caterpillars do not live on the trees, they have no preference for any kind. But their cases are most easily found on beeches because of the smooth bark. We also found them, however, on fir

trees and I saw them in numbers in the deep crevices of the bark of oak trees, but here it was hardly possible to collect them.

April is the best month for this work. In early seasons they may appear already at the end of March and in late ones some cases are still to be found at the beginning of May, at least in the Netherlands. No nicer work on a fine spring day than searching the tree trunks in a quiet locality for *Solenobia* cases, especially when a new spot is discovered where one or more species occur!

The genus has long been very unpopular because of the great difficulties in determining the different species. It is hardly possible to arrive at a definite result only by consulting the descriptions in the handbooks. The last few years, however, great progress has been made in our knowledge through the work of some Austrian and Swiss experts. In Austria it is especially Herr L. Sieder of Klagenfurt, who makes a profound study of the numerous species occurring in the mountains of Central Europe and who could describe already many new ones. In Switzerland, Prof. Seiler made a special study of the parthenogenetic forms of some species, whereas Dr W. Sauter made the Swiss *Solenobia* species the subject of his thesis (published September 1956 in Revue Suisse de Zoologie 63: 451-550, plate I-V). I had the good fortune to come into contact both with Herr Sieder and with Dr. Sauter, and this has greatly stimulated the study of the Dutch species.

In England two species are known, viz. *Solenobia lichenella* L. and *S. inconspicuella* Stainton. But Sauter showed already that there occur at least three species in the British Isles. Ford writes that sometimes a parthenogenetic form occurs of *S. inconspicuella*, the cases of which can then be found in large numbers. But there exists no such form of *inconspicuella*! This parthenogenetic form is nothing but the true *Solenobia lichenella* L., the cases of which are as small as those of *inconspicuella*. The question is, that the British Isles are inhabited by two parthenogenetic species just like the Netherlands, which can be easily separated by their cases. If you consult the beautiful plate which accompanies Ford's article (drawn by Mr. Jacobs) you see in fig. 14 a case with sharp ridges, and which is much larger than the *insconspicuella* case and even larger than the *staintoni* case of fig. 15. This case of fig. 14 is an excellent figure of the case of the second parthenogenetic species, viz. *Solenobia triquetrella* Hübner! Sauter also wrote, that he received material of this species from Ford, who writes, that it is locally found in the southern counties of England. In the Netherlands it is known from Friesland to Limburg and from Gelderland in the east to the dune area along the North Sea, without a distinct preference for a special biotope. It is the *Solenobia* of which we know the largest number of localities in Holland. Most of them are situated in woody districts, but the species also occurred in the immediate vicinity of Amsterdam (till 1963, then the locality was destroyed) along the railway from the capital to Haarlem The caterpillars no doubt lived on the plants growing on the verges of the railway, for moss or lichens failed completely there. In the spring they crawled upwards on the concrete palings which bordered the line. In these palings were holes through which iron-wire was drawn to separate the line from the public road. The caterpillars spun up their cases in these holes. It is, however, not a universal rule for this species to pupate in such a hidden place. I have also found the cases fully exposed on the trunks of

beeches. They are very often covered with small grains of sand, but can easily be recognised from those of *staintoni* because of their much stronger tissue. The colour varies from rather pale to blackish in the south of Dutch Limburg where nearly everything is covered by a thin layer of dirt owing to the vicinity of our coal mines.

As for the other Dutch species, *Solenobia inconspicuella* is at present only known from a few localities in the centre of the country. The parthenogenetic form of *S. lichenella* also occurs with us, but its distribution is not yet fully known. It seems at any rate to be more wide-spread than *insconspicuella*. But apart from the three species mentioned already, there occur at least two other forms in the Netherlands. The first is *Solenobia fumosella* Heinemann, which is considered by Sauter to be the bisexual form of *lichenella*. The cases are indistinguishable from each other and it is only the habit of the female which tells if she is a *lichenella* or a *fumosella*. In the first case she starts at once to lay eggs, in the second she sits outstretched on the distal end of the case and awaits the male. It is, however, not possible to furnish absolute proof that *lichenella* and *fumosella* really are one and the same species, for it is impossible to cross a male *fumosella* with a parthenogenetic *lichenella* female. The male is a little larger than that of *inconspicuella*, and as a rule it has a distinct dark discal spot on the fore wings and the white spotting is different. It can also easily be distinguished by the shape of the scales of the fore wings. It is of course not impossible that *fumosella* also occurs in England.

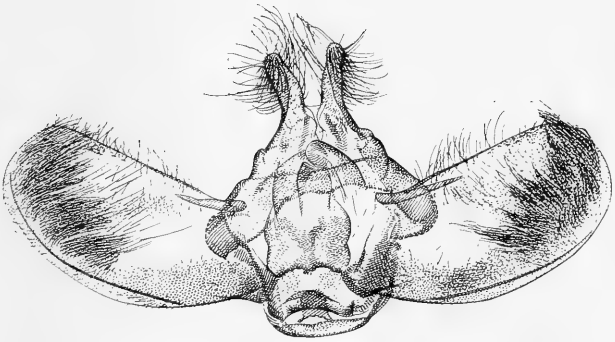
The second species is *Solenobia pineti* Zeller. As a rule this is not difficult to recognise. The cases are as large as those of *S. triquetrella*, but only seldom covered with a few grains of sand and the ridges are less sharp. The male is in accordance with the proportion of the case as a rule much larger than that of *fumosella* and of *inconspicuella* and beautifully adorned with sharp little whitish specks on the fore wings. Sometimes, however, real dwarfs occur, but then they can be recognised by the shape of the scales and by a very small spur on the tibia of the fore legs (so small, that it cannot be seen with a magnifying glass!). This *Solenobia* is our most common species of the genus in dry sandy districts. Contrary to the name it is not restricted to pine trees. I have collected dozens of cases from beeches and also found them on oaks, whereas we found on pine trees not only *pineti*, but also *inconspicuella* and *fumosella*. English collectors should keep a sharp look-out for this species when they visit a corresponding biotope in spring.

In this article I have given a complete survey of the present knowledge of the two genera in the Netherlands. I hope, that it may induce some English collectors to devote special attention to these interesting moths notwithstanding the fact that South neglects them.

Amsterdam—Z.2, Oude Ijselstraat 12 III.

ACHERONTIA ATROPOS L. IN NORTHAMPTONSHIRE.—A female specimen of the death's head moth was found alive, freshly emerged, at Kettering on 8th October 1963.—P. J. GENT, 3 Irthlingborough Road, Wellingborough, Northants.

1



2

3

Zygaena algira Boisduval. Fig. 1, lectotype ♂; fig. 2, genitalia; fig. 3, aedeagus.

The Identity of *Zygaena algira* Boisduval, 1834 (Lepidoptera: Zygaenidae)

By W. G. Tremewan

(Department of Entomology, British Museum (Natural History))

Duponchel (1835: 86) described as new a North African *Zygaena* species under the name of *algira* Duponchel and illustrated a specimen on pl. 7, fig. 6. As the figure does not agree with the description, Oberthür (1916: 226), who accepted figures in preference to descriptions, proposed the name *bachagha* for the species which Duponchel had described as *algira*. The name *bachagha* Oberthür can only be treated as a synonym of *algira* Duponchel (Tremewan, 1961: 257). This synonymy was originally cited by Rothschild (1917: 338) and was later accepted by Reiss (1930: 25). As Duponchel's figure does not agree with his description it is possible that an aberrant specimen was illustrated. According to Dr. P. Viette (*in lit.*) the type of *algira* Duponchel is not in Duponchel's collection and it is assumed that the specimen is either lost or destroyed.

According to the Catalogue of the Library of the British Museum (Natural History) (1922: 380), Duponchel's supplementary volume 2 was published in six parts. Pages 1-96, which contain the description of *algira*, and plates 1-6 were published in 1835. Pages 97-198 and plates 7-12 were published in 1836. The illustration on Plate 7, fig. 6, was therefore published in 1836.

Herrich-Schäffer (1846: 45) illustrated the species on pl. 15, fig. 106, and in the text actually referred to Boisduval as the author of *algira* while Duponchel's description and figure are not cited. Since then it has not been recognised that *algira* Duponchel was previously described under the same name by Boisduval (1834: 75). In his description, which is rather brief, Boisduval compares the species with *hilaris* Ochsenheimer, as follows:

"*Remarque.* M. le docteur Marloy, chirurgien de la marine, a rapporté d'Alger une Zygène (*Z. Algira mihi*) qui a quelques rapports avec cette espèce et avec *Fausta*. Dans les cinq individus que j'ai vus, les taches n'avaient pas de bordure, et étaient liées à-peu-près comme dans *Fausta*. Le collier, le corselet et l'abdomen étaient entièrement noirs, avec les pattes brunes.

Je ne connais pas la *Faustina* de Portugal; mais d'après la description qu'en donne Ochsenheimer, elle diffère trop de celle-ci pour supposer qu'elle en soit une variété.".

This description is valid and undoubtedly refers to the same species that was described by Duponchel. According to the library catalogue of the British Museum (Natural History) (1903: 188), Boisduval's Icones were issued as two volumes in one. These two volumes appeared in 42 parts, each part having 2 plates with letterpress. Nos. 21-30, which contain the work on the *Zygaenidae*, were published in 1834.

The synonymy may be expressed as follows:

algira Boisduval, 1834,
= *algira* Duponchel, 1835,
= *bachagha* Oberthür, 1916.

The Boisduval collection of *Zygaena* is now preserved in the British Museum (Natural History). It contains one male of *algira*, which I

designate as lectotype, with the following data: "Algira. Dup. Alger."; "EX. MUSAEO Dris. BOISDUVAL"; "coll. Ch. Oberthür."; "Rothschild Bequest B.M. 1939-1.". Boisduval's label refers *algira* to Duponchel but in spite of this I consider the specimen to be the type of *algira* Boisduval. It is probable that Duponchel's specimens were obtained from the same collector. As Boisduval's description is so brief, compared with that of Duponchel, it suggests that it was intended that the species was to have been described by, and attributed to, the latter author. However, as stated above, Boisduval's description is valid and *algira* Boisduval has priority over *algira* Duponchel.

The lectotype ♂ specimen, which is illustrated (Pl. I, fig. 1), is slightly aberrant compared with normal specimens of *algira* which generally have the forewing spots confluent. In the type, spots 1, 2 and 2a are confluent, the latter spot extending along the dorsum as far as the posterior edge of spot 4. Spot 1 extends along the costa and is confluent with spot 3. Spot 4 separate, spot 5 connected posteriorly to spot 6. The genitalia (Zygaenidae Slide No. 801) are illustrated, Pl. I, figs. 2, 3.

I am indebted to Mr. Arthur Smith for making the original drawings for the illustrations in this paper.

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Inverness-shire in 1963

By Commander G. W. Harper, R.N.(Retd.), F.R.E.S.

I feel that I must start this article by expressing heartfelt agreement with the opening paragraph of Mr. H. Syme's "Some Memories of 1963" (*Ent. Rec.*, **75**: 255). I can not remember such a disappointing season with so few real compensations, though, of course, so long as a few hardy insects struggle forth so there will always be some pleasant memories to recall. In my experience this year, in addition to appallingly bad weather for collecting both night and day, the season was marked by an unusual dearth of interesting insects, both species and varieties, while actual numbers seen remained fairly high, in spite of our quite unreasonable hopes of a fine warm summer, as in 1947, being frustrated.

The coldest winter for a hundred years started in Badenoch on 15th November 1962, and the first thaw occurred on 1st March 1963, which coincided with the appearance of the first hardy larva of *Phragmatobia fuliginosa* L. warming up at full gallop on my garden path! The principal trouble with our winter in Newtonmore was that we did not have enough

snow, so that the continuous frost went so deep that the village had no water for weeks!

March remained mild, wet, and rather windy, the first emergence of the year being that of *Phigalia pedaria* Fab., a male drying its wings on a garden fence on the 6th. This was followed by the first *Achlyia flavicornis* L. and immigrant Plovers and Thrushes in the middle of the month; by the end of it this species was present in unusually large numbers, while the early *Orthosias* were beginning to appear about two to three weeks late.

April became even stormier and wetter than March, but the usual species struggled out bravely and surprisingly not quite so late, as I found two *Brachyonica nubeculosa* Esp. drying their wings on Birch trees in the afternoon of the 2nd, while both sexes of *Poecilopsis lapponaria* Bdv. were on a local fence as early as the 9th, the female even having laid many of her eggs already! The sallows were at last beginning to swell, but were not well out until the last week of the month, which as so often in this area became fine and warm. A most remarkable feature this year was the complete absence of the common day-flying species at this season, not a single *Aglais urticae* L., *Saturnia pavonia* L., and *Endromis versicolora* L. being seen on the wing, and more surprisingly still also not a single *Archiearis parthenias* L. was noted. It rather looks as if a deduction here may be at least plausible; that those day-flying species which hibernate as adults or exposed pupae near the surface of the ground or tree suffered more from the prolonged severity of the winter than those that endured these conditions as ova or larvae. Certainly *Argynnis aglaia* L. and *Aricia aegestis* Schf. *artaxerxes* Fab. were the only Butterflies later to be even commoner than in most years.

Weather at the beginning of May reverted to snowstorms and very cold westerly winds. The first *Odontosia carmelita* Esp. came to my m.v. trap on the 8th, while *Anarta cordigera* Thun., a pair in cop. on a fence in the morning of the 12th, was several days later than usual. The cold blustery weather with snow on all the hills continued until the 23rd, but on the 17th the only really remarkable insect of the year occurred, a fine fresh *Acasis viretata* Hb., in my m.v. trap. This is a new species for my Badenoch list, no. 370, and is I believe the furthest North record for this interesting species, to date, though I understand that another specimen was taken about the same time as far North as Sutherland; if so, this is a truly remarkable expansion of range. It is likely that the food-plant so far North is Rowan, *Pyrus aucuparia*. Butterflies were late again this year in appearing, the first I saw being several fresh *Thecla rubi* L. flying actively in a brief sunny evening of the 20th over *Arcostaphylos uva-ursi* on my local moorland. Warm sunny weather at last on the 23rd brought out a good number of *Anthocaris cardamines* L. and *Argynnis euphrosyne* L. but *Pieris napi* L. usually so common with us was quite rare in the spring brood and almost non-existent in the summer one. The month ended with a continuation of warm sunny days and cold nights; a very pleasant short visit by my son and myself to Skye from 27th-29th May was productive of a good number of larvae of *Zygaena purpuralis* Br. and *Z. filipendulae* L. but very few *Z. lonicerae* Sch. ssp. *jocelynae* Tremewan, which was disappointing. Back in Badenoch the end of the month saw the foliage of the birches and aspens almost fully out, and a rapid advance in vegetation generally to a greater degree than the same date last year, but m.v. trap catches were equally small, only single figures!

In June the one warm sunny spell of the year, accompanied by a few thunderstorms but surprisingly small and uninteresting m.v. trap catches, continued until the third week. At this time we spent a few days with my son at Worcester, and I was able to revisit some old boyhood haunts in the Cotswolds, very pleasant but not very productive entomologically. The woods near Cranham produced a few nice *Discoloxia blomeri* Curt. and *Abraxas sylvata* Scop.; butterflies, however, were very scarce, and I saw no sign of *Maculinea arion* L., not surprisingly in view of the short time available and the poor weather. Several colonies of very variable *Z. trifolii* Esp. were in force but rather worn. Near Worcester, a memorable pleasure was the sight of numbers of *Leptidea sinapis* L. in a quite small wood, together with *Minoa murinata* Scop., neither of which I had seen for many years. Also in this wood I found larvae of *Orthosia gracilis* Schf. spun-up in the terminal shoots of low sallows, an unusual pabulum in the wild in my experience, which is usually Fleabane, Meadow-Sweet, or Bog Myrtle. Some months earlier my son had explored Wyre Forest and found one or more empty old cocoons of *Harpyia bicuspis* Bork. We therefore planned a night operation to try for this elusive insect on the 21st June. We were lucky with the weather, a fine warm night for once, and this turned out to be the only really good collecting night of the year. Over 90 species of Macros came to my portable m.v. light and sheet, and a very few only to sugar. So exciting and pleasant a night was it that in retrospect the only species not to turn up was *H. bicuspis*! Among the more interesting species were melanic examples of *Stauropus fagi* L. and *Semiothisa liturata* Cl., many *Tethea fluctuosa* Hb. and a few *T. duplaris* L., many fresh *Anaplectoides prasina* Sch. and *Polia tincta* Hb., *Bomolacha crassalis* Fab., *Boarmia roboraria* Schf., *Ectropis extersaria* Hb., *Angerona prunaria* L., *Apeira syringaria* L., *Mesoleuca albicillata* L., and *Euphyia rubidata* Schf. We were very interested to note a number of Small-leaved Limes growing near our operating ground, but *Drepana harpagula* Esp. did not put in an appearance! In steadily worsening weather conditions my wife and I moved on to Tan-y-Bwlch in North Wales on the 24th for a week, where collecting was hardly possible by night or day due to incessant heavy rain. I think my total daylight catch consisted of one beautiful fresh *Sterrha eburnata* Wocke female sheltering from the rain on a rock, and a few worn *Eupithecia plumbeolata* Haw. flushed from Cow-wheat in the only locality I know for this species. My attempts to rear it from ova later failed ignominously on hatching! Only one night was fairly prolific; a few nice *Amathes ashworthii* Dbld. and *Apatele menyanthidis* View. coming to m.v. light, but only common Noctuids to some sugared posts. My m.v. trap under these conditions did well, I suppose, by producing large numbers of common species, *Stauropus fagi* L. being almost the commonest. These handsome great insects always raise nostalgic memories of the thrill of finding my first *S. fagi*, a female, at rest on a Beech tree in Sussex in pre-m.v. days which provided me with a nice bred series.

On the 3rd July we returned home to Inverness-shire and cool cloudy weather with ground frost on the morning of the 10th! In spite of these conditions the usual summer moths were present in normal numbers judging by m.v. trap catches; one very noticeable feature of this summer was the extraordinary lushness of all the vegetation, and the wild Dog-roses were in glorious abundance, as were low-growing plants such as Bird's Foot Trefoil and Rock-rose, colonies of which have expanded

considerably. *Aricia aegestis* Schf. ssp. *artaxerxes* Fab. was consequently about in large numbers in its colonies, and by the 20th *Argynnis aglaia* L. was a lovely sight, fully out in very large numbers and very fresh at this late date. The last few days of the month were warm and sunny, and on the last day a male *Amathes alpicola* Zett. came to my m.v. trap. yet again in the odd-numbered year; it really is remarkable that this species never seems to leave its high ground haunts to visit my m.v. trap except in these alternate years of believed relative scarcity.

In August the weather soon reverted, on the 5th, to its usual wet, windy and cold state, and the month as a whole was only remarkable for absentee species of usual abundance; *Triphaena pronuba* L. only appeared for the first time on the 1st, and continued relatively scarce all autumn; *Amathes xanthographa* Schf. was really rare, only two specimens being seen. However, as the month progressed trap catches were over-compensated for the lack of these by the ever increasing abundance of *Dysstroma citrata* L. which reached a really stupendous peak in early September with over a hundred in the m.v. trap and quite as many in the Birch bushes nearby! I have never seen this common species so abundant, or so lacking in striking varieties.

September was marked by continued dull weather, with a few sunny days but a complete absence of frost; the first snowfall on the high tops occurred on the 25th. A notable absence of immigrant Lepidoptera continued, only a very few singleton *Plusia gamma* L. and one *Agrotis ipsilon* Hufn. were seen here. A pressing Naval occasion in the form of a re-union dinner in London towards the end of the month resulted in a most delightful week-end in Surrey with Mr. G. A. Cole as my host. The weather was fairly kind to us though chilly and windy, and he most kindly drove me over to the Dungeness area in Kent, where, with his expert aid I had the greatest thrill of the year in taking no less than three species new to me. Searching the patches of Yellow Toadflax revealed the splendid sight of plenty of larvae of *Calophasia lunula* Hufn. mostly of good size. By great good luck the only patch of this food-plant that I know of in Inverness-shire grows alongside the railway at Newtonmore station, probably seeded from a train years ago, so I was able successfully to bring them all to the pupal stage in October. Later the same day at Dungeness beating the dead seed heads of Yarrow in one spot produced several larvae of *Eupithecia millefoliata* Rössler. As dusk approached, Mr. Cole stopped by a fine series of ditches crossing water meadows along which grew plenty of clumps of Marsh Mallow plants. A cold Northerly wind was blowing, however, and dusking only produced a belated *Nonagria sparganii* Esp. and no *Hydraecia hucherardi* Fab.; but the ever helpful portable m.v. light came to the rescue and a few tolerably good specimens, males, appeared later. We had, of course, to set out on the long drive back to Surrey fairly early, and a last search of the plants failed also to reveal any newly emerged females.

October in Inverness-shire was wet and very windy, but mild and still with no frosts. The usual autumn species were well represented, with *Dasypolia templi* Thun. and *Agrochola macilenta* Hb. even commoner than usual. The third week of the month was remarkable for unusually large flocks of southward migrating birds, truly thousands of Redwings and Fieldfares, accompanied by small flocks of Long-tailed Tits filled my Birch spinney, and, curiously, a large number of swallows, presumably young birds from Scandinavia were also present for a day or two. But

there was not a single *Vanessa atalanta* L.! South again to London for the annual festivities and exhibition of the South London Ent. and Nat. Hist. Society at the end of the month, I experienced the one great immigrant thrill of the year by seeing alive, in Mr. J. L. Messenger's m.v. trap a fine specimen of the lovely and rare *Hippotion celerio* L. I believe that there was quite a widespread wave of this splendid immigrant at this time.

In November the first ten days were mild and wet, so I continued my m.v. trap in the garden; this proved fortunate, for among the usual late autumn species were a good number of *Xylena vetusta* Hb. and my last capture of the year was a superb melanic example which Mr. A. L. Goodson kindly informs me he thinks is probably ab. *dufayi* D'Aldin. The season virtually came to an end in the second week with the appearance of the first *Operophtera fagata* Scharf., and frosty cold weather completed the month. So ended a year only remarkable for a lack of immigrants and of sunshine. Hope springs eternal in the entomological breast!

Neadaich, Newtonmore, Inverness-shire. 15.i.1964.

Western Ireland, 1963

By Rear-Admiral A. D. Torlesse

General Lipscombe's account of his pursuit of *Polyommatus icarus* Rott. in Western Ireland this summer was of particular interest to me because it so happened that during the second half of July my wife and I followed his trail to Co. Mayo and the Burren. Like Mr. Wheeler, whose article in the December number appeared while I was engaged on this paper, we planned our first trip to the West of Ireland more with a view to seeing the country and spying out the land entomologically than the pursuit of particular species. However, I did hope that *Calamia virens* L. would put in an appearance in the Burren before our departure on 1st August, and that we might find the Co. Mayo form of *P. icarus* there or elsewhere, and we planned our itinerary accordingly; the first week in Donegal visiting Portnoo in the south and Port-na-blagh in the north, then five days at Newport, Co. Mayo, and lastly a week at that well-known haunt of the lepidopterist, Ballynalackan Castle in the Burren of Clare. In the event, neither hope was realised; we were too early for *C. virens*, and although we found the second brood of *P. icarus* flying everywhere we were much too late for the single-brooded form. However, our trip was interesting entomologically, the scenery was delightful, the bathing excellent everywhere, and the hotels and guesthouses we had chosen when we booked in February could not have made us more welcome and comfortable.

I took with me an m.v. trap for use where a mains supply could be arranged, but to save space on this trip in our small Herald estate car I discarded my portable battery-driven m.v. equipment in favour of an ultra-violet outfit made to a specification kindly provided by Mr. Kennard, who described this lamp in last year's "Record" (Vol. 74, No. 2). Considerable use was made of both outfits. I was able to run the trap at three out of our four hotels, although only in the Burren did I find a really

rewarding site for it. The portable lamp I took out on every suitable night —not very many in all, as a number of nights were windy and wet or cold —as well as on some very unpromising ones. I did not find the 18 watt u/v equipment as effective as an 80 watt m/v lamp, but I had some quite successful nights with it.

We crossed from Holyhead on the night of 11th July, being landed at Dun Laoghaire in time to drive round the centre of Dublin before the traffic became thick, after which we wandered across central Ireland by way of Athlone, Carrick-on-Shannon, Sligo and Donegal, arriving at Portnoo in time for dinner. The Portnoo Hotel with its fine coastal view proved most comfortable, with easy access by car to many miles of wonderful coastal scenery, and with good collecting grounds within a mile or two. The Irish form of *Maniola janira* L. was plentiful and in fine condition; also flying were *Eumenis semele* L. and *Coenonympha pamphilus* L. with, sparingly, *P. icarus*. *Pamphilus* appeared typical, but throughout coastal Donegal examples of the other three butterflies similar to the forms previously observed in the Island of Mull were frequent, the *semele* very dark, many *icarus* with bright red lunules, and the *janira* very large and brilliant. But the whole of Donegal reminds one so irresistably of parts of the western Highlands of Scotland that it is no surprise to find similarity in its fauna.

I worked the lamp on coastal moorland on two nights without very much success, but amongst some 24 species I was surprised to take *Leucania straminea* Treits. At Muckros, on the north coast of Donegal Bay, we accidentally came across Sir Robert and Lady Saundby who were spending a fortnight in this very remote spot and who had recorded much the same list of insects.

Leaving Portnoo on 16th July we chose a coastal route for the journey north to Port-na-blagh, noticing on the way the same butterflies as at Portnoo with the addition of *Aphantopus hyperanthus* L. During the next four days I worked places in the Horn peninsula and moorland in the Glenveagh range by day and night, finding much the same insects as at Portnoo, with the addition, on moorland, of *Entephria caesiata* Schiff.

On 20th July we drove via Letterkenny, Donegal, Sligo and Ballina to Newport, Co. Mayo, where we had booked at the Abbey Villa guesthouse, a mile out of the town on the Achil road close to the southern end of L. Furnace. Here I was able to run the trap behind the hotel, but with indifferent success; a surprise on the very warm night of our arrival was an enormous catch of at least 200 *Arctia caja* L., but without a single interesting abberation among the lot. *Nudaria mundana* L. abounded; I had also taken it in Donegal. The weather was distinctly unpromising, two of our five days at Newport being hopelessly wet, but we were lucky in having a fine sunny day for our one visit to the Mullet. Time only permitted of our visiting a small part of the sand dune area described by General Lipscombe as the habitat of the large *P. icarus*, but although the foodplant was growing quite freely here and there amongst the marram grass no "blues" were seen there. A few *P. icarus* were, however, flying in the hayfields in the area, still mostly uncut even at this late date; they were similar to the Donegal examples, but the males were slightly larger and certainly the finest seen on our trip. Hardly a female was to be found but the one or two caught did not approach the size described by the General.

On only one night during our stay was the weather fine enough to tempt me out with the u/v lamp. I first tried a moorland site near L. Furnace, moving later to a more wooded spot in the same area, but although conditions seemed good I recorded 25 species only compared with 40 species in the trap at the hotel on the first night, and there was nothing of particular interest among them.

As we wanted to see something of Connemara, on leaving Newport we took a circuitous route to Galway by way of Lenane, Clifden and Oughterard, a diversion well worth while for the wild mountain scenery about Lenane alone; indeed, the scenery on the whole route was most attractive, culminating in the climb up Corkscrew Hill and our first view of the Burren. Mrs. O'Callaghan made us most welcome at Ballynalackan Castle, where we found we were sharing the hotel with a cheerful party of members of the Bristol University Speleological Society, engaged in exploring the limestone caves in the vicinity, a task which members of the society undertake every summer. On their departure a day or two later, their place was taken by Messrs. G. M. Haggett and A. J. Wightman, who like us were in pursuit of *C. virens* but who, though they were able to stay a little longer, were also unsuccessful.

During our week in the Burren I worked the coastal strip between Doolin in the south and Black Point in the north, including the dunes at the mouth of the Caher river and places up the river valley, and various spots on the north coast between Black Point and Ballyvaughan. The same butterflies were to be found as in Donegal and Mayo, with the addition of a very few 'whites' and *Argynnis aglaia* L., which was numerous but mostly in tatters; I did not take a single specimen worth keeping. At considerable risk to life and limb, *Prokhedes captiuncula* Treits. was successfully pursued over the broken limestone slabs in the late afternoon. A very few *Setina irrorella* L. were found in a rough field on the coast at Doolin, and further north *Aspitates gilvaria* Schiff. was plentiful.

At night I worked the u/v outfit in a number of spots on or near the coast, taking a considerable list of insects, including *Apamea furva* Schiff. in plenty and a few *Ammogrotis lucernea* L. My first pitch for the trap at the Castle was unproductive, but I soon found a better place at a farm near Oughtdarra, a few miles away and below the Castle, where the owner kindly undertook to switch on at dusk and cover the trap at dawn. Here several quite large catches were made, particularly on the very wet night of 30th July when the catch was enormous and I actually recorded 68 species, though the real number was undoubtedly considerably greater. Unfortunately, as I was not using an anaesthetic, the whole contents of the trap was spoiled, including a single example of *Apatele euphorbiae* s.sp. *myricae* Guen., but there was something to be saved from the many hundreds of moths outside the trap, in the grass and herbage and on the surrounding rocks. A last expedition was made to the Ballyvaughan area in company with Messrs. Haggett and Wightman on the night of 31st July, none too warm and the ground very wet after a rainy day, in search of *C. virens*. On the following day we crossed Ireland to Wexford, en route for Rosslare and home.

A list of the species noted is appended. Admittedly, we did not stay in any one place long eonugh to work it at all seriously, but our holiday was not unrewarding entomologically, and the weather was probably as good as one has any right to expect in the west of Ireland. Owing to the date no attempt was made to look for *Erebia epiphron* Knoch., but with

Mr. Haynes' articles in the "Record" of 1955 and 1956 in mind, a lookout was kept for possible mountain localities. The number of peaks in north-western Ireland lofty enough to harbour this butterfly is certainly impressive, and from the records few of them seem to have been searched for *epiphron*. No doubt a reconnaissance would show many of these hills to be quite unsuitable, but it would be surprising if a number of them were not found to possess the type of ground favoured by the butterfly. However, to find *epiphron*, let alone prove that it is absent, the place, the date and the weather must all be right, and a systematic search of the west Irish highlands for the butterfly would be a task of some magnitude, requiring the concerted effort of several people over more than one season.

It is a far cry to the west of Ireland, but the lovely scenery, quiet roads and empty beaches, and the kind welcome everywhere, makes the long journey well worthwhile.

List of Lepidoptera taken in Western Ireland, July 12-31, 1963

Pieris brassicae L.
rapae L.
napi L.
Argynnis aglaia L.
Aglais urticae L.
Eumenis semele L.
Maniola janira L.
s.sp. *iernes*
Aphantopus hyperanthus L.
Coenonympha pamphilus L.
Polyommatus icarus Rott.
Laothoe populi L.
Deilephila elpenor L.
Pheosia tremula Clerck.
gnoma Fabr.
Notodonta ziczac L.
dromedarius L.
Lophopteryx capucina L.
Habrosyne derasa L.
Malocosoma neustria L.
Philudoria potatoria L.
Spilosoma lubricipeda L.
lutea Hufn.
Phragmatobia fuliginosa L.
Arctia caja L.
Nudaria mundana L.
Setina irrorella L.
Eilema lurideola Zinck.
complana L.
Apatele psi L.
euphorbiae Fabr
s.sp. *myricae* Guen.
rumicis L.
Agrotis exclamationis L.
Lycophotia varia Vill.
Ammogrotis lucernea L.
Graphiphora augur Esp.
Amathes c-nigrum L.
triangulum Hufn.
sexstrigata Haw.
xanthographa Fabr.
Diarsia brunnea Fabr.
festiva Schiff.
Ochropleura plecta L.
Axylia putris L.
Triphaena comes Hübn.
pronuba L.
Polia nebulosa Hufn.
Melanchra persicariae L.
Ceramica pisi L.
Diataraxia oleracea L.
Hadena thalassina Rott.
Cerapteryx graminis L.
Eumichtis adusta Esp.
Procus fasciuncula Haw.
literosa Haw.
Prothedes captiuncula Treits.
Apamea oblonga Haw.
furva Hübn.
secalis L.
lithoxylea Fabr.
sublustris Esp.
monoglypha Hufn.
Phlogophera meticulosa L.
Phalaena typica L.
Hydraecia oculea L.
Leucania pallens L.
impura Hübn.
straminea Treits.
lithargyria Esp.
conigera Fabr.

Caradrina blanda Schiff.
taraxaci Hübn.
Petilampa minima Haw.
Rusina umbratica Goeze.
Cucullia umbratica L.
Rivula sericealis Scop.
Plusia chrysitis L.
bractea Fabr.
festucae L.
iota L.
pulchrina Haw.
gamma L.
Abrostola triplasia L.
tripartita Hufn.
Zanclognatha tarsipennalis Treits.
Herminia barbalis Clerck
Hypena proboscidalis L.
Hipparchus papilionaria L.
Sterrha subsericeata Haw.
aversata L.
dimidiata Hufn.
Anaitis plagiata L.
Lygris populata L.
pyraliata Schiff.
Cidaria fulvata Forst.
Dysstroma truncata Hufn.
citrata L.
Thera obeliscata Hübn.
cognata Thunb.
Xanthorhoe ferrugata Clerck
montanata Borkh.
Colostygia salicata Hübn.
Pelurga comitata L.
Entephria ceasiata Schiff.
Epirrhoe alternata Müll.
Euphyia bilineata L.
Lyncometra ocellata L.
Perizoma alchemillata L.
albulata Schiff.
minorata Treits.
blandiata Schiff.
Hydriomena furcata Thunb.
Eupethecia centaureata Schiff.
absinthiata Schiff.
icterata Vill.
subumbrata Schiff.
Gymnoscelis pumilata Hübn.
Chloroclystis coronata Hübn.
Abraxas grossulariata L.
Lomaspilis marginata L.
Aspitates gilvaria Fabr.
Gnophos myrtillata Thunb.
Cabera pusaria L.
Campaea margaritata L.
Ennomos quercinaria Hufn.
Crocalis elinguaria L.
Opisthograptis luteolata L.
Ourapteryx sambucaria L.
Biston betularia L.
Cleora repandata L.
Eurrhypera hortulata L.
Rhodaria sanguinalis L.
Mesographa forficalis L.
Crambus hortuellus Hübn.
selasellus Hübn.
Hepialus humuli L.

Diptera in Galloway and Central Wales

By R. M. Payne

We spent the second half of August 1963 on the coast of Kircudbrightshire. The generally poor weather and apparent scarcity of Tipulidae led me to take an interest in some other families of flies.

During the whole fortnight there was a remarkable abundance of the large black fly *Bibio pomonae* (F.). The males could be seen drifting heavily over the pastures at about eye level, their long back legs hanging down. Clusters of *Angelica* flowers on the hillsides were often infested with them, as many as half-a-dozen on each head, while down at sea level they sprawled on the ragwort just above the shoreline. When on the flowers they were very easy to pick up by hand, appearing reluctant to take to flight. Males were everywhere, much more abundant than females. Our car had to be left in the open at night, and every morning there were numbers of the conspicuous red and black legs of the *Bibio* scattered on the roof and bonnet, presumably dropped by birds (or bats) that had captured the flies on the wing.

Amongst the Tipulidae, my first find was a pair of *Tipula scripta* Mg. *in cop.* on the lee side of a beech trunk in a wood near Annan (Dumfriesshire). A keen wind was blowing through the wood, and I have often noticed that in adverse weather—cold wind or driving rain—crane flies may be found in bark crevices on the more sheltered side of large trees.

Dalheattie Forest, a large coniferous plantation, did not prove very productive of flies. *T. scripta* and *Dicranomyia chorea* (Mg.) were taken in the rides, and I found single specimens of *Crunobia littoralis* (Mg.) and the handsome yellow-winged *Metalimnobia bifasciata* (Schrank) in more open boggy areas. *Ula sylvatica* (Mg.), one of the small hairy-winged Tipulids, occurred over a ditch. Ling was a common plant in open parts of the forest, and here *Syrphus cinctellus* Zett. was the most abundant Syrphid. The striking blue-banded *Syrphus glaucus* (L.) was taken several times from *Angelica* flowers. Is this fly commoner in the north than in the home counties? A hover-fly new to me was *Didea fasciata* Macq. which has a peculiar glassy appearance to its wings, and is at once noticeably flatter than most yellow-spotted *Syrphi.* I took a single male of this fly sunning itself on bracken in an open glade. The snipe-fly *Rhagio lineola* F. was often seen on spruce branches.

A very handsome Syrphid that proved itself to be widespread in the district was the large wasp-like *Sericomyia silentis* Harris. This was common flying low over the ling near the summit of Screel Hill, a local viewpoint rising to some 1100 feet, and I also found it in several boggy woods right down at sea level near Rockcliffe.

Flowery fields by the shore at Sandy Hills were a good hunting ground for flies, and three of the larger and less common Syrphids I caught here on ragwort were *Eristalis aeneus* Scop., *Arctophila fulva* Harris—a furry fly resembling a bumble-bee—and *Cheilosia bergenstammi* Becker. A boggy wood just above high-tide level produced the small Tipulids *Rhipidia maculata* (Mg.) and *Gonomyia dentata* de Meij.

A belt of alder scrub at the margin of Loch Arthur was carefully examined for crane-flies on day, but produced only the common species *Tipula fulvipennis* Degeer., *Dicranomyia modesta* (Mg.), *D. autumnalis* (Staeg.), *Limonia macrostigma* Schummel and *Austrolimnophila ochracea* (Mg.). From alder scrub at Loch Milton I took *Nephrotoma quadrifaria* (Mg.), the dusky-winged Empid *Rhamphomyia spinipes* (Fall.) and the brilliant Stratiomyid *Geosargus flavipes* (Mg.).

* * * *

In mid-September I spent a week in Brecon and Radnor, two of the wildest and least "developed" counties in the country. As a matter of interest, it is said that in the whole of Radnorshire there is not a single factory chimney! Armed with the necessary official permits (for which, of course, no charge is made) we visited several nature reserves, and here in mainly fine weather I concentrated on my favourite group, the crane-flies.

Craig Cerrig Gleisiad, in Brecon, is a splendid old red sandstone crag towering up to 2000 feet. At the foot of the rising ground below the cliffs I took *Dicranomyia didyma* Mg. amongst bracken by a stream (1200 ft.). A little higher up (1350 ft.) was an open area of boggy ground, and here I saw the common *Tipula marmorata* Mg. and *T. pagana* Mg. (no females of

the latter species) with *T. alpium* Bergroth, *Limonia nubeculosa* Mg., *Ormosia hederae* (Curtis) and *Rypholophus haemorrhoidalis* (Zett.). On ling and bilberry moorland at 1500 ft. *Dicranomyia autumnalis* and *O. hederae* occurred. Above this the ground rose very steeply to the top of the crags, and I followed up one of the mountain rills, finding *T. marmorata, L. nubeculosa, Paradicranota subtilis* Loew. (? a new county record), and *Crunobia straminea* (Mg.).

The *Crunobia*, with its uniformly pale yellow coloration and rather flaccid movements, has very much the appearance of a teneral insect.

Craig-y-Gilau N.R. (Brecon), a carboniferous limestone crag, produced nothing new, the only Tipulids seen being *T. marmorata, T. pagana* ♂♂ and *C. straminea*. In the extreme south of the county we visited the Cwm Clydach N.R., and in this steep, wooded gorge I took *Rhypholophus varia* (Mg.) and *R. bifurcata* (Goet.), as well as the common *Erioptera lutea* Mg. and *T. marmorata*.

R. varia also turned up, with *Limonia nubeculosa*, in a boggy oakwood in Nant Irfon (950 ft.) and in pasture by the R. Irfon I took *Dicranomyia autumnalis*. In the moorland bog above the valley (1200 ft.) were *Tricyphona claripennis* Verrall and *T. immaculata* (Mg.).

In Radnorshire we spent a warm afternoon on Rhosgoch Bog (800 ft.), where the yellow *Tipula melanoceros* Schummel was plentiful, with *Phylidorea lineola* (Mg.), *P. ferruginea* (Mg.) and *Ptychoptera albimana* (F.). Unfortunately, we picked a very wet day for the bleak, exposed moorland above Rhayader, where at 1500 feet the only crane-flies to be seen were *T. melanoceros*, although a single *T. marmorata* was noticed on some rocks by a waterfall at 1000 ft. A deep wooded ravine at Aberedw (550 ft.) produced *Rhypholophus haemorrhoidalis, Ormosia hederae* and the ubiquitous woodland fly *Limonia nubeculosa*.

I had long wanted to see the famous Tregaron Bog in Cardigan, reputed haunt of polecats and other scarce creatures. However, a brief visit on 20th September proved disappointing so far as insects were concerned. Amongst those I have so far identified, no particularly unusual species were taken, the only crane-flies being *Tipula melanoceros* and the very similar *T. luteipennis* Mg. (both abundant), *Dicranomyia modesta, Erioptera trivialis* Mg. and the huge Limoniid *Pedicia rivosa* (L.). (A single male *P. rivosa* also occurred in a muddy lane at Pencerrig, in Radnorshire.)

In the Allt Rhyd-y-Groes N.R. (Carmarthen) I took the following species in the damper parts of the oak wood (500 ft.): *Tipula fulvipennis, Limonia nubeculosa, Dicranomyia modesta, Phylidorea aperta* Verrall, *Pilaria nemoralis* (Mg.), *Rhypholophus varia* and *R. haemorrhoidalis*. Higher up the valley of the Doethie *Tipula rufina* Mg. and *Crunobia straminea* occurred in boggy oak wood.

8 Hill Top, Loughton, Essex.

The *Silvicola* Burgeff Group of the genus *Zygaena* Fabricius (Lep., Zygaenidae)

By W. Gerald Tremewan

(*Continued from p. 10.*)

Z. romeo Duponchel

♂ genitalia. Horns of uncus short, broad and flat, variable within the species. In the aedeagus, lamina dorsalis broad, triangular in shape, laterally edged with strong spines, with a larger and more strongly developed spine on each side at the base. Between these two large basal spines, a row of spines which vary in number and length but which are usually short and reduced and often vestigial. Central area of lamina dorsalis spiculate. Basal portion, anterior to the large spines, scobinate. Lamina ventralis rather broad, comprised of a field of short, strong spines. A large portion of the vesica spiculate with two groups of cornuti, one large and strongly developed, ending in 2-6 short, strong spines, the other group merely a field of short, minute spines. Vesical pad or "Blase" generally absent.

♀ genitalia. "Schildchen" broadly triangular but variable in shape. Lamella post-vaginalis undeveloped. Lamella antevaginalis strongly sclerotized, somewhat ovoid in shape and variable in width. Ductus bursae flattened, anterior two-thirds weakly sclerotized, angulated at entrance of ductus seminalis. Bursa copulatrix spherical, signum present or absent. When present, signum composed of a field of spines varying in number from 3-35 spines.

First pair of tibial spurs present or absent.

Z. romeo romeo Duponchel

Z. romeo Duponchel, 1835, in Godart & Duponchel, Histoire naturelle des Lépidoptères ou Papillons de France, Supplement, **2**: 131, pl. 12, fig. 1.

Z. celeus Herrich-Schäffer, 1844, Systematische Bearbeitung der Schmetterlinge von Europa, **2**, pl. 6, figs. 48, 49; 1846, *ibidem*, **2**: 38.

Type locality: Randazzo (at the foot of Etna), Sicily.

Material examined: A series from Nicosia; Bosco; Mistretta, Sicily.

♂ genitalia. Spines at the base of the lamina dorsalis reduced and almost vestigial, sometimes absent. Many of these spines may also be extended in length. Both groups of cornuti present.

♀ genitalia. A slight development of the lamella postvaginalis, lamella antevaginalis broad, ductus bursae weakly sclerotized, signum present, rather strong.

Superficially, the nominate subspecies is rather distinct from the remainder of the subspecies of *romeo* in having enlarged forewing spots.

Z. romeo calberlai Burgeff (comb. nov.)

Z. scabiosae calberlai Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 23.

Type locality: Sila; San Fili de Cosenza, S. Italy.

Material examined: A series of over one hundred specimens of both sexes from San Fili, Calabria.

♂ genitalia. Spines at the base of the lamina dorsalis variable in length. Both groups of cornuti strongly developed.

♀ genitalia. Lamella postvaginalis weakly developed, lamella antevaginalis broad, ductus bursae weakly sclerotized, signum present.

Z. romeo neapolitana Calberla

Z. scabiosae neapolitana Calberla, 1895, *Iris*, **8**: 209.

Type locality: Campania, Prov. Avellino, Italy.

Material examined: Over fifty specimens of both sexes from S. Angelo and Mte. Castello, Italy.

♂ genitalia. Spines at the base of the lamina dorsalis short and vestigial, cornuti of both groups reduced.

♀ genitalia. Lamella postvaginalis undeveloped, lamella antevaginalis narrower than that in ssp. *calberlai*. Ductus bursae rather moderately sclerotized compared with that in ssp. *calberlai*. Signum absent (? constant).

Z. romeo faitocola nom. nov.

Z. scabiosae faitensis Holik, 1944, *Iris*, **57**: 53 (preoccupied).

Type locality: Mte. Faito, Sorrento, Italy.

Material examined: A series of over seven hundred specimens of both sexes from Mte. Faito, Sorrento.

♂ genitalia. Spines at the base of the lamina dorsalis reduced, cornuti of both groups reduced.

♀ genitalia. Lamella postvaginalis weakly developed, lamella antevaginalis broad, ductus bursae weakly sclerotized, signum present, very weak.

The name *faitensis* Holik, 1944, is preoccupied by *faitensis* Stauder, 1929, which is a subspecies of *punctum* Ochsenheimer. We propose the name **faitocola** nom. nov. to replace the name *faitensis* Holik, 1944.

Z. romeo adumbrata Burgeff (comb. nov.)

Z. scabiosae adumbrata Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 22.

Type locality: Mte. Sirente, 1500-2000 m., Abruzzi, Italy.

Material examined: 1 ♂, Mte. Sirente (coll. H. Reiss).

♂ genitalia. Spines at base of lamina dorsalis vestigial, two lateral spines at base well developed, both groups of cornuti present.

Z. romeo jalina Rostagno (comb. nov.)

Z. transappenina jalina Rostagno, 1911, *Boll. Soc. zool. ital.*, (2) **12**: 106.

Z. scabiosae minima Turati, 1915, *Atti Soc. ital. Sci. nat.*, **53**: 609 (**syn. nov.**).

Type locality: Monti Aurunci, Italy.

Material examined: A series of over two hundred and forty specimens of both sexes from Monte Petrella and Monti Aurunci, Val de Petrella, Caserta, Italy.

♂ genitalia. Basal spines of lamina dorsalis short but somewhat longer than those in the above mentioned subspecies, both groups of cornuti moderately strong.

♀ genitalia. Lamella postvaginalis weakly developed, lamella antevaginalis broad but narrower than that in the above mentioned subspecies, ductus bursae weakly sclerotized, signum weak and reduced to a few spines.

The name *jalina* Rostagno was recognised by Verity (1920: 36) who correctly referred it to the populations of *romeo* from Monti Aurunci. Burgeff (1926: 12) incorrectly placed the name *jalina* as synonym of *neapolitana* Calberla and, querying Rostagno as the correct author, referred to Verity (*loc. cit.*). Holik (1944: 51) also recognised the name *jalina* but was unable to trace the reference to the original description. Verity (*loc. cit.*) considered the name *minima* Turati to represent small, aberrant specimens of ssp. *jalina* while Burgeff (1926: 13) considered *minima* as a subspecies from Monti Aurunci. Turati originally described

minima as a subspecies from the Monti Aurunci and the name is now placed as a synonym of *jalina* Rostagno.

Z. romeo romana Burgeff (comb. nov.)

Z. scabiosae romana Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 21.

Type locality: Albani Mts. and Roman Campagna, Italy.

We have been unable to examine material of this subspecies.

Z. romeo orion Herrich-Schäffer (comb. nov.)

Z. orion Herrich-Schäffer, 1843, Systematische Bearbeitung der Schmetterlinge von Europa, **2**, pl. 1, fig. 3; 1846, *ibidem*, **2**: 33.

Type locality: Tuscany; Marche (Sibillini), Italy.

Material examined: A series of both sexes from Monti Sibillini, Piceno.

♂ genitalia. Spines at the base of the lamina dorsalis reduced in number, cornuti of both groups well developed.

♀ genitalia. A slight development of the lamella postvaginalis, ductus bursae moderately sclerotized, signum present but reduced and rather weak.

Z. romeo ssp.

A series of specimens from Val Camaione, Lucca, Italy, 300 m., represents a new and undescribed subspecies. In size the specimens are similar to ssp. *orion* H.-S. but are more thickly scaled, consequently the coloration is brighter. The ground colour is intense blue-black with a slight gloss, forewing streaks and hindwings dark scarlet tinged with crimson, spot 3 reduced and very small, lower streak constricted in the middle and sometimes broken, forming two spots (2 and 4), especially in the females.

♂ genitalia. Spines at the base of lamina dorsalis lengthened. Both groups of cornuti well developed.

♀ genitalia. Lamella postvaginalis undeveloped, lamella antevaginalis narrow. Signum absent (? constant), ductus bursae moderately sclerotized.

Z. romeo megorion Burgeff (comb. nov.)

Z. scabiosae megorion Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 21.

Type locality: Pegli; Genoa; coastal regions of the Italian and French Riviera.

Material examined: 1 ♂, Mte. Sperone, Genoa (coll. H. Reiss), a series of both sexes from Moulinet and La Turbie near Nice, Alpes-Maritimes, France.

♂ genitalia. The number and length of the spines at the base of the lamina dorsalis rather variable. In some specimens, the spines are reduced in number and length and are often vestigial. In others, the spines may be lengthened and form a transverse row across the base. These moderately long spines, however, do not attain the length of those in *osterodensis*. Both groups of cornuti well developed.

♀ genitalia. Lamella postvaginalis undeveloped, lamella antevaginalis narrow, ductus bursae weakly sclerotized, signum vestigial.

This subspecies occurs as a mixture of races in the coastal regions from Genoa to Nice.

Z. romeo ssp.

A distinct and undescribed subspecies of *romeo* occurs in the neighbourhood of St. Baume and Marseilles in the department of Var. The

specimens are smaller than those of ssp. *megorion* and the more translucent wings have thinner scaling. The red coloration of the forewing spots and hindwings is a translucent carmine. In the forewings, spots 2 and 4 are narrowly connected by red scaling, this connection being often broken. Spots 3 and 5 are usually separate and are rarely connected by a fine line of red scaling.

♂ genitalia. Spines at the base of the lamina dorsalis variable in length, variation similar to that in ssp. *megorion*. Both groups of cornuti well represented.

♀ genitalia. Lamella postvaginalis variable and developed in some specimens, lamella antevaginalis narrow but variable; moderately strong, lateral sclerotization in the ductus bursae, signum absent. The absence of the signum appears to be constant.

This undescribed subspecies was recorded as *"scabiosae"* by Abeille (1909:9) who also noted that the broken forewing streaks are characteristic of this subspecies. According to Abeille (*loc. cit.*) the larva feeds on *Lathyrus pratensis* L. and exceptionally on *Hippocrepis comosa* L.

Superficially, this subspecies is not unlike *giesekingiana* Reiss but may be readily separated on genital characters.

Z. romeo loritzi Reiss

Z. romeo loritzi Reiss, 1958, *Bull. Soc. ent. Mulhouse*, p. 56.

Z. romeo loritzi Reiss, 1958, *Z. wien. ent. Ges.*, **43**: 182 (nomen nudum).

Type locality: St. Barnabé, Col. de Vence, Alpes-Maritimes, France, 900-1000 m.

Material examined: 18 ♂♂, 1 ♀, Vence, Alpes-Maritimes.

♂ genitalia. Spines at the base of the lamina dorsalis variable in length and number but generally reduced. Cornuti well represented in both groups.

♀ genitalia. Lamella postvaginalis undeveloped, lamella antevaginalis rather broad, ductus bursae weakly sclerotized, signum present, rather weak.

Z. romeo ssp.

An apparently new and undescribed subspecies of *romeo* occurs at St. Martin Vésubie, Alpes-Maritimes. Specimens from this locality have bright, scarlet forewing streaks and hindwings, ground colour of forewings blue-black with a slight gloss. Hindwing border fairly broad, especially at the apex. The lower forewing streak (2 + 4) is not broken although in some specimens it is constricted in the middle. The central streak is broken, forming two spots (3 and 5).

♂ genitalia. Spines at the base of the lamina dorsalis short and reduced in number. Both groups of cornuti strong, well represented.

♀ genitalia. A slight development of the lamella postvaginalis, lamella antevaginalis fairly broad, ductus bursae moderately sclerotized, signum vestigial.

Z. romeo parvorion Holik (comb. nov.)

Z. scabiosae parvorion Holik, 1944, Iris, **57**: 48.

Type locality: Digne, Basses-Alpes, France.

Material examined: 4 ♂♂, 1 ♀, Digne, Basses-Alpes.

♂ genitalia. Spines at the base of the lamina dorsalis variable in length and size, generally reduced; both groups of cornuti strong and well developed.

♀ genitalia, Lamella postvaginalis undeveloped, lamella antevaginalis narrow, ductus bursae moderately sclerotized. Signum absent (? constant).

The true *romeo* occurs in the neighbourhood of Digne and it is interesting to note that *osterodensis* (ssp. *schultei* Dujardin) occurs at Les Dourbes near Digne. It is not known whether the two species fly together on the same ground. The variability of the lamina dorsalis suggests possible hybridization between the two species. Holik originally described *parvorion* as a race of ssp. *subalpina* Calberla.

Z. romeo subalpina Calberla (comb. nov.)

Z. scabiosae subalpina Calberla, 1895, *Iris*, **8**: 205.

Type locality. Piedmont, N. Italy.

We have been unable to examine material of this subspecies.

Z. romeo freyeri Lederer (comb. nov.)

Z. freyeri Lederer, 1852, *Verh. zool.-bot. Ver. Wien*, **2**: 70, 94 (nomen novum for *triptolemus* Hübner *sensu* Freyer).

Z. triptolemus Hübner *sensu* Freyer, 1833, Neuere Beiträge zur Schmetterlingskunde, **1**: 28, pl. 14, fig. 4.

Z. scabiosae meridionalis Vorbrodt, 1913, in Vorbrodt & Müller-Rutz, Die Schmetterlinge der Schweiz, **2**: 253.

Z. scabiosae ephemerina Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 20 (**syn. nov.**).

Type locality: southern Alpine Valleys of Switzerland (Grono, Misox) and south Tyrol except the Etsch and Eisack valleys.

Material examined: A series of specimens from Tessin, Rovio; Bignasco, Switzerland; Val Randena, S. Tyrol.

♂ genitalia. Spines at the base of the lamina dorsalis variable, rather longer than those in the central and southern Italian subspecies of *romeo*. The two lateral spines at the base are stronger and very much enlarged. Both groups of cornuti strong and well developed.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis variable, ductus bursae moderately sclerotized, angulated anteriorly. Signum absent or, when present, weak.

The tendency of the genitalia of ssp. *freyeri* to show transitory characters to *osterodensis* suggests that hybridization is taking place.

The ssp. *freyeri* was first described and figured by Freyer who incorrectly attributed it to *triptolemus* Hübner, the latter being a subspecies of *achilleae* Esper. In 1852, Lederer proposed the name *freyeri* for the subspecies which was later renamed *meridionalis* by Vorbrodt. The latter name is preoccupied by *meridionalis* Oberthür, 1911, which is a synonym of *hippocrepidis provincialis* Oberthür, 1907. Burgeff proposed the name *ephemerina* to replace *meridionalis* Vorbrodt but these names now fall in synonymy under *freyeri* Lederer.

Z. romeo orionides Burgeff (comb. nov.)

Z. scabiosae orionides Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 21.

Type locality: Trient and Adamello region, N. Italy.

Material examined: 2 ♂♂, Trient, N. Italy.

♂ genitalia. Spines at the base of the lamina dorsalis variable in length and number, suggesting transitory characters to *osterodensis*. Both groups of cornuti present, well developed.

Z. romeo ssp.

A most remarkable and distinct subspecies of *romeo* occurs in the neighbourhood of Geneva, Switzerland. The British Museum collection contains a series of over eighty specimens of both sexes from Boix d'Onex and Bois de Bay. The forewing spots are confluent and form well defined streaks as in *osterodensis*. There is, however, a strong constriction in the middle streak (3 + 5) of the forewings. The lower streak has a slight constriction in the middle but is never completely broken. In the females, however, the middle streak may be more frequently broken to form two spots (3 and 5). The specimens have rounded forewings as in *romeo* and have a wingspan of 23-28 mm. in the males and 25-28 mm. in the females. The red coloration is a bright scarlet, ground colour of forewings blue-black with a slight gloss. Thorax and abdomen black, thinly haired and without gloss.

♂ genitalia. Lamina dorsalis short and broad, spines at the base variable in length and number. Two males show the formation of additional short spines in the disc of the lamina dorsalis. Both groups of cornuti well developed.

♀ genitalia. Lamella postvaginalis undeveloped, lamella antevaginalis broad, ductus bursae moderately sclerotized, signum absent (? constant).

Z. romeo lozerica Holik (comb. nov.)

Z. scabiosae lozerica Holik, 1944, *Iris*, **57**: 49.

Type locality: Florac, Lozère, France.

Material examined: 24 ♂♂, 5 ♀♀, Florac, Lozère.

♂ genitalia. Spines at the base of the lamina dorsalis variable, both in length and number. In one male examined, the spines are of equal length and form a transverse row across the base and are characteristic of *osterodensis*. Both groups of cornuti strong and well developed.

♀ genitalia. Slight development of the lamella postvaginalis, lamella antevaginalis broad, ductus bursae moderately sclerotized, signum present, very weak.

In superficial characters the subspecies is obviously referable to *romeo*. The male genitalia show slight transitory characters to *osterodensis* but are referable to *romeo*.

Z. romeo urania Marten (comb. nov.)

Z. scabiosae urania Marten, 1957, *Ent. Z.*, **67**: 218.

Type locality: Neighbourhood of Ripoll, Spanish East Pyrenees, 900-1100 m.

Material examined: 3 ♂♂, Thués-les-Bains, Pyrénées-Orientales; 2 ♀♀, Mt. Taga, Catalonia, 900 m.

♂ genitalia. Spines at the base of the lamina dorsalis variable in length and number. Both groups of cornuti present, well developed.

♀ genitalia. Slight development of lamella postvaginalis, lamella antevaginalis rather broad, ductus bursae moderately sclerotized, signum present and very weak in one female, absent in the other.

The two specimens examined from Mt. Taga, Catalonia, are true *romeo* and agree with the original description of ssp. *urania* Marten. Marten

himself considered *urania* to be a race of *orion* H.-S., i.e., the species *romeo*. The three males from Thués-les-Bains are also true *romeo*. It is interesting to note that, in a large series of over two hundred specimens of *osterodensis eupyrenaea* Burgeff, there are no specimens from Thués-les-Bains. This suggests that the two species do not fly together on the same ground. As noted under *osterodensis eupyrenaea*, certain specimens of that subspecies have superficial characters which resemble those of *romeo* while the spines at the base of the lamina dorsalis of these specimens are variable in length. This suggests that hybridization is taking place.

Z. osterodensis Reiss

♂ genitalia. Horns of uncus short, broad and flat, variable within the species. In the aedeagus, the lamina dorsalis is triangular in shape, rather longer than that in *romeo*, laterally edged with strong spines, with a longer and more strongly developed spine on each side at the base. Between these two large, basal spines, a transverse row of long spines, varying in length, but usually two-thirds that of the lamina dorsalis. Central area of lamina dorsalis spiculate. Basal portion, anterior to the large spines, scobinate. Lamina ventralis rather narrower than that in *romeo*, comprised of a field of short, strong spines. Spines of central area of lamina ventralis thicker and more strongly developed. A portion of the vesica spiculate, this part developing into a single, large cornutus ending in a group of from 3-9 short, strong spines, arranged rather to one side. Vesical pad or "Blase" absent or vestigial.

♀ genitalia. "Schildchen" broadly triangular in shape but variable. Lamella postvaginalis well developed but not sclerotized as in, e.g., the *filipendulae-lonicerae* group. Lamella antevaginalis strongly sclerotized, ovoid in shape and variable in width. Ductus bursae more strongly angulated at entrance to ductus seminalis compared with that in *romeo*, weak to moderate sclerotization in the anterior two-thirds, especially laterally. Bursa copulatrix spherical, signum present (in all specimens examined), varying from 20-27 spines.

First pair of tibial spurs absent.

Z. osterodensis asiatica Burgeff (comb. nov.)

Z. scabiosae asiatica Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 19.

Type locality: Sojmonowsk, northern part of the southern Ural Mountains.

Material examined: 4 ♂♂, 5 ♀♀, Ural Mts.

♂ genitalia. Spines at the base of the lamina dorsalis long and well developed, forming a transverse row across the base. Single group of cornuti strong and well developed.

♀ genitalia. Lamella postvaginalis well developed, ductus bursae weakly sclerotized, signum present and well developed.

Z. osterodensis filipjevi Holik (comb. nov.)

Z. scabiosae filipjevi Holik, 1939, *Rev. franç. Lépid.*, **9**: 276, pl. 7, figs. 12-15.

Type locality: 50 km. south-east of Uzjan, Bashkir.

No material of this subspecies was available for examination.

Z. osterodensis saratovensis Holik & Sheljuzhko (comb. nov.)

Z. scabiosae saratovensis Holik & Sheljuzhko, 1955, *Mitt. münch. ent. Ges.*, **44/45**: 106.

Z. scabiosae transiens Spuler, 1906, Die Schmetterlinge Europas, **2**: 155 (preoccupied).

Type locality: Saratov, southern Russia.

Material examined: 1 ♂, Churalinsk, 1 ♀, Sarepta.

♂ genitalia. Spines at base of lamina dorsalis long and well developed, cornuti reduced in length.

♀ genitalia. Lamella postvaginalis developed, lamella antevaginalis broader than that in *altaica* (see below), ductus bursae weakly sclerotized, signum present, rather weak, number of spines reduced.

Z. osterodensis sibirica Holik & Sheljuzhko (comb. nov.)

Z. scabiosae sibirica Holik & Sheljuzhko, 1955, *Mitt. münch. ent. Ges.*, **44/45**: 109.

Type locality: Tobolsk, west Siberian steppe region.

We have been unable to examine material of this subspecies.

Z. osterodensis altaica Holik & Sheljuzhko (comb. nov.)

Z. scabiosae altaica Holik & Sheljuzhko, 1955, *Mitt. münch. ent. Ges.*, **44/45**: 111.

Type locality: Altai, central Siberia.

Material examined: 13 ♂♂, 5 ♀♀, Baikal region and Irkutsk.

♂ genitalia. Spines at the base of the lamina dorsalis long and well developed, forming a transverse row, single group of cornuti present, well developed.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis broad, ductus bursae moderately sclerotized, signum present but number of spines reduced.

Z. osterodensis kenteina Burgeff (comb. nov.)

Z. scabiosae kenteina Burgeff, 1926, *Mitt. münch, ent. Ges.*, **16**: 19.

Type locality: northern Urga, Kentei Mts., Mongolia.

Material examined: 2 ♂♂, 2 ♀♀, Urga, Kentei.

♂ genitalia. Spines at the base of the lamina dorsalis long and strongly developed, cornuti strong, well developed.

♀ genitalia. Lamella postvaginalis developed. lamella antevaginalis narrow, ductus bursae weakly sclerotized, signum present, strongly developed as in ssp. *asiatica*.

Z. osterodensis caucasi Burgeff (comb. nov.)

Z. scabiosae caucasi Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 19 (nomen novum for *caucasica* Spuler).

Z. scabiosae caucasica Spuler, 1906, Die Schmetterlinge Europas, **2**: 155 (preoccupied).

Type locality: Achalzych, Georgia, Transcaucasia.

Material examined: 1 ♂, labelled "Causcasus".

♂ genitalia. Lateral spines of the transverse row at the base of the lamina dorsalis enlarged, central spines of transverse series shorter, but still well developed. Single group of cornuti present.

(To be continued.)

The genus *Idiocerus* (Hem.-Hom., Cicadellidae) in suburban North-west Kent

By A. A. Allen, B.Sc., A.R.C.S.

F. B. Jennings, writing over half a century ago (1909, *Ent. mon. Mag.*, **45**: 89), remarked on the paucity of records of insects of this suborder in general, and of this—in life—distinctly attractive genus in particular, which can hardly be said to share the obscurity of so many of its smaller relatives. To this day, however, it remains little known to the average field entomologist, and I therefore make no apology for offering some notes on the species of *Idiocerus* encountered during the past autumn within a few miles of my home.

I will first illustrate the above point by a comparison. Taking for this purpose a local list for a productive and well-worked area, compiled over a number of years—*The Natural History of the Oxford District*, 1926: 295—one finds only four species of *Idiocerus* listed for a circular area of seven miles' radius from the centre of Oxford. This contrasts oddly with a total of eleven species of these leaf-hoppers that may mostly quite readily be collected in a single day near here in an area a fraction of the size—nearly three times as many! W. West, working in the same district around the turn of the century, recorded in 1909 ('Woolwich Surveys') ten species of the genus, and later added one more; all of which the present writer, assisted at times by Mr. D. Collins, has met with recently either at Blackheath or Shooters Hill—places frequently mentioned in West's list. It is, perhaps, unlikely that any further species will now be found to inhabit the district, though one or two possibilities remain. At any rate it is interesting to note, in view of metropolitan 'sprawl' and increasing pollution, that every one of those taken over 50 years ago by West still occurs—most of them freely.

As the salicaceous host-plants of these bugs usually each support more than one species (up to three here in the case of certain kinds of poplar) it will be convenient to list the species under their foodplants. Synonyms are added where a different name is now in use.

Salix fragilis L.—*I. lituratus* Fln., Blackheath, in plenty, with *I. stigmaticalis* Lew. (=*adustus* H.-S.) much less commonly on the same willows. The former species appears to be at its peak in July, the males almost over by August (at least it seemed so in 1963), but females—as usual in the genus—may persist till late in the year. I know of only one tree of the white willow (*S. alba* L.) in the neighbourhood, which is almost unworkable but might probably yield the same two species.

Salix caprea L.—*I. confusus* Flor, Shooters Hill, one specimen; this apparent scarcity must be due to the lack of sallow in the area, the bushes being only very few and far between; in most localities this host supports *lituratus* besides *confusus*.

Populus alba L.—*I. distinguendus* Kbm. (=*cognatus* Fieb.), abundant at Blackheath on a row of young white poplars planted only a few years ago; this tree also is scarce in the district, which probably accounts for the absence of *I. albicans* from the row just mentioned. The young stages plentiful in July, more or less pale green—of which colour little remains in the adults.

Populus canescens Sm.—A single grey poplar in the woods at Shooters Hill, whose foliage is out of reach but which has given rise to a number of

seedling bushes growing mixed up with aspen, harbours thriving colonies of *I. distinguendus* and *laminatus* Kbm. on the bushes, together with *albicans* Kbm. very sparsely. The latter species perhaps breeds only on the parent tree, the few examples seen having strayed from it.

Populus tremula L.—*I. populi* L., Shooters Hill, generally distributed and common, locally plentiful; the striking form of the female having the normal bright green replaced by deep rosy or orange-pink (as fugitive after death as the green) occurs very sparingly. *I. tremulae* Estl. is considerably more local on the same aspens, its headquarters in one small area (with an outlier or two) and another even more restricted colony quite separate from this. At least one specimen of *I. laminatus* has been swept from aspen here but it may have been a straggler from the grey poplar, though some little distance from it. At Darenth Wood, however, we found these three species together and in about equal numbers on a row of mature aspens, the *laminatus* showing a wider range of colour than at Shooters Hill; one remarkable female had the normally rosy-flushed parts clear green—a very deceptive form, strongly resembling a large ♀ *populi*— while others showed a transitional phase in that only the abdomen was wholly or partly green instead of rosy.

Populus italica Moench.—Another productive host-tree regularly supporting three species around Blackheath: *I. fulgidus* F., *vitreus* F. (=*h-album* Fieb.) and *decimusquartus* Schrank (=*scurra* Germ.). The first two are general on it, occurring nearly always in company (as West and Jennings found), the last a good deal less common, at least this season, but still far from rare. West recorded it as abundant at Blackheath. Yet, apart from several localities around London, mostly on the north side (Jennings, *l.c. sup.*), British records of *I. decimusquartus* are very few—the most distant are isolated ones from West Sussex and Oxon. The same observers remark on the seemingly exclusive attachment of both '*scurra*' and *vitreus* to the Lombardy Poplar, and this we can fully confirm. (Unfortunately, this tree, known to yield two other species of *Idiocerus* in Britain, is by its situation and mode of growth often almost unworkable!)

Populus (*deltoidea* Marsh. × *nigra* L.=) × *canadensis* Moench.—The common hybrid 'black' poplar of the suburbs appears for some reason to be less acceptable to these insects than *P. italica*, notwithstanding the very close affiinity of the two trees; the only species found by us on it here and elsewhere is *I. fulgidus*, tolerably freely. One female among numerous typical specimens from Cheshunt, Herts., was bright salmon-pink instead of green—the only such specimen seen corresponding to the similar form of *populi* already noticed. (Whether the third green species, *confusus*, ever produces a like form seems uncertain.) Mr. Collins has found what appears to be colour-dimorphism in the 'larvae' of *fulgidus* at Carshalton Beeches, Surrey, where green and black forms occurred together last year in equal numbers on a bush of the above foodplant; but whether this is a sexual difference has not yet been demonstrated.

Besides these 11 species, there is a specimen standing over the name *I. cupreus* Kbm. (=*aurulentus* Kbm.) in the collection of British Homoptera at the British Museum (Nat. Hist.) with a label 'Blackheath, Kent/x.1909/W. West'—one of a series from various sources. With the exception, however, of the original specimen taken by James Edwards at Cossey, Norfolk, and recorded by him as *I. aurulentus* (his *cupreus* being probably an abnormal overwintered *vitreus*), they appear to have been

incorrectly placed as that species and to be in fact referable to *vitreus*. I suspected this from a naked-eye comparison and am glad to find that it is also the view of Dr. W. J. Le Quesne.

As a guide to anyone wishing to work the group, it may be mentioned that East Anglia is seemingly the richest part of the country in Idioceri, with two or three very rare species recorded many years ago for which further data, and any recent records, are badly needed; and that for many remoter parts virtually nothing at all is known of the fauna. It would be strange if some of our many northern and mountain species of *Salix*, for instance, did not harbour one or two species of *Idiocerus* not yet known from Britain. For all 18 species now reckoned as British, August to September is the peak period. One of the rarer, *I. vittifrons* Kbm., is exceptional in being attached to the field maple, *Acer campestre* L. Knowledge of foodplant is a most valuable aid to specific determination. The slight or pronounced sexual differences in colour or marking shown by about half the species may be rather confusing at first, but as they are all gregarious and the sexes are easily known by the different formation of the apical sternites, this will not give much trouble; besides, closely similar species do not as a rule affect the same host-plants. Each species in the fresh state has a distinctive facies which soon becomes familiar (hard as it may be to describe).

The curious 'allochromatism' among females of the *populi* group of species* seems to have a parallel in the pigmental changes undergone by females of certain Heteroptera (e.g. some Pentatomids and Mirids) in connection with hibernation, and beginning in the abdomen (cf. our experience with *I. laminatus*). As only females of the present genus are known to hibernate—a small proportion normally surviving the winter—it may well be that the phenomenon under notice is basically similar, i.e. a by-product of physiological changes preparatory to overwintering; but the low percentage of any population to be so affected seems to offer difficulty, moreover the colour-change (assuming it *is* a change, and not a constant feature of certain individuals) can be complete before mid-August. Clearly, the question could only be settled by keeping whole broods under constant observation in captivity, and breeding if possible from allochromatic females.

In conclusion I would thank my friend Mr. Collins for directly or indirectly drawing my attention to these interesting insects, and Dr. Le Quesne for his kindness in elucidating certain points and in freely giving us the benefit of his great knowledge of the 'hoppers'. 31.xii.63.

*Reversed in *laminatus*, where the green form is the exception, the rosy one the rule. In addition, there is sexual colour-dimorphism in *laminatus* (with brownish male) and *populi* (with yellow male), but in *confusus* and *fulgidus* both sexes are normally green. The reference throughout is of course to the ground colour—the markings remain unchanged.

Current Literature

Diptera Visitors to the Stinkhorn, Phallus impudicus Pers., in Denmark.

The Stinkhorn is a toadstool with a scent repulsive to human beings but attractive to many species of flies. Records of visitors to this fungus have been published by H. Luther in 1947 for Finland, for this country by myself in 1947 and 1951 and by K. G. V. Smith in 1955, 1956, and for Belgium by A. Collart in 1950.

B. Overgaard Nielsen in 1963, FLORA AG FLORA, **69**: 126-134, records *Phaonia errans* Mg. and *Helomyza fuscicornis* Zett. as new to the list of the Diptera of Denmark in an article on 1699 flies of 16 families captured at the fungus in two localities to the north of Copenhagen, Denmark, in September and October. The most numerous visitors were *Polietes lardaria* F., *Phaonia variegata* Mg., *Calliphora vomitoria* L. and *Drosophila phalerata* Mg. A comparison is made of the captures made in the four countries but it is evident that there is scope for further work to ascertain the full range of visitors and the reasons for the visits. Nielsen records breeding *Drosophila busckii* Coq. from the stinkhorn.

L. PARMENTER.

"The Biting Midges of Lyngby Aamose" in 1963, Natura Jutlandica, **10**: 1-46.

B. Overgaard Nielsen of the Zoological Institute, University of Aarhus, Denmark, presents his report of an investigation of the biting midges which were causing a great nuisance to the inhabitants of Lyngby Aamose. The town is in wooded fenland on the shores of Lake Lyngby, a few miles north west of Copenhagen. A description of the vegetation and the several methods of collecting is given before proceeding with the account of the midges. Some 20,000 *Culicoides* (Ceratopogonidae) adults were collected in 1960-62 with *C. impunctatus* Goet. providing over 90%. This is the species which was accidentally omitted from the British List in Kloet and Hincks, 1945, but is known as one of the most annoying species of the family in Scotland. The seasonal and daily activities of the species are discussed and also its dispersal, illustrated with tables and maps. The trapping of emerging midges and the micro-distribution of *Culicoides* larvae are described and a brief note on their pupation follows before the final summary. The paper concludes with a useful reference list of 27 items.

L. PARMENTER.

New Locality Records for British Ants, 1963

By C. A. COLLINGWOOD

Ponera coarctata Latr. workers were found in soil among loose rock on Brean Down. Somerset, in April 1963; this is the first record for Somerset. *Myrmecina graminicola* Latr. has usually been taken in limestone country, typically nesting under deep stones on well drained sites. It was a surprise, therefore, to find a strong colony nesting in the sphagnum bog on Stoke Heath Dorset. The nest had a small pile of fine litter fragments on top in which the *Myrmecina* were incubating their brood. Various *Myrmica, Lasius niger* L. and *Formica transkaucasica* Nas. were occupying similar situations nearby.

A large and thriving colony of *Leptothorax nylanderi* Foerst. was disclosed under flaking rock in a sheltered position on Stanner Rocks just within the county of Radnorshire in October 1963. This is the second record for Wales where previously it has only been found at Chepstow by the late H. M. Hallett. This is also the second time only that I have found this species in Britain other than in tree stumps or under bark.

More typically the species was abundant on old oak trees in Chilston Park, Kent, in September. Conversely, a strong colony of *L. tuberum* Fab. which normally nests in rock crevices or in moss, was found under ash bark in Goblin Coombe, Somerset, a locality where this species is not uncommon among the limestone exposures. These experiences illustrate the difficulty of attempting to define too closely the apparent ecological requirements of a species

Myrmica schencki Em. was found in two new localities, nesting in sand at Kenfig, Glamorganshire in June 1963, and in a grassy bank near Coombe Halt, Oxfordshire, in July. The Glamorgan discovery supplements the discovery of H. M. Hallett who first discovered this species in the British Isles nesting in a marl bank at the edge of a wood near Sully. To date, this ant is now recorded from 13 locations in England and Wales compared with twice that number in South Ireland. *Lasius rabaudi* Bond. was also found on Kenfig dunes nesting in sand banks. One colony was found in a large *L. flavus* Fab. like mound in the sand. The interior of the nest was constructed of blackened carton. The nest was probably of fair age and contained very large numbers of males and also a very few alate queens. Some of the males and workers were retained in captivity for a few weeks and I was surprised to see the males which are robust in form with well developed mandibles, feed themselves from moistened sugar and also drag about insect corpses.

Other new county records include *L. fuliginosus* Latr. seen foraging among willow near Hilton, Hunts., in September. *Myrmica rubra* L. and *M. sabuleti* Mein. at Portknockie, Banffshire, and *Formica sanguinea* Latr. on a wooded bank at Bridge of Canny, near Banchory, in Kincardineshire, in July 1963. This last place was about a mile away from a similar site where I found it in 1958 near Kincardine O'Neil, just over the county border into Aberdeenshire. Dr. Guy Morison also sent me some *F. sanguinea* from Marywell, in the same area.

Prodenia litura Fabricius: The Mediterranean Brocade (Lepidoptera: Noctuidae) in England in 1963

By J. M. Chalmers-Hunt

Newspaper entomology is not renowned for its reliability, and seldom contains information of import that cannot be located in the entomological literature. It was therefore of interest to read in the *Evening News* of 13th December 1963, a well-informed article drawing attention to the appearance of this species in England in unprecedented numbers. This short article, entitled "Looking for the Prodenia Litura", by L. B. Powell, is based on a Press notice issued by the Ministry of Agriculture, who have since confirmed that the moth occurred in this country as a pest on chrysanthemums in 1963.

Mr. F. H. Jacob of the Plant Pathology Laboratory, Harpenden, writes that from July onwards, a few chrysanthemum growers in the southern half of England noticed unusual damage, and that caterpillars proved

difficult to kill with the common insecticides used in glasshouses. Cases were reported to the Ministry of Agriculture, whose staff identified the larvae as those of *P. litura*. Subsequently, infestations were found in a number of glasshouses on nurseries in Kent, Sussex, Hampshire, Norfolk, Essex, Somerset, Gloucestershire, Glamorgan and Worcestershire. The species is believed to have been accidentally introduced as ova or young larvae on chrysanthemums.

P. litura has a wide range abroad in tropical and sub-tropical regions, and its larva is well-known as a potentially dangerous pest, notably on tomato and citrus fruits. Prior to 1963, however, it appears to have been very seldom noticed in this country, and the only instance of its occurrence to my knowledge, is of a specimen bred from a larva stated to have been imported from the Canaries in bananas, and which was feeding on the skin. The larva, and later the moth which was bred from it, were exhibited by Classey in 1949 (*Proc. S. Lond. ent. nat. Hist. Soc.*, 1949-50: 10, 25).

The species is not in Barrett (*Lep. Br. Isles*), South (*Moths Br. Isles* (1907)), nor in Meyrick (*Rev. Handbook Br. Lep.* (1927)). South (*Moths Br. Isles*, New Edition, 1961) states that it "has occasionally been reared here from caterpillars found on imported tomatoes", but gives no further particulars.

Notes and Observations

SOME LATE RECORDS FOR 1963.—As usual, my mercury vapour light trap has produced some exceptionally late records here, among which are the following: October 13th, *Apamea monoglypha* Hufn.; October 24th, *Epione repandaria* Hufn.; November 4th, *Hypena proboscidalis* L.; November 5th, *Leucania pallens* L.; November 14th, *Plusia gamma* L., and I also saw a fully-fed larva of *Pieris brassicae* L. crawling up the wall of the museum at Haslemere on November 30th.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking, Surrey. 22.xii.1963.

EUPHIA LUCTUATA SCHIFF. AND RHODOMETRA SACRARIA L. IN 1963.—I would like to mention two insects caught in 1963 which may be of interest. The first is a female *Euphia luctuata* Schiff. (white banded carpet) which I caught flying around some birch trees near Lewes on 5th May. The 1961 edition of "South" mentions June to August as the months of emergence of the moth. The second record is of a male *Rhodometra sacraria* L. (vestal). This was caught at light on 17th October at Cheltenham. The oblique stripes on the forewings are of a deep chocolate brown colour.—R. M. C. VAUX, M.B., B.CH., 29 Leckhampton Road, Cheltenham, Gloucestershire. 27.xii.1963.

EUPITHECIA INSIGNIATA HÜBN. AND HADENA COMPTA SCHIFF. IN NORTH BUCKS.—*E. insigniata* Hübn. appeared in my mercury vapour light trap on 16th and 27th May last year; there are several old apple trees near to where I station the trap and next year I hope to find larvae. A worn and slightly battered specimen of *H. compta* was taken in the trap on 22nd July. The only highlights of an otherwise undistinguished season.—J. ELLERTON, Captain, R.N., Granborough Lodge, Granborough, Bucks.

Obituary

ALFRED E. BURRAS (1871-1963)

Alfred Burras passed away at Newbridge Hospital, Salisbury, on 15th November 1963, at the great age of 92 years, and in spite of his advanced years, his death came as a great shock to a very large circle of his friends, for until he reached his nineties he was a man of very great energy with a tremendous zest for his entomological and ornithological pursuits. All who met him, even in his later years, must well remember his unbounded enthusiasm which he kept up virtually to the end. He might well be termed the doyen of field naturalists, since he had a very wide and all-round knowledge of natural history and was one who spent all his years in practical field work.

Excepting those years interrupted by hostilities, he pursued his interests almost annually on the continent, and among his favourite hunting grounds may be mentioned the Pyrenees, Alpes Maritimes, and such famous resorts in the Basses Alpes as Digne, Uvernet, Maurin and Dieulefit, while the Swiss Alps were an equally happy and profitable collecting ground for him. From all these trips abroad, which were often carried out twice a year so as to coincide with the spring and autumn emergences, he brought back much interesting material, especially among the high level lepidoptera. On many of these expeditions he was accompanied by his very close friend, the late William Fassnidge, and they collaborated to provide some very valuable data for entomologists at home and abroad. On all these occasions went with him his devoted wife, whose help in the field has been of inestimable value to his success in many spheres of natural history. But these collecting trips were not without adventure, and he used to tell how he was once taken for a smuggler on the Italian frontier, but was saved by his net, which acted as his emblem of office.

Although he spent much time out of this country, it was the New Forest which was his real home, and since 1907 he worked every corner of this famous region and had an unrivalled knowledge of its fauna, and it was here that he made his final home, near Redlynch, among its lepidoptera and birds which he also studied so closely, for he possessed a very extensive collection of eggs as well as of British butterflies and moths.

Of his earlier days, he was born of humble parents in Westmorland, where he first showed the flair for observation in the field. From 1894 he was assistant master at several grammar and high schools, both in Cumberland and the south of England, until he finally settled, in 1907, at the Boys Secondary School at Portsmouth, where he taught mainly English and French, and he remained on the staff there until he retired shortly before the 1939 war. Here again, he was recognized as a naturalist of marked talent. He was also a keen sportsman, being a cricketer, and especially a bowler, of no mean repute, being also an equally enthusiastic angler. In his early days he won an open swimming championship on Lake Windermere.

In the scholastic field he was a B.A. of London University, and also held the Diplome Superieur of the University of Caen, being fluent in French and Spanish. In the natural history world he was a fellow of the Royal Entomological Society of more than forty years standing, as well as a member of the British Ornithologists' Union, and he had been presi-

dent of the Society for British Entomology. He was also on the Convocation of the National Trust.

The sympathy of all his friends goes out to his beloved and devoted wife who, at the age of 86 years, carries her head high and is still living on the edge of those wild expanses of the New Forest that her husband loved so much throughout his long and active life.

C. M. R. P., W. G. T., C. G. M. de W.

H. E. HAMMOND, F.R.E.S. — An Appreciation

Ted Hammond was unusual amongst entomological personalities in that he earned his reputation as a taxidermist rather than as a collector or field-worker, and the sphere in which he not only excelled but which he truly made his own was in the preservation of lepidopterous larvae by what is called "blowing". This particular form of preservation had been carried on in only a desultory sort of way until Cockayne did it systematically and then Hammond perfected the art, which is now recognised as making an important taxonomic contribution to collections both public and private.

During the past twenty-five years Hammond devised new apparatus and ingenious techniques, all the while so polishing his expertise that he was able to operate on a tremendous scale and preserve great numbers of specimens for commercial distribution to schools and educational centres in addition to providing the large numbers of skins for private collections which was his major task and enjoyment. His industry was prodigious. He was never able to spend much time in the field so he became the centre of a highly organized band of widely scattered colleagues who maintained with him a rich and entertaining correspondence by which larvae were posted and preserved and distributed; the tales born of this enterprise are a legion and all gained from the earthy and indomitable joviality of Big Ted Hammond.

His reputation extended beyond Britain but he was known intimately only to his own Birmingham colleagues and to a small inner circle of his correspondents. He wrote two major papers about his work, one for the Amateur Entomologists' Society entitled "Preserving Caterpillars" (A.E.S. leaflet, no. 20, 1948) and one entitled "The Preservation of Lepidopterous larvae using the inflation and heat-drying technique" (Journ. Lep. Soc, 14, no. 1, 1960). He was a member of the South London Natural History and Entomological Society, and one of the pleasures of the Annual Exhibition was to meet him at Burlington House each October.

For many years, and for most of us for as long as we had known him, Hammond was afflicted by acute deafness but during recent years his health was much troubled by additional illness culminating in an exacting aorta operation just over a year ago; that he was able to maintain his energies and interests was due in part to his robust constitution and unyielding courage, but due equally to the devotion and care of his wife.

Ted Hammond died on 15th December 1963, aged sixty-one. His work will live in the beautiful and exquisitely preserved specimens that will eventually occupy a permanent place in the national collections, and his memory will live with those of us who were fortunate to know him and to share in his work.

To his widow we express our deepest sense of loss.

G.M.H.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

LOOKING FOR MICRO-PSYCHIDS. B. J. LEMPKE 31

THE IDENTITY OF *ZYGAENA ALGIRA* BOISDUVAL, 1834 (LEPIDOPTERA: ZYGAENIDAE) 35

INVERNESS-SHIRE IN 1963. Commander G. W. HARPER, R.N. (Retd.), F.R.E.S. 36

WESTERN IRELAND, 1963. Rear-Admiral A. D. TORLESSE 40

DIPTERA IN GALLOWAY AND CENTRAL WALES. R. M. PAYNE 44

THE *SILVICOLA* BURGEFF GROUP OF THE GENUS *ZYGAENA* FABRICIUS (LEP., ZYGAENIDAE). W. GERALD TREMEWAN 46

THE GENUS *IDIOCERUS* (HEM.-HOM., CICADELLIDAE) IN SUBURBAN NORTH-WEST KENT. A. A. ALLEN, B.Sc., A.R.C.S. 55

CURRENT LITERATURE 57

NEW LOCALITY RECORDS FOR BRITISH ANTS, 1963. C. A. COLLINGWOOD 58

PRODENIA LITURA FABRICIUS: THE MEDITERRANEAN BROCADE (LEPIDOPTERA: NOCTUIDAE) IN ENGLAND IN 1963. J. M. CHALMERS-HUNT 59

NOTES AND OBSERVATIONS 60

OBITUARY 61

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (151)

TO OUR CONTRIBUTORS

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Some Considerations on some Present Day Conditions as they affect the Continued Existence of Certain Butterflies

By Major-General C. G. Lipscomb and Captain R. A. Jackson, R.N.

1. It is sometimes stated that little is known about the management of downland so that it may continue to support its natural population of insects and flora. On the contrary there is a large fund of knowledge built up by field naturalists over the years that throws considerable light on this subject. It is the purpose of this paper to discuss this and kindred subjects dealing with conservation where it affects those insects whose larvae feed on grasses and low plants mainly growing on hillsides and downland.

Those which are most threatened by changing ecological conditions are:—

Maculinea arion Linn., the large blue
Lysandra coridon Poda, the chalkhill blue
Lysandra bellargus Rott., the Adonis blue
Melitaea aurinia Rott., the marsh fritillary

After examining the causes of the threat to these insects an attempt will be made to consider what can be done for their conservation.

2. **Historical background**

It has been said that towards the end of last century a man could hire a horse in Salisbury and ride out over downland the whole way to visit Stonehenge. If one did such a journey to-day one would be hard pressed to find a single patch of the original downs left undisturbed. Such is a fair measure of the changes that have taken place in Wiltshire and elsewhere in the life time of some of us.

In those long ago days it can safely be assumed from old records that *coridon, bellargus* and *aurinia* were of general distribution in Wiltshire and although colonies of any one of them were periodically reduced or destroyed by occasional grazing, once the foodplant had recovered the area was at once recolonised from outside and quickly regained its former strength. It is this mobility that these insects have now lost, confined as they are to small isolated areas which, once destroyed, can now never be recolonised by natural means. The same principle of loss of mobility applies to a certain extent in the case of *arion* although of course its habitat is different.

3. **The threat to the present isolated colonies**

This comes under four headings:—

(a) Ploughing downland.
(b) The virtual disappearance of the rabbit.
(c) New building and development.
(d) Intensive grazing by cattle, sheep and pigs.

Each of these threats will be considered seperately and known examples of localities lost to the various insects thereby will be quoted.

(a) **Ploughing**

The call for more and better pasture, on what might be called marginal land, aided by the Government subsidy has led to quite steep hillsides being ploughed up and reseeded.

A case in point was Homington Down near Salisbury, well known to many for its interesting colonies of Coridon and Bellargus. Initially the former was hardest hit as it was the feeding ground of the larvae at the western end of the down which came under the plough (*bellargus* suffered a different fate, see below). Another somewhat similar case has occurred at Camp Down on the northern outskirts of Salisbury where a thriving colony of *coridon* existed partly on unfenced downland and partly in an adjacent field. A few years ago the downland was ploughed up, grew a few crops of corn, and is now apparently abandoned to weeds and rough grass. At the same time the field is being heavily grazed by cattle and the chances of any *coridon* surviving this double onslaught seem remote.

(b) **The rabbit**

The increase of rabbits between the wars when so much land went out of cultivation, was almost phenomenal. Perhaps it reached its most damaging proportions in the stony fields of the North Devon and Cornish coasts. In this country of wide stone walls, it was almost impossible to control the increase and the loss to growing corn was very heavy. However, after the last war, relief was at hand, for in the early fifties that horrible disease myxamatosis appeared and in a year or two the rabbit was almost exterminated. This had a disastrous effect on both *arion* and *coridon*. The larvae of *arion* spends the first weeks of its life on thyme growing on anthills, but with no rabbits to keep them down, the coarse grasses are smothering the thyme—this is very clear in Gloucestershire, where the butterfly is now very scarce, if indeed it still exists. In many of its old localities, visited by the authors last summer, it is quite gone. The anthills are still there but they are smothered in grass and there is no thyme on them.

In Devon and Cornwall the same story is true but it is the young gorse which is smothering the thyme. In the case of *coridon* and *bellargus* the larvae feeds on the horseshoe vetch (*Hippocrepis comosa*) and it is this plant which is gradually choked out by the coarse grasses. It might be remarked here that on the other side of the picture the absence of rabbits has led to an amazing increase in the numbers of the larger fritillaries whose larvae feed on dog violet. This has occurred on poor stony hillsides, where the rabbit used to crop the violets, whilst, luckily, there are not the coarse grasses to choke the plants.

(c) **New building and development**

More and more land is required for housing and in some cases planning permission is given for downland dwellings. A case in point can be quoted again from Homington Down where ploughing killed poor *coridon*.

bellargus lived further to the East and was spared the plough, but instead a house was built there, a large garden was made on its breeding ground and some pigs did the rest.

(d) Intensive grazing

(i) pigs

There is no doubt that of all animals, pigs present the greatest menace to the butterfly population. Wherever they are turned out they create a complete upheaval and butterflies breeding there are doomed.

An outstanding example of this is Standlynch Down about 5 miles S.E. of Salisbury just west of the Southhampton Road. This was a small down with a good and variable colony of *coridon*. Directly pigs were turned out the colony was doomed to extinction, and has been completely destroyed.

(ii) sheep

In this county sheep have grazed on the Plain from time immemorial, but conditions to-day bear no resemblance to the past. Farming is so intensive now and so much land is under the plough that the grazing available is greatly reduced. The result is that the downs are overgrazed by great numbers of sheep, who are not moved until the down is cropped bare, with the result that the Horseshoe Vetch and any larvae on it are practically destroyed for a season. The plants recover but the insects are wiped out. Two cases may be quoted.

Between Codford and Chitterne there is a patch of down, too steep for the plough, where both *coridon* and *belargus* occurred in quantity and across the valley there was a colony of 'skippers' where the Essex skipper (*A. lineola* Ochs) far outnumbered its commoner relation the small skipper (*A. sylvestris* Poda). In the early fifties these downs were selected as a pasturage for a large flock of sheep in the early spring. The effect has been to blot out the colonies of all the insects named.

An even more extreme case must be quoted. On another down with steep sides running up to a level top, which is under the plough, there existed a vast colony of *coridon*, containing many thousands of butterflies as well as great numbers of meadow browns (*M. jurtina* Linn). The down was very extensive being nearly a mile long, and so great was the concourse of insects that a visiting collector, with unrivalled experience of this country, gave it as his opinion that it was the largest colony he had ever seen. This was in 1961 but in the spring of 1962 at least 600 ewes with their lambs were enclosed on the down. The spring was extremely dry with cold winds. When the flock was moved, the whole down was eaten bare. There were no flowers on the down and no *jurtina* were to be seen. Of *coridon* perhaps forty or fifty were seen over the whole season.

(iii) cattle

Until recent years the emphasis has been on milk production, but the government is now urging a large increase in home produced beef. The dairy herd hardly affected our problem, as the great majority of the cattle were pastured in the meadows near their stalls. With young bullocks being reared in large numbers, the downland is in great request and is often subject to heavy grazing. This is assisted by piped water being available at the most distant points on any downland farm. From the roads it is easy to see which land has been denuded of its butterfly population for it presents a bare appearance with the grass covered 'toomps' standing out clearly on the hillsides. Where this is the case, there will be no flowers and the butterflies will have been destroyed.

Cases in point which may be cited are Edington Down eaten bare, about 1952, Stoford Down about 1960 and a most interesting down near Upton Scudamore which produced good numbers of *coridon* and *bellargus* and in addition a colony of the marbled white (*S. galathea* Linn) containing an aberational form found previously only on the Polden Hills. The area was enclosed for grazing in the spring of '63 with the result that the butterflies were grazed out. Hod Hill, in Dorset, which possesses one of the fast dwindling colonies of *aurinia* is yet another example. The vallums which encircle the hill top are well clothed in scabious and are grazed heavily at various periods of the year by both cattle and sheep. There is, however, a very limited area of hillside which is fenced off and here *aurinia* can breed undisturbed as it did over the whole hill top up to world war II. Each year it attempts to expand its range on the vallums, but equally regularly stock destroy the larvae. If it wasn't for this small reservoir *aurinia* would have ceased to exist years ago.

4. **The present position**

From the foregoing paragraphs it is clear that the survival of many of our butterflies is in a very precarious position, and that some action is essential if they are to continue to exist. This review has been written from the Entomological standpoint, but the botanists are equally concerned. The absence of rabbits is equally detrimental to many of the choicer wild flowers especially the rarer orchids, whilst heavy grazing means that there will be practically no flowers at all, although the perennial plants themselves will be alive.

5. **What is to be done?**

To deal with a situation like this is one of the reasons for which the Nature Conservancy has been set up and it has acquired many properties as nature reserves. These are under special supervision and control by officers of the Conservancy

It is obvious however that the Conservancy can make but little impact on the whole countryside and its reserves are few and far between (in Wiltshire there is one, in Sussex two and in Kent five—two of small interest to naturalists). To further the work of the Conservancy and to make use of voluntary workers, County Trusts for Nature Conservation have been or are being set up in most counties of England and Wales. As a first action Nature Conservancy earmarked sites of Special Scientific interest (S.S.S.I.s) and the landowners concerned have been told of their existence. County Trusts are now equally concerned with the preservation of these areas and recommend further areas for preservation to the Conservancy. However, unless they can buy or lease them outright, which is seldom possible, they have no control over their management, and if agricultural or forestry interests choose to destroy them there is no redress or compensation. In the authors' opinion this is one of the weakest links in the conservation chain as it seems essential that S.S.S.I.s should be given more effective protection. At the same time it is fully realised that the farmer who has pigs, sheep or cattle, is running a business undertaking and it would be invidious for the Trust to approach an individual and ask him not to graze his land so heavily or even to fence off certain portions as reserves. Fortunately there have been a few bright spots in this gloomy picture at any rate in Wiltshire, where big farmers have

voluntarily undertaken to preserve areas of downland. In one case a farmer has fenced off several acres near Codford when it was explained to him that it contained rare orchids which were being destroyed by grazing cattle. In another near Salisbury a farmer has undertaken to preserve quite a large area of downland in its natural state.

6. The management of downland reserves

This is a most difficult problem for little experience is available as a guide. The idea to be aimed at is to preserve the Ecology of the area under consideration if the insects and flowers are still flourishing, or to restore it to its original state where grazing and other causes have led to a threat to that which we wish to preserve. Naturally we cannot reintroduce our best friend the rabbit so we must have recourse to controlled light grazing and in certain cases burning.

Where coarse grasses have established a hold and are choking the finer plants, fire will probably be essential. Burning must be carefully supervised and carried out in strips so that the insects remaining on the untreated portion will have good ground to transfer to when the portions burned have been rejuvenated. Where tor grass (*Brachypodium pinnatum*) is the trouble, careful watch will have to be kept to see that the burning does not lead to an actual expansion of the plant's territory.

This burning or swaling has proved most successful in the case of *arion* on the west coast and a reserve at St Catherine's Tor near Hartland maintained the species in this way for many years. On the other hand before the last war, a private reserve was established at the Dizzard and all swaling was strictly forbidden. When inspected in 1947 it was found that the whole area was smothered in a thick growth of young gorse and the thyme was completely choked out. Of course the butterflies had vanished, killed by the kindness of their protectors.

To return to our grass downs in Wiltshire where burning is either not judged to be necessary or is impracticable, grazing by a few cattle must be carried on.

Only experiment and the experience gained can decide on the extent, but it is only common sense that in the first instance this should be very light, Under no conditions should grazing be commenced before 1st November and the beast should be withdrawn by the end of January or middle of February at the latest. The number to be used must depend on the area to be controlled, but the figure of one beast to five acres is recommended as a start.

As experience is gained after one or two years, the number of beasts and the period of their employment will have to be reviewed.

7. Responsibility for the future

That the whole question of the preservation of the flora and fauna of our downland is of great importance not only to our County Trusts but to future generations cannot be gainsaid. Whereas in the past Wiltshire was renowned for its lovely flowery downs and was visited year by year by naturalists and nature lovers, the position to-day is that those downs worth a visit are few and far between.

A large part of the responsibility for their preservation should be shouldered by the County Council authorities who alone in the county have been invested with the powers to establish nature reserves. So far

few have taken advantage of this and to quote Mr. E. M. Nicholson, the Director General of the Nature Conservancy, speaking of County Councils in general, 'It is necessary that they wake up and exercise the powers they have got before it is too late'. (*Times* 5th Dec. 1963.)

Lepidoptera in the Isle of Wight, 1963

By T. D. Fearnehough, A.MET.

Following a blizzard which swept over the Island on 29th December 1962, the new year opened with arctic conditions which prevailed throughout January. Even so, entomology could not be completely forgotten, for during visits made to regions under the roof necessitated by frozen water pipes, masses of cobwebs were encountered thickly sprinkled with insect remains. Large numbers of *Pieris brassicae* L. had been caught in the webs and a little exploration showed these to have come from pupae cases attached to the roof spars. Only one living pupa was found. Remembering the old legends told of rare moths found in spiders' webs, I neglected the pipes for a while to investigate, but no entomological treasure was forthcoming. At the end of the month I brought indoors a few pupae of *Pieris rapae* L. obtained from larvae found wandering around the outside of the house during the previous autumn. These gave butterflies a few weeks later, and as the maximum temperature they experienced could not have exceeded 70°F. it was not surprising they were of the spring form. One specimen, however, was a fine example of the male ab. *praeterita*, having two black spots on the forewing.

The first day of February brought more snow and frost. A thaw began on the 6th but was short lived. The temperature went low again and frost, often severe, prevailed every night until 4th March. For several consecutive nights I then searched hedgerows for *Thria rupicaparia* Schiff. The moth was found in one spot only, on the 7th, but although there were good numbers, it was not to be seen again on following evenings. The 14th brought a mild evening which tempted me to try sugar in America woods. The only moths attracted were several each of *Conistra vaccinii* L., *Eupsilia transversa* Hufn. and *Agrotis ipsilon* Hufn. Evening searches in the same wood, using a lamp, produced a few *Erannis marginaria* Fab. and one each of *E. leucophaearia* Schiff. and *Alsophila aescularia* Schiff. About twenty larvae of *Nudaria mundana* L. were found under a piece of loose oak bark. On the 24th, a survey of the undercliff at St. Lawrence was unproductive of spring larvae with the exception of a single *Arctia villica* L. Larvae of *Endothenia gentianaeana* Hübn. were common in teazle heads but very few larvae of *Phalonia roseana* Haw. could be detected.

During the first week in April the mercury vapour trap in the garden attracted only four moths, one each of *Biston strataria* Hufn., *Xylocampa areola* Esp., *Orthosia gothica* L. and *O. stabilis* Schiff. On the 7th, which was warm and sunny, *Nymphalis io* L. and *Aglais urticae* L. were flying about the cliff path between Shanklin and Sandown. By the 17th sallow was fully out but was not very productive of moths. During several evenings the species seen were *O. gothica* L., *O. stabilis*, *O. incerta* Hufn., *O. cruda* Schiff., *Cerastis rubricosa* Schiff., and *C. vaccinii*. During this period mercury vapour light became more attractive, all the species noted

above at sallow being present and in addition were *O. gracilis* Schiff., *Anticlea derivata* Schiff. and *Earophila badiata* Schiff. On 24th April *Chimabacche fagella* Fabr. was present in large numbers in the local woodland. Almost every bole had specimens, sometimes as many as half a dozen. Whilst looking over these, a female *X. areola* was found. The following day a visit was made to the undercliff at St. Lawrence where larvae of *Melitaea cinxia* L. were found in very small numbers. However, a few days later a large number of larvae were seen near Binnel Bay. Only two larvae of *A. villica* were found during the whole spring. On 30th April a visit to Brading Down was unproductive, for apart from numbers of *Ancylis comptana* Fröl. flying over the turf, only a few fresh *Pararge egeria* L. were seen.

During early May, mercury vapour light in the garden was not well attended, the noteworthy captures being a few *Pheosia gnoma* Fab., *P. tremula* Clerck, *Cucullia chamomillae* Schiff., *Notodonta ziczac* L. and *Selenia bilunaria* Esp. Along the coast near Sandown, larvae of *Platyptilia gonodactyla* Schiff. were common in the flower heads of coltsfoot, and *Laspeyresia perlepidana* was flying in good numbers. On the 15th the butterflies *Syrichtus malvae* L., *Erynnis tages* L., *Aricia agestis* Schiff., and *Coenonympha pamphilus* L. were flying on Brading Down. *Laspeyresia ulicitana* Haw. was swarming around the gorse bushes. In Borthwood *Asthena albulata* Hufn. was common among the hazels, each tap with a stick causing several to take wing. In the same locality *Nemophora swammerdamella* L. was equally common. Brading Down was again visited on the 26th, when *Polyommatus icarus* Rott. was found to be emerging in fair numbers. Along the roadsides near the Down, *Anthocaris cardamines* L. was flying in better numbers than in the previous season, but later the larvae suffered severely when the roadsides were sprayed with weedkiller, and much of the foodplant, hedge garlic, was destroyed. Near home, a very limited colony of *Panemeria tenebrata* Scop. was found, but the species was not seen elsewhere during the season. At the end of the month *Cupido minimus* Fuessl. was common on Brading Down and later in the same locality *Lysandra bellargus* L. was seen in very small numbers. On the 31st, beating hedges at the foot of St. Boniface Down was quite productive of moths, the following species being obtained: *Epirrhoe alternata* Mühl., *E. galiata* Schiff., *Electrophaes corylata* Thinb., *Lyncometra ocellata* L., *Melanthis procellata* Schiff., *Colostygia pectinataria* Knock., *Xanthorrhoe spadicearia* Schiff., *Opisthograptis luteolata* L. and *Bapta temerata* Schiff. The same night proved to be the first good one for mercury vapour light, but although a large number of moths was attracted there were no rarities. Among those attracted were the first hawks of the season, one each of *Laothoe populi* L. and *Smerinthus ocellata* L. A feature of the season was the scarcity of hawk moths, a total of only twelve being attracted to the light trap during the whole year. This number was composed of seven *L. populi*, one *S. ocellata*, three *Deilephila elpenor* L. and one *Sphinx ligustri* L. The last mentioned was a female which subsequently laid a few eggs but these were infertile, confirming the scarcity of specimens in the district. Only two *Macroglossum stellatarum* L. were seen at flowers.

Beating broom in a local wood on 5th June showed larvae of *Chesias legatella* Schiff. to be plentiful. At dusk in the same locality *Perizoma affinitata* Steph. and *P. flavofasciata* Thunb. were flying together in

numbers. On 9th June a visit was paid to the cliffs at Luccombe to look for *Laspeyresia gemmiferana* Triets. One specimen only, a female, was seen, but many *Eucosma farfarae* Fletch. were flying in the sunshine. The *gemmiferana* locality is rapidly deteriorating, for not only did large cliff falls occur after the severe winter, burying a large amount of vegetation, but recently, abnormally high tides have caused extensive erosion and further falls of cliff. The night of the 9th was not good for mercury vapour light, but a fresh specimen of *Heliophobus albicolon* Hübn. was obtained.

The Acronyctinae had a very poor season here, only single figures of *Apatele megacephala* Schiff. and *A. rumicis* L. appearing in the trap. Apart from *Cryphia perla* Schiff., which was more numerous, none of the other species were recorded at all. Sugar was attempted several times towards the end of the month but proved a dismal failure. One evening, when applying the sugar, I noticed a larva of *Polyploca ridens* Fab. on the upper surface of a bramble leaf, a suspicious position later confirmed when a parasite proved to be present. At this period, larvae of *Cucullia verbasci* L. were to be found wherever mullein was examined. During the month, *L. bellargus* was seen in several widely spaced localities on the downs, but always in very small numbers. On 15th June, I led the entomological section of the Isle of Wight Natural History and Archeological Society on a visit to Brading Down. About 5 p.m. males of *Macrothylacia rubi* L. appeared on the wing, careering over the slopes of the down. We saw a swallow pursue and capture one of the moths. The only other moth of note was *Eupithecia scabiosata* Borkh.

The arrival of July brought better mercury vapour results in the garden, the best species captured being *Lithosia complana* L., *Miltochrista miata* Forst., *Euphyia unangulata* Haw., *Apamea furva* Schiff., *Sterrha trigeminata* Haw., *Hydrelia flammeolaria* Hufn., *Hadena bicolorata* Hufn., *Agrotis clavis* Hufn., *Habrosyne pyritoides* Hufn., and *Gastropacha quercifolia* L.

The July butterflies were generally disappointing. Of the fritillaries, *Argynnis selene* Schiff. was seen in fair quantity at Cranmore, where also a few *A. paphia* L. were recorded. *A. aglaia* L. was not seen at all, although the insect was searched for in several downland localities where it used to be plentiful. *Limenitis camilla* L. had a good year, being reported in numbers from Cranmore, Newtown, Havenstreet and Whitefield Wood. Most of the species of browns were below average with the exceptions of *Melanargia galathea* L. and *Pararge aegeria* L. the latter being widespread and continually in evidence through the season.

A visit to Tennyson Down failed to produce any *Alucita spilodactyla* Curt. and a search on Brading Down for *Pyrausta flavalis* Schiff. was unavailing. During the first few days of August a lot of time was spent looking for pupae of *Nonagria sparganii* Esp. in likely localities. None were found, but pupae of *N. typhae* Thunb. were plentiful and from these several fine ab. *fraterna* Treits. were reared. Night searching using a torch in the same localities was interesting. A strong colony of *Leucania straminea* was found, and at the same spot *Chilo phragmitellus* Hübn. was on the wing. Other species encountered were *Apamea unanimis* Hübn., *A. ophiogramma* Esp., and *Lampra fimbriata* Schr., the last named seeming out of place on marsh land. A worn specimen of *Laspeyria flexula* Schiff. was found at rest on a reed stem. Just before dusk one

evening a number of *Euschesis interjecta* Hübn. were flying around a clump of alders and proved most difficult to catch, as movement was hampered by the marshy ground.

During the second half of August attention was turned again to butterflies on the downs. *Lysandra coridon* Scop. emerged in good strength and hundreds were examined for variation. This, however, proved to be slight, only a few *arcuata* forms being found. *Pieris rapae* L. became abundant on the downs and again some hundreds were examined. A fine female, having a black spot on each hindwing was obtained and also a well banded female specimen. The latter, being damaged, was caged, but no eggs were forthcoming. A nice capture was a fresh *Aricia agestis* Stgr. with golden lunules. Finally, an asymmetrically marked specimen of *Maniola jurtina* L. rewarded my efforts in searching for vars.

September was a most unproductive month. Mercury vapour light attracted commoners in small numbers and sugaring on several nights gave no encouragement to persist with that particular sport. The native butterflies were waining on the downs and no migrants came to replace them. I turned to the pugs. After covering many miles of ground and spending many hours beating clematis, yarrow, ragwort, bramble, and other blossoms I acquired a good assortment of pug larvae. Alas, about 95% of them proved to contain parasites.

During early October mercury vapour light in the garden attracted moths in but small numbers, including *Aporophyla nigra* Haw., *Eumichtis lichenea* Hübn., and *Thera obeliscata* Hübn. On the 22nd, a young collector, Roger Oakley, drew my attention to the presence of large numbers of larvae of *M. rubi* L. at Carisbrooke. On the 25th a period of mild weather commenced and the attraction of mercury vapour light became much enhanced. The numbers of common species were accompanied by a few desirable ones including *Epicema caeruleocephala* L., *Lithopane ornitopus* Hufn., *Brachionycha sphinx* Hufn., *Dasypolia templi* Thunb. and *Leucania l-album* L. The better conditions tempted me to have a final go at sugaring in Borthwood. I got only one moth on the sugar, but it was a very nice *Anchosceles helvola* L. A disappointing feature of the month was the failure of ivy blossom to attract moths. On several nights I went to look over the masses of ivy blossom to be found along the landslip but the results were always negative.

The autumn butterflies were not very numerous; *Nymphalis io* L. and *Aglais urticae* L. were in fair numbers, *Vanessa atalanta* L. was scarce, *Pyrameis cardui* L. was seen twice. However, it was pleasant to see half a dozen *Polygonia c-album* L. feeding on blackberries at Luccombe on 4th October.

During November a few sorties were made to look for moths after dark with a torch. The scarcity of the late moths was not unexpected, for a feature of the spring had been the non-eaten condition of the leaves of woodland trees. A total of about two dozen *Erannis aurantiaria* Hübn. were seen but only two *E. defolaria* Clerck. A specimen of *E. marginaria* Fabr. which had presumably got its seasons mixed up was also found.

In summary the 1963 season has been generally disappointing, both climatically and entomologically. It was hoped that history would repeat itself and that the arctic winter would be compensated by a sub-tropical summer, but in fact we got a cool rather dull summer, unfavourable to insect life. Features of the season were the scarcity of many species of

lepidoptera normally abundant, the lack of migrants, and the failure of sugar.

Finally I should say, in these days of fugitive nomenclature, that the names of the macrolepidoptera were taken from "The Moths of the British Isles" by South, 1961, and those of the microlepidoptera from "A Guide to the smaller British Lepidoptera" by L. T. Ford, 1949.

26 Green Lane, Shanklin, Isle of Wight.

Cranleigh Butterflies, 1963

By Major A. E. Collier

The optimism of the entomologist dies hard, but it must be very tough to survive the steady, in some cases drastic, deterioration in numbers of most species of butterflies in this area of Surrey.

Twenty years ago the Chiddingfold woods abounded with most of the Fritillaries, and even ten years ago the High Brown *Fabriciana cydippe* L. was not uncommon, while the Silver-washed *Argymus paphia* L. could be found in every suitable bit of woodland, with a surprisingly high percentage of *Ab valesina* Esp.; and *Mesoacidalia charlotta* Haw. was frequently seen on the nearest parts of the North Downs.

The small fritillaries were unusually abundant and those collectors who were able to visit the area in the middle forties will not easily forget the sight of clusters of Small Pearl Bordered, *Argynnis selene* Schiff. on every patch of Birdsfoot Trefoil or Ragged Robin. The Pearl Bordered *Clossiana euphrosyne* L., although not quite so plentiful, was widespread, and both species produced a great number of spectacular aberrations.

Even in 1952 there were fifteen localities within ten miles of Cranleigh which demanded attention during May and June on account of their sizeable colonies of *euphrosyne* and *selene*. Of these localities only two remain to-day where small numbers may be seen, although many of the old localities are largely unaltered. The White Admiral, *Limenitis camilla* L., was not uncommon, and its hibernacula could easily be found along the paths and rides of the Canfold and Somersbury woods; while the Purple Emperor, *Apatura iris* L., was so widespread that I found no difficulty in recording its eggs and larvae in nineteen well-separated spots, all within five miles of Cranleigh.

The indigenous Vanessids could be seen in moderate numbers in every flower garden, and one did not have to search far to find the larvae of the Small Tortoiseshell, *Aglais urticae* L., and the Peacock, *Nymphalis io* L. The Pieridae and the Lycaenidae were reasonably plentiful, while the Satyridae and most of the Hesperiidae occurred in profusion and fortunately, in most cases, continue to do so.

To-day it is almost a contradiction in terms to speak of butterflies in the Cranleigh district, and that this is recognised will explain the fact that in the past nine years I have never met another entomologist working the many apparently attractive areas within a radius of six miles of the village.

The 1963 season with its generally cool and sunless weather, broken only by a short hot spell in early June and another slightly longer one at the end of July, showed a further decline in the numbers of most species of butterflies.

The Pieridae made their appearance from 26th April when *Pieris napi* L. and *P. rapae* L. were seen rather more often than for some years, and a week later *P. brassicae* L. appeared, but never became numerous or a nuisance in the garden. *Euchloe cardamines* L., first seen on 4th May, was subsequently recorded singly only three times, while two females were seen on the 25th, after which no more were noticed.

Leptidea sinapis L. started in a promising fashion when a dozen males were encountered on 17th May in a wood where the population remains steady, but could expand very easily. *Gonepteryx rhamni* L. were exceptionally scarce throughout the year, and there was no sign of *Coleas croceus* Fourcroy. Some of the Satyridae failed, particularly *Coenonympha pamphilus* L., which started the season well but dwindled later to such an extent that to see a second brood specimen in late summer was a rare event.

Judging by a number which I am rearing from eggs laid in May and June, the generally low temperatures and lack of sun has resulted in the larvae making very slow growth and failing to reach maturity before the winter. All my larvae have over-wintered, with occasional feeding observed, and in the wild this may lead to a sizeable emergence in the early summer.

Pararge aegeria L. also had a disappointing year and, after a fairly promising start in mid April, failed to improve, and the second brood was nearly a complete failure.

P. megera L. was even rarer than usual, and *Eumenis semele* L. was not seen at all in its usual habitat on the North Downs.

Maniola tithonus L. first appeared on 19th July and were to be found in good numbers in August, but with noticeably less variation than in 1962.

Aphantopus hyperantus L. was first recorded on 30th June, and in my three largest colonies numbers were well up to normal, *lanceolata* forms being not uncommon, though *caeca* forms were conspicuously absent. In two other colonies, where conditions appear to be very favourable, the population remains low in spite of the room for expansion.

Maniola jurtina L. were on the wing from 11th June and had obviously not suffered, or been delayed, by the long hard winter. They flew in great numbers during their long overlapping emergence, and were almost a nuisance on the North Downs until nearly the end of September.

The Nymphalidae continued their decline. *Clossiana euphrosyne* L., in evidence from 16th May, failed to improve on 1962, and *A. selene* were even more disappointing, a reversal of the usual course of events.

Two specimens of *M. charlotta* were seen on the North Downs on 25th July, but I again failed to record *cydippe*. *Paphia* was recorded only three times, a solitary male on 7th July, three on the 20th and a single female on 5th August, and this in areas which might have been expressly designed for the species.

Euphydryas aurinia Rott. appeared in very small numbers from 31st May, and in the autumn I saw no signs of larvae in either of two large, and once well populated, areas.

Urticae io, Vanessa atalanta L. and *V. cardui* L. were rarely seen at any time of the season.

Polygonia c-album L. was met with on three occasions, and then only singly or in pairs, until one rare sunny day on 19th October when no

fewer than seven appeared together on a small plant of Michaelmas daisies.

Apatura iris L., although now very rare in this neighbourhood owing to the destruction of most of the oak woods, still persists in some outlying patches of forest. Many hours of searching revealed three eggs, recently laid, on 15th August, and a male insect was seen flying in another wood earlier in the month.

I do not expect to see *camilla* nowadays, and was surprised and delighted to meet with a couple on 29th July in what was recently an oak forest, but is now a devastated area, almost impassable in places, but with a few clear patches surrounded by birch trees, brambles and honeysuckle.

The Lycaenidae made a mixed showing. *Lycaenopsis argiolus* L. was not recorded, nor was *Strymon w-album* Knock. A single specimen of *Quercusia quercus* L. was seen on 17th July but later visits to many once favoured localities produced no results, although the insect was reported to be plentiful in the Hook district.

Callophrys rubi L. seems to have become rarer locally, as has *Thecla betulae* L. whose eggs a few years ago could be found in a great many situations round Cranleigh.

Lycaena phlaeas L. again failed almost completely in the wooded areas, although a few were seen in late September on the downs.

It was good to find that *Lysandra coridon* Poda and *L. bellargus* Rott. were holding their own in an environment where conditions are still favourable for a great increase in numbers if, or when, we get a succession of reasonably warm seasons.

The Hesperiidae made a mixed showing, with great numbers of *Ochlodes venata* B. & G. and *Thymelicus sylvestris* L. in every suitable locality, whereas *Syrichtus malvae* L. and *Erynnis tages* L. were noticeably less plentiful than usual.

The past season was remarkably free from spring frosts, and I cannot recollect another year when it has been impossible to find a wild strawberry flower with a blackened centre; on the other hand the cool and unsettled June, and the stormy and cold August and September, will have seriously interfered with mating and egg-laying by certain species, particularly *selene* and *coridon*. In the case of *coridon*, however, the ill effects will be minimised by the fact that owing to the cold autumn few, if any, eggs will have hatched prematurely.

VANESSA IO L. IN EARLY FEBRUARY.—While on a visit on February 2nd to Mr. W. J. Kaye at his home at Longdown on the downs just south of Guildford, we were surprised to see a peacock butterfly fluttering about in front of his house at about mid-day, with a temperature of about 56° F. That in the sun was just on 70° F. on his verandah where the butterfly eventually settled. I do not remember ever having seen a hibernated Vanessid as early in the year.—C. G. M. DE WORMS, Three Oaks, Woking. 3.ii.1964.

The *Silvicola* Burgeff Group of the genus *Zygaena* Fabricius (Lep., Zygaenidae)

By W. GERALD TREMEWAN

(*Concluded from p. 54.*)

Z. osterodensis irpenjensis Holik & Reiss (comb. nov.)
Z. scabiosae irpenjensis Holik & Reiss, 1932, in Holik, *Iris*, **46**: 114, pl. 1, figs. 12-15.

Type locality: Irpenj near Kijev, North Ukraine.

Material examined: 1 ♂, paratype, Irpenj (coll. H. Reiss); 2 ♂♂, 2 ♀♀, Podolia.

♂ genitalia. Transverse spines at base of lamina dorsalis long and well developed, single group of cornuti well developed.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis broad, ductus bursae moderately sclerotized, signum present, well developed.

The populations of Podolia are probably referable to ssp. *irpenjensis* Holik & Reiss.

Z. osterodensis ssp.

A short series of specimens from Gyergyo Szt. Miklos, Transsylvania, probably represent a new and undescribed subspecies.

♂ genitalia. Cornuti well developed, transverse spines at base of lamina dorsalis well developed but a slight reduction in the length of the central spines.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis narrow, sclerotization of ductus bursae weak or absent, signum present, well developed. In one female, however, the signum is reduced to three spines.

Z. osterodensis budensis Holik (comb. nov.)
Z. scabiosae budensis Holik, 1942, *Ent. Z.*, **56**: 197.

Type locality: Budapest, Budakeszi, Hungary.

Material examined: 1 ♂, 1 ♀, Budapest.

♂ genitalia. Spines at the base of lamina dorsalis long, well developed, single group of cornuti well developed.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis narrow, ductus bursae weakly sclerotized, signum present, reduced and rather weak.

Z. osterodensis matrana Burgeff (comb. nov.)
Z. scabiosae matrana Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 18.

Type locality: Matra Mts., 500-800 m., northern Hungary.

Material examined: a short series from Galyatetö and Nagzkovacsie, Matra Mts.

♂ genitalia. Spines at base of lamina dorsalis long and well developed, single group of cornuti well represented.

♀ genitalia. Lamella postvaginalis developed, lamella antevaginalis narrow, ductus bursae moderately sclerotized, signum present, rather weak.

Z. osterodensis ssp.

A series of specimens (6 ♂♂, 16 ♀♀) from Mezoeseg, Transsylvania, represent a new subspecies. According to the superficial characters these specimens might easily be placed as a subspecies of *romeo*. However, an examination of the genitalia shows that the specimens are conspecific with *osterodensis*. In superficial characters, the specimens have short,

rather rounded forewings as in *romeo*. In the majority of specimens, the middle streak is divided, forming two spots (3 and 5). Apparently this is a constant character of the Mezoeseg populations.

♂ genitalia. Spines at the base of the lamina dorsalis long, well developed, single group of cornuti strong, well developed.

♀ genitalia. Lamella postvaginalis strongly developed, lamella antevaginalis broad, variable, ductus bursae moderately sclerotized on one side only, signum present, rather weak, number of spines reduced.

Z. osterodensis ssp.

A series of specimens (3 ♂♂, 1 ♀) from Rila Dagh, south-west Bulgaria, probably represents a new subspecies. The ground colour of the forewings is dull, bluish black, without gloss, forewing streaks and hindwings scarlet, the middle streak of the forewings divided and forming two spots (3 and 5). Hindwing border fairly wide, thorax and abdomen rather hairy. According to the genitalia these specimens are conspecific with *osterodensis*.

♂ genitalia. Transverse row of spines at base of lamina dorsalis long and well developed, single group of cornuti well developed. In one specimen, however, the central, basal spines of the lamina dorsalis are reduced in length while the vesica shows a slight formation of a second group of cornuti.

♀ genitalia. Lamella postvaginalis developed but somewhat reduced, lamella antevaginalis fairly broad, ductus bursae moderately sclerotized, signum present but number of spines reduced.

Z. osterodensis koricnensis Reiss (comb. nov.)

Z. scabiosae koricnensis Reiss, 1922, *Int. ent. Z.*, **16**: 66.

Type locality: Maklen-Pass, Koricna, Bosnia.

Material examined: Holotype ♂, Koricna, Bosnia (coll. H. Reiss).

♂ genitalia. Spines at base of lamina dorsalis long and fully developed, single group of cornuti developed.

Z. osterodensis goriziana Koch (comb. nov.)

Z. scabiosae goriziana Koch, 1937, in Holik, *Mitt. münch. ent. Ges.*, **27**: 7.

Type locality: Görz, Istria.

Mr. M. Koch, Dresden, very kindly supplied drawings of the genitalia of a male and female (paratypes) of *goriziana* in his collection. The subspecies *goriziana* is referable to *osterodensis* (= *scabiosae auct.*).

♂ genitalia. Spines at base of lamina dorsalis long and well developed, forming a transverse row, single group of cornuti present.

♀ genitalia. Lamella postvaginalis developed, moderate, lateral sclerotization in the ductus bursae, signum present, moderately strong.

Z. osterodensis ssp.

A female from Mte. Simeone, Interneppo, Friaul, north Italy, 400-600 m. (coll. H. Reiss) is referable to *osterodensis*.

♀ genitalia. Lamella postvaginalis large and fully developed, lamella antevaginalis rather broad, ductus bursae sclerotized, signum present but very weak and vestigial.

Z. osterodensis praecarpathica Holik (comb. nov.)
Z. scabiosae praecarpathica Holik, 1942, *Ent. Z.*, **56**: 198.

Type locality: Smrkovica, Djumbir region, Little Carpathians.
We have been unable to examine material of this subspecies.

Z. osterodensis austrocarpathica Holik (comb. nov.)
Z. scabiosae austrocapathica Holik, 1942, *Ent. Z.*, **56**: 198.

Type locality: Kosow; Kobaki, northern slopes of the east Carpathians.
We have been unable to examine material of this subspecies.

Z. osterodensis polonia Przegendza (comb. nov.)
Z. scabiosae polonia Przegendza, 1933, *Ent. Z.*, **47**: 27, figs. 4-6.

Type locality: Szerszeniowce near Lemberg, Poland.
Material examined: 2 ♂♂, 1 ♀, Genow, Lemberg, Poland.

♂ genitalia. Transverse spines at base of lamina dorsalis well developed, especially laterally, central spines somewhat reduced in length, single group of cornuti well developed.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis rather broad, ductus bursae moderately sclerotized, signum present but reduced and rather weak.

Z. osterodensis warszawiensis Holik (comb. nov.)
Z. scabiosae warszawiensis Holik, 1939, *Ann. Mus. zool. Polon.*, **12**: 26, pl. 1, figs. 31-33.

Type locality: Pyry near Warsaw, Poland.
We have been unable to examine material of this subspecies.

Z. osterodensis ladina Holik (comb. nov.)
Z. scabiosae ladina Holik, 1944, *Iris*, **57**: 44.

Type locality: Gröden, Dolomites, Italy.
We have been unable to examine material from this locality.

Z. osterodensis curvata Burgeff (comb. nov.)
Z. scabiosae curvata Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 17.

Type locality: Bruck a. d. Mur, Thörl, Styria, Austria.
Material examined: A series from Judenburg, Styria.

♂ genitalia. Spines at the base of the lamina dorsalis long and well developed, single group of cornuti well developed.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis broad, ductus bursae weakly sclerotized, signum present, rather weak.

Z. osterodensis tenuicurva Burgeff (comb. nov.)
Z. scabiosae tenuicurva Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 18.

Type locality: Neuhütten, Karlstein near Prague, Bohemia.
Material examined: A series from Prague.

♂ genitalia. Strong, well developed spines at the base of the lamina dorsalis, single group of cornuti present, strong and well developed.

♀ genitalia. Lamella postvaginalis developed, lamella antevaginalis broad, ductus bursae weakly sclerotized, signum present, strong and well developed.

Z. osterodensis kessleri Reiss (comb. nov.)

Z. romeo kessleri Reiss, 1950, *Jber. naturf. Ges. Graubünden*, **82**: 102, fig. 4.

Type locality: Albulatal, Bergün, Switzerland, 1300-1400 m.

Material examined: 1 ♂, paratype, Bergün (ccll. H. Reiss); 5 ♂♂, 2 ♀♀, St. Moritz; Ragatz; the Engadine.

♂ genitalia. Spines at base of lamina dorsalis long and well developed (somewhat reduced in Bergün specimen), single group of cornuti well represented.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis fairly broad, ductus bursae moderately sclerotized, signum present, fairly strong.

Z. osterodensis validior Burgeff (comb. nov.)

Z. scabiosae validior Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 17.

Type locality: Martigny, Wallis, Switzerland.

Material examined: 1 ♀, Martigny (coll. H. Reiss).

♀ genitalia. Lamella postvaginalis broad, well developed, ductus bursae sclerotized, signum present, well developed.

Z. osterodensis vosegiensis Le Charles (comb. nov.)

Z. scabiosae vosegiensis Le Charles, 1960, *Bull. Soc. ent. Fr.*, **65**: 103 (nomen novum for *vogesiaca* Le Charles).

Z. scabiosae vogesiaca Le Charles, 1957, *Rev. franç. Lépid.*, **16**: 20, pl. 6. fig. 6 (preoccupied by *vogesiaca* Przegendza, 1932, ssp. of *trifolii* Esper).

Type locality: Nonnenbruch près Cernay; Mulhouse; Haut-Rhin, France.

Material examined: Lectotype ♂, Nonnenbruch; 3 ♂♂, Nonnenbruch; 1 ♂, Uffholtz near Cernay; Haut-Rhin (Paris Museum coll.).

♂ genitalia. Spines at base of lamina dorsalis variable but long and well developed. Single group of cornuti present.

The lectotype was selected by Le Charles (1960: 103).

Z. osterodensis expansa Le Charles (comb. nov.)

Z. scabiosae expansa Le Charles, 1957, *Rev. franç. Lépid.*, **16**: 20, pl. 6, figs. 9-11.

Type locality: Lac de Montrion, Haute-Savoie, France, 1200 m.

Material examined: Lectotype ♂, Lac de Montrion; 2 ♂♂, 1 ♀, same locality (Paris Museum coll.).

♂ genitalia. Spines at base of lamina dorsalis well developed, single group of cornuti present.

♀ genitalia. Lamella postvaginalis developed, ductus bursae moderately sclerotized, signum present, spines rather weak.

The lectotype was selected by Le Charles (1960: 103).

Z. osterodensis droiti Le Charles (comb. nov.)

Z. scabiosae droiti Le Charles, 1960, *Bull. Soc. ent. Fr.*, **65**: 103 (with reference to Le Charles, 1957, *Rev. franç. Lépid.*, **16**: 20).

Type locality: Céuze, Hautes-Alpes, France.

Material examined: Holotype ♂, allotype ♀, Céuze; 3 ♂♂, same locality (Paris Museum coll.).

♂ genitalia. Spines at base of lamina dorsalis long and well developed, single group of cornuti present.

♀ genitalia. Lamella postvaginalis developed, ductus bursae weakly sclerotized, signum present, weak.

Z. osterodensis schultei Dujardin (comb. nov.)

Z. minos schultei Dujardin, 1956, *Bull. mens. Soc. linn. Lyon,* **25**: 256.

Type locality: Les Dourbes near Digne, Basses-Alpes, France, 1500 m.

Material examined: 38 ♂♂, 4 ♀♀, Les Dourbes, Digne.

♂ genitalia. Transverse row of spines at base of lamina dorsalis well developed, single group of cornuti well developed.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis broad, well developed, ductus bursae moderately sclerotized, signum present, rather weak and reduced to a few minute spines.

Z. osterodensis valida Burgeff (comb. nov.)

Z. scabiosae valida Burgeff, 1926, *Mitt. münch. ent. Ges.,* **16**: 17.

Type locality: Schwäbische Alb, Württemberg (Klingenstein, Blaubeuren, Neuffen, etc.), Germany.

Material examined: 1 ♂, Blautal bei Ulm (coll. H. Reiss); 4 ♀♀, Hohen-Neuffen, Württemberg.

♂ genitalia. Spines at base of lamina dorsalis strong and well developed, single group of cornuti present.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis fairly broad, ductus bursae moderately sclerotized, signum present, rather weak.

Z. osterodensis lineata Reiss (comb. nov.)

Z. romeo lineata Reiss, 1933, in Seitz, Die Gross-schmetterlinge der Erde, Supplement, **2**: 253, pl. 16k.

Type locality: Dollnstein, Fränkischer Jura; Neighbourhood of Stuttgart and Leonberg (Württemberg), Germany.

Material examined: 1 ♂, 1 ♀, Stuttgart (coll. H. Reiss).

♂ genitalia. Spines at base of lamina dorsalis long, forming a transverse row, single group of cornuti present.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis broad, ductus bursae sclerotized on one side, anteriorly, signum present, well developed.

Z. osterodensis hassica Burgeff (comb. nov.)

Z. scabiosae hassica Burgeff, 1926, *Mitt. münch. ent. Ges.,* **16**: 17.

Type locality: Ingelheim, Heidesheim, Rheintal, Hessen, Germany.

Material examined: 1 ♂, Unter-Ingelheim (coll. H. Reiss), 4 ♂♂, 1 ♀, Frankfurt on the Main.

♂ genitalia. Spines at the base of the lamina dorsalis well developed, single group of cornuti present.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis broad, ductus bursae moderately sclerotized, signum present, strong and well developed.

Z. osterodensis osterodensis Reiss

Z. scabiosae osterodensis Reiss, 1921, *Int. ent. Z.,* **15**: 118.

Type locality: Grünortspitze, Osterode, East Prussia.

Material examined: 1 ♂, 1 ♀, paratypes, Grünortspitze (coll. H. Reiss).

♂ genitalia. Spines at the base of the lamina dorsalis well developed, single group of cornuti present.

♀ genitalia. Lamella postvaginalis very broad and well developed, lamella antevaginalis broad, ductus bursae moderately sclerotized, signum present, well developed.

Z. osterodensis masoviensis Reiss (comb. nov.)

Z. romeo masoviensis Reiss, 1941, *Z. wien. EntVer.*, **26**: 58.

Type locality: Rüdzanny, Masuren, East Prussia.

Material examined: 1 ♂, paratype, Masuren (coll. H. Reiss).

♂ genitalia. Spines at the base of the lamina dorsalis long and well developed, a single group of cornuti.

Z. osterodensis haegeri Reiss (comb. nov.)

Z. romeo haegeri Reiss, 1941, *Z. wien. EntVer.*, **26**: 58.

Type locality: Bublitz (Stadwald), east Pommerania.

Material examined: 1 ♂, paratype, Bublitz (coll. H. Reiss).

♂ genitalia. Spines at base of lamina dorsalis well developed, single group of cornuti present.

Z. osterodensis trimacula Le Charles (comb. nov.)

Z. scabiosae trimacula Le Charles, 1957, *Rev. franç. Lépid.*, **16**: 15, pl. 6, fig. 8.

Type locality: Forêt de Sainte-Maure, Indre, France.

Material examined: Lectotype ♂, Forêt de Sainte-Maure; 1 ♂, 3 ♀♀, same locality (Paris Museum coll.).

♂ genitalia. Spines at the base of the lamina dorsalis long and well developed, a single group of cornuti.

♀ genitalia. Lamella postvaginalis moderately developed, ductus bursae weakly sclerotized, signum present, moderately strong.

The lectotype was selected by Le Charles (1960: 103).

Z. osterodensis eupyrenaea Burgeff (comb. nov.)

Z. scabiosae eupyrenaea Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 20.

Type locality: Vernet-les-Bains; Mt. Canigou, 800-1200 m., Pyrénées-Orientales, France.

Material examined: Over two hundred specimens of both sexes from Vernet-les-Bains; Haut-Cady; Mariailles; Casteil à la Forêt de Rondai; Pyrénées-Orientales (B. M. coll.); 1 ♂, Mt. Louis (C. W. Mackworth-Praed coll.).

♂ genitalia. Spines at the base of the lamina dorsalis long and fully developed but in many specimens a slight reduction in length of those in the centre. Single group of cornuti present, number of spines varying from 3-8.

♀ genitalia. Lamella postvaginalis large and well developed, lamella antevaginalis rather broad, ductus bursae moderately sclerotized, signum present, variable but generally strong and well developed.

A small percentage of the males have short forewings with a rounded apex and, in superficial characters, resemble *romeo*. The middle streak of the forewings is broken and forms two spots (3 and 5) and in more extreme examples all the streaks are divided and form five spots (1, 2. 3, 4, 5). The genitalia of these specimens, which have superficial characters

resembling those of *romeo*, are rather variable. The spines at the base of the lamina dorsalis are often reduced in length. It is possible that hybridization is taking place between *osterodensis eupyrenaea* and *romeo urania* Marten although it is not known whether the two species fly together on the same ground.

Z. osterodensis leridana Marten (comb. nov.)
Z. scabiosae leridana Marten, 1957, *Ent. Z.*, **67**: 218.

Type locality: Espot, Prov. Lerida, central Pyrenees, 1000-1100 m.

Material examined: A series of over one hundred and eighty specimens of both sexes from Cauterets, Hautes-Pyrénées.

♂ genitalia. Spines at base of lamina dorsalis long and well developed, single group of cornuti fairly well developed.

♀ genitalia. Lamella postvaginalis well developed, lamella antevaginalis broad, ductus bursae moderately sclerotized, signum present, generally strong and well developed.

In superficial characters this subspecies is fairly constant and the forewing streaks are not divided into spots as in some examples of ssp. *eupyrenaea*. Only in extremely aberrant examples of *leridana* are the streaks rather constricted in the middle but then, are not completely broken. The genitalia do not exhibit any diverse variation as in some specimens of *eupyrenaea*.

The ssp. *leridana* was described from a series of specimens from Espot, Prov. Lerida, on the south (Spanish) side of the central Pyrenees. Specimens from Cauterets (Hautes-Pyrénées) agree with the original description of *leridana* and are placed under that subspecies.

Z. osterodensis cantabrica Marten (comb. nov.)
Z. scabiosae cantabrica Marten, 1957, *Ent. Z.*, **67**: 217.

Type locality: Gorges of the Cantabrian Mts., between the Sierra de Covadonga and the Massif of the Picos de Europa, North Spain, 500-700 m.

We have been unable to examine material of this subspecies but, according to the original description, it should be referred to *osterodensis*. Marten described *cantabrica* as a race of *scabiosae auct.* (= *osterodensis*). The specimens were found flying together with *nevadensis* Rambur. The populations of *nevadensis* from the Picos de Europa have been described by Agenjo as ssp. *picos*. *Z. osterodensis cantabrica* was previously recorded by Reiss (1931: 113) and Koch (1948: 322).

Z. osterodensis ssp.

Two specimens (♂, ♀) from Bronchales, Teruel, Aragon, probably represent a new subspecies. The middle streak of the forewing is constricted, especially in the male. Ground colour of forewings bluish black, without gloss, forewing streaks and hindwings bright scarlet, hindwing border rather wide at the apex. Thorax and abdomen rather hairy, black, without gloss.

♂ genitalia. Spines at base of lamina dorsalis long and fully developed, single group of cornuti present.

♀ genitalia. Lamella postvaginalis poorly developed, ductus bursae sclerotized on one side, signum present, weak.

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Salad Days

By A. D. Irvin

In nearly every edition of the *Entomologist's Record* we read an article entitled "Collecting Notes for 1963" or "This Year in the New Forest". Many of these I find extremely interesting, but some tend to be so much a list of latin names that, I regret, with my lack of classic learning (*Ent. Rec.*, **74**: 253) I tend to give up the struggle. Such articles must surely give the writers great pleasure as they look back through their notes and diaries, and recall the pleasures of the chase and excitement of new and rare captures. Thinking along these lines has prompted me to write some collecting notes with a difference and to look back at the diaries which I started at the tender age of fourteen, my second year at Bradfield College in Berkshire.

My entomological career began at the age of twelve when my father presented me, as a reward for passing my Common Entrance Exam., with a second-hand cabinet full of butterflies and moths, and the three essential Wayside and Woodland Volumes by Richard South. The second step on going to Bradfield was meeting two other new boys, Michael Braid and Nigel Webb, both in the same house as myself and both enthusiastic entomologists; this remarkable coincidence (during the whole of our five years there only two other boys showed any interest in entomology) really laid the foundation to what looks like being a lifelong hobby.

As I look back, it is interesting to note the gradual change that occurs throughout the years from youthful enthusiasm to the gradual introduction of the latin names and a more scientific approach to the subject. Also I can look back at the great day among my entries when Braid and Webb became Mike and Nigel; at last seniority was affording me the privilege of calling my friends by their christian names.

The very first entry I made was 1/1/54, and here I read that I had fifty-three pupae in my possession including six lime hawks (this compares somewhat sadly with this year's pupa digging, nine pupae and only one *M. tiliae*). Also on that day I notice "ruby tiger hatched", this record is followed on 31/1/54 by "small white chrysalis hatched", surely somewhat premature hatchings. As well as similar extraordinary entries there are some which reveal the rather naïve approach we had to the subject in those days, particularly with regard to killing agents; 1/2/54 "Killed my small white with Windolene", 7/2/54 "Webb tried to kill Best minor's elephant hawk with D.D.T., it turned black". Presumably having found these agents unsuccessful I read on 12/2/54, "Resorted to extremities in killing my ruby tiger".

As with all eager young entomologists we did at times let our imagination run away with us; 26/1/54, "Braid and Webb convinced me that my powdered quaker var. *rufescens* was only a common quaker"; 23/1/54, "Went to Great House Woods to look for young bee hawk larvae, found none"; 29/9/54, "Went to Streatley in search of brown hairstreaks". Although our imagination did at times run riot, our enthusiasm appears to have been endless, there are numerous entries such as 15/5/54, "Went to Bucklebury but found nothing"; all these entries were recorded in great detail, even to the extent of 4/4/54, "Removed from setting board one lime hawk". I notice in the beginning of April 1954 that on seven

sugaring expeditions in ten days I caught six moths, and still our ardour could not be damped. We must have cycled thousands of miles and run and walked hundreds, we would think nothing of an hour's cycle ride to a haunt where we might only be able to spend half an hour before we had to return for tea, and often as not we would come away empty handed. This cycling certainly kept us fit and we were doing things then, which most of us would shudder at now; 8/5/54, "Went to Bucklebury and saw several emperors, Braid caught two"; 7/6/54, "Went to Bucklebury but caught nothing, Braid caught five fox moths". (Michael Braid later went on to captain the school athletics team and equalled the hundred yards record.)

There must be few entomologists who had the opportunities that we had at school; there were four half days each week and we were allowed to go wherever we liked on our bicycles (except into Reading); and on top of that we were set in the middle of some of the finest collecting countryside in the British Isles, within easy reach of us were woods, marshes, downs, heathland and fields—apart from cliffs and mountains we had everything. Despite this and despite our enthusiasm there were no real rarities that we recorded; rather local captures included *H. lucina, S. w-album, E. aurinia, C. minimus* and *L. bellargus.* Probably our best capture was a variety of *H. fusconebulosae* taken at rest on a tree trunk, and once Michael Braid saw *N. antiopa* at rest in the College's open-air Greek theatre, but alas no net. There were probably two reasons for our apparent failings, the first was plain ignorance, we just didn't know when to look, where to look or what to look for. The second reason was lack of equipment, our nets were the spring-steel type (twelve inches in diameter), we possessed no beating trays or m.v. traps, and of course no transport other than bicycles. We manufactured several moth traps ourselves, these were usually made out of old oil drums or biscuit tins, with an inverted enamel lampshade as the cone, and an ordinary 75 w. bulb as the light source; these were used more or less non-stop throughout the summer term and gave us a very good cross section of the moth population of that area. Various unsuspecting masters were persuaded to run these traps in their gardens, one even lived four miles away, and he would duly bring the trap in each morning with the moths scrabbling inside trying to escape, and of course when we opened it in the house-room they invariably did escape much to everyone's annoyance.

In spite of our limited knowledge and facilities we of course had our good luck (Michael Braid especially). 2/6/57, "Mike and Nigel went to Beggars Bridge Green, Mike caught five marsh fritillaries and two narrow bordered bee hawks, Nigel caught nothing". Then there was the occasion when I saw three male *A. iris* flying round the top of an oak tree (surely a rare sight nowadays). I was up that tree an hour and a half before I captured one, during which time two elderly ladies had their picnic lunch under the tree completely oblivious of my presence. Nigel Webb, envious of my capture and obviously intent on subtler methods, disappeared for some time and then returned with several fresh cow pats neatly wrapped in newspaper and these were distributed in likely-looking spots, but all to no avail; and I remained during the whole five years the only one of our trio who possessed this rarity.

As well as our luck in the field we were very fortunate in meeting two very distinguished entomologists while at school. The thrill it gave us was

tremendous, but I feel that it must also have given them immense pleasure showing these wide-eyed schoolboys their superb collections, and we, hanging on their words would avidly lap up any information or tips we could. The first of these men was the late F. A. Oldaker who, in addition to having Nigel and myself to supper and showing us his collection, very kindly invited us on the Haslemere N.H.S. annual ramble which he was leading (unfortunately his last) on 30/7/55. It was on this expedition that we saw our first specimen of *A. iris* while having our lunch in a small clearing. This magnificent insect came sailing down over the trees, possibly attracted by our white sandwich papers, Nigel in his enthusiasm leapt up, scattering his sandwiches, missed the butterfly by a good six feet and sadly watched it sail back over the treetops. Our second great meeting was on 30/11/55, my diary reads, "Went to see Air Marshal Sir Robert Saundby with Mike and Nigel, who showed us a specimen of *Plusia acuta* he had taken in his m.v. trap. This is only the third time it has been recorded in England; of the others one was taken in about 1870, the specimen of which has since disappeared, the other was taken on the same night as his at Woking. Incidentally we were the first outsiders to whom he had shown this rarity". A great day for us.

As the years progress the entries in my diaries seem to become less, and those in my last year at school are all in Latin and confined to records of more unusual captures; we were beginning at last to become more particular in what we chased and more scientific in our approach. The entries lost any comic touch which youthful ignorance often betrayed, and were now more clear and concise as we began to learn the whats, whens and wheres of entomology. Some of the early entries I made now seem extremely amusing although at the time were written in all seriousness: 12/3/54, "Fox caught a satellite for me in my net", quite a feat in this modern age! 11/3/54, "Caught a peacock in the changing room"; 16/10/54, "Caught a brick in the house-room"; these must surely have been *N. io* and *A. circellaris* respectively. I think pride of place must go to an entry on 12/8/55 and here I repeat in full: "Went swimming at Wellington College Baths, saw six old ladies sheltering in the place where the water goes out, two of these I managed to catch in my hands and kill by pinching. The others escaped".

These were indeed our Salad Days but inevitably they had to come to an end, Michael Braid went to Sandhurst, but on manœuvres would always conceal his net or try and post himself near likely-looking sallow bushes; Nigel Webb did a year's teaching at a preparatory school before going to Cambridge, he managed to borrow an m.v. trap from one of the masters and recorded some good captures in 1958, including *P. fuliginosa*; I went to Cambridge on a six year veterinary course, but there was always an empty tin in my pocket ready for any unsuspecting moths which might creep into lectures or practicals.

I feel it would be wrong to end on such a nostalgic note, when the most satisfying and enjoyable day's entomology any of us ever knew was to come six months after leaving school. We had arranged to meet on 29/6/58 and try for the black hairstreak; after a week of rain and dull weather we almost decided to cancel our expedition, but the Saturday dawned one of the best days of the summer. I left home at 8.30 and collected Michael Braid half an hour later outside the main gate of Sandhurst, we had an hour or so to kill before meeting Nigel so a quick

trip to Chobham Common and I added two new species to my collection. Having picked up Nigel, off to Oxford; before we had got out of the car two *S. pruni* had been seen on privet blossom. All of us were lucky, and in addition I beat one fully-grown *T. betulae* larvae and obtained one *A. prunaria* (another new species). Leaving late in the afternoon we had a rapid drive over to Aldworth Downs and here collected several *C. minimus* at rest among the long grass, and finally before returning home just to clock up our hundred miles, we dropped in at Bradfield just to make sure it hadn't changed. The perfect ending to this day was provided by some explosive beer tins, having been shaken up in the car, these emptied most of their contents on the ceiling, but we managed to salvage sufficient to drink to *S. pruni* and the future.

15 Jenkinson Road, Towcester, Northants.

Current Notes

ENTOMOLOGICAL RECORDS FROM WILTSHIRE

In this wide but sparsely populated county, entomologists are very few and far between. In fact a reviewer of our recently published volume, The Macrolepidoptera of Wiltshire, by de Worms, remarked that the county lists often showed the distribution of collectors as well as that of the insects. This is particularly true of Wiltshire.

This society is very anxious to extend the scope of the annual report which is compiled mainly from local sources. To this end it is requested that visiting collectors would be good enough to let me have a few notes of their observations. In this way we may get a better knowledge of the distribution of the various species in the county. For instance, there are indications that *E. ochroleuca* is extending its range, and that *P. chryson* has also occurred.

Reports would be welcomed at any time up to the end of January each year and a copy of our report will be sent to all contributors as soon as possible after publication.

Should rare or local insects seem to be endangered by human activities, early information on the subject would be very welcome. This would then be referred for any action that might be desirable to the newly-formed Wiltshire Trust for Nature Conservation.—B. W. Weddell (Recorder for Lepidoptera for the Wiltshire Archaeological and Natural History Society), 11 The Halve, Trowbridge, Wilts.

Notes and Observations

Apatele Leporina L. Overwintering Two Years.—When I read Mr. M. J. Leech's note on this subject in the January Record (p. 29), I felt sure that I had had pupae of *leporina* (miller) that had gone over for a second year. On examining my series of this moth, I found one that had been bred in 1923 from a larva taken in 1921 near Winchester, and another bred in 1931 from a New Forest larva taken in 1929, but these were merely isolated instances, quite different from the brood mentioned by Mr. Leech.—H. Symes, 52 Lowther Road, Bournemouth. 25.1.1964.

A Very Early Butterfly.—On 2nd February, a warm, sunny morning, when we were out in the garden at 10.50 a.m., my wife called my attention to a butterfly that was fluttering around. It was *Polygonia c-album* L. (comma) and it alighted on the lawn almost at our feet. After about ten minutes there, it took to the air again and settled on my wife's dress. It was very tame and quite content to stay there for a while. Eventually it came to rest on a patch of damp, warm earth in a very sheltered position, spead its wings to the sun and remained motionless until I went indoors after observing it for over half an hour in all. It was a female in perfect condition and I think it must have been one of those that I saw on my Michaelmas daisies last October. There were a few wallflowers and purple primroses in bloom within a few yards and I hoped that these would provide food for its needs.—H. Symes, 52 Lowther Road, Bournemouth. 3.ii.1964.

Emergence of Monopis rusticella Hübn. in Early January.—From the fact that the late L. T. Ford (1949, *Guide Small. Brit. Lep.*: 180) gives 5-6 and 8-9 as the months for the appearance of this common Tineid in the imago state, I conclude that a midwinter emergence is distinctly unusual. It was therefore surprising to find an example fairly freshly disclosed—it had not been there a short time previously—on one of the first few days of January, in a perspex box in which I had put some dipterous pupae collected from an old blackbird's nest in the garden, along with some of the nest debris in which, no doubt, the *Monopis* pupae* had been concealed. The box had stood ever since in an unheated room, so, although of course the temperature would be a little higher than outdoors, there was no question of forcing. It is true, however, that after a cold Christmas period the last week of December had been rather mild, and this sudden marked change may have sufficed to precipitate the moth's emergence. As a matter of interest, it seems to follow that with pupae hatching usually in spring or summer but occasionally the previous winter, imaginal development within the pupa must either take place at an unsuspectedly early stage in its life, or be capable of remarkably rapid onset and completion in response to an abnormal (and necessarily unpredictable!) mild spell.—A. A. Allen, 63 Blackheath Park, S.E.3. 2.ii.64.

*One more was later found in the box; and, just before dispatching this note, a second *M. rusticella* has made its appearance.

Gynandromorphism in British Lycaenidae.—I was much interested in Mr. Bretherton's article on the intersex forms of *P. argus* from north-west Surrey. The species is well known for this kind of aberration, and over the years, I have taken almost every form of gynandromorph, from those slightly marked with blue (male) scaling, to extreme blue nearly all over all four wings, some three wings male and one female, others with three wings female and one male, and last July and August I took five halved gynandromorphs from one small ground, but not in the Woking area.

In each case, even in those specimens with only one or two wings affected, the male wings are always smaller than the female wings, and

the sexual organs appear to be female. Over the forty years I have been collecting Lycaenidae vars., I have heard of only two hermaphrodites in this species where the insect is truly halved in wings and including antennae and sexual organs.

In *L. coridon*, gynandromorphism is more varied (see Bright and Leeds's Monograph on *coridon*) and includes ab. *roystonensis* and the mosaic forms with one wing male, another female, and the others mixed. Yet there are many more halved gynandromorphs in *coridon* (I know of at least fourteen) with sexual organs different on both sides, and even more in *P. icarus* than in any other of the Lycaenidae. *L. bellargus*, again, I know of only two halved true hermaphrodites, and although I possess two gynandromorphs, one with right side male, left side forewing female and half hindwing male, other half female. The other taken by myself in the presence of the late L. W. Newman in 1929, and seen alive by him, had left forewing completely female, the other three wings all male. The left antenna was shorter and apparently female.

To sum up, although gynandromorphism is obviously fairly common in *P. argus*, except for the halved and three winged ones of the same colour, the truly halved hermaphrodite, which includes the distinctly different sexual organs, is extremely rare.—A. E. Stafford, "Corydonis", Colborne Way, Worcester Park, Surrey. 7.i.1964.

Euphydryas aurinia Larvae in Second Winter.—The following behaviour of larvae of *Euphydryas aurinia* Rott., the marsh fritillary, was so unusual that I thought it worth recording.

Aurinia having now gone from the county of Northamptonshire, and knowing that the original stock was still being bred by Major Alan Collier of Cranleigh, I requested some larvae in 1962 and in August of that year I received a very fine web of larvae.

They were put on a growing plant of *Scabiosa succisa*, Devil's bit scabious, that had all available sunshine until about 2 p.m. each day: they went into hibernation between two leaves spun together, the size of a walnut, on the ground. They remained under deep snow throughout the winter and were first seen sunning themselves on 8th March 1963, and fed well on *Symphoricarpus*, snowberry, to suppliment the scabious.

With the exception of two batches of ova, the whole brood of imagines were released in suitable surroundings. Both batches of ova were from observed pairings; one was sent to Douglas Fearnehough in the Isle of Wight, and the other I retained. Both batches succumbed to the fungal growth referred to by Dr. E. Lees (*Ent. Rec.*, **75**: 264).

On cleaning out the wood-framed, glass-fronted, muslin-covered cage, 16″×16″×24″ high, I found up in one corner a strong silken web about an inch in diameter inside which were some fifteen small, active larvae, the same size as when I saw them sunning on 8th March 1963. One fed up and was a male pupa by the second week of August, but was taken by a bird. I have three small larvae still, and on 2nd January 1964 (these have not eaten during the summer) and remain in a curled leaf in a small plastic container.—J. H. Payne, 10 Ranelagh Road, Wellingborough, Northants. 3.i.1964.

Current Literature

Butterflies in Britain. By George E. Hyde. 48 pp. Jarrold Tableau Series, 5/-.

This book is a small collection of coloured and black and white photographs of British butterflies and their early stages together with short notes on the insects illustrated, preceded by a page of general introduction to the lives and status of British butterflies. The book should appeal mainly to young people interested in the subject and could well encourage some of them to take up entomology as a hobby and possibly an eventual calling. It should also appeal to those who like to have well executed picture books. I could wish, however, that the author had ascribed the Satyrids to the satyrs, or rustic sprites rather than to Saturn, who is the property of the emperor moths.—S. N. A. J.

The Amazing World of Insects. Arend T. Bandsma and Robin T. Brandt. x+46+134 plates, 42/-.

With the perfection of cameras and of colour photography, many books have been put on the market recently, giving collections of excellent insect photographs with comments either by the photographer if he be an entomologist, or by an entomologist employed for the purpose. This volume, however, has an additional interest in that the insects treated come mainly from the southern hemisphere, and accordingly, they arouse the interest of northern entomologists.

The subjects are well spread over the Arthropoda and the main groups of this phylum are explained on the first page of the introduction, the remainder of which goes into Evolutionary Development, Wings, Adaptability, Sense Organs, and Limits of Size, bringing out interesting facts which should help those merely interested in nature to take a closer interest in one or more of the insect orders.

The following 45 pages are taken up with short comments on the subjects of each plate, with the plate number in the outside margin against each description, which makes reference very easy.

The photographs are excellent without exception and cannot fail to be of interest to any intelligent reader, and it is to be regretted that the relation of cost and circulation debar more serious works from making more use of such photographs for illustration purposes, but possibly in due time this difficulty may be overcome. In the meantime, the volume under consideration is a worthy accession to the picture book shelf for moments of pleasurable browsing.—S. N. A. J.

The Distribution and Abundance of Tsetse. J. P. Glasgow. 241 pp., 2 plates. Pergamon Press, Oxford. 1963. Price 60/-.

The tsetse flies were first described as of a single genus *Glossina* by Wiedemann in 1830. By 1861 they were known to be responsible for the absence of cattle in certain parts of Africa. They have attracted the attention of many entomologists with support from governments and universities. This has resulted in the publication of several hundred papers covering a variety of aspects of study in field, laboratory and museum.

C. F. M. Swynnerton's *The Tsetse Flies of East Africa*, 1936, volume 84 of the Transactions of the Royal Entomological Society, comprised some 600 pages with plates and figures galore. Although primarily a report of the work in East Africa for the years 1931-4, it included a mass of data on the genus and was in effect a study of the ecology of *Glossina*.

In 1955, P. A. Buxton's *The Natural History of Tsetse Flies* was published. Its 800 pages, abundance of plates, figures and tables covered every aspect and gave 27 pages of references up to 1953. It is a work essential to all working on tsetse flies and needs to be read by all dipterists. Whilst it was in the press, there appeared *The Distribution and Abundance of Animals* by H. G. Andrewartha and L. C. Birch. This had an immediate consideration by ecologists.

The present work under review serves two functions. It is concerned with the ecology of the genus *Glossina*, dealing with the advances since Buxton's work and considers Andrewartha and Birch's work, testing their theory with the facts of a single genus. This has been done mainly under the headings of weather (including heat, humidity and light), food, interrelations with other animals and the habitat. The biology of the genus is first dealt with in a chapter labelled "Background information". Numerical increase and dispersal are next considered before the main chapters in which the research work on the factors affecting the ecology of the genus are discussed. Then follow chapters on the variation in the flies, their numbers and distribution. The general theory of the numbers of tsetse flies in natural populations is considered with the views of Andrewartha and Birch and is followed by an admirable summary which takes into account the earlier reviews of their work by O. W. Richards, L. C. Cole, A. Milne, etc.

The list of references is comprehensive, encompasses the spate of publications since 1953 and includes many items not mentioned in Buxton's work prior to that year. The numerous figures and tables include many useful original summaries.

The author maintains an open mind throughout the book and time and time again points out where more studies need to be undertaken. The index, where tested is accurate and adequate and the proof reading well done, but it was a surprise to see the name Wigglesworth twice misquoted as Wrigglesworth. The sole coloured plate misses the detail and accuracy such as is shown in the coloured figure of *Glossina austeni* in B. Weitz, "Feeding habits of tsetse flies". 1964. *Endeavour*, **23**: 39.

The book is one that should be studied by all ecologists as well as by entomologists. It must attract attention from many, to whom the destruction of game animals in the attempt to control the numbers of tsetse flies and their spread of trypanosomes, has been of interest. With a quarter of Africa denied to cattle by the genus that transmits Nagana, this book may form a further step in the effort to increase food production in the continent.—L. PARMENTER.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

SOME CONSIDERATIONS ON SOME PRESENT DAY CONDITIONS AS THEY AFFECT THE CONTINUED EXISTENCE OF CERTAIN BUTTERFLIES. Major-General C. G. LIPSCOMB and Captain R A. JACKSON, R.N. ... 63

LEPIDOPTERA IN THE ISLE OF WIGHT, 1963. T. D. FEARNEHOUGH, A.MET. 68

CRANLEIGH BUTTERFLIES, 1963. Major A. E. COLLIER 72

THE *SILVICOLA* BURGEFF GROUP OF THE GENUS *ZYGAENA* FABRICIUS (LEP., ZYGAENIDAE). W. GERALD TREMEWAN 74

SALAD DAYS. A. D. IRVIN 83

CURRENT NOTES 86

NOTES AND OBSERVATIONS 86

CURRENT LITERATURE 89

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (159)

TO OUR CONTRIBUTORS

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Holiday at Greatstone, Kent—July 1963

By J. M. Chalmers-Hunt and S. Wakely

This holiday together was planned early in the year, and the time chosen was from 13th to 27th July. So many interesting species of lepidoptera were taken that it was decided to write an account of the holiday. For convenience we decided to make separate items of the various places visited, arranged in alphabetical order, and it was also felt that in this form it would be of most interest to readers interested in each particular place mentioned.

The nomenclature used is that adopted by I. R. P. Heslop in his "Revised Indexed Check-list of the British Lepidoptera, 1962", and printed in various numbers of the "Entomologist's Gazette".

Appledore.—Several visits were made to Appledore searching for the larvae of *Depressaria ultimella* Staint. The foodplant is the Fine-leaved Water Dropwort (*Oenanthe aquatica* (L.)) Poiret (*phellandrium* Lamarck), a very local plant which grows in abundance in some of the roadside ditches in this area. On our first visit only a few small larvae were found, but on the 25th we made a special effort and found about three dozen larvae, some of which were full-grown. The larvae were found not only in the main stem (which often grows three inches or more in diameter), but also in the smaller branches. The plants were pulled out of the ditch and came up with heavy clots of mud, the plant itself being five or six feet tall. It took a long time to open up every stem of a single plant, so we were able to examine a few plants only in the time at our disposal. The larvae of *D. ultimella* are pale green or yellow in colour and feed only on the internal pith of the stems. Six-inch sections of the stem were also taken for foodplant and the larvae fed up rapidly on this on our return home. They were kept in large glass jars or plastic containers with plenty of tissue paper to absorb excess moisture. Several thicknesses of linen material were tied tightly over the top of each container as the larvae are apt to eat their way through a single thickness when full fed. If the foodplant is kept in an airtight receptacle it quickly goes mouldy and rotten. The larvae spun up readily among the tissue paper. While searching the plant, many larvae and pupae of *Depressaria apiella* Hb. (*nervosa* Haw.) were found in the stems. This is an exceedingly common species which has a number of other foodplants and feeds in external spinnings among the flowers or leaves and frequently enters the stem to pupate. Larvae and pupae of the beetle *Prasocuris phellandrii* (L.) were to be found in every stem in large numbers. One lepidopterous larva which was actually feeding on the pith inside the stem was subsequently reared and proved to be *Clepsis costana* F.—a common species usually found in spun leaves of various plants. Another small larva found feeding inside the stem was kept for some weeks and grew into a large fat noctuid larva, which is probably *Agrotis segetum* Schiff. It fed up latterly upon dock, groundsel, etc., but had not emerged at the time of writing.

Brooke, near Wye, was visited on the 19th, when Colonel Duffield took us round his fields. Many species were noted, the most interesting being: *Phalonia cnicana* Westw., *Epinotia immundana* F.R. (a late larva found in rolled alder leaf), *Coleophora fuscedinella* Z. and *Caloptilia elongella* L. (larvae of both on alder), and *Opostega crepusculella* Zell. (one imago taken by Col. Duffield).

Camber, Sussex.—We found this one of the most rewarding places to visit and as it was so near, several visits were made, usually to the same spot—the salterns to the west of Camber Golf Course by Rye Harbour. Hereabouts, *Artemisia maritima* grew in large clumps and at dusk one evening a few *Eucosma maritima* Westw. were taken flying round its foodplant. A few more were taken later by sweeping the *Artemisia*. The 22nd was one of the best nights at this locality. *Pediasia* (*Crambus*) *aridellus* Thunb. (*salinellus* Tutt) was quite plentiful, many being freshly emerged and drying their wings on the grass. A surprise was the capture of a single *P. contaminellus* Hb.—the dark form known as ab. *sticheli* Constant. This was thought to have strayed from the adjoining golf course. Single specimens of *Hysterosia inopiana* Haw. and *Depressaria badiella* Hb. were also taken. Two local moths taken here were *Bactra furfurana* Haw. and *Aristotelia lucidella* Steph. The larvae of both these species feed in the stems of the Common Spike-rush (*Elocharis palustris*), and we found several ditches where this plant grew in abundance. By sweeping this rush, many moths were obtained, especially *A. lucidella*. The foodplant of *B. furfurana* is given by several authors of well-known standard books on lepidoptera as *Elocharis lacustris*. There is no plant with this name, although there is a *Scirpus lacustris*. *Elocharis palustris* was formerly called *Scirpus lacustris*, but *Scirpus lacustris* has never been known as *Elocharis lacustris* as far as we can find out.

Ditchling, Sussex, was visited on the 21st. Parking the car near the pond on the Common, we had not gone far before a small, dark tortrix was netted and determined as *Dichrorampha pseudoalpestrana* Danil. This species was first recorded for Britain in 1893, when specimens were taken in Epping Forest among its foodplant, Sneezewort (*Achillea ptarmica*). We noted there was plenty of Sneezewort growing nearby and spent an hour or more walking slowly among the plants and occasionally netting one of the moths. In this way we took four each—eight in all. They were not in perfect condition and had evidently been out some days, but it was quite an exciting find. Other very local species taken here were: *Phalonidia manniana* F.R. (one near the pond), *Ancylis inornatana* H.-S. (among its foodplant, *Salix repens*), *Coleophora vibicella* Hb. (larval cases were found and a few imagines taken, but most of the cases were empty or produced hordes of minute parasites, although a few moths emerged a day or two later), and *Leucoptera wailesella* Stt. (a minute moth common among *Genista tinctoria*) and on which its larvae —and those of *Coleophora vibicella*—feed. If Ditchling had been nearer Greatstone, we should certainly have visited it again.

Dungeness was practically "on our doorstep"—only a few minutes' run by car along the coast road. The best capture here was undoubtedly three specimens of *Thalera frimbialis* Scop. at dusk on the 18th. Although larvae have been actually taken on *Achillea millefolium* here, they probably feed locally on other plants as no Yarrow was seen in the immediate vicinity of where the moths were taken although it occurred not far away. On the Continent its foodplants are numerous and even include birch, blackthorn and whitethorn, as well as several low plants, so it is probably the hibernating problem that makes it so difficult to rear. *Eilema pygmaeola* Doubl. ssp. *pallifrons* Zell. was quite common at rest on grass stems after dark on most of our visits. When returning from Camber about midnight on one occasion we saw a bright light on the shingle near the road at Dungeness. Being curious, we investigated

and found Mr. C. G. Bruce (of Lee) having a wonderful time with his M.V. light, surrounded by an unbelievable number of moths. They were milling round in a mass in the immediate vicinity of the light, and the sheet was covered by others resting. He kindly let us help ourselves to the micros as he was only selecting the pick of the macros. The two commonest species present were *Eilema pygmaeola* and *Synaphe punctalis* F. (*angustalis* Schiff.), which were in hundreds, together with odd specimens of *Eurhodope marmarea* Haw. and crowds of common species. He said he had hoped to get a few *E. pygmaeola*, but, he added, pointing to the mass present—"This is ridiculous". Evidently, conditions were perfect, as this kind of night is not of frequent occurrence. Other species of special interest to us taken on our visits to Dungeness included: *Dolicharthria punctalis* Schiff.. *Thiodia citrana* Hb. (quite common at rest on Yarrow), *Aristotelia palustrella* Dougl., *Agonopterix flavella* Hb. (common at flowers of rushes), *Ethmia terminella* Fletch. (a number taken at rest on *Echium vulgare* after dark), and *Oegoconia quadripuncta* Haw. (flying in abundance at one spot where a pair *in cop.* were at rest on a twig of dwarf broom).

Folkestone Warren.—We paid several visits to the Warren. Larvae were found in spinnings on *Daucus carota* and proved to be *Depressaria rotundella* Dougl. A single specimen of the extremely local and little-known *Cnephasia genitalana* Pierce was netted on one occasion. A few *Cochylidia rupicola* Curt. were taken in clumps of *Eupatorium cannabium*, and a single *Aplasta ononaria* Fuessl. was seen but left. We were disappointed at not finding two local species which we had hoped to come across; notably *Lobesia euphorbiana* Freyer (larvae of which had been taken in numbers here by the late L. T. Ford), and *Agonopterix pallorella* Zell., of which a single larva had been taken here by one of us in 1962, and successfully reared.

Greatstone.—As our bungalow was here, it is natural that this place produced the greatest number of moths recorded on our holiday. We ran a light trap every night and on many nights the captures were in embarrassing numbers. One of our first finds was the larvae of *Calophasia lunula* Hufn., which occurred on plants of *Linaria vulgaris*. It is an attractive looking larva which is conspicuous enough when spotted. It comes up and feeds on the newest growths at the top of the shoots. Half-a-dozen from a good-sized bed of the plant is a usual find, but a visit again the following day will often produce the same number, so presumably the larvae rest lower down when not feeding. It is still a local species here, but seems to be holding its own, in spite of the previous cold winter when the Dungeness district was snowbound for months on end. At the eastern end of Greatstone there are some high sand dunes covered with Sea Buckthorn. On the 21st we visited these dunes after dark and also used a Coleman's lamp on a sheet. It was a remarkably good night and several species were taken which had not been seen at the bungalow, including the rare *Melissoblaptes zelleri* Joan. (one). A number of *Witlesia pallida* Steph. came to light, which puzzled us as it is usually taken in marshy places, particularly in the fens—a very different habitat to dry sand-dunes. Other species of interest taken here included *Melanargia galathea* L. (one at rest—also seen flying at Lydd on 26th—a new record for this area), *Nola albula* Schiff., *Semiothisa alternaria* Hb., *Anerastia lotella* Hb. (common), and *Argyritis pictella* Zell. (a small tineid) swarming on the ground round the lamps. The commonest species in the

trap was undoubtedly *Apamea monoglypha* Hufn. A complete list of the species seen would be too long, but the following which were taken in the trap are worthy of mention: *Dasychira fascelina* L. (several males), *Spilosoma urticae* Esp. (one, very worn), *Euschesis interjecta* Hübn., *Pyrrhia umbra* Hufn., *Heliophobus albicolon* Hübn., *Leucania litoralis* Curt., *Nonagria dissoluta* Treits., *Apamea oblonga* Haw., *Lygephila pastinum* Treits., *Laspeyria flexia* Schiff., *Plemyria rubiginata* Schiff. (*bicolorata* Hufn.), *Hydrelia flammeolaria* (*luteata* Schiff.), *Eupithecia millefoliata* Rossl., *Eupithecia tenuiata* Hübn., *Eupithecia haworthiata* Double., *Cynaeda dentalis* Schiff., *Nyctegretis achatinella* Hübn., *Heterographis oblitella* Zell. (one), *Phalonia margaritana* Haw. (*dipoltella* Hübn.), *Ancylis achatana* Schiff., *Yponomeuta evonymella* L., and *Monopis imella* Hübn.

Lydd.—On the 14th we spent some time in the fields by Lydd Town Station. *Mesotype virgata* Hufn. was as common as usual among its foodplant, *Galium verum*, and a single *Ethmia bipunctella* F. was taken at rest on a fence post. Larval mines of *Aspilapteryx* (*Gracillaria*) *tringipennella* Zell. were exceedingly abundant here, as many as three being found on a single leaf of *Plantago lanceolata*.

St. Margarets-at-Cliffe.—This picturesque spot, with the French coastline visible on clear days, was visited twice and provided some very good records. Larvae of *Amelia* (*Tortrix*) *paleana* Hb. in their characteristic large spinnings were found on various plants including *Plantago lanceolata, Centaurea scabiosa, Carduus arvensis*. Larvae of *Agonopterix subpropinquella* Staint. were found in spun leaves of *Centaurea nigra* and those of *A. rotundella* Dougl. on *Daucus carota*. Very local species captured included: *Childonia piercei* Obraztsov (*subbaumanniana* Wilk.), *Stenodes alternana* Steph., *Eana osseana* Scop., *Grapholita caecana* Schlag. (a single specimen taken among *Onobrychis viclifolia* (Sainfoin)), *Eucosma fulvana* Steph. (on plants of *Centaurea scabiosa*) and *Thiotricha subocellea* Steph. A number of plants of *Solidago virgaurea* were seen growing here, a plant not usually associated with chalk, and the blue flowers of the local *Phyteuma tenerum* (Round-headed Rampion) were also noticed. On the way to St. Margarets on the 17th we stopped at a wood near Dover, and collected a number of rolled leaves of *Centaurea nigra*. It was a great surprise to find later that the moths which emerged were *Agonopterix carduella* Hübn., a local moth more common in the north and so far as we are aware has not been taken in Kent for many years.

Westwell.—On the 24th we were invited by Dr. Scott to have an evening's collecting in his garden and the adjoining woods. Several other entomologists were present and we were delighted with the opportunity to take some of the very local species occurring in his garden. At dusk, with hand lamps, we collected on the high wooded ground near the house and took *Schrankia taenialis* Hübn., *Orthotaelia sparganella* Thunb. (a very unexpected find on such high ground), and *Tinea semifulvella* Haw. Returning to the garden we found two M.V. lights fixed up—one at each side of the house—and were allowed to help ourselves to the numerous micros attracted to the sheets. These included *Pandemis cinnamomeana* Treits. (18), *Phycholomoides aeriferana* H.-S. (6) (a rare species first recorded for Britain by Dr. Scott in 1952), *Spilonota lariciana* Hein. (30), and a single *Brachmia gerronella* Z. We greatly enjoyed this trip and the hospitality accorded by Dr. and Mrs. Scott.

Looking Back Over 1963

By T. W. Harman

The hard winter caused a very late start to the season and it was 4th March before m.v. light was used and resulting in only half a dozen *Theria rupricapraria* Schiff. This period was enlivened by the emergence of *Trichopteryx polycommata* Schiff. from larvae taken on privet at Folkestone Warren last year. Seven specimens from nine larvae successfully came through. My wife saw a Brimstone butterfly on 6th March and this one must have revived very quickly after its refrigeration. The first field trip was with Mr. T. J. G. Homer on 14th March to an oak wood near Twyford, Berks. After a warm day the temperature stayed at 53°F. with cloud culminating with heavy rain at 9.30 p.m. when we had to pack up. By this time we had seen an extraordinary number of insects for this time of the year. There were several forms of *Apocheima hispidaria* Schiff. in dozens, *Achlya flavicornis* L. in plenty and some lovely forms of *Erannis leucophaearia* Schiff. Except for numbers of species it was like collecting in June. On calling at a local hostelry after getting back on to the metalled road, we found all these species settled around the light over the entrance porch. By mid-March *Gypsitea leucographa* Schiff. from local ova began hatching and a nice series resulted, mostly well marked.

The rest of March was uneventful and it was 1st April before we made another field trip, to another oakwood in the area mentioned earlier. Among seventeen species, only *Trichopteryx carpinata* Borkh. was of any interest. On 2nd April the first of several *Lophopteryx cucullina* Schiff. from local ova hatched, these did not seem particularly difficult to rear. After several poor days we made a trip to Crowthorne, Berks. The temperature dropped to 46°F. with a slight wind, but we did manage to get one specimen of *Dasycampa rubiginea* Schiff. and *Nycteola revayana* Scop. On the return home that night we stopped at some local sallows and shook out five specimens of *G. leucographa* Schiff. and one *Lithophane semibrunnea* Haw. At light here was one *Hypena rostralis* L. The following night saw us in Hampshire, again after *D. rubiginea* Schiff. Three specimens came to light by 9.30 p.m. and also one *Panolis flammea* Schiff., but we were washed out by rain at 10 p.m. Mr. S. Coxey came down from the 'Far North' on 12th April for a few days. His main quarry was *G. leucographa* Schiff., but the first night produced low temperature and no moths. The night of 13th April was rather unusual and worth describing. After heavy showers all day and up to 8.30 p.m., the sky suddenly cleared and the stars shone brightly. The temperature dropped to 42°F. and all looked hopeless, but after such a long journey for the moth, we decided to try sallows. From a lone male sallow bush close to a beechwood we shook seventeen *leucographa*, surely a world record!? Mr. Coxey's other quarry was *D. rubiginea* Schiff. and we went to Fleet, Hants., for it on 14th April, without luck except for one *Orthosia miniosa* Schiff. We went back the following night with great hopes as the temperature was 55°F. Within twenty minutes it began to rain and we had to retreat to Mr. Coxey's car at intervals. Still we managed three *rubiginea* and Mr. Coxey patiently fed a male until June for eggs! Mr. Homer had a female which obliged us with five eggs, from these I reared one moth and he got two. The 16th April found us on the banks of the river Kennet searching for the larvae of *Panaxia dominula* L. We found quite a number, but they

seemed local, very easy to bring about their extinction, I should think, if collectors fail to use restraint. One of the most pleasant evenings of the year was on 17th April when Mr. Homer and I accompanied Sir Robert and Lady Saundby and Mr. B. R. Baker on a *leucographa* hunt. A visit was made to the 'Coxey' sallow, but the entrance to the site was blocked by a car containing a courting couple. Our noisy arrival followed by the extraction of numerous white sheets from the car boots disturbed the amorous pair who decided to leave hastily, much to our delight. Sir Robert's prize comment was, "They can do that anywhere but this is a local insect". At the conclusion of operations the sorting of sheets for their rightful owners proved rather difficult and a voice from the fray remarked, "Whose is this marked 'British Railways'?". Our evening's endeavours produced nine *leucographa*.

Another larvae hunt was made on 20th April, this time Mr. B. R. Baker took Mr. Homer and myself to Burghfield Common for the larvae of *Polia hepatica* Clerck. on birch saplings. We searched for an hour with little success, but after finding a larva on a clean, thin stem which arose where a tree had been cut, I decided to stick to these and forget saplings whose catkins proved distracting. This made things easy as these single growths were much more backward with still quite small buds. The larvae showed up for yards in the light of an ordinary cycle lamp. We all got a nice number which subsequently hatched well. Yet another trip to the oak-woods near Twyford was made on 22nd April, this time with *Polyploca ridens* F. in view. We did get five even though the temperature dropped to 37°F. and two policemen were also attracted but did not settle! The next day at Medmenham produced another *H. rostralis* L. and the only female *Lycia hirtaria* Clerk I have ever seen at light. One *Abraxas sylvata* Scop. from local larvae hatched on 24th April, few came through all told. 25th April produced the first *Odontosia carmelita* Esp. for the year here so on 28th April Mr. Homer and I tried light under some birches in a large beechwood clearing not far from here. We got seven specimens by 10.0 p.m. when they appeared to stop flying. At home that night was another *O. carmelita* Esp., *T. polycommata* Schiff., *Clostera curtula* L. and *Cucullia verbasci* L.

May began with a dreadful night. On 3rd May Messrs. Fairclough and Parfitt came up hoping to obtain *Eupithecia insigniata* Hübn., but it was such a cold night that we held a conference rather than collect. The next night saw Messrs. Baker, Homer and myself at Padworth, Berks, after *Cleora cinctaria* Schiff. I managed to get one worn male but little else was taken apart from one *O. carmelita*. The same evening saw the first *Stauropus fagi* L. of the year at Medmenham. The 7th May resulted in one *Orthosia advena* Schiff. and a very nice male melanic *Menophra abruptaria* Thunb. My brother and I made a long trip to Devon for *Xylomyges conspicillaris* L. on 10th May. It was nearly midday on 11th May before we began the ritual of searching railway posts and it took three hours to find two moths. A quick glance at a tree in a nearby copse resulted in one *conspicillaris* but this must have been luck as no other trees held moths of any species. That evening we returned with the generator. It was so cold that only three moths turned up by 11.30 p.m., one of which was *conspicillaris*! This made a grand total of four for the trip. It was 16th May before I could record another night as excellent. Among nine new species for the year was *E. insigniata* Hübn. The banks of the Kennet were again visited on 19th May, this time a search being

made for the larvae of *Plusia chryson* Esp. Only two were found the whole afternoon, but a later visit to another locality with Mr. B. R. Baker produced more which duly hatched well. The first *Cucullia lychnitis* Ramb. from larvae obtained near Henley-on-Thames emerged on 24th May. About half a dozen came out and the rest chose to lie over another winter. A female *E. insigniata* Hübn. taken on 30th May laid eggs and 23 larvae later pupated having fed up easily on hawthorn. Mr. R. Fairclough beat a large amount of hawthorn for larvae of this species without success, so perhaps it does not feed on this bush in the wild state.

The 5th June found me at Dungeness, but it was a rather colourless trip except for a journey to Orlestone Woods with Mr. R. E. Scott on 5th June. Thundery conditions prevailed and all was perfect. By 11.0 p.m. we had three specimens of *Moma alpium* Osbeck, and all came within 15 mins. of each other. Sugar yielded *Tethea or* Schiff. fairly commonly. We were back again the following night under less favourable conditions, the only thing of interest seen being *Anagoga pulveraria* L. Back at Medmenham on 9th June saw one of the best days I have known so far, with the temperature at 68°F. at 10.0 p.m. and 93 species taking advantage of the conditions. A sun temperature during the day in the upper 80's F. produced 16 new species for the year. On 10th June Mr. Homer and I visited Pamber Forest where we took *Apoda avellana* L., *Hadena contigua* Schiff., and *Apatele alni* L. as a new species. At Woolhampton, Berks, on 13th June I managed to obtain two specimens of *Leucania obsoleta* Hübn. and one *Leucania straminea* Treits., the latter being quite common here later in the month. Another new species to me, *Polia nitens* Haw., appeared on 28th June. There was then little to report until 20th July when Messrs. Baker, Homer and myself went to Pamber Forest. Among 101 species were *Parastichtis suspecta* Hübn., *Nola strigula* Schiff., *Bupalus piniaria* L. and *Schrankia costaestrigalis* Steph. as new ones to me. This turned out to be a very late night and it was 5.0 a.m. before we got home. Awaiting me was another new species, *Xanthorhoe biriviata* Borkh. with another the following night, both males. A couple of even better nights followed with my record of species for one night at Medmenham broken with 118 species on 22nd July.

After reading and hearing so much about Southwold, we booked up for 27th July to 10th August and hoped the fortnight would give us a few nights without wind. Mr. Homer was there for the first of the two weeks and we ran three m.v. lights over this period and I ran two from our bungalow in Ferry Road for the second week. The second week was in fact the best of the two. Among the highlights of the holiday was a visit to Walberswick Marshes with the generator. Although rather breezy, some shelter was found on a path between tall reeds and here *Nonagria neurica* Hübn. proved fairly common. On 3rd August I joined Mr. and Mrs. F. H. Lyon and Mr. H. E. Chipperfield at Walberswick and we had a couple of wonderful hours on the edge of the marsh with hundreds of insects coming in, the best of which were *Arenostola brevilinea* Fenn, *Arenostola fluxa* Hübn., *Coenobia rufa* Haw., *Sterrha emarginata* L., *P. suspecta* Hübn. and *N. neurica* Hübn. There were two *A. brevilinea* Fenn in the trap at Southwold that night. A hunt for pupae of *N. neurica* Hübn. proved pretty hard work but of course I was a little late in the season. It took an hour to find two pupae and both hatched before leaving Suffolk. Other moths of interest were *Apamea oblonga* Haw., fairly frequent over the fortnight, *Hadena compta* Schiff., one only, *Arenostola*

elymi Treits., common at light, *Zanclognatha cribrumalis* Hübn., a few worn specimens and *Cucullia asteris* Schiff., fairly common at light and very common as larvae in one area near Southwold. Sugar at Southwold was useless and marram grass was almost as unproductive. I found there were two natural baits that were extremely attractive to a fair number of species. One was honeydew on a small patch of phragmites, which was well attended every night by moths. An even better attractant, but to rather less species, were the heads of a small rush, not more than nine inches high, which grew commonly at Southwold. In places it was covered with moths on good nights, namely *Leucania impura* Hübn., but also *Euxoa tritici* L., *Euxoa cursoria* Hufn. and the occasional *A. oblonga* Haw. The rushes are on the opposite side of the road from the beach and are more sheltered than the marram grass, which may account partly for the differences in numbers of insects at the two plants. Altogether it was a wonderful holiday for anyone interested in lepidoptera, especially those with a family. The beach is ideal for children and not overcrowded. I must admit I did not try the water as my feet rebelled too strongly for more tender parts to be immersed!

After getting home again we were soon at Woolhampton where we saw *Zenobia retusa* L. and a single *Oria musculosa* Hübn. on 12th August. On this and the following night all three 'Cosmias' showed up at Medmenham. The rest of August was rather dull and it was 3rd September before another field trip was made, to Burghfield Common for larvae of *Bomolocha fontis* Thunb. About a dozen fell to the trays and on heather nearby, the larvae of *Anarta myrtilli* L. were quite common. The autumnal moths really began in force on 9th September with *Anchoscelis litura* L. and *Tiliacea aurago* Schiff., the latter being very common here this year. The 21st September saw a successful hunt for *Tiliacea citrago* L., five specimens were obtained before 11.0 p.m., with one *Cosmia affinis* L. putting in a late appearance. This day saw another emergence, that of our second son, a typical specimen of F_1 generation from abnormal parents!! Two nights later was the only occasion I can remember seeing three species of 'Snouts' together. They included *Hypena proboscidalis* L., *Schrankia taenialis* Hübn. and *H. rostralis* L. Pamber Forest was again visited on 7th October and we noted *Anchoscelis helvola* L., *Asphalia diluta* Schiff., *Griposia aprilina* L. and *Episema caeruleocephala* L. On the way home we spotted a moth high on a lampost, and after a scramble and the help of a net we had another *E. caeruleocephala* L. We then zig-zagged our way from lampost to lampost into Reading!

The next trip of interest was with Mr. Homer to Swanage from 18th-21st October. We stayed at a guest house where we received royal treatment and ran four m.v. lights on the cliffs between Swanage and Durleston. It was a wonderful four-day visit and we got everything we went for plus some bonus species. Among those of interest were *Dasypolia templi* Thunb., about sixty seen with thirty at one trap on the last night, *Lithophane leautieri* Boisd., eleven specimens, *Lithophane ornitopus* Hufn., one fresh specimen, *Nycterosea obstipata,* three males and two females, all fresh specimens, *Rhodometra sacraria* L., one fresh male on 19th October, *Palpita unionalis* Hübn., two fresh males on 21st October.

One *R. sacraria* L. came to light at Medmenham on 23rd October, so there must have been quite a number migrating around that time. The first *L. semibrunnea* Haw. appeared on 25th October and *Ptilophora*

plumigera Schiff. on 5th November, a day earlier than last year.

Before closing the year's notes, mention had better be made of *Trisateles emortualis* Schiff. It was seen again this year and so is definitely resident. We have, however, learned little of its status or breeding habits. This is due mainly to the fact that we avoided overcollecting in the area in case it is extremely local and liable to extinction. So far all specimens, nine in all, have been taken within one hundred yards of each other and one task for 1964 is to try and find the insect in other localities.

In conclusion may I defend the shocking summer by saying that the moths of 1963 kept me extremely busy and what we looked for we nearly always found. It was particularly satisfying to hunt larvae and find them and no matter what the weather is like, larvae still appear to feed and be found. The migrant hawks continue to pass me by but here is looking forward to 1964 and another fortnight at Southwold.

3 Lodge Farm Cottages, Medmenham, Marlow, Bucks.

Scientific Names

By Hans Reisser

I have read with great interest the discussions about Latin or English names for the Lepidoptera. As a "continental" reader, may I be permitted to say that Latin names are indispensible. What shall I, as a foreigner, understand of the species treated when there is only a name like, for instance, Lulworth skipper? When I am interested, I am compelled to fall back on South, from which I see that it is *Thymelicus actaeon*. What should an English collector do on reading in a German paper names like "Hausmutter" or "Erdpfahl" only without the correct name *Noctua pronuba*?

Certainly, a pure collector, not interested in any literature, is not upset by the using of popular English names only, and without the authors' names. But every lepidopterist who writes and intends to be understood by other (which include foreign) colleagues should be obliged to use scientific, i.e. Latin, names and also cite the author's name. In synonyma it is important to know the author's name for consulting the literature to see exactly which species is treated. Nobody should be forced to omit English names, but everybody should be so helpful to his colleagues as to use at least *once* in every species he treats, the Latin name and that of the author together with the English name.

In many cases using South, I am angry that the vernacular name is set first, and it is rather difficult to discover the scientific name together with the complication that the Latin names used in England are different from those used in publications in other countries. It is to be hoped that one day names shall be the same in all countries based on exact priorities or the exceptions agreed by the commission of nomenclature.

Excuse me for having spoken with frankness; I have no wish to offend my English colleagues, and of course, anyone may use the popular names, which are often very signficant in the different languages, but in order to enable easy understanding, we should always employ the Latin names, too.

Wien I, Rathausstrasse 11, Austria.

More about Latin

Mr. Burton's letter in the issue of October last was indeed welcome and so was the information vouchsafed in Mr. Jacobs' opening paragraph on 'Scientific names'.

But do some of Mr. Jacobs' statments stand up to analysis?

I should like to know how he reconciles 'names which are known and accepted throughout the world' with the numerous alterations made in recent years.

One need go no further than to compare the scientific names given by South in 1906 in his 'Butterflies of the British Isles' with those by Frohawk in 1934. Since when were these scientific names known throughout the world?

Judging by an article by Commander Harper in the December issue, chaos is still the order of the day; however, let us get down to elementary facts.

The Entomologists Record is printed in English for those people who are capable of reading and understanding English, and no one else, as it is utterly unintelligible to Chinese, Muscovites or Patagonians.

To these latter and similar nationalities it might as well be printed in Sanscrit.

The Record is intended primarily for readers in the British Isles, and I am prepared to gamble that 'not so scientific' readers outnumber the soi-distant scientific ones; I fully appreciate however that there are a large number of pukka scientists.

There is no 'vernacular name only' class as far as I am aware; it is the 'Latin name only' class that is responsible for the paternity of this correspondence and the numerous offspring of supporters of Irvin and myself, neither of whom incidentally suggested popular names for the vast army of 'Micros'.

It is not without significance that the supplements on the 'Lepidoptera of Kent', which have been such a feature of the Record for many months, give the English as well as the Latin names of the respective insects.

This defection from scientific standards will doubtless be frowned on by the cognoscenti, who 'scorning the base degrees by which they did ascend' gaze down from their Olympian heights at the rabble below.

The diversity of opinions at present is as wide as the gap that separated the Rich Man from Lazarus; can we narrow it?

L. G. F. Waddington.

9 Greenleafe Avenue, Doncaster.

Was Linnaeus a Bighead?

By S. N. A. Jacobs

Some reply to Mr. Waddington's note is required, and in the hope that it may close this correspondence, I put the following on record. The whole correspondence was brought into being by Mr. Irvin asking why vernacular names were printed before instead of after the scientific names: a very reasonable question, and one to be commended to the publishers of popular and semi-popular natural history books.

The Record has Argentinian (if not Patagonian), Chinese and Muscovite readers, whom it is most pleased to welcome, and I can see no reason for making it unintelligible to these friends by talking of drinkers and lackeys

and Mother Shiptons, fanciful as these names may seem to some of us. We have a long list of interested subscribers in other foreign lands, too, some of whom have written to me on this subject.

I very strongly refute any suggestion of snobbery in the use of world-wide names in preference to those only known to a small community. It is true that the world-wide names are apt to change in the light of new discoveries, but they change in accordance with rules (albeit somewhat complicated rules) accepted throughout the world, and these changes are notified throughout the world by the medium of the entomological periodicals and other publications. Commander Harper's perhaps not unjustified strictures were against the complicated nature of these rules, an entirely different matter.

I am convinced that objection to scientific names is, I regret to say it, a mixture of mental laziness and a "with it" objection to the classical languages on unreasoning principle. I am also shocked by the separation of Macro- and Micro-Lepidoptera. If vernacular names are necessary for the one they are necessary for the other, but I do not agree that they are necessary to either. What is the imaginary difference? I would suggest the slightly higher degree of care needed for handling the smaller subjects, and although there is something imaginary about this, it again comes down to some sort of laziness. By all means specialise in certain families but the "Micros" are not a separate order. For the matter of size, I have many "micros" exceeding two inches in expanse, and some even exceeding three inches, and if it were a matter of classification, the *Cossidae*, *Zeuzeridae* and *Hepialidae*, among which are some of the world's largest moths (oh, sorry, goats, leopards and swifts) are all "micros" while *Psychidae* (bag-worms) are considered by some to be "macros."

There is nothing against using an intelligible vernacular name to a layman; in fact, it would be snobbish to mention the scientific name alone, but when talking to a gardener, a warehouseman, a miller, or some other person who, though not an entomologist, is constantly in touch with insects, the scientific name should be added so that he may be able to follow up the matter in the literature should he so wish.

One of the most pleasing features of the naturalist world is the entire absence of snobbery from amongst its fellows, who are to be found in almost all social strata. The only passport required is a genuine interest in the subject, and a genuine interest would take the stile of international nomenclature in its stride.

Throughout the centuries of our history, latin has been the basis of the *lingua franca*, and this became "dog latin" as it became necessary to use its natural flexibility in the manufacture of new words. On what better bank of names could Linnaeus have drawn than on the inexhaustible resources of Latin and Greek to form euphonious appellations which could be regarded as standard throughout the world. Did this make him a "bighead"? Do not forget that he was a Swede, not a native of this staunch island—and just think what it would have been like had he named his insects in Swedish only!

Then, again, let us think of some of our best field naturalists, the artisan naturalists of the past century, who spent their week-ends "sleeping rough" on the moors, collecting and studying the insects which gave them so much healthy interest. During my few months in the early summer of 1914 as an engineer apprentice at the Erith (Kent) works of Vickers Ltd., I derived much pleasure from an old labourer, known to all as "Toby"

(I never knew his real name) from whom I learned a great deal of my early butterfly and moth lore, and I cannot recollect him using vernacular names on any occasion, although I very much doubt whether his schooling had lasted many years in the village school.

In my 1914-18 army days, I met a few kindred spirits, who always discussed insects by their scientific names (with the possible exception of *Pedicularis pubis*). Even "Chums" and "The Boys' Own Paper" gave us scientific names to lead us to the upper levels, and in those days the challenge of a little more effort caused practically all to follow this sensible lead. There is no scorn for the "base degrees from which they did ascend", only for those who took the "primrose path" of vernacular names.

The main object of the study by the greater number of non-professional entomologists is to have an interesting hobby which brings them in contact with the outdoor world and which gives them a mental stimulus. The scientific side is also important, and the amateurs contribute to this as well as the professionals, by providing material and data on which the professionals can work, but what good would this be if only Britishers could understand their writings.

Mr. Parkinson-Curtis, who has figured in this correspondence, refers to the vernacular name for *Melanotus vulgaris*, the common cockchafer, in his letters to me, which in Dorset is known, irrespective of sex, as a buck buzzard. Hearing this appellation, a foreigner might well ask whether it was a mammal or a bird, but he could hardly suspect that it was indeed an insect.

A Continental Holiday, 1963

By Dr. Neville L. Birkett

I left England complete with family and caravan on 8th August 1963 for my annual holidays. After a dismal summer in England the main objective was to seek sunshine and with this in view Venice was our goal. Many friends had eulogised the charms of this ancient city but we had been frequently warned also of the excessive heat and pungency of Venice in August. These prognostications were fortunately not fulfilled during the time we spent near Venice. We had a pleasant trip motoring across France via Reims, then across the Jura to cross into Switzerland at Vallorbe. Then a wonderful stretch of motoring, with superb views, past Lake Leman to reach Martigny in the Rhone valley at tea-time on the 11th. Here we found an excellent site for the caravan and stayed about five nights. The superb weather of the 11th was too good to last so that by the evening there started a series of thunderstorms and torrential rains which were to last for over twenty-four hours. In consequence the "Glorious Twelfth" was most inglorious and was spent in idleness watching the rain descend and the only entomology was another look through Wheeler's excellent little book on the Butterflies of Switzerland dreaming day dreams of what treasures would be in store if the weather would clear.

On 13th August, perhaps in answer to the prayers of the many holiday-makers, the day broke gloriously sunny and we set out early from Martigny ascending the Col de la Forclaz—which is the road leading to Chamonix. Most of the Swiss side of the Col is a magnificent new

road but there is a steep and rough middle section which, however, will soon be altered by the new construction actively in progress. The top of the Forclaz provides magnificent scenery and having taken this in and taken some photographs we then ascended by the Télésiège de l'Arpille to the top of that mountain—about 6,400 ft. Apart from the even more magnificent views, especially looking up the whole length of the upper Rhone Valley, there is an extensive summit plateau which provided interesting and good collecting. I noted the following species in the course of a morning collecting here:—

Erebia tyndarus carmenta Frhst. Very common and in excellent condition all over the summit of Arpille.

Erebia melampus tigranes Frhst. Common. The males getting worn but many of the females in good condition.

Erebia montanus de P. Common but passé.

Erebia euryale f. *isarica* Heyne. Fairly common and the female undersides were very fine.

Erebia ligea L. A few specimens were noted flying among the pine trees on the summit plateau but the species was much more common when I walked down from the summit to Forclaz through the pine woods later.

Erebia epiphron Knock. I took only a single female of this species in this area.

Colias palaeno L. Two fine males taken and others seen. Species of this genus are not the easiest to net!

Lasiommata maera L. A few seen and taken. This was more commonly seen during the descent through the woods than on the summit.

Melitaea diamina hebe Borkh. (*dictynna* Esp.). Frequent.

Fabriciana niobe L. Many seen but few taken due to their rapid flight.

Boloria pales Schiff. Frequent—very few females seen.

Vacciniina optilite Knock. Two quite fresh males taken but I saw no signs of the females.

Other more common species seen were:—*Pieris rapae* L., *Papilio machaon* L., *Vanessa cardui* L., *Aglais urticae* L. and a few common "skippers".

In the early afternoon I walked down through the aromatic pinewoods and had a picnic lunch before setting out along the Val du Trient towards the Trient glacier. As so commonly happens in alpine regions the clouds began to gather and butterfly activity diminished in consequence. In fact by the time we got within a mile of the glacier there was so much cloud that we did not continue the excursion on to the glacier itself. However a number of interesting species was taken on this walk but in smaller numbers than would have been the case had the sun continued with its morning brilliance.

Fabriciana niobe niobe L. and f. *eris* Meig. were taken in small numbers.

Mesoacidalia charlotta Haw. (*aglaia* L.). Common. (And perhaps I should, in utilising this name, apologise to various writers who dislike the change from the more familiar 'aglaia'!).

Argynnis amathusia Esp. Two good ones taken and numerous other worn examples seen.

Heodes virgaureae f. *zermattensis* Fallou. Fairly common and in good condition.

Lasiommata maera L. Frequent.

Erebia ligea L., *E. montanus* de P., and *E. euryale* Esp. were all quite common.

Erebia manto mantoides Esp. Quite common and well marked.

Erebia melampus tigranes Frhst. A single fine female taken. I also took a few each of *Mellicta athalia celadussa* Frhst. and *Melitaea diamina hebe* Borkh.

14th August was another sunny morning and we set off in good time for the summit of the Grand St. Bernard Pass, 8,100 ft. En route I passed many likely-looking collecting grounds which lack of time prevented my exploring. Considerable time was also lost on the journey by traffic congestion caused by vast construction works in operation near the summit. The summit was rather disappointing being very bleak and windy, the wind being very cold at this rather high altitude. Few butterflies were in evidence and I took only a single fresh male *Boloria pales* Schiff. seeing a few others as well as having a distant view of an *Erebia*! While I was failing to find butterflies my family visited the museum at the Hospice on the summit. My wife drew my attention to a collection of insects exhibited in the museum which I duly inspected. The collection was the relics of one formed by the well-known Ch. Favre who did so much to elucidate the lepidopterous fauna of the Valais. The lepidoptera were in a poor state and the coleoptera little better. The whole lot were in store boxes covered with dusty cellophane and exhibited in a rather dark set of glass-fronted cupboards.

As usual the afternoon was very cloudy and no further collecting could be attempted.

On 15th August we struck camp and moved up the valley to Brig finding a well-run site at the foot of the Simplon Pass. That afternoon, in spite of the inevitable cloud, I went to the top of the Simplon Pass (6,600 ft.) there finding the inevitable crowd of tourists but little signs of butterflies. In fact I found only a single *Erebia tyndarus* Esp. However by way of compensation sitting about on the low vegetation was a great mass of *Zygaena exulans* Hoch. and I was able to take a short series of these in a few minutes. Returning towards Brig the sun began to shine again and I made a short halt just below Berisal. Here I took *Erebia montanus* de P., *E. alberganus* Esp. and *Heodes virgaureae montana* M-D. The latter was a fine female abundantly distinct from the f. *zermattensis* Fallou which Wheeler indicates to be the form found on the northern side of the Simplon.

In glorious sunshine we set off on the 16th for Zermatt deciding beforehand that we should not let any water pass our lips even though having the protection of suitable inoculation. We motored to Stalden and then took train up the fantastic Nikolaital to Zermatt. While waiting for the train at Stalden I saw the only *Euvanessa antiopa* L. of the whole trip but by the time my net was operational le "Morio", as our French confrères term it, had disappeared. Having taken many photographs ascending the Nikolaital and also in Zermatt itself I turned my attention to the butterflies which were plentiful in the fields beyond the town. Here in two hours I filled my boxes, a large cyanide bottle as well and developed a wonderful thirst! The following species were seen and/or taken:—

Parnassius apollo L. Only two females taken but many others seen. These females are heavily dusted with dark grey and no doubt have a varietal name. Unfortunately this species is beset with a plethora

of named forms and I do not pretend to understand its many geographical races, etc.

Heodes virgaureae f. *zermattensis* Fallou. Both sexes abundant and I took a good series.

Hyponephele lycaon Rott. This also was common. The males were for the most part worn to shreds but the females were fine and varied.

Aporia crataegi L. One only taken. I may well have seen others and not recognised them on the wing. The area I was working was rather difficult ground for running after fast flyers.

Argynnis niobe niobe L. Frequent but rather difficult to contact.

Mesoacidalia charlotta Haw. (*aglaia* L.). Common.

Lysandra coridon Poda. Abundant. There appeared to be two overlapping broods as far as concerns the males. Many were quite fresh with well-marked spotting on the undersides. Others equally numerous, were decidedly passé and had generally weaker underside spotting. It is possible there may be two species here which I have failed to recognise. The few females I took were fresh and with strong spotting.

Palaeochrysophanus hippothoë L. Two males only taken. The specimens were fresh and I did not see any other specimens.

Agrodiaetus damon Schiff. I took a single worn male only.

Aricia glandon de P. I took a single male only of this species.

Lycaenides idas var. *aegidion* Meissner. I took a fine male of this form. There seems to be some confusion in the nomenclature of this form. Wheeler describes *aegidion* for *argyrognomen* Bergst. (which is now *idas* L.) while Verity in Le Farfalle Diurne D'Italia, Vol. 2, gives *aegidion* as a variety of *argus* L. (*aegon* Schiff.). My putative *aegidion* from Zermatt definitely has got a spine on the tip of the anterior tibia. Thus it is definitely a form of *idas*.

Lysandra escheri Hübn. Frequent.

Aricia agestis Schiff. and *Hesperia comma* L. were both frequent at Zermatt.

Polyommatus eros Ochs. A single male only taken.

Pyrgus carlinae Ramb. A few.

Pyrgus 'alveus' s.l. A number taken. I have examined the genitaliea of these and seem to have (1) *accreta* Verty., (2) *alveus* Hübn., and (3) *sifanicus* Gr.-Gr. However I have little experience of this group and confirmation of these tentative diagnoses will have to be sought.

So ended my day at Zermatt—a wonderfully exhilarating place with many butterflies to be obtained amidst most magnificent scenery.

17th August dawned very cloudy and rain soon followed. We set forth from Brig to cross the Simplon Pass into 'sunny' Italy. Hopes of collecting at the summit were literally drowned in the great downpour which continued throughout our journey as far as Bergamo. We there found a rather primitive site for the caravan just outside the town and thought little of the weather we had come so far to enjoy! After an entertaining meal at a somewhat plebeian restaurant in Bergamo we were glad to get to bed and forget the weather. Fortunately the morning of the 18th was bright and sunny and a few *Graphium podalirius* flying about the camp site cheered up at least the entomologist of the party. As the weather in the hills looked unsettled from our vantage point in the Plain of Lombardy we decided to proceed to Venice. After a satis-

factory run on the fine autostrada, stopping once to buy a box of peaches at just over one penny each, we reached the Venice area in the early afternoon. We went north a little from Venice and pitched our caravan some fifty yards from the Adriatic on the fine and superbly appointed German site at Cavallino. Here we stayed for eight nights and had superb weather for most of the time. During the time we spent in this area I did a considerable amount of collecting in the rough fields near the caravan site and on some rough ground a few miles away. The site, incidentally, was among many poplar trees and at night the lights attracted multitudes of *Leucoma salicis* L. which were also seen frequently by day sitting about on the buildings and poplar trunks. This in spite of twice-weekly spraying of the trees with some anti-pest substance, possibly D.D.T. The following species were seen or taken near Cavallino between 19th and 25th August:—

Graphium podalirius L. Many seen and a few taken. The species was common flying about the sun-bathers on the beach. Specimens are fine and large with relatively pale ground colour.

Pontia daplidice L. Many seen and a few taken. Most of the specimens were more or less worn and very few were worth taking.

Vanessa cardui L. A few seen. A large and well-coloured form.

Colias croceus Fourc. Generally common. Two females agree with the description of the f. *suffusa* Tutt with considerable suffusion of dark scaling at the base of the forewings. Var. *helice* Hübn. was also present and frequent.

Pieris rapae L. Common.

Coenonympha pamphilus L. This species was plentiful and interesting. The form taken appears to be referable to f. *ferrea* Verty. It is large with well-marked marginal suffusion. One or two specimens have the double apical spots on the forewing—ab. *bipupillata* Cosmovici. The under surface of the hindwings in one specimen shows complete absence of the whitish central suffusion normally present. The submarginal discal series of dots is indicated by small brightly metallic dots as described for ab. *marginata* Ruhl. I only took a small series not at the time realising the great interest and variety exhibited in this area.

Syntarucus pyrithous L. (*telicanus* Hübn.). I took a single specimen only of this interesting blue. I have read somewhere that it is a difficult species to see when on the wing so perhaps my failure to take more is accounted for by this fact.

Plebeius icarus Rott. Common in the rough fields and not showing any particularly interesting features.

Lysandra bellargus Rott. Abundant. All the specimens fine and large with magnificently marked undersides referable to ab. *magnolutea* Verty.

Everes argiades Pallas. Common. In general the specimens seem rather small, especially compared with a short series I have taken last year in the Landes area of France. Perhaps the Landes specimens are true *argiades* and those from Cavallino are *polysperchon* Bergstr.

Plebeius argus L. (*aegon* Schiff.). Common about the fields and not showing any strong racial characteristics.

(To be Continued)

Formica sanguinea Latreille (Hym. Formicidae) in Southern England

By K. E. J. Barrett

Introduction

The habits of this robust and interesting ant have been reviewed in detail by Donisthorpe (1927). During the summer months raids are made by *sanguinea* workers on nests of the *Formica fusca* group, from which

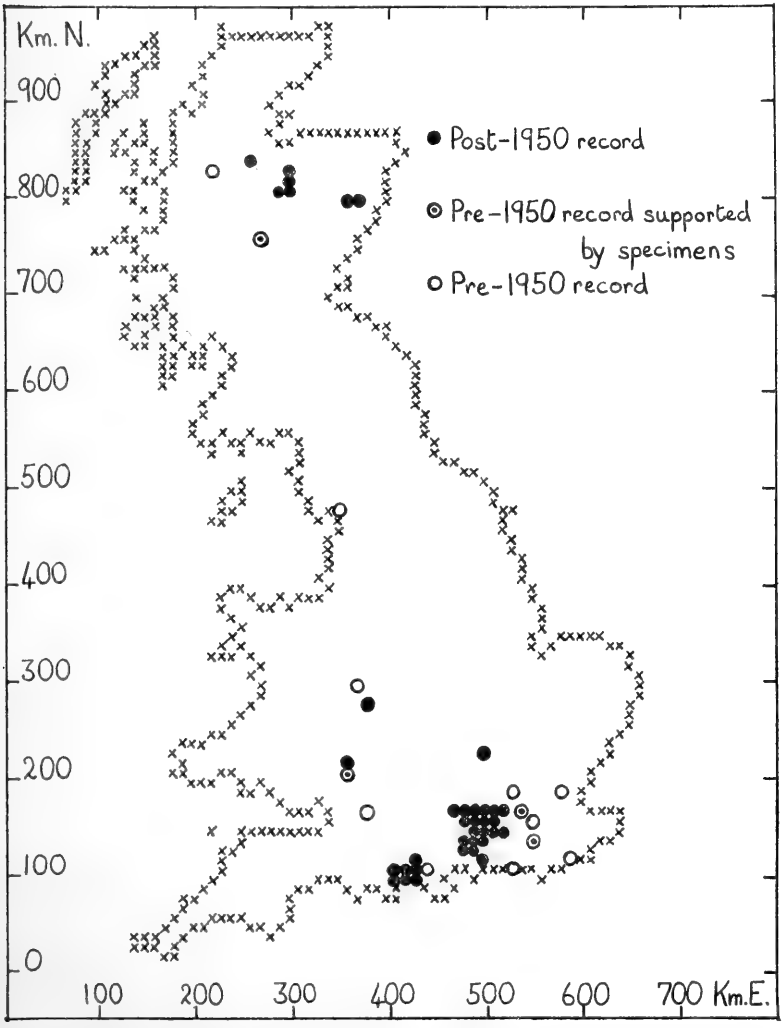

Figure 1. Distribution of *Formica sanguinea* Latr. in Britain.
(Based upon the Ordnance Survey map with the sanction of the Controller of H.M. Stationery Office. Crown copyright reserved.)

worker cocoons are carried back to the raiders' nest and which hatch out there to become auxiliary workers or "slaves". In Southern England and the Midlands *Formica fusca* L. is enslaved; in Scotland the more abundant *Formica lemani* Bond., a species not recognised by Donisthorpe, is taken. In Continental Europe, other species of the *Formica fusca* group, including *F. cunicularia* Latr. and *F. rufibarbis* Fab. are also enslaved. These species, however, are much less abundant in this country and no recent authentic record of their occurrence here as *sanguinea* slaves has been reported. Workers of the *Formica rufa* group of species have also been found in *sanguinea* nests in Continental Europe. Such occurrences have been described in Scotland (Donisthorpe, 1927; Weatherill, 1939) and these probably refer to the northern species, *F. lugubris* Zett. Surprisingly no such observations appear to have been recorded yet from the Midlands and Southern England where *F. rufa L.* often abounds in the same vicinity as *F. sanguinea.*

Descriptions of "slave-raids" were assembled by Donisthorpe (1927), but few observations have been published in recent years. On a hot day in July 1963, in the early afternoon at Lichett Plain, N. Hants., several raids were in progress. One in particular was observed for over an hour. At first, a few *sanguinea* workers were seen in and about the entrances of a *fusca* nest situated in sandy soil surrounding the roots of an upturned tree. After about fifteen minutes, a sudden evacuation of the *fusca* workers carrying cocoons occurred and these were seldom molested by the *sanguinea* workers, who then systematically began to carry worker cocoons from inside the nest back to their own nest situated about forty yards away.

One supposed mode of *sanguinea* colony foundation is by the capture and rearing of *fusca* pupae by the *sanguinea* female after the marriage flight. A number of incipient colonies have been described in support of this theory (Donisthorpe, 1927). Such colonies containing uniformly small and active *sanguinea* workers with an unusually large proportion of *fusca* workers have been seen by the author, at Yateley Common, N. Hants, 1961, and at Lavington Common, W. Sussex, 1963.

General Distribution

Formica sanguinea Latr. occurs widely throughout Europe. In Britain it has a discontinuous distribution resembling that of *Formica exsecta* Nyl. (Yarrow, 1954). *F. sanguinea* is known in Britain from the Scottish Highlands, the Wyre Forest, the Forest of Dean and the sandy heaths of Southern England. It does not occur in Ireland. No structural difference has been detected between specimens from the different areas in Britain in which it occurs. This species, in all its castes, is readily distinguishable from the other members of its genus by the frontal emargination of the clypeus.

The known British records have been assembled in Table I and Table 2. For species with a localised occurrence it is convenient to replace the vice-county system with a distribution plan based on the 10 kilometre squares of the Ordnance Survey which has previously been used for the British Flora (Perring and Walters, 1962). In Table 1, records for Southern England have been assembled, together with the geological formations on which they occur. Where the position of a record can be accurately assigned, the 1 kilometre square (within the 10 kilometre square) is given in parenthesis. In Table 2, records for the rest of Britain are listed but

are not further discussed. The overall British distribution is illustrated in Figure 1.

The author (K.E.J.B.) would like to acknowledge the assistance of the following who have given details of their own recent unpublished records or helped in other ways:—Mr. S. C. S. Brown (S.C.S.B), Dr. V. H. Chambers, Mr. D. Chapman, Mr. C. A. Collingwood (C.A.C.), Mr. J. C. Felton (J.C.F.), Dr. G. Morison (G.M.), Mr. A. J. Pontin (A.J.P.), Mr. M. Speight (M.S.), and Dr. I. H. H. Yarrow (I.H.H.Y.).

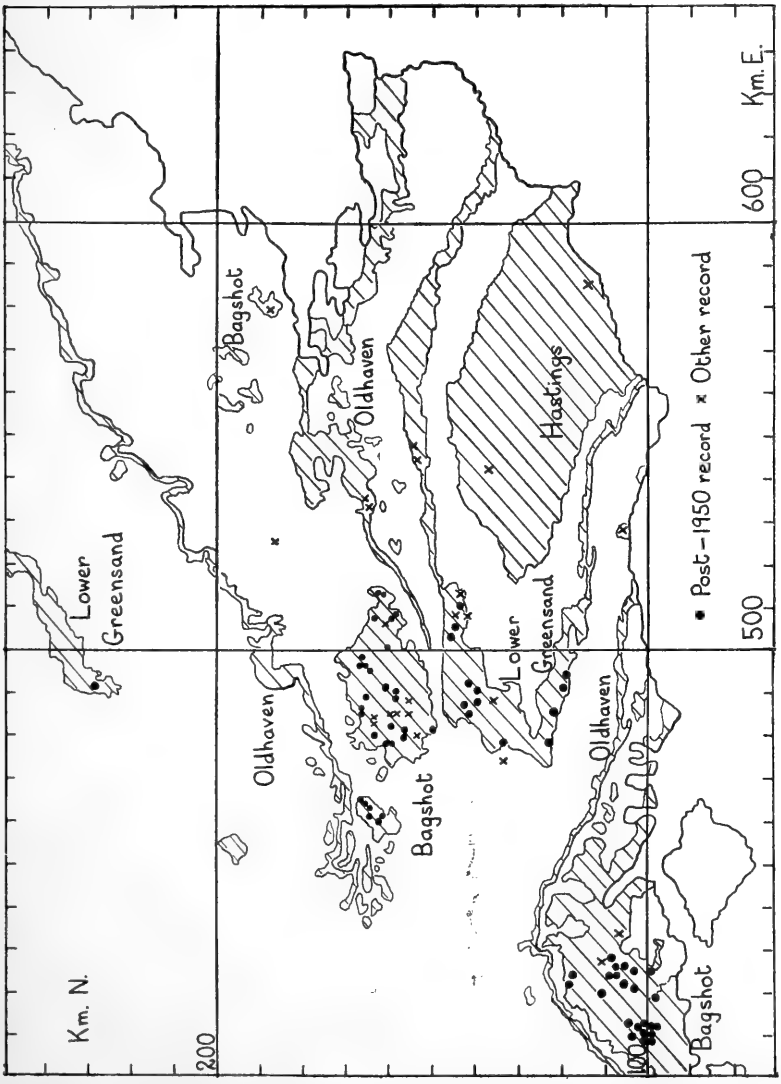

Figure 2. Distribution of *Formica sanguinea* Latr. in southern England. (Based upon the Ordnance Survey map with the sanction of the controller of H.M. Stationery Office. Crown copyright reserved.)

TABLE 1

Distribution of *Formica sanguinea* Latr. in Southern England.

10 Km. Square	*Geology*	*Localities*
SZ 09	Bagshot	Parley Heath (Donisthorpe, 1927); Parley Common (99), Dorset, C.A.C., 1962.
SZ 19	Bagshot	East Parley Common (09), C.A.C., 1962; West Heath (19), S.C.S.B., 1955 Hurn Heath (Brown 1958); Pussex Common (28), S.C.S.B., 1955; Avon Common (28), K.E.J.B., 1963; Week Common (29), S.C.S.B., 1955; Bransgore (98), S. Hants., I.H.H.Y., 1955.
SZ 29	Bagshot	Broadley Inclosure (59), S. Hants., A.J.P., 1959.
SU 00	Bagshot	Ferndown (90), Dorset, S.C.S.B., 1955.
SU 10	Bagshot	St. Leonards (03), Barnsfield Heath (10), C.A.C., 1962; Matcham's (21), Week Wood (30), S.C.S.B., 1955; Ashley (34), S. Hants., K.E.J.B., 1963.
SU 20	Bagshot	"New Forest", 1858, 1908 (Donisthorpe, 1927); Burley (13), I.H.H.Y., 1955; Oakley Inclosure (25), S.C.S.B., 1962; Mark Ash (47), S.C.S.B., 1954; Bolder Wood (48), S.C.S.B., 1953, A.J.P., 1959; Rhinefield (53), Vinney Ridge Inclosure (65), A.J.P., 1959; Holidays Hill (67), K.E.J.B., 1957; Emery Down (88), M.S., 1962; Lyndhurst, S. Hants., 1908 (Donisthorpe, Brit. Mus. Nat. Hist. Collection).
SU 21	Bagshot	Milkam Inclosure (00), S. Hants., K.E.J.B., 1963; Redlynch (28), C.A.C. 1961; Hamptworth Heath (47), S. Wilts. (Collingwood 1962); Manor Wood (70), S. Hants. (Brangham, 1937).
SU 30	Bagshot	Brockenhurst, I.H.H.Y., 1955; Beaulieu Road (46), S. Hants., (Brangham, 1937).
SU 66	Bagshot	Tadley Common (02), A.J.P., 1950; Pamber Heath (11), Padworth (14), I.H.H.Y., 1955; Mortimer (Donisthorpe, 1927), (34, 45), A.J.P., 1959; Burghfield, 1906 (Donisthorpe, 1927); Burghfield Common (56), Berks. K.E.J.B., 1951, 1953, I.H.H.Y., 1955.
SU 72	Lower Greensand	West Heath Common (82), W. Sussex, K.E.J.B., 1963.
SU 73	Upper Greensand	Selbourne (43), N. Hants., ca. 1880 (Donisthorpe, 1927).
	Lower Greensand	Blackmoor (83), N. Hants., K.E.J.B., 1963.
SU 75	Bagshot	Eversley Common (89), N. Hants., K.E.J.B., 1963.
SU 76	Bagshot	Eversley (80), N. Hants., K.E.J.B., 1963.
SU 82	Lower Greensand	Iping Common (51), W. Sussex, K.E.J.B., 1963.

SU 83	Lower Greensand	Hindhead (85), (Donisthorpe, 1927); Kettlebury Hill (89), Surrey, K.E.J.B., 1963.
SU 84	Bagshot	Farnham (29), Surrey, C.A.C., 1962.
	Lower Greensand	Frensham Common (51), Tilford Common (72), Surrey, K.E.J.B., 1963.
SU 85	Bagshot	Fleet (03), (Donisthorpe, 1927); Lichett Plain (06), Minley Wood (16), K.E.J.B., 1963; Yateley Common (29), K.E.J.B., 1961; Cove (55), 1843, Hawley (58), 1858, Blackwater (59), 1871 (Donisthorpe, 1927), N. Hants.; Mytchett (85) (Annotation in Brit. Mus. Nat. Hist. Copy of Donisthorpe, 1927); Frimley (98), Surrey, K.E.J.B., 1962.
SU 86	Bagshot	"Windsor Forest" (Donisthorpe, 1933); Finchampstead Ridges (03), I.H.H.Y., 1955; Wellington College (33), 1895, 1916, (Donisthorpe, 1927); Crowthorne (43), 1895, (Donisthorpe, 1927), (Steel 1946); Ninemile Ride (56), Easthampstead Wood (56), Caesar's Camp (66), Penny Hill (95), Berks., K.E.J.B., 1962.
SU 91	Lower Greensand	Ambersham Common (19), Lavington Common (48), W. Sussex, K.E.J.B., 1963.
SU 93	Lower Greensand	Thursley (09), Surrey, K.E.J.B., 1963.
SU 94	Lower Greensand	Rodborough Hill (21), Surrey, K.E.J.B., 1963.
SU 95	Bagshot	Frith Hill (08), Surrey, K.E.J.B., 1962.
SU 96	Bagshot	White Hill (10), K.E.J.B., 1962; Chobham, 1880, (Donisthorpe, 1927); Chobham Common (54, 65, 66), Longcross Halt (86), Surrey (Barrett, 1963).
TQ 04	Lower Greensand	Blackheath (Donisthorpe, 1927), (35), K.E.J.B., 1962; Farley Heath (54), K.E.J.B., 1962; Ewhurst (81), (Donisthorpe, 1927); Peaslake (84), Surrey, 1938 (K. M. Guichard, Brit. Mus. Nat. Hist. Collection).
TQ 05	Bagshot	Woking, 1896, 1923, (Donisthorpe, 1927; Leicester City Museum Collection, Collingwood, 1957); Wisley Common (79), K.E.J.B., 1963; Ockham Common (88), Surrey, K.E.J.B., 1962.
TQ 06	Bagshot	Horsell Common (00), K.E.J.B., 1962; Byfleet (60), (Donisthorpe, 1927); Weybridge Heath (73), Surrey, 1855, 1915, (Donisthorpe, 1927; Leicester City Museum Collection, Collingwood, 1957), C.A.C., 1953.
TQ 14	Lower Greensand	Holmbury Hill (03), J.C.F., 1953; Leith Hill (33), Surrey, (Donisthorpe, 1927).
TQ 16	Bagshot	Oxshott Heath (31), Esher Common (32), Surrey, A.J.P., 1963.
TQ 20	Oldhaven	Hove (85), E. Sussex, 1905, Donisthorpe, 1927).

TQ 28	Bagshot	Hampstead Heath (56), Middlesex, ca. 1880, now extinct (Donisthorpe, 1946).
TQ 36	Oldhaven	Croydon (34), 1865 (Donisthorpe, 1927); Shirley (55), Surrey, 1877, 1882 (Donisthorpe, 1927; undated specimens in Brit. Mus. Nat. Hist. Collection).
TQ 43	Hastings	Ashurstwood (26), E. Sussex, 1913 (Leicester City Museum Collection, Collingwood 1957).
TQ 45	Lower Greensand	Westerham (43), Brasted (74), W. Kent, (Donisthorpe, 1927).
TQ 78	Bagshot	Thundersley (97), S. Essex, (Donisthorpe, 1927).
TQ 81	Hastings	Guestling Wood (53), E. Sussex, (Donisthorpe, 1927).
SP 92	Lower Greensand	Heath and Reach (Donisthorpe, 1927); Baker's Wood (18), Bedfordshire, 1945, (Chambers, 1949), K.E.J.B., 1963.

TABLE 2

Distribution of *Formica sanguinea* Latr. in the rest of Britain

10 Km. Square	*Localities*
ST 76	Monkton Combe,* N. Somerset (Annotation in Brit. Mus. Nat. Hist. Copy of Donisthorpe, 1927).
SO 50	Trelleck, Monmouth (Hallett, 1931; Specimens in Nat. Mus. Wales, Cardiff, Hallett, 1939).
SO 51	Speechhouse—Coleford Road, Forest of Dean, W. Gloucester, (Collingwood, 1950).
SO 69	Much Wenlock*, Shropshire (Donisthorpe, 1927).
SO 77	Bewdley, Worcestershire, 1909, (Donisthorpe, 1927); Wyre Forest, Worcestershire-Shropshire (Donisthorpe, 1927, Collingwood, 1955).
SD 47	Grange-over-Sands,* Westmorland (Donisthorpe, 1927). Not seen in recent survey (Collingwood and Satchell, 1956).
NN 65	Rannoch, Mid-Perth, 1913 (Donisthorpe, 1927). Specimens in Leicester City Museum (Collingwood, 1957).
NO 59	Kincardine O'Neil (Collingwood, 1961); Marywell, S. Aberdeen, (G.M., 1963).
NO 69	Bridge of Canny, Kincardine (C.A.C., 1963).
NH 12	Glen Affric, Westerness (Weatherhill, 1939).
NH 53	Loch Ness, Easterness (Collingwood, 1961).
NH 80	Loch an Eilein, Easterness (C.A.C., 1961).
NH 90	Loch Morlich, Easterness (C.A.C., 1961).
NH 91	"Aviemore and Nethy Bridge", 1907 (Donisthorpe, 1927); Coylumbridge, Loch Garten, Abernethy Forest, Easterness (C.A.C., 1961).
NH 92	Carrbridge, Easterness (Collingwood, 1961).

*These records are unsupported by specimens and must be regarded as doubtful until confirmed.

Distribution in Southern England

In Southern England this ant occurs exclusively, but abundantly, on

heaths and woodland borders based on sands and gravels. It is now largely confined to the sandy deposits of East Berkshire, Surrey, North Hants., West Sussex and the New Forest. Although still abundant in many areas, many sites have now been, and are being, extinguished by the extensive building operations of the last decade. The detailed distribution is illustrated in Figure 2. The species has been recorded from the following geological formations.

1. *Oldhaven, Blackheath, Woolwich, Reading and Thanet Beds.* (Eocene).
Although apparently abundant on the heaths of Croydon and Shirley in Surrey in the nineteenth century, the area is now largely built over and is probably extinct there. (It could not be found this past season in the Addington Hills area nor on Headley Heath in Surrey on this formation.) Similarly, an early record from Hove, E. Sussex, is unlikely to be substantiated now. These gravel beds (Figure 2) extend widely from Dorset to Sussex and to the north and south of the Thames Valley, but no recent records are known from these areas.

2. *Lower Greensand.* (Cretaceous).

This ant occurs widely on the western lower greensand areas of Surrey, Hampshire and West Sussex, particularly on heather-covered hillsides facing south (Figure 2). The very old record for Selbourne, North Hants., which is situated on the upper greensand-chalk border, if authentic, is unlikely to refer to a nest-site, but could possibly refer to the presence of an air-borne winged sexual from sites on the near-by lower greensand a few miles to the east on which it is now known to occur (Blackmoor). It is not known to occur with certainty to the east of the Leith Hill area of Surrey, nor to the east of the Petworth area of West Sussex. The records for Westerham and Brasted, West Kent, quoted by Donisthorpe (1927) are unsupported by specimens and could not be confirmed this year in that area. Although it would not be surprising for the species to be found on the sands from Reigate to Folkestone or from Petworth to Eastbourne, suitable heathlands are not as abundant as in the eastern areas and have not so far been found.

A further belt of lower greensand spreads from Leighton Buzzard, Bedfordshire, northwards to Hunstanton, Norfolk. Its presence in the Leighton Buzzard area was confirmed in 1945 by Dr. V. H. Chambers (1949). A few colonies were still present this year at the site described in a very small area of heather on an otherwise bracken-covered hillside. It is not now known elsewhere in this area or further north.

3. *Barton, Bracklesham and Bagshot Beds.* (Eocene).

The species occurs widely on heaths and woodland borders on this formation (Figure 2). It abounds around Bagshot and around Mortimer, although extensive building in these areas has reduced the number of sites on which it now occurs. It has not been recorded from the smaller areas of sand to the west, near Newbury. Smaller outcrops of sand occur in the London Clay towards the east. The species apparently formerly occurred at Hampstead Heath (Donisthorpe, 1946) and has been recorded from Thundersley in Essex (Donisthorpe, 1927), but no supporting specimens are known. The latter site is now largely built over and A. J. Pontin (private communication, 1963) has not found it in the South Benfleet-Thundersley-Hockley area.

The species has been found throughout the New Forest and is particu-

larly abundant in the Parley Heath area on the South Hants-Dorset border. S. C. S. Brown (private communication, 1963) has pointed out that Dale and Curtis, who collected extensively in the Parley Heath area in the early nineteenth century, did not record it and believes that the westward extension from the New Forest has occurred over the last one hundred years. This view is supported by the absence of records from sandy heaths further west into Dorset towards Dorchester, where much collecting has gone on. The species has not been found on the Bagshot sands to the east of the New Forest, nor does it occur on the Isle of Wight.

4. *Hastings Beds.* (Cretaceous).

This ant was recorded by Donisthorpe (1927) from Guestling Wood, E. Sussex, on this formation. It could not be confirmed when this site was visited during 1963. The habitat, mixed woodland (mainly oak) on a heavy soil, would seem unlikely. *Formica rufa* L., however, occurred abundantly there. Specimens of *sanguinea* from Ashurstwood, E. Sussex, are included in a collection of British Ants (1908-1914) presented by Donisthorpe to the Leicester City Museum (Collingwood, 1957) and this locality, which was omitted from Donisthorpe's distribution list (1927) may have been confused with Guestling Wood. The heather-covered areas of the Ashdown Forest are much more likely but recent confirmation of its presence here has not so far been obtained.

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129 Smith's Lane, Windsor, Berks. 20th October 1963.

Eremobia ochroleuca (Schiff.), the Dusky Sallow, in Wiltshire—a Further Report

By Captain R. A. Jackson, C.B.E.

As a result of reports in the late summer of 1962, it appeared possible that this insect was on the increase in the county.

To gain information on this subject, I appealed to collectors who had come across it in Wiltshire to let me know of their experiences (*Ent. Rec.*, **75**: 122-3), and I received a good many replies. May I take this opportunity for thanking your readers although I hope they all received an acknowledgment at the time.

Of these reports, only one referred to 1962, when 18 *ochroleuca* were recorded as coming to mercury vapour light near Salisbury on 18th August. This taken in conjunction with Commander Harper's report of "many" on 30th August on the Devizes road, west of Tilshead, confirms that the insect was far commoner in 1962 than hitherto.

The other replies, of equal value, dealt with cases of either one or two specimens observed prior to that year, which support the conclusions reached above.

In 1963 the weather on the Plain was most unpropitious, and I saw no *ochroleuca* on knapweed at all.

O. musculosa was late in appearing, and I found it freshly emerged about two miles west of Tilshead on 14th August. Mr. Weddell was with me that night and one very fresh *ochroleuca* came to his lamp. He told me that he had taken one a few days earlier to the east of Tilshead, and that two other collectors had taken three a day or two later.

As last year, I should be very grateful for any further records. However, in view of the cold clear nights we had, and the chilly winds, these captures seem to indicate that this insect is definitely on the increase in the county.

Middle Farm, Codford St. Mary, Warminster, Wilts.

Idaea lineata Scop. (the Black Veined Moth)

By Clifford Craufurd

My friend Mr. Curtis of 'Loxwood', Sussex, when writing to me on 9th February informed me that some members of the South London Ent. & N.H.S. were not convinced that the above insect occurred in West Sussex. They contended that there were no records from Sussex. This is probably my fault as I did not put upon record my finding of the insect.

On 9th June, 1935, I was staying in Plaistow and on the Sunday evening went for a walk over a farm with a friend. Passing through some fields near the old Coach Road, I saw a white moth flying ahead and caught it by putting my cap over it, having no net. I recognised it at once from the plate in South. I also saw several more. Next evening I again visited the same fields and found the moth was flying in good numbers.

On 10th June, 1938, I visited the locality in the evening and there were large numbers flying. I should say that I saw at least a hundred.

Mr. Curtis generally accompanied me when I was visiting the farm in question in the years 1935 to 1938 and can testify that we regarded *lineata* as a common, though local moth as far as we were concerned.

The specimens in my cabinet—fifteen in all—are dated 9th and 10th June, 1935, and 10th June, 1938. I did not visit Plaistow in 1939, 1940 or 1941.

The fields where the insects flew were at those times yellow with *Genista tinctoria* in bloom. I do not remember seeing the insect flying where the *Genista* did not occur. Allan's *Larval Food Plants* gives *Genista*, with a note of interrogation as the Foodplant. I had probably told him of my experience with *lineata*.

I advised the late Dr. Cockayne in 1935 regarding *lineata* in Sussex and told him I considered *Genista* to be the Foodplant. He told me to prove it by taking a torch at night and lying down beside the Foodplant to observe the larvae feeding.

Mr. Curtis advises me that the insect is not to be found in its old haunts. The fields were burnt and "scruffed up" in 1942 and I believe the *Genista* has gone.

I. lineata (*dealbata*) has been recorded by Barrett and various other authors as taken in Herts. (1), Gloucester (1), Somerset, Dorset, Sussex (1) and of course at its headquarters in Kent where it was getting rarer in 1901. I should be pleased if readers who have taken *lineata* in Kent would advise me whether *Genista tinctoria* grew where the moth was found.—17.iii.1964.

Notes and Observations

PLATYTES ALPINELLUS HÜBN. AT BLACKHEATH.—On the night of 2nd-3rd August last I boxed an unfamiliar Crambid from a wall of my m.v. 'trap' (a small upper room) just before turning off the light about dawn. I believe the moth was a genuinely late arrival, rather than that it had entered early in the night and secreted itself for some time—this not being the usual habit of Crambids attracted to the light. Next day I found to my great astonishment that it was without doubt *Platytes alpinellus* Hübn., a very local species of coastal sandhills, recorded no nearer here than parts of the East Kent coast and the Isle of Wight, etc., and never at any distance inland. On informing Mr. S. Wakely some time later, I learnt that single specimens had turned up at light at several places in the south-east that year (of which probably we shall be hearing more in due course). Thus, a small immigration from the Continent appears to have taken place —a phenomenon not, I think, previously recorded for the species in question— and suffices to explain the occurrence of a specimen at Blackheath, which it is probably safe to claim as the first for the London area. It will be interesting to see whether similar inland captures of *alpinellus* are made this year, which would suggest that some of the moths had succeeded in breeding outside their usual haunts, but this seems quite unlikely.—A. A. ALLEN, 63 Blackheath Park, S.E.3. 2.iii.1964.

EUCHELIA JACOBAEAE L. IN AUGUST.—On the occasion just mentioned, two examples of the cinnabar moth surprised me by coming to the light. I have seen no record of this familiar insect for the month of August, or even late July; although there probably have been cases of second-brood specimens, the works I have by me make no mention of them. Moreover, last year was hardly one likely to produce abnormal second broods of normally univoltine species—in this part of the country at any rate. I wonder whether others, who run light-traps more regularly, had August

specimens of *jacobaeae*. It seems scarcely possible that the two Blackheath moths were retarded individuals of the ordinary May and June brood (which, as it happens, I did not notice last season). In any case the species is quite irregular in this district, though I see one or two flying—always a welcome sight—in or about the garden in most years; possibly they are vagrants from further afield where it is more frequent, as I never see the larvae here though the Oxford ragwort is common enough.—A. A. Allen, 63 Blackheath Park, S.E.3. 2.iii.1964.

A Note on Two Species of Hyponomeuta Latr. at Blackheath — *Hyponomeuta evonymellus* L. was not uncommon at my m.v. lamp for a short time in early August, 1963; one undersized specimen had occurred about the same time in 1959. Four appeared on 22nd July, and on 2nd August several more, some very fine. It increased somewhat during the next few nights, but seemed to have disappeared after the 6th or 7th. I understand that this species is quite common towards the west and in Wales (and perhaps in the north) but that near London it occurs by odd specimens only—corresponding, presumably, to the rarity there if its recognized foodplant, *Prunus padus* (the bird cherry). The occurrence of the insect here in considerable numbers, however, suggests that it may have lately adapted itself to the common cherry trees of our gardens (*P. avium, P. serratula*). Possibly the question will be settled by the finding of larval colonies of *evonymellus* thereon in future years.

I have seen no reference in the literature to the striking variability in ground-colour of the forewings which the ubiquitous *H. padellus* L. (*sensu lato*) exhibits here; perhaps this too is recent, and an instance of industrial melanism. I have a long series showing a steady gradation from the typical clear whitish-grey to a smoky brown. Intermediate stages, which are common, have the wing-tips and a patch about middle of costa faintly to very distinctly darkened, the two patches enlarging and coalescing until they cover the wing; one does not, apparently, find forms that are the result of a progressive darkening of the wing as a whole. Specimens thus in varying degrees darkened were already common in 1959, the first year that I ran the lamp; but I have not seen one such specimen among those met with at large or the few I have bred, either here or elsewhere. I believe that Mr. Wakely finds similar variation in *padellus* at Camberwell, S.E. Which of the biological races composing the species is or are involved in this variation I am unable to say, but it is likely that most of the specimens belong to *malinellus* Zell. There appears to be no comparable tendency, so far at any rate, in the local populations of *H. evonymellus* and *cognatellus* Hübn.

Nomenclature has not been at its happiest with this genus, the two species which are the subject of this note being most misleadingly named. I may add that the generic name, whether spelt with or (barbarously) without its initial aspirate, is unquestionably masculine; and therefore we ought to write *padellus*, etc., as of old, and not *padella* etc. as is often now done. (Another case is *Nematois*, a specifically masculine* formation (Greek, = 'threadlike'; the feminine would be *Nematoessa*), so the rules require *N. fasciellus*, etc., not *-a*. Further, it should be written with a medial *a* (cf. nematode, Nematocera)—unless priority insists on the misspelling with o, now common).—A. A. Allen, 63 Blackheath Park, S.E.3. 2.iii.64.

*Like *Myelois*, *Cololois*, etc.

PHYTOMYZA SCOLOPENDRII ROB. DESV. [DIPT., AGROMYZIDAE]—EARLY MINE IN DORSET.—The months when mines occupied by the larvae of *Phytomyza scolopendrii* in the Hart's Tongue fern, *Phyllitis scolopendrium* (L.) Newm. in Europe have been stated by Hendel and Hering in their standard works as May, June and September, October. Mr. G. C. D. Griffiths found the larvae in mines on this fern and on *Polypodium vulgare* L. at Thursley, Surrey, on 21st August 1955. At a recent meeting of the Entomology Section of the London Natural History Society, Mr. J. F. Shillito mentioned finding the mine in Dorset in February. He kindly sent me a pressed specimen taken on 10th February this year at Nether Compton, near Sherborne. The mine contained a larva. This may be the earliest date on which the larva has been found and suggests that in suitable habitats the insect may have more than the two broods previously known.

The mine is linear and generally found wandering near to the mid-rib on the upper side. The last portion of the mine usually runs parallel and close to the mid-rib itself. The frass is laid at the edge of the mine in a continuous line and not in dots. The fly pupates in the earth. The fly has been found in Lancashire and Cornwall and no doubt occurs in many counties. It is known to mine also in ferns of the genera *Asplenium, Ceterach* and *Polypodium.* Some of these are attacked by other diptera and lepidoptera leaf-miners, but only *P. scolopendrii* has been found in *Phyllitis scolopendrium.* Could readers please look at this fern in gardens and report, and so extend our knowledge of at least one small fly?.—L. PARMENTER, 94 Fairlands Avenue, Thornton Heath, Surrey.

PRODENIA LITURA FABR.—Referring to Mr. Chalmers-Hunt's note on this species (*antea*, **59**), I would point out that the larva of this species is almost the most catholic feeder I know and could, if it established itself in English glass-houses, become a most serious pest.

The following is my list of food-plants, from which it will be seen that there is little it might not eat:—Lantana, Antirrhinum, Zinnia, spinach, lettuce, castor, Caladium, cotton, bersin, lucerne, maize, ground-nut, beet, sweet potato, Colocasia, potato, leaf beet, mallow, jews mallow, French bean, *Hibiscus esculentus,* sesame, red pepper, tomato, vine, orange, plum, mulberry, chrysanthemum, wheat, rice, soya bean, fenugreek, egg plant, water melon, cucurbit, cabbage, onion, mandarin, guava, fig, poplar, banana, rose, mint, viola, agathi, tobacco, jute, indigo, elephant yam, peas, grass, *Eugenia malacensis, Carissa carandas, Moringa pterygosperma, Ficus religiosa,* celery, cauliflower, shaddock, apple, pear, radish, *Clitorea ternata, Cestrum nocturnum, Thuya orientalis, Anona squamosa,* papaya, mango, *Glycosmis pentaphylla,* teak, dahlia, *Argemone mexicana, saintpaulia.*

P. litura is the cotton leaf worm of Egypt, although it does little apparent damage to cotton in Uganda, where it is common.—D. G. SEVASTOPULO, F.R.E.S., Mombassa. 22.iii.1964.

ERIOGASTER LANESTRIS L., SECOND YEAR.—These notes are a sequel to my previous article, *Ent. Rec.*, **75**: 171). Some time in April 1863, I put the cage containing about 70 cocoons on a lower shelf in my garden shed, screened from the sun, to avoid the possibility of the pupae being dried up in the heat of the summer, a precaution scarcely necessary last year. Here they stayed until 1st February, when, in spring-like weather, I inspected the cocoons and found that there were 65 good ones. Besides

these, there were also four or five that consisted only of the inner white lining, and one normal cocoon with a crack down one side. All these, when opened, were found to contain the dried remains of a larva. I brought the cage indoors and put it in a sunny window. The first moth emerged on 3rd February. Several very sunny days followed, and although there were sharp night frosts, by 7th February eight more moths had emerged.

There followed a long period of dull weather, lasting until 24th February, and broken only by a sunny day on the 13th, when five moths duly emerged. Another came out on the 24th, after which there ensued another long sunless spell until 7th March. On the 9th, the third sunny day running, a very small male came out. Altogether sixteen moths emerged, of which three did not develop their wings perfectly. There were also four cocoons from which the caps had been cut out, but the moths had been unable to extricate themselves. There remain 41 cocoons, the contents of which are anyone's guess.—H. SYMES, 52 Lowther Road, Bournemouth, Hants. 21.iii.1964.

AN OCCURENCE OF PONTIA DAPLIDICE L. IN WILTSHIRE IN 1945.—I regret that I omitted a reference to this occurrence in my paper on the Macrolepidoptera of Wiltshire (*Ent. Rec.*, **75**: 199) and the present note may be considered as a postscript to that paper.

The late Major Stuart Maples, of East Grimstead, Wilts., told me that in 1945 he had taken a specimen of the Bath white in a clover field near his home and was going to look there again. Major Maples was no longer a systematic collector (in fact he had sold his collection), but on his death on 11th September 1949, there passed into my possession some of his later casually taken insects (approximately 1944 onwards). Besides a few set specimens of various species in a store box, there was a pocket collecting tin into which were pinned, just as they had been taken, two specimens of the Bath White (♂ and ♀) and also some Clouded Yellows and other insects. I relaxed and set all these but naturally have kept them separated from my own collection, with the result that they were overlooked until recent events brought them to mind.

Those who remember Major Maples as a successful and discriminating collector of *Coenonympha tullia* Müll, *Apatura iris* L., *Lysandra coridon* Poda and other species, of all of which he had the most beautifully set specimens, will be sorry to hear of the death also of his widow, Judith Maples, at East Grimstead on 28th November last.—I. R. P. HESLOP, "Belfield", Burnham-on-Sea, Somerset. 22.iii.1964.

NYMPHALIS ANTIOPA L. IN SURREY.—In *Ent. mon. Mag.* for June/July 1963 (vol. 99) Mr. P. A. Hitch of Juniper Hall Field Centre, Dorking, Surrey, records a specimen of *Nymphalis antiopa* L. (Camberwell Beauty) which flew in and out of the door of his house on 3rd October 1963. A specimen of this butterfly, possibly the same one, had been seen in the garden two days previously and, says Mr. Hitch, "it may well have been looking for a suitable place for hibernation".

This note is printed on the wrapper of the magazine, and as wrappers are not always included when the monthly parts are bound up into a volume, those of our readers who collect records of the Camberwell Beauty in England may like to have this reference.

Current Literature

Ecological Genetics. By E. B. Ford. 1964. Methuen & Co. Ltd., London. $8\frac{1}{2}'' \times 5\frac{1}{2}''$. Pp. xv and 335, 16 plates, 11 text figures, 7 maps and 17 tables. Price 42/-.

Although this book is primarily intended for research workers and students nevertheless there is much in it to attract the intelligent amateur entomologist. In the first place the author is well known as a writer on entomology and he frequently refers to other distinguished entomologists. Secondly, a glance at the contents list shows that many chapters deal with such familiar insects as *Melitaea aurinia, Maniola jurtina, Panaxia dominula, Cleora repandata* and *Triphaena comes*. A word of warning must follow. There is assumed a knowledge of ordinary genetics and ecology and of the technical terms.

In the first chapter we are told what is meant by ecological genetics. Briefly it is a combination of laboratory work and field studies. The chapter goes on to describe the material chosen and the methods used.

Chapter two deals with fluctuations in numbers due to climate, food, predators and vegetation. The author is concerned to show that marked numerical increase can greatly accelerate the speed of evolution.

It may come as a surprise to some to learn that though the number of spots on the wing of a butterfly is perhaps of itself of no biological significance yet the polygenes which control the spots may be of importance for survival. This is fully explained in chapter four, where the spot frequencies of *M. jurtina* in the Isles of Scilly and elsewhere are carefully considered and are found to illuminate various aspects of ecological genetics.

In chapter five there is an exciting account of the discovery of an instance of the apparently rare phenomenon of sympatric evolution in animals. The precise location of the boundary line between the two forms of *M. jurtina* was found.

It is truly said that no natural population of animals has been so fully quantified as *P. dominula* at Cothill in Berkshire and a chapter is devoted to a study of this colony.

Many species of Lepidoptera are reviewed in chapter eight. The remarks about *T. comes* and the reference to the specimens collected by the late Dr. E. A. Cockayne will interest entomologists.

The subject of mimicry has often been treated but it is refreshing to read a modern account. A whole chapter is given over to describing the evolution of mimicry in *Papilio dardanus* and it is shown that recent experiments have made clear the mechanism involved.

Kettlewell's long-continued work on Industrial Melanism is fully analysed and receives well deserved praise.

In the concluding chapter the following points are stressed:—(1) the universality of the principles illustrated; (2) the unsuspected rapidity of the operation of genetic forces in evolution; (3) the comparative unimportance of mutation and of random drift; (4) the probable increase in the part played by genetics in medicine.

The book seems to be almost free from printers' errors. One only was noticed: on p. 19 *Achillea* becomes *Achilles*. The section describing the plates is most useful. Even if the ordinary amateur entomologists does not quite understand it all he will be the better for reading this excellent book.—T. R. Eagles.

THE ENTOMOLOGIST'S RECORD
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(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

HOLIDAY AT GREATSTONE, KENT—JULY 1963. J. M. CHALMERS-HUNT and S. WAKELEY ... 91

LOOKING BACK OVER 1963. T. W. HARMAN ... 95

SCIENTIFIC NAMES. HANS REISSER ... 99

MORE ABOUT LATIN. L. G. F. WADDINGTON ... 100

WAS LINNAEUS A BIGHEAD? S. N. A. JACOBS ... 100

A CONTINENTAL HOLIDAY, 1963. Dr. NEVILLE L. BIRKETT ... 102

FORMICA SANGUINEA LATREILLE (HYM. FORMICIDAE) IN SOUTHERN ENGLAND. K. E. J. BARRETT ... 107

EREMOBIA OCHROLEUCA (SCHIFF.), THE DUSKY SALLOW, IN WILTSHIRE—A FURTHER REPORT. Captain R. A. JACKSON, C.B.E. ... 115

IDAEA LINEATA SCOP. (THE BLACK VEINED MOTH). CLIFFORD CRAUFURD 115

NOTES AND OBSERVATIONS ... 116

CURRENT LITERATURE ... 120

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... (163)

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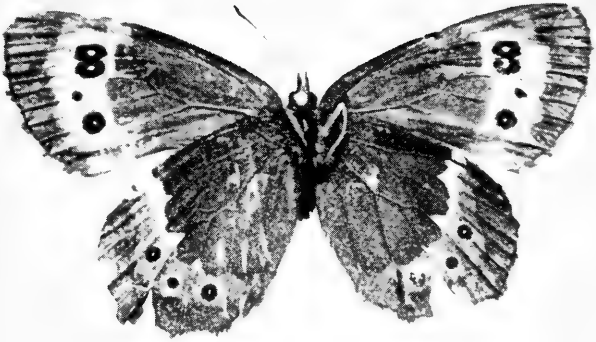

Fig. 1 (upper). *Erebia ligea* (Linnaeus): Gillespie specimen. Fig. 2 (lower). Tray from Gillespie collection as received containing this specimen (in row at left).

Comments on the supposed occurrence in Scotland of *Erebia ligea* (Linnaeus) (Lepidoptera, Satyridae)

By E. C. Pelham-Clinton,
The Royal Scottish Museum, Edinburgh

In January 1963, an old and almost entirely unlabelled collection of Lepidoptera was brought into the Royal Scottish Museum by Mr. A. C. Gillespie of Colinton, Edinburgh. In the section devoted to British butterflies was a female *Erebia ligea*.

Although investigations inspired by this discovery made it seem unlikely that this was a genuine Scottish specimen, some of the possibilities revealed by a study of the literature concerning the species are worth putting on record.

ALLEGED DISCOVERY BY SIR PATRICK WALKER

The history of the discovery in Scotland of *Erebia ligea* (Linnaeus) and of *E. aethiops* (Esper) has been confused ever since the original announcements by Sowerby (1804-5). In December 1804 Sowerby described and figured *Erebia ligea* as "*Papilio Blandina*" (the species we know as *aethiops*); it was stated to have been caught in the Isle of Arran and to be in the cabinet of Alexander McLeay, secretary of the Linnean Society. In January 1805, *Erebia aethiops* was described and figured as "*Papilio Ligea*": a note on the species reads "This is another new British Insect, procured by A. MacLeay, Esq. Sec. L.S., from the same place as the one figured in *tab.* 3. [an error for *tab.* 2.] of this Work".

Donovan (1807) corrected the error of indentification and stated (p. 87) that "*Papilio Ligea* was discovered by Major Walker [i.e. Sir Patrick] in the isle of Arran at the same time as *P. Blandina*". Thereafter, the majority of British authors told the same story. Ford (1945), for instance, was interested in the possibilities of *Erebia ligea* occurring in Britain, and wrote (p. 148) "when Sir Patrick Walker captured the first British specimens of the Scotch Argus, *Erebia aethiops*, in 1804, it is said that he took in addition to that well-known British butterfly a second species flying with it. This was the "Arran Brown", *E. ligea* . . . . . ". But who had ever stated that the first *aethiops* were *captured* in 1804? As I will show, the truth is that *aethiops* was first found by a different collector about 40 years earlier.

J. F. Stephens is the only British author I have discovered who has attributed the discovery of *Erebia aethiops* in Scotland to the right man. He stated in his "Illustrations" (1828) under *Hipparchia blandina* (p. 62) "Discovered many years since, at the beginning of August, in the Isle of Arran, by Dr. Walker, and, subsequently, taken there by Sir Patrick Walker and Dr. Leach". Stephens later (1850, p. 9) showed that he had seen a manuscript description of *aethiops* by Dr. Walker (as *Papilio Amaryllis*) for he put "*Papilio Amaryllus* [sic], Walker, MSS" in the synonymy of *Erebia blandina*.

Dr. John Walker (no relation to Sir Patrick), Professor of Natural History at Edinburgh University from 1779 till his death in 1803, must have discovered *aethiops* during one of his tours of the Hebrides between 1760 and 1786. There is an excellent description of the species (as *Papilio Amaryllis*) in a notebook in Edinburgh University library entitled

"Miscellaneous Papers Vol. 1": the place of capture is here given as "in Insula Bota. Septembro.", but no year is given. Other dates in this notebook range from 1763 to 1777. I presume "Bota" to be Bute, though I cannot find this form of latinisation elsewhere. A similar description of *Papilio Amaryllis* is given in another notebook dated 1769, one of a series in Edinburgh University library containing descriptions of specimens in his collection: here he adds "Mr. Fabricius assured me that this was different from the Ligea, and a species not in Linnaeus" and (judging by the handwriting at a later date) "I found in in [*sic*] Abundance Aug. 13 in Drifesdale [=Drysdale, Dumfriesshire] in the Meadows. At a Distance it seems quite Black". Dr. Walker's collection remained at Edinburgh University, but very few of his specimens (no insects) are still in existence and few of his descriptions were ever published. He has been ignored by British writers on insects since Stephens.

Sir Patrick Walker (1772-1837) was also a well-known collector. According to a manuscript journal of Lawrence Jameson, nephew of Robert Jameson who succeeded Dr. Walker as Professor of Natural History at Edinburgh, his uncle Robert "derived much knowledge from Peter's [=Sir Patrick Walker's] elegant and select collection of Insects, a collection considered at the time, the second best in this country—Dr. Walker's being superior". His collection appears to have been dispersed at Stevens' in 1839, but I have seen no details of the sale. We have no first-hand evidence from Sir Patrick of his capture either of *ligea* or *aethiops*. Presumably he gave specimens of both species to McLeay, but there is only the confused evidence of Sowerby and Donovan that both were taken in Arran, and it is quite possible that Sir Patrick had the two species confused and that *ligea* was not recognised until the specimens were in McLeay's collection. The manuscript journal of Robert Jameson's tour of Arran and Ireland in 1797 reveals that Mr. Walker (later Sir Patrick) joined him in Arran on July 25th that year—just the right time and place to collect *aethiops*. From this time onwards Patrick (or Peter) Walker must have had less time for collecting: he was admitted to the Faculty of Advocates in June 1798, became Heritable Usher of the White Rod in 1806, was knighted in 1814 and fought at Waterloo. He was a founder member of the Wernerian Society in 1808 and became its first treasurer, but his few contributions to its proceedings were never published and he took no part in the society's later activities. Charles Stewart, another early member of the Wernerian Society, in his Elements of Natural History, 2nd edition, Vol. 2 (1817) gave a hint that *aethiops* and *ligea* may not have been found in the same localities. Under *Papilio Blandina* (p. 133) his note reads "Found plentifully in the island of Arran by Sir Patrick Walker", but for *Papilio Ligea* he wrote "Found in woods in Scotland by Sir Patrick Walker". The earlier edition of this work (1801-2) included neither species.

The two specimens of *ligea* figured by Stephens (1828) were stated by him to be a pair in his own collection, and must therefore have been presumed by him to be British, but he did not say how he acquired them. McLeay emigrated to Australia in 1825 and I cannot find what happened to his British collection, but this may have been the origin of Stephens' specimens. This pair is at present in the British Museum (Natural History) and both are undoubtedly *ligea*, although Butler (1867) supposed that the male was *E. euryale* (Esper.).

The confused accounts of Sir Patrick Walker's "discovery" of *Erebia ligea* are open to a number of interpretations. I think it most likely that the specimens were not captured in Arran, but not being recognised as distinct from *aethiops* by Sir Patrick, they were added to his series of *aethiops* from Arran. It is possible that they were of continental origin but, for reasons which will appear later, just as likely that they were captured by Sir Patrick elsewhere in the south of Scotland.

SUBSEQUENT RECORDS

Since *Erebia ligea* was given a place in the British list it was inevitable that other supposedly British specimens would appear. "Inquisitor" (1837) mentions "*Ligea*, in the cabinet of Mr. Stephens, and lately introduced into those of Mr. B. Standish, and several of our dealers". A third "British" specimen has mysteriously appeared alongside the two originals in the Stephens collection. Mercer's (1875) record of *ligea* in a Margate garden provides a touch of humour and cannot have deceived many.

The specimen in the Tring collection recorded by Willoughby-Ellis (1929) is in a different category as it has been given some prominence by Ford (1945, pp. 148-9). It was found by Lord Rothschild in the collection of A. E. Gibbs labelled simply "Galashiels". However, I am indebted to Mr. A. L. Goodson of the Zoological Museum, Tring for information (*in litt.*) which suggests that the specimen was wrongly labelled. Mr. Goodson tells me that Gibbs collected on the continent every year: his British specimens were set fresh, but those from the continent were papered and set during the winter. The "Galashiels" *ligea* had been papered before setting. Moreover, Gibbs knew the Continental species well enough to recognise *ligea* and would surely not have overlooked it among his *aethiops*. But in spite of this it appears that the specimen must at some stage have been mistaken for *aethiops*, for it was found in a box of that species.

THE GILLESPIE SPECIMEN

The collection presented by Mr. Gillespie was contained in two wooden boxes, each containing two wooden trays of insects. One box contained a tray of British moths, all of species resident in the south of Scotland, and a tray of mixed insects, chiefly Lepidoptera and Coleoptera: apart from a few British moths these Lepidoptera were probably all non-European—the butterflies were certainly all from America and Australasia. The second box contained two trays: except for one British dragonfly (*Agrion virgo* (Linnaeus)), one exotic cockroach of a frequently imported genus (*Panchlora*) and a few British moths, the contents of both appeared at first sight to consist entirely of unnamed, unarranged, unlabelled British butterflies, among which by its setting low on the pin and slightly ragged condition a single female *Erebia ligea*, set underside uppermost, did not look out of place (Plate II). Mr. T. G. Howarth has since pointed out to me that the single *Papilio machaon* Linnaeus included is of the continental race, but this could of course have been a migrant individual. The only locality label in the whole collection was lying loose in the tray that included *ligea* and a number of *aethiops;* it reads—"*Erebia blandina*/Taken on Bute (North End) July 1891." and has a hole made by a pin of the same size as that bearing the *ligea* specimen. Why

should a locality label have been written for only one specimen in the collection unless it was an unusual one, such as a *blandina* with white spots under the hindwings!? But it is also possible that the label was never on a specimen and at one time could have applied to a whole row of *aethiops*.

Mr. Gillespie has kindly informed me that the collection was formed by two uncles of his, A. B. and J. W. Gillespie, who, at the time they were collecting, lived at Bonnybridge, Stirlingshire. They died in 1942 and 1941 respectively, but probably did not collect after 1900. Both travelled to many parts of the British Isles and always took collecting apparatus (there are several southern species in the collection). J. W. Gillespie travelled on the continent and the countries visited included Austria, but not Scandinavia. They corresponded with relatives in America and Australia. The "*Erebia blandina*" label is in the hand of A. B. Gillespie.

I think it likely that this specimen of *Erebia ligea* was taken and set by one of the Gillespie brothers. They set many of their butterflies underside up, and the specimen is set in the same manner and on one of the same types of pin as other specimens in the collection. The fact that J. W. Gillespie travelled abroad makes it possible for him to have taken a continental example to fill a blank space in the collection (though the complete lack of arrangement and naming does not suggest that he would have been tempted to do so) and were it not for this there would be a strong presumption that the specimen is of Scottish origin.

The races of *ligea* are not sharply distinguished, and comparing the Gillespie specimens with material in the British Museum (Natural History) Mr. Howarth and I were able to match it fairly well with specimens from Scandinavia and from central Europe. In the opinion of Mr. L. G. Higgins, however, the specimen could not be well placed in a Scandinavian race. Of the two Stephens specimens the male looks more Scandinavian, the female more central European.

OTHER CONSIDERATIONS

The foodplant of *Erebia ligea* is stated by continental authors to be the grass *Milium effusum* L. Some authors also give *Digitaria sanguinalis* (L.) Scop., a rare casual in Britain, and other unspecified grasses. *Milium effusum* is an uncommon grass in Scotland. Clapham, Tutin and Warburg (1957) state that it is "local and *perhaps less frequent than formerly*" (my italics). Perring and Walters (1962) show that it is (or was) thinly scattered over the south of Scotland, almost absent from the highlands, and that there is no definite record from Arran. I am indebted to Mr. B. L. Burtt of the Royal Botanic Garden, Edinburgh, for a record from Kintyre, presumably not accurate enough to be recorded by Perring and Walters, and there is another vague record for Kintyre given by Ewing (1901).

The distribution of its foodplant suggests, then, that it is most unlikely that *Erebia ligea* ever occurred in Arran. If Sir Patrick Walker's specimens were British they would more probably have been captured somewhere on the mainland.

Erebia ligea has a two-year life cycle and in some parts of its continental range the adult appears in the odd-numbered years only: some references to this phenomenon were given by Cockayne (1953).

CONCLUSION

It now seems to me a distinct possibility that *Erebia ligea* once occurred or may even still occur in damp woods in the south of Scotland. This area has still not been investigated sufficiently by lepidopterists; intensive sheep-farming has made large parts of it desolate in appearance and most unrewarding to the collector, but there may yet be remote habitats suitable for *ligea*. I have learnt recently of another butterfly species never yet recorded from the south of Scotland found for the first time in 1963 apparently resident in a border county. I doubt whether anyone has ever looked for *ligea* in Britain in the right places and at the right time. By now, owing to the destruction of suitable habitats and probably to the increasing scarcity of its foodplant, it may be too late.

ACKNOWLEDGMENTS

Besides those whose help has been acknowledged above, my thanks are due to Mr. T. G. Howarth of the British Museum (Natural History) for enabling me to examine the reputed British specimens of *Erebia ligea* and for some literature references. I am also much indebted to Miss J. M. Sweet, lately of the Department of Mineralogy, British Museum (Natural History) and now working at the Royal Scottish Museum, for references to the Jameson journals, and to the Librarian of the Edinburgh University Library for allowing me to quote from these and from the John Walker notebooks.

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A Continental Holiday, 1963

By Dr. NEVILLE L. BIRKETT

(*Continued from page 106*)

Mellitaea didyma Esp. Just emerging at the time of my visit and very plentiful. Many pairs in cop. were found on the low vegetation bordering the irrigation channels of the ground I collected on. The facies is very bright and well-marked, especially the females. The females I took showed no evidence of the extensive suffusion associated with Staudinger's *meridionalis*, but otherwise they seem nearer to this form than the f. *occidentalis* of the same author.

Pararge megaera L. Quite common.

Hipparchia statilinus Hufn. Became common towards the end of my stay in the area. My specimens seem referable to f. *marmorea* Verty. This species requires considerable stalking to effect its capture. Much patience is required especially when the temperature is nearly or quite 90 degrees F. Skippers were not much in evidence and I took only *Erynnis tages* L. and *Carcharodus alcaeae* Esp.

On a visit to Venice itself I saw half a dozen *Polygonia egea* Cramer sunning themselves on the wall of an ancient church. Unfortunately I had no net with me and was unable to make closer contact. Incidentally I saw this species, again when I had no net available, in the Roman arena at Padua! Outside built-up areas I did not see the species so came home without any specimens to my considerable disappointment.

We left the Venice area on 26th August and journeyed to the shore of Lake Garda where I was not able to do any collecting during the period of our short stay. Then we journeyed across north Italy taking advantage of the extremely good autostrada and reached a most pleasant lakeside site by one of the lakes of Avigliana. On 29th August we made a trip from here to the summit of the Col de Sestriere—about 6,000 ft. A number of interesting butterflies was taken here in the morning before the almost inevitable cloud put a stop to proceedings in the afternoon.

Parnassius apollo L. Quite common but getting very worn. I took two only—both females with considerable dark suffusion of the wings.

Graphium podalirius L. A few seen but none taken.

Colias phicomone Esp. A few seen but only one taken. This is of the f. *pulverulenta* Verty. (*Ent. Rec.*, 1926: 171).

Vanessa cardui L. Common.

Aglais urticae L. Common and of a bright form.

Mesoacidalia charlotta Schiff. Common.

Argynnis lathonia L. One only seen and taken.

Mellitaea didyma Esp. Common. The females definitely of the *meridionalis* Stgr. form.

Agapetes galathea L. Common but very worn.

Lasiommata maera L. Common.

Satyrus bryce Hübn. (*cordula* Fab.). A single female taken.

Erebia neoridas Boisd. I took five males of this species and these seem referable to f. *nichocares* Frhst. I find the separation of this form from typical *neoridas* (of which I have a series I took at Vernet les Bains in the Pyrenees Orientales a few years ago) none too easy. Warren in his famous Monograph of the Genus *Erebia*, p. 344, states

that *nichocares* features are found among races of the typical *neoridas* and vice-versa. This agrees with my own observations. One point of difference not noted by Warren seems to be that the red banding on the underside of the fore-wings of *nichocares* is narrower and altogether more irregular in outline than in typical *neoridas*. But my series of both forms is not really big enough for me to feel quite sure that this character affords means of separation of the forms.

Agrodiaetus damon Schiff. Both sexes of this blue were abundant and in good condition.

Philotes baton Bergstr. A few very worn specimens of this species were seen.

Lysandra coridon Poda. Common but worn.

After the clouds had blocked the sun in the afternoon I spent some time searching rough herbage and in this way found a number of skippers at rest on the grass, etc. In this way I took *Thymelicus sylvestris* Poda, *Hesperia comma* L., *Pyrgus alveus* Hübn., *Pyrgus carlinae* Ramb., and *P. carthami* Hübn. Regarding the last-named Warren in his Monograph of the Tribe *Hesperiidi* (*Trans ent. Soc. Lond.*, **74**: 71) states that the latest date he has taken this species is 22nd August in the Rhone Valley. My specimen, a male in good condition, was taken on 29th August. I should perhaps add that the determination was checked by genitalia preparation and the appearance of my slide agrees well with the figure on Plate XV of Warren's Monograph.

On 30th August we crossed the Mont Cenis Pass into France. Just below the summit on the French side I stopped to take photographs and see if any butterflies were about. I took *Erebia euryale* Esp. very worn out; *Erebia epiphron* Knock., *Erebia tyndarus* Esp. and a single *Boloria pales* Schiff. Later we stopped for picnic lunch at lower altitude between Modane and Lansleburg. I did a little collecting in a rough field by the road. Quite a lot of interesting insects were in evidence including:— *Lysandra bellargus* Rott.: common, but not nearly so finely marked as those from Cavallino. *Plebeius icarus* Rott.: common. *Melitaea didyma* Esp.: common. One male taken was of extremely dark facies and approaching f. *graeca* Stgr.; *Colias callida* Verty.—a few taken; *Boloria pales* Schiff., frequent. One female appears to be *B. napeae* Hoffmsg. *Fabriciana niobe niobe* L. and *A. cydippe* L. both frequent. This was quite a useful list of insects in an hour especially as I was not feeling very energetic after a dose of unknown species and race of Italian abdominal virus the night before.

The only other collecting I did on this trip was again when we stopped for lunch, this time near Avallon, Yonne, France, in the foothills of the Mont. de Marvan. Here on 1st September on a rough hillside I found butterflies plentiful and quite interesting. The following species were noted:—

Erebia aethiops Esp. Common and in very fine condition. I took six males and two females and could have taken many more. These are of a large size and with very bright markings referable to ssp. *sapaudia* Frhst. The differences from the British form in size and markings are most marked. Perhaps a curious feature was the lateness of the date for such fresh specimens at no great altitude.

Clossiana dia L., common but worn. *Melitaea phoebe* W.V., a single fresh male only. *Pontia daplidice* L., common and fresh. *Lysandra coridon* Poda, many fine large fresh males. *Plebius icarus* Rott., common. *Heodes tityrus* Poda (*dorilis* Hufn.), males common but worn. A fine female taken. *Hesperia comma* L., frequent. *Satyrus dryas* Scop., common but worn to shreds. The most interesting species I took here was *Lycaenides idas* L. (*argyrognomen* auct.). I got only three males and two females but the latter are shot with a wonderful shade of blue against which background the yellow marginal spots of the hindwings stand out brilliantly.

So ended the collecting part of this most interesting holiday in which I was able to visit a number of localities. One now wishes to return to some of these for a more leisurely sampling of their most interesting lepidopterous fauna.

It might be pertinent to add here a note on a thorny subject—that of the nomenclature of the European butterflies. At the present time this seems to be in a state of chaos. There is a great need at the present time for a really up-to-date check list of the species and races of the region. More and more entomologists are now turning their footsteps to the European mainland for their holidays and the formation of even a small collection of Continental species is interesting and also help to put into perspective the native British fauna. To find a chaotic nomenclature is far from encouraging and any official list which could form a basis for operations would be most welcome. Not all collectors are placed near London where ready access to up-to-date nomenclature of museum collections is available, with the advantage also of ready access to libraries. I have noted that most writers of notes on collecting experiences on the Continent do not give references to literature consulted in making determinations. In the hope that it may be of help to those placed away from the centre of activities, like myself, I append a list of references to works that I have found more or less helpful when working out my own captures from 'foreign parts'. I give these, not from the point of view of the expert, but as another tyro so far as concerns European species and collecting.

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Kendal. 24th January 1964.

New Synonymy in the Genus *Zygaena* Fabricius (Lepidoptera : Zygaenidae)

By Hugo Reiss and W. Gerald Tremewan

The preparation of a systematic catalogue of the genus *Zygaena* Fabricius has revealed new synonymy. It should be pointed out that many of the synonyms cited below were originally published by Burgeff (1926a; 1926b) and Reiss (1930; 1933) as new names to replace certain names that were considered by them to be junior, primary homonyms. These names, however, represent aberrations and have no status in nomenclature, and therefore cannot be preoccupied by names which are of subspecific or specific status. Similarly, names of specific or subspecific rank cannot be preoccupied by names of forms or aberrations.

During the course of our work, many junior, primary homonyms have come to hand and new names are proposed for these below.

It is not intended to discuss here the systematic arrangement of the species, subspecies, forms and aberrations. We have merely cited the new synonymy and proposed new names to replace junior, primary homonyms. It is not considered necessary to discuss the regrouping of species and subspecies as this will be shown in the systematic catalogue which, it is to be hoped, will be published in the near future.

It might be appropriate here to draw attention to the dates of publication of two works on the *Zygaena*. These are Spuler, *"Die Schmetterlinge Europas"*, Vol. 2, the *Zygaena* part of which has been incorrectly dated 1910 by earlier authors, and Seitz, *"Die Gross-Schmetterlinge der Erde"*, Vol. 2, which has also been dated 1910. The work of Spuler was published in parts, the dates of which are shown on the reverse side of the page entitled "Schlusswort". The parts on the *Zygaena* were published in 1906 and the "Nachtrag", which contains references to the *Zygaena*, in 1910. Spuler's "Die Raupen" was also published in 1910. The part on the *Zygaena* by Seitz was published in 1907 and evidence of this is supplied by Griffin (1936: 261), and also by Dziurzyński (1908: 17), who refers to Seitz under *Z. brizae* Esper ab. *cingulata* Seitz and dates the work 1907. Holik & Sheljuzhko (1956: 119) considered the date of publication to be 1908 but the citation of Dziurzyński proves this to be incorrect.

Z. laeta occidentissima Holik ab. **pseudomannerheimi** Burgeff

Z. laeta occidentissima Holik ab. *pseudomannerheimi* Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 41.

Z. laeta occidentissima Holik ab. *pseudoorientis* Holik, 1935, *Sborn ent. Odd. nár. Mus. Praze*, **13**: 57, 64, fig. 21 (**syn. nov.**).

Holik proposed the name *pseudoorientis* Holik to replace the name *pseudomannerheimi* Burgeff but, as the latter is not preoccupied, *pseudoorientis* Holik is an unnecessary replacement name and is placed as a synonym.

Z. purpuralis rosea Burgeff

Z. purpuralis rosea Burgeff, 1914, *Mitt. münch. ent. Ges.*, **5**: 44.

Z. purpuralis rosalis Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 14 (**syn. nov.**).

The name *rosalis* Burgeff, 1926, was proposed to replace the name *rosea* Burgeff, 1914. However, the latter name is not preoccupied by the earlier, infrasubspecific names of other authors. The name *rosalis* Burgeff, 1926, is an unnecessary replacement name and is now placed as a synonym of *rosea* Burgeff, 1914.

Z. purpuralis rebeli Drenowski

Z. purpuralis rebeli Drenowski, 1928, *Spis. blg. Akad.*, **27**: 211.

Z. purpuralis drenowskii Holik, 1937, *Mitt. münch. ent. Ges.*, **27**: 1 (**syn. nov.**).

Holik proposed the name *drenowskii* Holik to replace the name *rebeli* Drenowski, 1928, which he considered to be invalid, as the description was published in Bulgarian and was not accompanied by a Latin diagnosis. Holik considered the name *rebeli* Reiss, 1932 (ssp. of *graslini* Lederer) to be valid but this is a junior, primary homonym of *rebeli* Drenowski, 1928. A new name is proposed to replace *rebeli* Reiss later in this paper. The name *drenowskii* Holik, 1937, is an unnecessary replacement name and is now placed as a synonym of *rebeli* Drenowski, 1928, which is valid.

Z. purpuralis reissi Burgeff

Z. purpuralis reissi Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 13.

Z. purpuralis reissiana Burgeff, 1926, in Strand, *Lepid. Cat.*, **33**: 8 (**syn. nov.**).

Burgeff proposed the name *reissiana* Burgeff, 1926, to replace the name *reissi* Burgeff, 1926, as he considered the latter to be preoccupied by *reissi* Stauder, 1922 (ab. of *oxytropis* Boisduval). As *reissi* Stauder has no status in nomenclature, the name *reissi* Burgeff, 1926, is valid and *reissiana* Burgeff, 1926, being an unnecessary replacement name, is placed as a synonym.

Z. felix felix Oberthür

Z. felix felix Oberthür, 1876, Études d'Entomologie, **1**: 36; 1878, *ibidem*, **3**: 41, pl. 5, fig. 4.

Z. eudaemon Mabille, 1885, *Bull. Soc. philom. Paris* (7) **9**: 57.

Z. felix andalusiae Burgeff, 1914, *Mitt. münch. ent. Ges.*, **5**: 53 (**syn. nov.**).

Burgeff described, from a series of specimens purported to have been taken in Andalusia by Korb, a subspecies of *felix* Oberthür under the name *andalusiae* Burgeff. There are no authentic records of the species occurring in Andalusia and we originally suspected that the specimens might prove to be the closely allied species *beatrix* Przegendza (*felix auctorum*) from west Algeria and Morocco. Prof. Burgeff, however, has very kindly supplied us with a photograph of the type series and the genitalia of the type ♂ in his collection. The genitalia agree with those of the true *felix* Oberthür and the photograph shows typical specimens

of the nominate subspecies. We therefore consider that the type series of *andalusiae* Burgeff originated from east Algeria and we place the name as a synonym of *felix felix* Oberthür.

Z. felix constantinensis nom. nov.

Z. felix faustula Reiss, 1933, in Seitz, Die Gross-Schmetterlinge der Erde, Supplement, **2**: 272 (preoccupied).

Z. felix Oberthür ab. *faustula* Staudinger, 1887, *Berl. ent. Z.*, **31**: 37 (infrasubspecific).

Staudinger originally described *faustula* Staudinger as an aberration. In 1933, Reiss quite justifiably raised the name to subspecific status and, according to the Rules of Nomenclature, the subspecific name *faustula* should date from 1933 and be attributed to that author and not to Staudinger. However, *faustula* Reiss, 1933, is a junior, primary homonym of *faustula* Rambur, 1866 (=*fausta genevensis* Millière, 1861). We propose the name **constantinensis nom. nov.** to replace the name *faustula* Reiss, 1933. The name *faustula* Staudinger, 1887, being infrasubspecific, has no status in nomenclature but, for convenience, is placed in synonymy under *constantinensis* nom. nov.

Z. cocandica cocandica Erschoff ab. **fumosa ab. nov.**

We propose naming the melanic aberration of *cocandica* Erschoff, figured by Burgeff (1906: 161, fig. 2; 1914: 52, pl. 6, fig. 54), ab. **fumosa ab. nov.** The specimen has spots 3, 4, 5 and 6 darkened with black scales. Type ♂ in H. Burgeff collection.

Z. algira algira Boisduval ab. **barraguei nom. nov.**

Z. algira algira Boisduval ab. *aurantiaca* Barragué, 1961, *Alexanor*, **2**: 135, 136 (preoccupied).

The name *aurantiaca* Barragué, 1961, is preoccupied by *aurantiaca* Holl, 1912 (ab. of *algira algira* Boisduval). The former is a true, genetical, orange aberration while the latter is merely tinged with orange in places and is probably only a pathological form. Mr. G. Barragué (*in lit.*) has agreed that we should re-name the genetical, orange form described by him. We propose the name **barraguei nom. nov.** to replace the name *aurantiaca* Barragué, 1961.

Z. algira exigua Rothschild

Z. algira exigua Rothschild, 1917, *Novit. zool.*, **24**: 340.

Z. algira Boisduval ab. *exigua* Seitz, 1907, Die Gross-Schmetterlinge der Erde, **2**: 29, pl. 8a (infrasubspecific).

Seitz originally described *exigua* Seitz as an aberration of *algira* Boisduval, but Rothschild, recognising it as a subspecies, raised it to subspecific rank in 1917. According to the Rules of Nomenclature, the subspecific name *exigua* should be attributed to Rothschild and date from 1917. The infrasubspecific name *exigua* Seitz, 1907, is placed, for convenience, in synonymy under *exigua* Rothschild, 1917. Rothschild cited as type localities, Batna, Lambessa and Khenchela, Algeria.

Z. fausta oranoides de Sagarra ab. **disjuncta** de Sagarra

Z. fausta oranoides de Sagarra ab. *disjuncta* de Sagarra, 1925, *Butll. Inst. catal. Hist. nat.* (2) **5**: 274.

Z. fausta oranoides de Sagarra ab. *sagarrai* Reiss, 1930, in Seitz, Die Gross-Schmetterlinge der Erde, Supplement, **2**: 25 (**syn. nov.**).

The name *sagarrai* Reiss was proposed to replace the name *disjuncta* de Sagarra, 1925, but the latter is not preoccupied by *Z. occitanica disiuncta* Spuler, 1906. The name *sagarrai* Reiss, 1930 is an unnecessary replacement name and is now placed as a synonym of *disjuncta* de Sagarra, 1925.

Z. carniolica onobrychis Denis & Schiffermüller ab. **nigra** Reiss

Z. carniolica onobrychis Denis & Schiffermüller ab. *nigra* Reiss, 1926, *Int. ent. Z.*, **20**: 217.

Z. carniolica onobrychis Denis & Schiffermüller ab. *totanigra* Reiss, 1930, in Seitz, Die Gross-Schmetterlinge der Erde, Supplement, **2**: 30, pl. 3d (**syn. nov.**).

The name *nigra* Reiss, 1926, is not preoccupied and *totanigra* Reiss, 1930, is an unnecessary replacement name and is placed as a synonym.

Z. carniolica formidacola nom. nov.

Anthrocera carniolica magnaustralis Verity, 1946, *Redia*, **31**:66 (preoccupied).

The name *magnaustralis* Verity, 1946, is a junior secondary hononym of *Z. trifolii magnaustralis* verity, 1926. We propose the name **formiacola nom. nov.** to replace the name *magnaustralis* Verity, 1946.

Z. carniolica sagarraiana nom. nov.

Z. carniolica catalonica de Sagarra, 1940, *VI Congr. int. Ent., Madrid*, p. 392 (preoccupied).

We propose the name **sagarraiana nom. nov.** to replace the name *catalonica* de Sagarra, 1940, which is preoccupied by *Z. hilaris catalonica* de Sagarra, 1924.

Z. carniolica gaumaisiensis Holik

Z. carniolica gaumaisiensis Holik, 1936, *Lambillionea*, **36**: 182.

Z. carniolica Scopoli ab. *torgniensis* Lambillion, 1909, *Rev. Soc. ent. namur.*, **9**: 75 (infrasubspecific).

Holik attributed the names ab. *dissociata* Lambillion, ab. *albilunaris* Lambillion, ab. *adunata* Lambillion, ab. *rubricostata* Lambillion, ab. *faustoides* Lambillion, ab. *flavicostata* Lambillion and ab. *torgniensis* Lambillion to Cabeau. These names were originally manuscript names of Cabeau, but should be attributed to Lambillion who first published them in 1909. The name *torgniensis* Lambillion represents the typical form, but being infrasubspecific, has no status in nomenclature and, for convenience, is placed in synonymy under *gaumaisiensis* Holik.

Z. carniolica berolinensis Lederer

Z. carniolica berolinensis Lederer, 1853, *Verh. zool.-bot. Ver. Wien*, **2**: 102.

Z. carniolica berolinensis Staudinger, 1871, in Staudinger & Wocke, Catalog der Lepidopteren des Europaeischen Faunengebiets, p. 49 (**syn. nov.**).

This subspecies of *carniolica* Scopoli from the neighbourhood of Berlin was first described by Lederer as ssp. *berolinensis* Lederer in 1853. In 1871, Staudinger described the same subspecies as *berolinensis* Staudinger which, in addition to being synonymous, is also a junior, primary homonym.

Z. exulans apennina Rebel

Z. exulans apennina Rebel, 1910, *Verh. zool.-bot. Ges. Wien*, **60**: (5).

Z. exulans abruzzina Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 25 (**syn. nov.**).

The name *apennina* Rebel, 1910, is valid and is not preoccupied by the earlier, infrasubspecific names of other authors. The name *abruzzina* Burgeff, 1926, is an unnecessary replacement name and is therefore placed as a synonym of *apennina* Rebel, 1910.

Z. loti ligustica Rocci ab. **latomarginata** Rocci

Z. loti ligustica Rocci ab. *latomarginata* Rocci, 1915, *Atti Soc. ligust. Sci. nat. geogr.*, **25**: 112, pl. 1, figs. 6b, 10c, 11c.

Z. loti ligustica Rocci ab. *latemarginata* Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 36 (**syn. nov.**).

The name *latomarginata* Rocci, 1915, is not preoccupied by *latomarginata* Tutt, 1899 (f. of *lonicerae transferens* Verity) as both names have no status in nomenclature and are infrasubspecific. The name *latemarginata* Burgeff, 1926, is an unnecessary replacement name and is placed as a synonym of *latomarginata* Rocci, 1915.

Z. loti ligustica Rocci ab. **diaphana** Rocci

Z. loti ligustica Rocci ab. *diaphana* Rocci, 1915, *Atti Soc. ligust. Sci. nat. geogr.*, **25**: 115.

Z. loti ligustica Rocci ab. *translucens* Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 36 (**syn. nov.**).

Burgeff proposed the name *translucens* Burgeff, 1926, to replace the name *diaphana* Rocci, 1915, but the latter is not preoccupied by the species name *diaphana* Staudinger, 1887. The name *translucens* Burgeff, 1926, is an unnecessary replacement name and is placed as a synonym of *diaphana* Rocci, 1915.

Z. loti ruberrima Verity

Z. loti ruberrima Verity, 1920, *Boll. Lab. Zool. Portici*, **14**: 37.

Z. loti maximerubra Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 33 (**syn. nov.**).

The subspecific name *ruberrima* Verity, 1920, is not preoccupied by the earlier, infrasubspecific names of other authors and the name *maximerubra* Burgeff, 1926, is an unnecessary replacement name and is now placed as a synonym of *ruberrima* Verity, 1920.

Z. loti achilleae Esper ab. **grisea** Reiss

Z. loti achilleae Esper ab. *grisea* Reiss, 1922, *Int. ent. Z.*, **16**: 84.

Z. loti achilleae Esper ab. *flavogrisea* Burgeff, 1926, in Strand, *Lepid. Cat.*, **33**: 21 (**syn. nov.**).

The name *grisea* Reiss, 1922, is infrasubspecific and has no status in nomenclature. It is therefore not preoccupied by *Z. rhadamanthus grisea* Oberthür, 1909. The name *flavogrisea* Burgeff, 1926, is an unnecessary replacement name and is placed as a synonym of *grisea* Reiss, 1922.

Z. graslini rebeliana nom. nov.

Z. graslini rebeli Reiss, 1932, *Int. ent. Z.*, **26**: 275, figs. (preoccupied).

We propose the name **rebeliana nom. nov.** to replace the name *rebeli*

Reiss, 1932, which is a junior, primary homonym of *Z. purpuralis rebeli* Drenowski, 1928.

Z. ephialtes ephialtes Linné f. **trigonelloides nom. nov.**

Z. ephialtes ephialtes Linné f. *quinquemaculata* Vorbrodt, 1913, in Vorbrodt & Müller-Rutz, Die Schmetterlinge der Schweiz, **2**: 276 (preoccupied).

Z. ephialtes ephialtes Linné f. *unipunctata* Vorbrodt, 1913, in Vorbrodt & Müller-Rutz, Die Schmetterlinge der Schweiz, **2**: 276 (preoccupied).

We propose the name **trigonelloides nom. nov.** to replace the names *quinquemaculata* Vorbrodt, 1913, and *unipunctata* Vorbrodt, 1913. The former is preoccupied by *quinquemaculata* Vorbrodt, 1913 (=*Z. ephialtes ephialtes* Linné f. *aemilii* Favre, 1897) while the latter is preoccupied by *unipunctata* Vorbrodt, 1913 (=*Z. ephialtes ephialtes* Linné).

Z. ephialtes slabyi nom. nov.

Z. ephialtes montana Slabý, 1953, *Acta Mus. Silesiae*, **3** (A):46, figs. C3, D1 (preoccupied).

We propose the name **slabyi nom. nov.** to replace the name *montana* Slabý, 1953, which is a junior, primary homonym of *Z. loyselis montana* Rothschild, 1925.

Z. transalpina intermedia Rocci

Z. transalpina intermedia Rocci, 1914, *Atti Soc. ligust. Sci. nat. geogr.*, **24**: 115.

Z. transalpina interjacens Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 74 (**syn. nov.**).

Burgeff proposed the name *interjacens* Burgeff to replace the subspecific name *intermedia* Rocci, 1914. However, *intermedia* Rocci is valid and is not preoccupied by the earlier, infrasubspecific names of other authors. The name *interjacens* Burgeff, 1926, is an unnecessary replacement name and is therefore synonymous with *intermedia* Rocci, 1914.

Z. transalpina maritima Oberthür ab. **trimaculata** Oberthür

Z. transalpina maritima Oberthür ab. *trimaculata* Oberthür, 1909, Études de Lépidoptérologie comparée, **3**, pl. 30, fig. 189.

Z. transalpina maritima Oberthür ab. *trimacula* Reiss, 1930, in Seitz, Die Gross-Schmetterlinge der Erde, Supplement, **2**: 39 (**syn. nov.**).

The name *trimaculata* Oberthür, 1909, is not preoccupied and *trimacula* Reiss, 1930, is an unnecessary replacement name and is placed in synonymy.

Z. transalpina bavarica Burgeff

Z. transalpina bavarica Burgeff, 1921, *Mitt. münch. ent. Ges.*, **11**: 102.

Z. transalpina boica Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 80 (**syn. nov.**).

The subspecific name *bavarica* Burgeff, 1921, is valid and is not preoccupied by *bavarica* Burgeff, 1914, which is the name of a hybrid and, being infrasubspecific, has no status in nomenclature, The name *boica* Burgeff, 1926, is an unnecessary replacement name and is placed as a synonym of *bavarica* Burgeff, 1921.

Z. hippocrepidis jurassica Burgeff

Z. hippocrepidis jurassica Burgeff, 1914, *Mitt. münch. ent. Ges.*, **5**: 65,

pl. 2, figs. 186, 187, pl. 4, figs. 124-128.

Z. hippocrepidis jurassicola Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 82 **(syn. nov.)**.

The subspecific name *jurassica* Burgeff, 1914, is valid and is not preoccupied by *jurassica* Blachier, 1905, which is infrasubspecific. The name *jurassicola* Burgeff, 1926, is an unnecessary replacement name and is placed as a synonym of *jurassica* Burgeff, 1914.

Z. elegans Burgeff ab. **burgeffi nom. nov.**

Z. elegans Burgeff ab. *confluens* Burgeff, 1926, *Mitt. münch. ent. Ges.* **16**:83 (preoccupied).

The name *confluens* Burgeff, 1926, is preoccupied by *confluens* Reiss, 1925 (=*Z. elegans* Burgeff ab. *splendida* Reiss, 1920). We propose the name **burgeffi nom. nov.** to replace the name *confluens* Burgeff, 1926.

Z. viciae nigrescens Reiss

Z. viciae nigrescens Reiss, 1921, *Int. ent. Z.*, **15**: 118.

Z. viciae nigrina Burgeff, 1926, in Strand, *Lepid. Cat.*, **33**: 49 **(syn. nov.)**.

The subspecific name *nigrescens* Reiss, 1921, is valid and is not preoccupied by the name *nigrescens* Rocci, 1914, which is infrasubspecific. The name *nigrina* Burgeff, 1926, is an unnecessary replacement name and is placed as a synonym of *nigrescens* Reiss, 1921.

Z. trifolii caerulescens Burgeff

Z. trifolii caerulescens Burgeff, 1914, *Mitt. münch. ent. Ges.*, **5**: 62.

Z. trifolii Esper ab. *caerulescens* Oberthür, 1910, Études de Lépidoptérologie comparée, **4**: 493 (infrasubspecific).

From the Sierra de Alfacar, Oberthür described specimens of *trifolii* Esper, which he named ab. *caerulescens* Oberthür. In 1914, Burgeff recognised the Sierra de Alfacar populations as a subspecies and raised the name *caerulescens* to subspecific rank. According to the Rules of Nomenclature, the subspecific name *caerulescens* should be attributed to Burgeff and date from 1914. Tremewan (1961: 7) incorrectly attributed the subspecific name *caerulescens* to Reiss (1936: 90), not realising that the status had been previously raised to subspecific rank by Burgeff in 1914.

Z. lonicerae lonicerae Scheven ab. **diaphana** Burgeff

Z. lonicerae lonicerae Scheven ab. diaphana Burgeff, 1906, *Ent. Z.*, **20**: 163, fig. 10.

Z. lonicerae lonicerae Scheven ab. *translucens* Burgeff, 1926, *Mitt. münch. ent. Ges.*, **16**: 70 **(syn. nov.)**.

The infrasubspecific name *diaphana* Burgeff, 1906, is not preoccupied by the species name *diaphana* Staudinger, 1887, and the name *translucens* Burgeff, 1926, is an unnecessary replacement name and is placed as a synonym of *diaphana* Burgeff, 1906.

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Orthoptera Notes from S.W. Britain, 1963

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I have decided in this paper to give the recently standardized and now generally accepted English names of the British Orthoptera (*q.v.*, Kevan, 1952, 1961) together with the scientific ones, on each occasion a species is mentioned for the first time. Thereafter, the scientific name only will be used. I feel justified in following this course, as these English names are to be used in Dr. D. R. Ragge's forthcoming book on the British Orthoptera in the "Wayside and Woodland" series.

Tettigonia viridissima L. (Great Green Bush-cricket)

On 14th September, Michael Kendall and I found this species very common in several places in north Somerset. It was to be heard stridulating in great numbers in the roadside hedgerows and fields all along the road over the Mendip Hills from Cheddar via Shipham to Churchill. It was also met with in profusion on the Somerset Levels at Ashcott, Buscott and Shapwick. A male from Ashcott which I released in my garden at Pill on 15th September immediately ate a blade of grass and then climbed a bramble bush and consumed a ripe blackberry, tearing the skin with its mandibles and imbibing the juice.

Pholidoptera griseoaptera (De Geer) (Dark Bush-cricket)

The south-west of England is a real stronghold of this species and I again found it in abundance in many parts of north Somerset, including Pill, Portishead, Ashton Park (near Bristol), Failand, Cheddar, Churchill, Shipham, Ashcott, Buscott and Shapwick. In Gloucestershire, it is abundant at Shirehampton and along the cliff-tops of the Avon Gorge at Clifton and Durdham Downs.

In spite of the long and severe winter, I found the first very small nymph, at Pill, on 12th May, compared with 13th May in 1962. I heard the first adults stridulating on 5th August and the last on 5th November.

Conocephalus dorsalis (Latr.) (Short-winged Conehead).

On 14th September, Michael Kendall and I found this beautiful, active

little bush-cricket in great abundance in the Somerset Levels at Meare, Ashcott and Shapwick Heaths. At Meare we found it in association with *Stethophyma grossum* (L.) in a habitat comprising a mixture of wet fen and quite dry peat bog with great reed grass (*Glyceria maxima* (Hartman) Holmberg, red rattle (*Pedicularis palustris* L.) and purple loosestrife (*Lythrum salicaria* L.) dominant in the wetter parts. In another part of Meare Heath it occurred in a very wet boggy field and here we caught a fine female of the macropterous form *burri* Ebner, which I later presented to the British Museum (Natural History). The habitat at Shapwick Heath consisted of rather dry bog with sphagnum moss (*Sphagnum* spp.), cross-leaved heath (*Erica tetralix* L.) and bog myrtle (*Myrica gale* L.) dominant. We reached this locality around 6.00 p.m. B.S.T., and discovered both *S. grossum* and *C. dorsalis* congregating in the evening sunshine on the foliage of the big clumps of bog myrtle.

Mr. J. Cowley (1949 and *in. litt.*,) has also encountered *dorsalis* in this neighbourhood, namely at Street Heath (1945-48), Shapwick Heath (1952), Catcott Heath (1947 and 1950), Westhay Moor, Meare (1954), Walton Moor (1955) and Edington Moor (1947), as well as at Berrow (1949) and Clevedon (1952).

Leptophyes punctatissima (Bosc.,) (Speckled Bush-cricket).

On 7th July, I found an immature male on Canterbury Bells in my garden at Pill, N.W. Somerset, and several adult males and a female on Wild Hop (*Humulus lupulus* L.) and Traveller's Joy (*Clematis vitalba* L.) growing on the cliff-tops of the Avon Gorge at Clifton Down, Gloucestershire.

Acheta domesticus (L.) (House Cricket).

I heard this species stridulating at the Ashton Court Country Club, near Failand, Somerset, while attending a dance there one evening in late July.

Tetrix subulata (L.) (Slender Ground-hopper).

I collected a male from a grassy drove at Meare Heath, Somerset, on 14th September. This species has also been reported by Cowley (1949 and *in litt.*) from several neighbouring localities in the Somerset Levels.

Stethophyma grossum (L.) (Large Marsh Grasshopper).

This fine insect, the largest British Acridid, has been reported from the Somerset Levels by Walton (1944), who found a nymph near Shapwick, and by Cowley (1949), who discovered it in numbers at Catcott Heath in August 1947 and at Street Heath in September 1947. Subsequently he encountered it (personal communication) at Shapwick Heath in August, 1950 and July, 1952, and at Westhay Moor, near Meare, in August, 1954 and 1957. He also saw it again on Catcott and Street Heaths in the years 1948-1950.

On 14th September, a beautifully hot and sunny day, Michael Kendall and I decided to look for it ourselves and decided from a scrutiny of the 1" O.S. map that Meare Heath was a likely looking locality. We arrived by car soon after 1 p.m. and on getting out of the car, I immediately heard *S. grossum* stridulating from the boggy ground on both sides of the road. As already mentioned under the notes on *C. dorsalis*, the habitat consisted of a mixture of wet fen and quite dry peat bog. It was very plentiful here and I collected five males and four females in a very short time. Two pairs of these I sent to Dr. Ragge of the British Museum (Natural History) for the National Collection. I saw two females of the beautiful rose-

coloured form, one of which I managed to catch and included among the specimens I sent to Dr. Ragge.

Further south along the road over Meare Heath, we found both *grossum* and *Conocephalus dorsalis* very common in a boggy piece of pasture, which we learned from the owner was eventually to be sold and ploughed up. At Ashcott Heath, we came upon an adult male *grossum* in the marshy border of a meadow, but failed to find the species in apparently suitable areas just south-west of Buscott. We reached the western part of Shapwick Heath around 6 p.m. and, as already mentioned under *C. dorsalis*, we found it commonly on rather dry bog.

This habitat was in the process of being invaded by alder carr and, presumably, will eventually become drier still and therefore unfavourable to *grossum*, unless something is done by the Nature Conservancy, whose reserve it is, to reduce the alder growth. However, it was reassuring to discover that this magnificent insect is still well established and apparently in no immediate danger in this part of Somerset.

Omocestus viridulus (L.) (Common Green Grasshopper).

This species was plentiful in rough limestone turf at Failand Golf Course together with *Chorthippus parallelus* (Zett.) on 12th September. On the 14th I noted it stridulating at Meare and Ashcott Heaths.

On 6th August, my secretary, Miss Sheila McCarthy, gave me some live grasshoppers which she collected amongst bilberry (*Vaccininum myrtillus* L.) at 2,000 ft., on Twyn Tal-y-cefn, Breconshire, while camping at Capel-y-ffin the previous weekend (3rd-5th August). These proved to be two adults (male and female) of this species and three immature females of *Ch. parallelus*. The *viridulus* were the same rich green colour as those I collected on the adjacent mountains in August, 1948 (Burton, 1959).

Chorthippus brunneus (Thunb.) (Common Field Grasshopper).

In Gloucestershire in 1963 I noted *brunneus* commonly on the limestone turf of Clifton Down, near Bristol, and in North Somerset at Pill, Ashton Park, Failand, and in the drier parts of Meare Heath. I encountered the first adults on 5th August.

Ch. parallelus (Zett.), (Meadow Grasshopper).

This year *parallelus* was abundant in many parts of north Somerset including Pill, Portishead, Ashton Park, Failand, Abbot's Leigh, Cheddar, Wedmore, Meare, Shapwick and Ashcott. I did not find the first adults until 5th August at Pill, whereas I first noticed them in mid-June in 1961, and at the end of the first week of July in 1962 (Burton, 1963). The last ones of the year I saw at Pill on 19th October.

I have already referred under *Omocestus viridulus* to the specimens of *parallelus* brought me from Twyn Tal-y-cefn mountain, Breconshire, by my secretary in August.

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Ant Records and Observations

By K. E. J. Barrett

Details of some records which have been incorporated in a forthcoming chart of the vice-county distribution of British ants assembled in collaboration with Mr. C. A. Collingwood are described here together with other general notes and observations. The following species have been recorded over the past few years:—

Strongylognathus testaceus Sch. Studland, Dorset, 1952 (with *Tetramorium caespitum* Latr.).

Tetramorium caespitum Latr. Headon Warren, Isle of Wight, 1962; Matley, Ridley Plain and Clay Hill, New Forest, S. Hants, 1962-3; The Warren, Bordon, N. Hants, 1963; Kettlebury Hill, near Thursley, Rodborough Hill, near Milford, Frensham Common and Horsell Common, Surrey, 1962-3; neither the author nor A. J. Pontin (private communication, 1963) have been able to confirm the Tubney record, 1912, for Berkshire (Donisthorpe, 1927).

Myrmecina graminicola Latr. Goblin Combe, Congresbury, N. Somerset, 1961 (with C. A. Collingwood).

Leptothorax acevorum Fab. Records (1961-3) from the Isle of Wight, S. Hants, N. Hants, N. Somerset, W. Sussex, E. Sussex, Surrey, Berks., Bucks, Oxon, Bedford, and for Carnarvon (1955), Cheshire (1955), Flint (1956), Derby (1955) and S. Lancs. (1954).

Leptothorax nylanderi Först. Great Hazes, near Twyford, Berks., 1962.

Leptothorax interruptus Sch. Rhinefield, New Forest, S. Hants, 1957 (a number of *Myrmica sulcinodis* Nyl. and *Tetramorium caespitum* Latr. colonies also occurred in the area).

Myrmica sabuleti Mein. Records (1961-3) for the Isle of Wight, N. Somerset, S. Hants, N. Hants, Berks. (one nest under the bark of a fir-stump in a wood near Hatford, an unusual nest-site for this species; an ergatandromorph was found on a railway embankment near Ruscombe), Oxon, Surrey, Bucks., W. Sussex, E. Sussex and for Carnarvon (1955), Merioneth (1956), Montgomery (1956), Flint (1956), Cheshire (1955) and Derby (1955).

Myrmica lobicornis Nyl. Heckfield Heath, N. Hants, 1962; Burghfield, Berks., 1951 (pterergates of *Myrmica scabrinodis* Nyl. were also found here); Frimley, Surrey, 1962; Welshpool, Montgomery (1956); Hebden Bridge, S.W. Yorks. (1956).

Myrmica schencki Em. The nests seen at Shipton on Cherwell, Oxon, in 1962 (Barrett, 1963a) were still there in 1963; root-aphids were present in one nest.

C. A. Collingwood (private communication, 1963) also found it at Coombe Halt, Oxon, in 1963. There are now four reported sites in the small area (Ordnance Survey 10 Kilometre Square, SP41) to the north of Oxford on the Cornbrash formation which also extends widely from Dorset to Yorkshire and which may indicate other areas in which this rather local species might occur. The records for Barnack, Northants., and for Wilsford, S. Lincoln (Collingwood,

1958) appear to be on or near this formation.

Lasius fuliginosus Latr. Horsell Common and Frimley, Surrey, 1962; Tubney and Bagley Wood, near Oxford, Berks., 1951-1962; Charndon, Bucks., 1963 (nest under the masonry of a railway bridge away from trees).

Lasius rabaudi Bond. A single male was found at Easthampstead Wood, near Bracknell, Berks., 1962.

Lasius umbratus Nyl. Rhinefield, New Forest, S. Hants, 1957; Frensham Common and Rodborough Hill, Surrey, 1962; Tubney and Windsor, Berks., 1963.

Lasius mixtus Nyl. Goblin Combe, N. Somerset, 1961; Windsor Great Park, Surrey (deälated female, October) 1962; Southport, S. Lancs., 1954.

Lasius brunneus Latr. Watereaton Copse, Oxon, 1955; Windsor Great Park, Berks., 1962; Langley Park, Bucks., 1962—all confirmations of previously recorded localities.

Lasius alienus Först. Studland, Dorset, 1952; Headon Warren and Arreton Down, Isle of Wight, 1962; Matley, New Forest, S. Hants, 1957; Goblin Combe, N. Somerset, 1961; Wisley Common, Horsell Common and Oxshott Heath, 1962, Kettlebury Hill, and Rodborough Hill, Surrey, 1963; Sullington Warren, W. Sussex, 1963.

Tapinoma erraticum Latr. Studland, Dorset, 1952; Rhinefield, New Forest, S. Hants, 1957.

Formica sanguinea Latr. Detailed records including localities in W. Sussex, 1963, a new vice-county record have been described elsewhere (Barrett, 1964).

Formica exsecta Nyl. This species was recorded from Parkhurst Forest, Isle of Wight, 1907-1913 (Yarrow, 1954) and was subsequently described as common there (Jeffery, 1931). S. Wakely (J. Lobb, private communication, 1963) states that Jeffery's site is now occupied by a factory. The species could not be found by the author during several visits to the Forest in 1962.

Formica rufa L. This species has been found or confirmed in the following localities in recent years: Goblin Combe, N. Somerset, 1961. Parkhurst Forest and Firestone Copse, Isle of Wight, 1962. Norley Inclosure, Broomy Inclosure, Milkham Inclosure, Slufter's Inclosure and Buskett's Wood, New Forest, and near Ampfield, S. Hants, 1963. Fleet and Bramshill, N. Hants, 1963. Langley and Cold Harbour Wood, Rake, W. Sussex, 1963. Five Hundred Acre Wood, Crowborough; Abbot's Wood, Hailsham (nests on old oak stumps in dense undergrowth on clay); Tilsmore Wood, Cross in Hand; Jews Wood, Tunbridge Wells; Creep Wood, Battle; Guestling Wood, Hastings (known here as the "soldier-ant") and Bixley Wood, Beckley (pseudogynes were present in one nest), E. Sussex, 1963. Frith Hill; Frimley (alate females were still present in one nest in August, 1962); Ockham Common; Oxshott Heath; Blackheath and Winterfold Heath, Guildford, 1962; Tilford, Surrey, 1963. Caesar's Camp and Easthampstead Wood; Great Hazes, Berks., 1962. Formerly abundant at Tubney, Berks. (1951-1955) but by 1962 the woodland had become much overgrown and had disappeared from the locality. A few colonies remain at Triangle Plantation, Tubney (A. J. Pontin, private communication, 1962). Burnham Beeches, Bucks., 1961-1963 (three examples of nests 6-8 ft. up in dead trees, a habit previously described

by Richards (1958) at Oxshott, Surrey, have been seen here). First found at Shabbington Wood, Bucks., by A. J. Pontin (private communication, 1962) a few colonies were also present nearby at York's Wood, 1962.

The author is grateful to the following who have supplied specimens for identification from Holne Bridge, Ashburton, S. Devon (F. W. Pexton, 1963); Birchden Wood, Groombridge (P. G. Osborn, 1963) and High Woods, Bexhill (J. P. Hodgkinson, 1963), E. Sussex; Joyden's Wood, Bexley Heath (W. D. Roberts, 1963), Oldbury and Bedgebury Park Woods (Miss S. Cloke, 1961), W. Kent; Hockley, S. Essex (R. Lambourne, 1963); Burleigh, Ascot, Berks. (A. J. Backhouse, 1962).

Many of the localities listed by Nelmes (1938) and by Yarrow (1955) still require confirmation. The author would welcome details of any new records or recent confirmations (year and map reference, if possible) of this species.

Formica nigricans Em. Guernsey, Channel Islands, 1961 (Miss S. Cloke).

Formica cunicularia Latr. Studland, Dorset, 1952; Beaulieu Road and Ogden's Purlieu, New Forest, S. Hants, 1963.

Formica rufibarbis Fab. A further nest of this rare species was found in a turf mound in June 1963, some 200 yards away from the nest at Ship Hill, Chobham Common, found in 1962 (Barrett, 1963). The latter nest was still flourishing and had reared sexuals. The following are the nest sites which are now known at Chobham Common —Staple Hill (1), Ship Hill (2), Longcross Halt (1). The nest at Longcross was found by A. J. Pontin (1960) and was still present in 1963. A single nest is also known at Oxshott Common (Pontin, 1960) and has also been seen again in 1963 (A. J. Pontin, private communication). No recent confirmations have been obtained from other recorded sites in Surrey—Reigate, 1905, Ripley, 1908, and Weybridge, 1937 (Yarrow, 1954).

The following introduced species have been found in heated buildings:— *Monomorium pharaonis* L. Reptile House, Belle Vue Zoo, Manchester, 1953; *Tetramorium simillimum* Smith and *Paratrechina longicornis* Latr. Kew Gardens, Surrey, 1953. The author is grateful to Mr. C. A. Collingwood for the identification of one of these species.

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129 Smith's Lane, Windsor, Berks. 10th November 1963.

Notes and Observations

THE SPREAD OF HADENA COMPTA (FABR.) AND CUCULLIA ABSINTHII (LINN.)—In view of recent correspondence on the spread of these two species I thought it might be of interest to record a further extension of their range.

On a visit to Monkswood, Hunts., on the 16th June 1963, I found a specimen of *Hadena compta* sitting on the warden's cottage. Upon reporting this event to The Nature Conservancy I was informed by Mr. J. A. Thompson the Nene Warden Naturalist that it was a new record for the county, although a second specimen was observed there on the 26th July.

On the 11th July 1963, I saw a light coloured moth hovering over Bladder Campion in my garden at Stowmarket. Upon capturing it I discovered that it was a perfect specimen of *Cucullia absinthii.* Although this species has long been known to occur on the Suffolk coast, this is the first time I have heard of it from the interior of the county, but it has been recorded from Cambridgeshire by the Rev. Guy A. Ford.—H. E. CHIPPERFIELD, 27 Chilton Avenue, Stowmarket, Suffolk. 13.iii.64.

A PROLONGED MIGRATION OF BUTTERFLIES IN MALAYA.—From the 15th May until the 20th June 1959, there was a considerable migration of butterflies flying towards the south-west and into the prevailing wind, in the vicinity of Tanah Rata (alt. 4,500 feet), Pahang, Malaya.

At least eight species were involved in this flight. They were *Euploea mulciber* Cram. (Danaidae), *Cirrochroa emalea* Guér-Méné., *C. satellita* Butl. (Nymphalidae) and *Eurema hecabe* L. (Pieridae) with smaller numbers of *C. orissa* C. & R. Felder, *Terinos terpander* Hewitson, *Paduca fasciata* C. & R. Felder (Nymphalidae) and *Jamides bochus* Stoll (Lycaenidae).

The migratory movement was most in evidence on sunny days between 11 a.m. and 2 p.m. and the direction of flight seemed constant day after day throughout the period. If an attempt were made to catch a specimen, it would take abrupt evasive action, and unless captured, would quickly resume its original course.

On one occasion during this period butterflies were observed crossing the summit of Gunong Jasar (alt. 5565 feet). On this day a strong wind was blowing from the west, but despite a sudden and violent check in flight upon reaching the top, they immediately recovered, flew low over the summit and descended directly into the wind, always keeping low and sheltered.

An interesting feature was that while this migration was in progress, *Vanesst cardui* L., so well known as a migrant elsewhere, was common in some gardens where it visited Coreopsis and other flowers, and was content to remain there.—B. K. WEST, 121 Summerhouse Drive, Bexley, Kent.

MYIOLIA CAESIO HARRIS IN SURREY.—This Trypetid fly is apparently quite a rarity, and I should therefore like to record the capture of a specimen near Eashing Bridge, Surrey, on 31st August 1963. At first glance I though it was *Philophylla heraclei* L. (the Celery Fly), but an examination of the specimen at home showed that the wing markings were quite distinct. Mr. R. Uffen kindly offered to examine it and give an opinion as to its identity, and I was pleased later when he told me it was *Myiolia caesio,* a species I had read about and which I hoped to take.

Talking to Mr. L. Parmenter about the species, he kindly offered to send

me a list of localities where it had been taken. He himself had taken single specimens at Limpsfield Common and Oxshott in Surrey, St. Erth in Cornwall, Panshanger in Hertfordshire, and Failand in Somerset, from 1937 to 1955. It has also been recorded from Glamorganshire, Suffolk, Norfolk, Gloucestershire (6 records), Somerset (7 records including the one already mentioned), and Nottinghamshire (2 records).

Myiolia caesio is on the wing from June to August and most if not all the records are of single specimens. The foodplant of the larva is unknown. The earliest record in the list sent me by Mr Parmenter was at King's Lynn, Norfolk, 1902-10, by E. A. Atmore. I should like to record my thanks to Messrs. Parmenter and Uffen for supplying me with the material to write these notes.—S. Wakely, 26 Finsen Road, Camberwell, London, S.E.5.

British Flies VI. Empididae—Amendments.—Mr. J. E. Collin's "Short Table of the British Genera" in this volume runs in couplet 47 (46) on page 19 to genus "18. *Trichina*". On page 279, *Trichina* genus is numbered "19" on Mr. Collin's acceptance of Tuomikoski's genus *Trichinomyia*, with our *flavipes* as generic type, page 277 and the genus numbered "18". Thus couplet 47 (46) should be amended to show that it covers the two genera 18. *Trichinomyia* and 19. *Trichina*.

Mr. Collin has kindly informed me of four small errors he has also noticed in the book and copies should be amended as follows:—

p. 388. Fig. 135a for 'side view' read 'rear view'.

p. 448. Couplet 41 (42) insert 'not' between 'slender' and 'laterally'.

p. 752. Under 'synonomy', in last line of first paragraph for '*nec* Zett'. read '*nec* Fln.'.

p. 766 In the paragraph 'Abdomen', the last line should be deleted. No hairs should have been shown on the 'pygidium' in fig. 317b.

L. Parmenter.

The Flight Period of Hydromya dorsalis Fab. (Dipt., Sciomyzidae).—The biology and immature stages of this snail-killing fly was described in a recent paper, 1963, in *Proc. R. ent. Soc. Lond.* (*A*). **38**, by L. V. Knutson and C. O. Berg. They give an interesting range of flight periods, a short one 16th June to 4th September for central Finland and Lapland, 1st March to 6th November for central Europe and 10th April to 15th October for the more southern area of Tunisia and Algeria. For Great Britain the period is given as from 25th February to 23rd November. At Bookham Common, Surrey, a male was taken on 12th January 1947, when I was sweeping my net over dead bracken in the open area of Eastern Plain. The following year I captured a female in an area of *Juncus* of a pond close to this plain on 8th February. It is possible that the species overwinters as an adult in this country for a female was caught on 10th November 1946, during one of the regular monthly visits, two months before the January capture in 1947. No capture was made on the monthly visit in December 1946 as it coincided with a period of rain preventing collecting by sweeping and the visit was abandoned. The more equable climate of this country may account for the longer flight periods but it must also be borne in mind that records of occurrence also depend on the coincidence of the presence of insect and observer.—L. Parmenter.

Willow Warbler, Phylloscopus trochilus L. fly-catching.—The leafless branches of a sallow, *Salix atrocinerea* Brot. permitted an excellent

close view of a willow warbler that had attracted my attention with its beak snapping. It was watched for several minutes on Hayes Common, Kent, as it made darting flights amongst the twigs capturing two species of diptera--*Dasyphora cyanella* Mg. and *Egle muscaria* F. These flies with a few *Egle parva* R.D., 3 or 4 *Bombus terrestris* L. queens, several honey bees *Apis mellifera* L. and two Peacock butterflies *Nymphalis io* L. were visiting the male catkins of the sallow to-day 17th April.—L. PARMENTER.

THE BRITISH RANGE OF TRICHIUS FASCIATUS L.: A CORRECTION AND A WARNING.—From one or two statements in the pages of the *Record* over the past few years, it seems there are some misconceptions current about the distribution in our Islands of this handsome chafer. To begin with the least serious, Mr. Byerley (1961: 262) appears to regard it as very local and seldom noticed in the Scottish Highlands, remarking "This beetle may be more widespread than we think. Is it the recorders that are rare?" The answer is largely supplied by Commander Harper when he writes of it (1962:57) ". . . always quite common in various parts of the Highlands of Scotland"—a fact of which coleopterists have long been aware. Fowler, the standard authority, wrote as long ago as 1890 (*Col. Brit. Isl.*, **4**: 61) "Scotland, local, Highlands, Tay, Dee and Moray districts". Still, I think there is something in Mr. Byerley's suggestion, inasmuch as it is likely that many collectors have not troubled to give definite localities or even to report it at all; at least it is true that records from outside the favourite collecting areas of Aviemore, Rannoch, etc., are relatively few, and, like Mr. Byerley's, welcome.

Mr. Burton (1961: 222), in taking his cue from Linssen's book, has been unfortuate—having stumbled into one of the pitfalls with which that highly unequal and unreliable work is, alas, so liberally strewn. He is probably far from being the only one to have been thus led astray. I avail myself of this opportunity, therefore, to issue a warning against accepting as 'gospel' any statement made in it—*but above all, any relating to distribution, incidence, etc.*—without an independent check (cf. my review, 1960, *Ent. Rec.*, **72**: 39-40). In the present case the author has perpetrated an extraordinary mish-mash, having for some unaccountable reason jumbled up the distribution of *Trichius* with that of a wholly unrelated species. That this is so emerges clearly from what he writes. Consider the following statements (*Beetles of the British Isles*, **2**: 126):— ". . . occurs especially on *Thymus serpyllum* (Wild Thyme) . . . Its distribution is North Wales and very local . . . It is mostly found on Snowdon. Entomologists should consider it as being a 'protected' species". No coleopterist—asked to guess what species was the subject of this quotation—would think for a moment of *T. fasciatus*, to which not a single item of it will properly apply; but there is one beetle, and one only, that he would instantly recognize as filling the bill, namely *Chrysomela* (or *Chrysolina*) *cerealis* L.! The true distribution of *Trichius* is squeezed, as it were, into a mere afterthought of a concessive clause: "though it has been recorded from the south of Wales and Scotland"! Further comment would, I trust, be superfluous.

The Editorial note following Mr. Burton's has fared somewhat better, but even here there is a statement calling for emendation, viz., that "this species has its main stands *in the extreme south-west of England* and in the Inverness-shire mountains . . ." (my italics). Here the writer may have

been misled by Joy who in his *Handbook* (1932: 255) gives 'Devon', besides Scotland and S. Wales. However, the sole basis for this datum appears to be an old and perhaps questionable record for Exeter by Leach, going back probably something like a century and a half—scarcely a firm foundation, it will be admitted, for a belief that the insect is a settled inhabitant of S. W. England at the present time. In fact there is but one English county for which a few undoubted records (all recent) exist, and that is Herefordshire. Otherwise, apart from Scotland, it seems purely a Welsh species; and the records, though few, suggest that it probably occurs from Monmouth (where I have taken it) and Swansea, to Merioneth. In Wales, its headquarters are, however, decidedly in the south and mid-east. It will very likely be found to occur in Shropshire. This is one of a few species with a characteristic distribution which may be called Caledonian-Cambrian, and is paralleled remarkably closely in its range by the Pyrochroid *Schizotus pectinicornis* L., in Britain found only in the Scottish Highlands, east and perhaps central Wales, and Herefordshire (the Black Mountains). Such species appear to be absent not only from the south-west—unlike many 'northerners'—but also from N. England, S. Scotland, and Ireland. Most of the more recent records of *T. fasciatus* are assembled by M. W. Shaw (1961, *Ent. mon. Mag.*, 97: 209).—A. A. Allen, 63 Blackheath Park, S.E.3. 2.ii.64.

A Postscript on Emus hirtus L.—I thank Mr. Huggins for his additional Essex record of this rare beetle (Southend district—*Ent. Rec.*, **74**: 279) and Mr. Brown for his interesting article on its early history in Britain (*ibid.*, **75**: 87-8). Since I wrote on the subject, a few further data have come to hand which it will be as well to add to those already given.

The easternmost locality in Kent I mentioned previously, from which it had been recorded, was Faversham. At that time I had forgotten—what was later recalled through casual conversation with Mr. Chalmers-Hunt—that a specimen had been taken some years ago in the Canterbury district by Mr. John Parry. I have no further details of this find, but it is notable, being the most easterly to date that I have heard of in the county.

Mr. R. L. E. Ford has been remarkably lucky in coming across chance specimens of *Emus*, and I am obliged to him for telling me of his captures, which, I understand, were picked up at large, rather than in the proper habitat. The most interesting was at Pevensey Bay, Sussex, several years back, as it provides a new county record. The others were at Faversham Creek (I believe the third or fourth from that neighbourhood in fairly recent times), and at Funton, near Cliffe, a few years ago. This locality is on the south bank of the Thames almost opposite Benfleet and Canvey Island, and the curious thing is not that the insect occasionally strays across the river but that it does not seem to establish itself anywhere on the north side, though conditions appear quite suitable. In view of these and other odd captures sometimes vaguely heard of, there is hope that *E. hirtus* may be holding its own in North Kent; but it now has fresh hazards to contend with in the form of chemicals which, I am told, are applied to pastures in spring to improve the new growth, and might be expected to affect adversely the early stages of the beetle and its prey —both living in the soil. So much for 'progress'!

It is just possible that there may have been, or even still be, a permanent colony in the vicinity of Guildford in Surrey, whence J. F. Stephens had specimens (*vide* Brown, *l.c.*: 88). At any rate, it is interesting to note that there was an example from the same district in the collection of the late R. W. Lloyd, now at Manchester; the exact locality is Merrow, but I do not know the date or captor, or whether others occurred there. Perhaps—and one would think more probably—it is mere coincidence. On the other hand it is possible, as I pointed out earlier, for *Emus* to remain very highly localized even during periods of relative abundance, so that, if present in only small numbers, it could presumably pass almost unnoticed in a locality for many years.—A. A. ALLEN, 63 Blackheath Park, S.E. 3. 2.ii.64.

Current Literature

Index Literaturae entomologicae. Series II, by Dr. Walter Derksen and Dr. Ursula Scheiding: Berlin. 1963.

This series follows Series I by Dr. Walther Horn and Dr. Sigmund Schenkling, which covered entomological literature up to 1863, and deals with world literature on entomology from 1864 until 1900.

The present series will contain some 90,000 references classified under the authors' names, which are classified alphabetically, where possible including a short biographical note on the author and references to obituary notices. The titles are as published without any attempt at translation, so present no difficulties; the short introduction and the biographical notes are in the German language.

It is obvious that a very considerable amount of care has gone into the compilation.

The first volume covers A to E, and one would expect the work to be completed in five or six such volumes. The index will be of the greatest assistance to research workers and should find a place in the libraries of all entomological establishments throughout the world. The volumes are bound in grey buckram covered boards.

S. N. A. JACOBS.

Dissection of the Locust. By Joan G. Thomas. 9″ × 7″, 72 pp., 55 diagrams. H. F. & G. Witherby Ltd., London. Price 8/6.

Intended for sixth forms in schools and undergraduate students, this work deals adequately with the dissection of the locust.

Short chapters deal with the life history, breeding, preservation of specimens and the external features. The internal structure is covered in more detail each system or organ being described before the instructions for dissection. Practical instructions are in italics so that they can easily be picked out during the work.

The Appendix gives hints on the preparation of permanent mounts, a number of observations which can be made on living specimens and books recommended for further reading.

A. E. GARDNER.

The Natural History of Flies. Harold Oldroyd. 9½″×6½″. Pp. xiv, 324, 32 half-tone plates (of 55 photos.), 40 line drawings. Weidenfeld & Nicolson. London, 1964. Price £2 10/-.

The author, for many years Editor of the Royal Entomological Society, a systematist of the Entomology Department of the British Museum (Natural History), has a world wide reputation already based on his systematic studies and varied publications. He has taken full advantage of his access to literature and collections in the production of a work dealing with the diptera of the whole world. But the book is no mere compilation for the author contributes items based on field work in several countries as well as from his museum studies. Avoiding duplication of other standard works he has refrained from a systematic account and biological matters except as they illustrate his chosen theme—"an impressionist account of flies in evolution". With species already more than 80,000 to choose from, his task of selection was great. The introductory part is comprised of chapters on "the pattern of flies" and their life history. Then follows Part 2 broken into chapters devoted to the hundred or so families of flies in groups under titles such as water-midges, horse flies, compost- and dung-flies. The great variety of habits of larva and adult found in these families are described and compared, illustrating the several lines of evolution of habit and adapted structure taken by flies, and their future trend. In Part 3 the impact of flies on man and the swarming of flies, are discussed in detail with a chapter in conclusion on "the past, present and future of flies" that contains doubts on the result of insecticides on animals other than diptera, including man. A page or so on "Further Reading about Flies" leads to the bibliography of 331 items and the final comprehensive index of 24 pages.

The book is very readable and with few exceptions reference to further reading is adequately made. Readers may not find their own choice of interesting accounts of habits selected, may wish for more expansion on their own favourite families or topics, but in all it is a very satisfactory, instructive and entertaining product. The line drawings are mostly by Arthur Smith and of his usual excellence and those of Boris Jobling and the author are of the highest quality. The plates suffer in comparison, for the detail is often none too clear and at times the photograph is over magnified. Those taken by the author himself are good. The absence of specific names in some instances is regretted as is the siting of a page devoted to figures of wingless flies, an empid *Apterodromia evansi* and an ephydrid *Anomalopteryx maritima*, and the page is headed "Mosquitoes"! Further, the appearance of "eg" and "ie" without the customary full stops, is surprising.

The volume is the first of a new series edited by R. Carrington entitled "The World Naturalist". It will be widely read and should greatly increase the interest in flies, the insects that have such fascinating habits especially as so many diptera play an important part in human lives. The coloured photograph of the Trypetid *Dacus oleae* on the jacket must attract attention and cause the purchaser to retain this cover. It would have made an excellent frontispiece. L. P.

Current Notes

A New Aberration of Procris Statices L. (the Forester).—In *Opuscula Entomologica*, xxviii: 3 (Lund, 1963) at page 225 J. Landin gives (with illustration) an account of a hitherto unrecorded aberration of this moth, taken in S.E. Scania in 1963.

"In the summer of 1963", he writes, "I succeeded in catching two specimens (♂ and ♀) of a *Procris* species so peculiarly coloured that I failed to identify them at once. The problem was not solved until the examination of the male genitalia could be performed. Then it was verified that the specimens must belong to *P. statices*.

"The main colour appearance is . . . . reddish. As a matter of fact it looks mostly like a *Zygaena*, apart from the hind wings which are entirely greyish. The body is black and red, the underside of the thorax in the female with a greenish tint. The forewings are entirely reddish (♂), or red with basal green spots (♀). The grey hindwings are darker than in the ordinary *statices;* on the whole the aberration is much duller, lacking the bright metallic shine in typical specimens of the species.

"The collecting was made in Löderup in S.E. Scania on 27th July in an arid meadowland. *P. statices* used to be common at this locality, but I have never seen the aberration there before. I got the two specimens in one and the same net-sweep".

Landin goes on to remark that although the scientific names of infrasubspecific categories are excluded from the nomenclatorial provisions governing the species-group names (Art. 45 of the International Code, 1961) it might be justifiable to give this extremely aberrant form a name. "This is particularly important because the *two* specimens, representing the two sexes, indicate the possible existence of an aberrant population in the area". For this reddish aberration he suggests the name *Procris statices* L. ab. *rufescens* (ab. nov.).

Both specimens are now in the Entomological Museum at the Zoological Institute of Lund.

It would be interesting to know if any Zygaenids occur in the same place.

Chazara (Satyrus) Briseis L. in Sweden.—In *Opuscula Entomologica* xxviii: 3 (Lund, 1963) at page 223, H. Andrén records the capture of a specimen of this butterfly at Löderup in S.E. Scania on 13th July 1963. This appears to be the first record of this Satyrid butterfly north of the Baltic. Löderup is about 2 or 3 miles from the coast, opposite the island of Bornholm. *C. Briseis* is not included in Hoffmeyer and Knudsen's *De Danske Storsommerfugle*, 1938, so it seems unlikely this specimen came from Denmark. The shortest sea route from Pomerania to Löderup would be about 75 miles; if viâ Bornholm, about 60 miles. We can find no mention of *C. briseis* in the Baltic coastlands and indeed one usually associates this insect with stony and rocky places at some elevation.

Wild Life Tape Recording Competition.—The B.B.C. and the Council for Nature are sponsoring a competition for recordings of natural sounds of British wild life. There will be five classes:

1, Individual Bird Species; 2, Individual Mammal Species; 3, Individual Insect Species; 4, Individual Amphibian Species; 5, Atmosphere (environmental recordings).

There will be prizes of 25 guineas for the best entry in each class and 10 guineas for the runner-up. Entries must be received by the B.B.C. Natural History Unit by 1st September, 1964.

Full information about the conditions for the competition can be obtained from the B.B.C. Natural History Unit, Whiteladies Road, Bristol 8, or from the Council for Nature.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

COMMENTS ON THE SUPPOSED OCCURRENCE IN SCOTLAND OF *EREBIA LIGEA* (LINNAEUS) (LEPIDOPTERA, SATYRIDAE). E. C. PELHAM-CLINTON 121

A CONTINENTAL HOLIDAY, 1963. DR. NEVILLE L. BIRKETT 126

NEW SYNONYMY IN THE GENUS *ZYGAENA* FABRICIUS (LEPIDOPTERA: ZYGAENIDAE). HUGO REISS and W. GERALD TREMEWAN 129

ORTHOPTERA NOTES FROM S.W. BRITAIN, 1963. J. F. BURTON, F.R.E.S., F.Z.S. 136

ANT RECORDS AND OBSERVATIONS. K. E. J. BARRETT 139

NOTES AND OBSERVATIONS 142

CURRENT LITERATURE 146

CURRENT NOTES 147

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (165)

TO OUR CONTRIBUTORS

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Collecting *Zygaena* Fabricius (Lep., Zygaenidae) in Scotland in 1963

By W. G. Tremewan and W. B. L. Manley

For some considerable time we had both wanted to visit Scotland to collect some of the Scottish subspecies of the genus *Zygaena* Fabricius, but it was not until 1963 that the opportunity arose. After reading various collecting accounts and studying maps of Scotland, we decided to visit the Isle of Skye. Due to the near arctic conditions that prevailed while making our plans, we assumed that the season would be a late one. We were particularly anxious to obtain a series of the recently discovered *Z. lonicerae jocelynae* Tremewan. This subspecies was described from a series of specimens bred from cocoons collected by Mr. R. F. Bretherton in 1961 on the Isle of Skye (Tremewan, 1962: 10). We also wanted specimens of *Z. purpuralis caledonensis* Reiss and *Z. filipendulae* Linné from Skye. As these normally appear towards the end of June in Scotland, we decided to try for these species and hoped to obtain *lonicerae jocelynae* by collecting the cocoons as Mr. Bretherton had done. We therefore decided to leave for Skye on 20th June.

Our party consisted of the two authors and the wife and son of W. G. T. We left Byfleet, Surrey, at 5 a.m. on 20th June and, having lunched on arrival in Scotland, arrived at 7 p.m. that evening at Glencoe, where we spent the night. The weather during our journey north was atrocious, with torrential rain and showers, so we feared that any insects that might have emerged would be badly damaged. Leaving Glencoe at 9 a.m. on the morning of the 21st, we arrived early in the afternoon at Kinloch Farm, Isle of Skye, which was to be our headquarters for the next five days. Although the weather was still poor, occasional glimpses of the sun between the showers raised our hopes. However, we were rather worried as to the possibility of our having arrived too early in the season as, during our journey through Glencoe, patches of snow were still to be seen on the north-facing slopes of the mountains. We were somewhat encouraged with the news from our hosts that, although there had been severe and prolonged frost on Skye, no snow had fallen there during the winter. Later that afternoon we explored the coastal area near Kinloch but found no sign of *Zygaena*.

On the morning of the 22nd the weather had improved and, in spite of a cool breeze, the greater part of the day was warm and sunny. Driving to a remote, coastal part of the island where we knew that *lonicerae jocelynae* occurred, we soon came upon *purpuralis caledonensis* in great profusion. This species was so abundant that at times it was difficult to walk without crushing specimens under our feet. Most of them were males, with an occasional female, all in fresh condition and many, mainly females, were still emerging. The cocoons of *purpuralis* were spun low down on the ground amongst the herbage, and many were attached to rocks and stones. We were rather anxious to study the variation, if any, of *purpuralis* and our efforts were soon rewarded. In addition to a good series of typical specimens, several were taken in which the normal, carmine red of the forewing streaks and hindwings is replaced with brownish red. This aberration is more apparent when the insect is alive with folded wings than when set, when the colouration is

more translucent. A female was captured with distinct, red scaling on the underside of the last two abdominal segments. One of us (W. B. L. M.) took a perfect male in which the normal red colouration is replaced with orange-yellow. The specimen was feeding, in company with normal specimens, on a thistle-head and was easily spotted from a distance of several yards. The species was very active in the sunshine, flying and feeding on flowers, including those of *Thymus drucei* Ronn., the foodplant of the larvae. On one thistle-head, nine *purpuralis* were counted, each struggling for a place to feed.

Both sexes of *filipendulae anglicola* Tremewan were found in fresh condition. In the Isle of Skye the species is rather variable compared with populations from the south of England. The cocoons of *filipendulae* were found spun low down near the ground on grass and other stems. They were easily detected and were not concealed like those of *trifolii palustrella* Verity on the chalk downs of southern England. The cocoons of the Skye *filipendulae* are very uniform in size and are rather narrower than those of the English specimens. In colour, the cocoons are very constant and are a bright, shining yellow, showing no variation. An abundance of *Lotus corniculatus* L., the foodplant of the larvae of *filipendulae*, grows in the area.

The colonies are situated on the steep, south-facing slope of a valley and extend from the coast to about a mile inland. Both species occur from the foot of the valley to the top, at an elevation of approximately 300 ft. The area is fairly heavily grazed by sheep and cattle but this does not have any apparent effect on the abundance of either *purpuralis* or *filipendulae*.

It was not until we had actually arrived on the edge of the sea-shore, that we found cocoons of *lonicerae jocelynae*. Here, there is no grazing and the cocoons were spun fairly high up on grass stems, amongst lush herbage at the foot of the cliffs. As the tide was low, we were able to walk along under the undercliffs and, further along on the slope of the undercliff, we found more cocoons and a few larvae of *lonicerae*. Some larvae were just beginning to spin up and many others had not yet pupated within the cocoons. Available foodplants which grow in the area are *Lathyrus pratensis* L., *Trifolium pratense* L. and *Lotus corniculatus* L., but all larvae that we found were resting or feeding on *L. pratensis*.

The 23rd June proved to be a cold and wet day and, driving to another coastal spot, we found only one *filipendulae*, a freshly emerged male.

The morning of the 24th greeted us with subnormal temperatures and heavy rain and showers. However, we decided to revisit our first locality which we reached about mid-day, by which time the rain had stopped. During the afternoon we again worked the north side of the valley, concentrating our efforts in obtaining further aberrations of *purpuralis*. In this we were successful and captured further specimens of the brownish red form. One of us (W. B. L. M.) found a female in which the right forewing streaks are enlarged and suffused so that practically the whole of the forewing is red. Unfortunately, the left forewing is deformed and crippled. The specimen was *in copula* with a normal male.

The weather during the afternoon was cloudy with occasional showers and collecting was made easy by the inactivity of the insects. During dull or wet weather, *purpuralis* rested exposed but low down on flower heads and grass stems. Many were also found sheltering under fronds

of bracken (*Pteridium aquilina* (L.) Kuhn). When for a brief moment the sun appeared, the *Zygaena* species became very active. It is evident that, in such northerly localities where prolonged periods of bad weather are frequent, the insects have to take advantage of every glimpse of sunshine for feeding and pairing.

A new station was discovered for *lonicerae* when we found cocoons of this species in the more inaccessible area above the top of the slope. Here, the vegetation is more luxuriant and grazing by sheep and cattle is less evident. *Z. filipendulae* was conspicuous by its absence, both as imagos and cocoons. However, the ubiquitous *purpuralis* was found here although not so abundantly as lower down on the slope. The cocoons of *lonicerae jocelynae* are readily distinguished from those of *filipendulae*. The cocoons of the latter are situated exposed but low down, and are long and narrow in shape and bright yellow in colour. The cocoons of *lonicerae jocelynae* are situated fairly high up on grass stems but lower than those of *lonicerae transferens* Verity in the south of England. In the latter region the cocoons of *lonicerae transferens* are difficult to separate from those of *filipendulae*. The cocoons of *lonicerae jocelynae* are readily separated from those of *lonicerae transferens* in being larger and broader. Further cocoons of *lonicerae jocelynae* were found along the sea-shore. Even here, a few *purpuralis* were found resting on rocks and pebbles. It is necessary to emphasize that heavy grazing by sheep and cattle has no apparent effect on *purpuralis* or *filipendulae*, whereas the cocoons of *lonicerae* were found only above the top of the slope where grazing was not so heavy or along the sea-shore, which was inaccessible to sheep and cattle.

When we reached the shore it was late afternoon by which time it had started to rain. Rather than return to the car by the laborious route along the slope we decided to walk along the shore to the south side of the valley. However, we were unaware that we had to cross the river, described locally as "the wee burn", which, with the recent heavy rains, was almost a torrent. Our only course was to wade across and we dried out our clothes during the journey back to Kinloch.

The weather of the 25th had improved considerably, with more prolonged periods of sunshine. After visiting Portree, the capital of Skye, we drove to a further locality situated on steep, south-facing slopes above low cliffs on the north side of a loch. Here, the grass- and bracken-covered slopes were heavily grazed by sheep. There was an abundance of *Thymus drucei* and *Lotus corniculatus* which supported colonies of *purpuralis* and *filipendulae* respectively. However, neither species was so abundant here. A short series of both species was taken but very little variation was noted, except in *filipendulae*, in which the forewing spots are frequently confluent in pairs. No cocoons of *lonicerae* were found.

On 26th June, our last day on Skye, we decided to return to the first locality where all three species of *Zygaena* occurred. The weather was still very unsettled and, shortly after we commenced collecting, a heavy shower soaked us. The rest of the day was dull and cool with only occasional glimpses of the sun. We again concentrated on searching for aberrations of *purpuralis* and our efforts were well rewarded. The wife of W. G. T. captured a fairly good male of *purpuralis* in which the forewing streaks and hindwings are clear yellow. Although this aberration has been recorded once from Ireland (ssp. *hibernica* Reiss ab. *flava* Tutt)

it had previously not been taken in Scotland. Almost simultaneously, one of us (W. G. T.) captured an orange-yellow specimen which, unfortunately, is in very poor condition. A perfect male was captured with the forewing streaks suffused, so that the whole of the forewings are red with the exception of a narrow border of the ground colour around the apex and termen. This aberration is of the same form as the crippled female taken on the 24th. Further specimens of the brownish red form were taken. A not uncommon aberration was captured in which the hatchet-shaped streak (3+5) is reduced in size and constricted in the middle. This aberration was also captured on the 22nd and the 24th. The females were now more abundant and some beautiful specimens were taken with yellowish scaling in the ground colour of the forewings.

The variation of *filipendulae* was of the usual form found in this region, with the spots confluent in pairs, especially spots 5 and 6. Two extreme examples were taken with spots 5 and 6 confluent and extended in a red suffusion towards the termen.

Further cocoons of *lonicerae* were collected above the top of the slope. Here, *Lathyrus pratensis* appears to be absent, but a larger species of pea, *Lathyrus montanus* Bernh., grows abundantly. A larva of *lonicerae* was actually seen feeding on this plant a few weeks earlier by Dr. M. Harper (*in litt.*). In addition to *L. montanus*, *Lotus corniculatus* and *Trifolium repens* L. grow in the area and one larva of *lonicerae* was found feeding on the latter plant (*T. repens*).

We left the Isle of Skye early on the morning of 27th June and made our way to Braemar, via Spean Bridge, Aviemore and Grantown-on-Spey. We had hoped to call on Cmdr. Harper at Newtonmore but, unfortunately, he was collectiing in North Wales at the time. On route to Braemar we were often in the clouds in the Tomintoul area and our hopes of seeing *Erebia epiphron* Knock and *Coenonympha tullia* Müller soon disappeared. The nearer we approached Braemar the more the weather deteriorated and we finally reached our destination in the late afternoon in a thick drizzle.

On the morning of the 28th the weather had worsened but we decided to look for *Z. exulans subochracea* White, the object of our visit to Braemar. We drove up the mountain to about 1500 ft. when we began to enter the cloud layer. A bitterly cold, northerly gale, with rain and drizzle, forced us to abandon our search for *exulans*. In Scotland, the species flies between 2000 ft. and 3000 ft. and at the time of our visit the whole of the area was enveloped in cloud. We had allowed two days for collecting at Braemar but, as the weather showed no signs of improving, we departed on the 29th, reaching Byfleet early in the afternoon of 30th June, having broken our journey overnight at Boroughbridge, Yorkshire. We considered that our complete failure at Braemar had been compensated for by the remarkably good collecting that we had experienced on Skye, in spite of indifferent weather conditions.

A more detailed analysis of the specimens captured or bred is given below.

Z. purpuralis caledonensis Reiss

Z. purpuralis caledonensis Reiss, 1931, Int. ent. Z., **25**: 341.

The specimens of *purpuralis* from the Isle of Skye differ little from those from Oban, Argyllshire, the type locality of ssp. *caledonensis* Reiss. As noted above, the variation is remarkable, but such variation may not

necessarily be confined to Skye and may have been overlooked in other Scottish localities where the species occurs. The orange and the yellow forms have not previously been recorded from Scotland and this also applies to the other aberrations. The brownish red aberration, which was not uncommon, is of great interest. The two aberrations with the forewings suffused with red are probably the result of exposure of the larvae or pupae to extreme temperatures.

Z. filipendulae anglicola Tremewan

Z. filipendulae anglicola Tremewan, 1960, Ent. Gaz., **11**: 189.

The populations from the Isle of Skye are quite distinct but are best referred to ssp. *anglicola* Tremewan. The chief characteristics of the Skye populations, and also of those from the other islands of the Inner and Outer Hebrides excepting the Isle of Berneray, are the rather hairy thorax and abdomen and the frequent confluence of the forewing spots into pairs, especially spots 5 and 6. This variation has already been noted by Heslop-Harrison (1940: 135; 1945: 25). The populations of the Inner and Outer Hebrides may prove to be a subspecies distinct from ssp. *anglicola* but, before separating them, it is necessary to compare them with large series of specimens from the mainland of West Scotland.

Z. lonicerae jocelynae Tremewan

Z. lonicerae jocelynae Tremewan, 1962, Ent. Gaz., **13**: 10.

From the cocoons that were collected, we bred a series of over one hundred specimens of *lonicerae jocelynae* Tremewan. The rather hairy thorax and abdomen, broad forewings with rounded apexes and enlarged forewing spots, separate this subspecies from *lonicerae transferens* Verity from England. Three males and sixteen females show varying degrees of confluence, from examples with spots 2 and 4 confluent, to specimens with all the spots suffused and confluent. In the females, spots 3 and 4 are joined and are rarely separated by the ground colour. These forms are uncommon in ssp. *transferens*. Two females have the base of the hindwings tinged with orange-vermilion.

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Butterflies at Gibraltar, March 1964

By Major General Sir George Johnson, K.C.V.O.,

A ten day visit to Gibraltar in March produced some interesting butterflies, both on the Rock itself and in adjacent parts of Andalucia. A crowded and uncomfortable three hour night flight from London brought me to the Rock Hotel about 1 a.m. on 10th March. The following day was overcast with only intermittent sun, and was spent investigating the gardens and walks behind the hotel and in obtaining a permit for the military zones on the Rock from Fortress Headquarters. Three fresh *Zerinthia rumina* L., one *Gonepteryx cleopatra* L., two of the bright Spanish form of *Pararge aegeria* L., and one *Celastrina argiolus* L. were

caught. *Pieris brassicae* L., *Pieris rapae* L., and *Pyrameis atalanta* L. were seen.

On 11th March, Colonel Mackworth Praed showed me a delightful cliff path in the military zone. It faced south above Europa Point, and the cliff was covered with flowers and shrubs, particularly various sweet smelling leguminosae. Barbary partridge and the blue rock thrush were amongst the birds to be seen. Sun was weak and intermittent, but we saw several *Euchloë tagis* Hübn., and caught one. At about 11.30 a.m. we motored into Spain taking the San Roque-Ronda road. About three miles beyond San Roque, we stopped by a railway line in cork oak woodland. Thanks to the railway fence, the herbage was less grazed than usual along the line. Though sun was only fitful, a number of *Z. rumina* were flying, and a fresh series was obtained. Other butterflies noted were *Anthocaris euphenoides* Stgr., *Leptidea sinapis* L., *Colias croceus* Fourc., and *Callophrys rubi* L.

The next three days were overcast and wet, but 15th March was lovely, sun all day, though rather windy in the afternoon. A visit to the cliff path previously described (known as the Mediterranean steps) produced six *E. tagis* and one or two *Z. rumina* and *A. euphenoides*. *E. tagis*, as usual, flew very fast and erratically on the steep ground, and could not be followed. The only procedure possible was to select a likely corner and to stand and wait, taking a wild shot whenever the insect came within range, perhaps about once every ten minutes; as many were missed as caught. In the afternoon we joined Colonel Mackworth Praed, who was staying near San Roque. His hostess allowed us to collect in her almond orchard on a north facing slope. Despite a strong wind, *Thestor ballus* Fab. was flying over the short turf and we obtained a series. A large, white *Astragalus* was growing here in clumps, and round them flew *Tarucus telicanus* Lang. and a few *Cosmolyce boeticus* L., The only *Papilio machaon* L. we saw on our trip was on this ground.

On 16th March I made an expedition to the sandhills west of Tarifa. Here amongst white broom, a few of the small Andalucian form of *Polyommatus icarus* Rott. were flying with a few *T. ballus*.

17th March was a day of rather thin sun but a morning visit to the Mediterranean Steps produced three *E. tagis* and one *Aricia agestis* Schiff.

On 18th March we visited Castellar de la Frontera, a hill top village 27 kilometres from La Linea off the Ronda road. The tiny, winding cobbled streets and outer walls were clearly unchanged since mediaeval days, and many lesser kestrels were breeding in the towers and walls. On the way down, as the road to the north-east entered the cork oak zone, some fast flying "whites" were seen. A stop for one hour produced a nice series of *Euchloë ausonia* Hübn. and a few of the spring brood of *Euchloë belemia* Esp.

So ended a pleasant trip; a list of the butterflies noted follows:— *Papilio machaon* L., *Zerinthia rumina* L., *Pieris brassicae* L., *Pieris rapae* L., *Euchloë ausonia* Hübn., *Euchloë belemia* Esp., *Euchloë tagis* Hübn., *Anthocaris cardamines* L., *Anthocaris euphenoides* Stgr., *Leptidea sinapis* L., *Colias croceus* Fourc., *Gonepteryx rhamni* L., *Gonepteryx cleopatra* L., *Pyrameis atalanta* L., *Pararge megera* L., *Pararge aegeria* L., *Callophrys rubi* L., *Thestor ballus* Fabr., *Cosmolyce boeticus* L., *Taracus telicanus* Lang., *Aricia agestis* Schiff., *Polyommatus icarus* Rott., *Celastrina argiolus* L.

Castlesteads, Brampton, Cumberland. 28.iii.1964.

Melanism in Lepidoptera in the West of Ireland

By H. C. Huggins, F.R.E.S.

It is now fifty years since my first collecting trip to Ireland, which was in late April and May of 1914, and since then I have made in all 24 visits. I should probably have gone more often had it not been for the "troubles" and the second world war.

Not all my time there was devoted to lepidoptera, I put in quite a lot of trout fishing, and my first five trips were mainly concerned with land and freshwater shells, especially the curious races of *Lymnaea pereger* Müll. found in the mountain lakes of west Cork and Kerry. As a result of my collecting *Lymnaea involuta* Thompson was reduced to subspecific rank, and *L. praetenuis* Bowell washed out altogether.

Communications in my first days were either difficult or non-existent. To get to Glengarriff it was necessary to take the now defunct Cork, Bandon and Bantry railway and then wait at Bantry for the boat, which only sailed twice a week. When my wife and I spent our honeymoon at Glengarriff in 1919 we hired a side car and drove the eighteen miles from Bantry. A side-car is what tourists, guides and romantic authors call a "jaunting car". I never heard the word used in Ireland until after the second world war, though it may have been at Killarney, which was early devoted to such rubbish as bog-oak, post cards of angels and the lakes printed in Germany and the Colleen Bawn (invented by Dion Boucicault circa 1850).

On 10th May, 1914, I took the first recorded Irish specimen of *Eupithecia pulchellata* sub-sp., *hebudium* Sheldon, which whetted my interest in the Irish melanics. I have the insect still and it is identical with Sheldon's Scottish type in the B.M. Since then I have kept records and specimens of most of the melanic western forms, and have tried at times to produce theories about them, but have always given up in despair. Nature is rather a sorry jade; just as you seem to have mastered the cause of some phenomenon, she gets behind you and treats you as More of More Hall did the Dragon of Wantley.

My first difficulty is the utter inconsistency of species, several of which are extremely light in the west. *Hadena conspersa* Esp., which has black forms in the Shetlands, and even on the silver sand at Tresco is slightly suffused with buff when fresh, is at Dingle as clear a black and white as on the Kentish downs or at Dungeness.

Eupithecia castigata Hübn. is represented at Dingle by a whitish insect with black bands: I took this to the B.M. to be confirmed, and even Mr. Fletcher was doubtful until he had examined the genitalia. As I have only taken two, so far, I have not sufficient material to tell whether it is a sub-species or an aberration of which I have missed catching the typical form.

Cleora repandata L. is, at Dingle, the lightest I have ever seen. I have taken beautiful dove-grey forms at Glengarriff, but these are there mixed with heavily speckled ones, but at Dingle the majority are whitish grey with a few dark lines. Unfortunately all these forms change from grey to dirty brown after a few years in the cabinet.

Polia nebulosa Hufn. The whitest I have ever seen come from Glengarriff and Dingle.

I will not multiply examples, of which I could give others, but it is

disconcerting when insects much paler than usual turn up with the melanics.

My second difficulty is the utility of melanism in these coastal insects. Apart from cryptic reasons, Dr. Kettlewell has suggeted that in these misty and rainy areas, a black insect can absorb sunlight more readily than a light one. His arguments with painted coins, etc., are quite convincing, but I cannot understand how an insect can be benefited by sunlight to which it is seldom, or never exposed.

I have done little collecting with a light in Ireland and made most of my captures by hard searching yet I have never seen *Hadena lepida* ssp. *capsophila* Dup. or *H. caesia* Borkh., both of which are markedly melanic, at rest on a rock although I have found plenty of *H. nana* Hufn., whilst looking for them. This is the more remarkable as *capsophila* is one of the commonest insects where it occurs, as I have often found the light *lepida* Esp. on fences and posts in Kent. Although I have netted both species at dusk over flowers, I have never heard of anyone finding *capsophila* at rest naturally, and the only *caesia* that I know was so found was one by P. H. Grierson on the cliffs of Moher, Co. Clare. Grierson, who was in the Irish Land Survey, was, like R. A. Phillips, primarily a botanist and conchologist, and was no doubt peering for snails when he found it. It may be remembered that he was the first to find the glass snail *Vitrina pyrenaica* Fér. in the British Isles at Collon, Co. Louth; when first found, it was described as a new species by the late J. W. Taylor as *V. hibernica*.

In 1915 Grierson, Phillips and myself had a discussion on Irish melanics and other subjects at Galway, and these two acute observers both said how seldom you found melanic insects when snail-hunting. I remember the occasion particularly as we did not knock off until 1 a.m. and my boat left for the Arran Islands at 5.30!

I have mentioned these two Hadenas particularly as their coloration is uniformly dark, whereas in most others the darker specimens are mixed with more typical. Even here, however, insects are seldom seen at all unless disturbed, or attracted to M.V. light, and I think are mostly hidden by day.

I will now give a few notes on the dark forms I have seen, in the hope they will help others in forming conclusions.

Cryphia muralis Forster. I have only seen this moth, on which I specialise in Ireland, at Dingle in the far west. It is rare there and runs from pale grey through green, to black (ab. *nigra* Huggins). In thirty days hunting, mostly in company with my wife, who was quite as good as I was, I have seen 70 examples, of which four were ab. *nigra* and five of a greenish black form which might fairly be called melanic. These melanics were sitting on walls in company with the lighter specimens. I have never seen a melanic *muralis* in Cork, where it is locally common, or elsewhere.

Hadena caesia Borkh. The so-called black *caesia*, which is dark iron grey with still darker areas, appears to be the only form found in west Cork and Kerry. I have it from Adrigole, Slea Head and the Blaskets, and I also bred two of this kind amongst a long series of the blue-grey ones from the Burren.

Hadena cucubali Fuessl. Kane mentions a specimen from the Blaskets of a blackish ground colour with only the faintest trace of purple. I have bred a number from Adrigole (my locality there was a large rock, cut off, except at low tide, and covered with spray in every wind) and also

Inishvickilaun in the Blaskets, and all were exactly similar to my Kentish ones, or those found on ragged robin on inland bogs in Ireland.

H. lepida ssp. *capsophila* Dup. The melanic ab. *confusa* Tutt is the only form from Seven Heads in Cork, to Dingle. When fresh it may fairly be called black, but turns brownish black after a few years. I have also bred ab. *obsoleta* Richardson, in which the lighter markings are almost entirely gone, from Adrigole, Slea Head, and the Blaskets. Curiously enough I bred four or five from Adrigole which are as light grey as any Howth ones, but these were a very small percentage as from 1948-50 I bred over 100, as all my friends wanted black ones and the larva was very common at Adrigole.

Eumichtis adusta Esp. All Dingle specimens are deep blackish-brown, the lighter brown and marbled forms which predominate in England are absent.

Apamea monoglypha Hufn. The very dark brown, almost black, forms are found all round the coast of west Cork and Kerry from Glengarriff to Dingle in varying proportions. At Glengarriff I should estimate them at 5%; at Dingle at 25%. The Dingle ones are darker than any I have seen from Scotland or elsewhere.

Caradrina taraxaci Hübn. At Dingle 25% of this moth are deep brownish black. Mr. E. S. A. Baynes has informed me that this form is the commoner one in some parts of the Burren. As the moth is most obscure in habits (I have never seen one in the day time) the value of its melanism in Western Ireland appears somewhat problematical.

Euphyia bilineata L. This is another Irish insect on which I have specialised; it is also the most puzzling. On most of the sea cliffs and beaches of west Cork and Kerry it varies little, yet on a thirty mile range from Dingle to Dursey, occasional cliffs have a profuse range of variation from slightly striped and banded forms to *hibernica* Prout and very rare extremes such as almost uniform blackish brown near to *isolata* Kane and *ethelae* Huggins, the blackish brown form with a few white hair lines on the forewings. My two specimens of this were taken in localities thirty miles apart and at an interval of eight years. In these mainland cliffs, where it does vary 90% of the moths are ordinary yellow, or nearly so; the variations only exist in gullies on the cliff face, and in some gullies a small percentage of *hibernica* and its allied forms is found, whilst in exactly similar ones a few hundred yards away, all specimens are yellow. A peculiarity of these *hibernica* forms is that they in some cases inhabit caves and others live in the rough grass, ragwort, and occasional brambles growing on the rock surface, and that those inhabiting caves are in all cases accompanied by typical ones, whilst the darkest may lurk in a tuft of grass. The original ab. *ethelae* taken by my wife was dislodged by me from a mass of grass and brambles twenty feet below the top of a cliff and flew to the top where she was standing, and was boxed by her from a rock on which it alighted. I have never seen any of these extreme forms except where the cliff is periodically drenched with spray in rough weather. Finally there is the most extreme form *isolata* Kane. This so far has only been found on Tearaght and Inishvickilaun in the Blaskets. Kane's specimens were all taken on Tearaght, and I know nothing further about them except that they were the only kind found on the island and that he took a number of females. They are now, after over sixty years, of a blackish brown colour. On Inishvickilaun I have seen 18 specimens, of which seventeen were males and one a female. Of these I obtained eight,

all males, whilst in 1953 Mr. J. E. Flynn in a week on the island took two males and a female (most of his time was spent bird-ringing). *Isolata*, when fresh, has a remarkable jetty sheen, which goes off in a year or so; I have seen no comparable specimens on the mainland. It is the only *bilineata* found on the island, and quite different in habits from those on the mainland cliffs. It appears to live only in clefts and caves on the sea face, I have never disturbed one from grass, thrift, or sea campion. When Mr. Baynes and I first visited the island in 1960 we worked all over it, beating bracken, stone walls, a nettle bed, and brambles, and saw nothing except the single specimen we dislodged from the cliff face. It would appear that shortly after emergence it makes its way into these caves and clefts, and also that the female is very sluggish and difficult to dislodge by day. The only one I saw went into a narrow cleft and did not come out; she probably flies at dusk as Mr. Flynn caught one during his stay. I imagine Kane, who visited Tearaght in his yacht, worked for the females in the evening. On a day trip to Inishvickilaun it is not safe to stay after mid-afternoon owing to the danger of fog and navigation amongst the rocks and races of the journey. The females on the mainland cliffs are as easy to dislodge as the males. It seems that *isolata* differs not only in being a homogeneous population, but also in habits from all other *bilineata*.

Eupithecia pulchellata ssp. *hebudium* Sheldon. This subspecies, which totally lacks the pale brick-red of typical *pulchellata*, appears to be the only coastal form from Glengarriff to Dingle; I have it from Glengarriff, Adrigole, and Dingle, and Mr. Baynes has it from Valentia. It penetrates at least three miles inland, but as Donovan knew nothing of it until I told him of my original Glengarriff specimen, I infer it is not found in his collecting grounds in east Cork or Killarney. In the long series I bred from Glengarriff, one or two have a slightly brownish suffusion; my Dingle ones are the most extreme, clean black and white.

Eupithecia venosata Fab. All specimens I have bred from Inishvickilaun are the ssp. *plumbea* Huggins, a very deep leaden insect. I recently showed some to Mr. Fletcher at the B.M. and he could find none like them in the collections there. They are far more extreme than any Shetland or Orkney ones. I have a few pupae from the mainland and it will be interesting to see if they are also *plumbea*, or like Donovan's smoky ones from Cork.

Cnephasia conspersana Doug. I bred a few of this moth from sea campion gathered on Inishvickilaun, but as I did not open the bags for several days, all were spoilt except one male and one female. The male is exactly like a small Scottish *octomaculana* Haw., the female plain shining black, quite a different colour from the blackish form of *chrysanthemana* Dup. The ruined insects were the same colour. This is another interesting case as the males on the cliffs opposite at Slea Head are uniform pale grey. The identity of these has been checked at the B.M.

As I intend visiting the west shortly, I had thought of postponing these notes until the Slea Head *venosata* had emerged and until after I had returned, but thought I might celebrate my jubilee with them. Also readers can guess my other reason; anno domini.

Notes on the Microlepidoptera

By H. C. Huggins, F.R.E.S.

Platytes alpinellus Hübn. Mr. Allen's note on this Crambid (antea 116)

is very interesting. On the night of 8-9th July 1957 a perfect male came to my mercury vapour light in the garden here at Westcliff and in recording this (*Entomologist*, **90**: 269) I pointed out that the nearest known localities were Sandwich Bay and Aldebrough and that it was new to Essex and appeared to be a migrant. I have, of course, no knowledge as to the localities where other specimens were captured last year, but, at any rate until 1932, the moth was common on the golf course at Sandwich Bay, so a local migration thence seems to me at least as likely as one from abroad.

Cnephasia conspersana Dougl. The confirmation of my Blasket insects as this moth once more draws my attention to its protean character. In my Blasket specimens, the male was pale grey with almost black markings as in *C. octomaculana* Haw. and the female shining leaden black. On the Kerry coast it is pale grey with a few dots, and in the Scillies the markings are much heavier. On the Dorset coast it is heavily spotted, and at St. Margaret's Bay it was a chalky white insect (see Barrett, **10**: 262). This chalky form, however, was really very scarce; of about thirty specimens submitted to Pierce, only one was *conspersana*, the rest being a white or pale chalky grey form of *octomaculana*. The curious form found on the salt marshes of the Thames estuary (see Tutt's Practical Hints, **1**: 39) which Tutt said had not been reported on, was also sent by me to Pierce, and proved to be *S. pascuana* Hübn.

Lobesia euphorbiana Freyer. I was sorry my friends Chalmers-Hunt and Wakely had no luck with this moth at the Warren. I turned it up commonly there in 1925 and passed on the locality to my friend Ford. It fed on wood spurge and was double brooded; possibly in a late year like 1963 they were between the broods.

Collecting in Elba
Charaxes jasius L. and other Species

By J. A. C. Greenwood, O.B.E., F.R.E.S.

Most islands are attractive, particularly if they are small enough to allow a visitor to see a large proportion in a short stay. If, in addition, the weather is excellent, the scenery superb, and the visitors concentrated in a few resorts, the prospects for a pleasant holiday are promising. Elba also provided the final ingredient, a numerous and interesting population of butterflies and moths.

We arrived on the island on the 27th August 1963 and left on the 16th September. We flew from London to Pisa, paused there for three days to see the Leaning Tower and the other spectacular buildings in this interesting city, and then travelled southwards by train for a couple of hours to the port of Piombino, which is ten miles west of the main Rome-Genoa railway to which it is joined by a branch line.

From Piombino there is a regular service of ferry steamers, modern vessels carrying up to 1,500 passengers and 40 or 50 cars on each trip across the six miles or so of sea dividing Elba from the mainland. We landed at Portoferraio, the capital of the island with a population of 11,000. The hotel car met us at the ferry terminal and took us six miles westwards to the bay of Procchio, where we were to stay.

Elba has a coast-line of 90 miles, but an area of only 62 square miles. Our base was roughly in the middle of the north coast; at this point the island is just three miles wide. This North/South axis through a fertile plain is highly cultivated, largely with vines. On either side the hills rise sharply and from them the islands of Pianosa and Montecristo are visible on a clear day. Almost the whole island is mountainous, the highest point being Monte Capanne, some 3,400 feet, a great mass of granite which, perhaps because of the small scale of this island, seems very much higher than it really is.

The hills are thickly covered with vegetation, including cork oaks, sweet chestnuts, olives, pines; with dense growths of heathers (sometimes six to ten feet high) and arbutus.

It would be difficult to move about on the hillsides through this tough undergrowth if there were not innumerable paths, criss-crossing in every direction and well marked on the local map. Many of these routes seem to have been cleared either as a means of access for the cork cutters to their trees or to provide short cuts from isolated farmhouses to the village or main road. In addition a considerable length of water pipeline has been laid quite recently and these cleared strips also provide a way into and over the hills.

Our hotel was modern, admirably equipped, with a private bathing beach (water temperature 70°+) and a large sea-water pool. From Procchio a large part of the island can be reached on foot and there are also buses (with a somewhat erratic and inconvenient time-table), taxis and cars to be rented.

My collecting was mainly from an area within a four mile radius of the hotel with two expeditions to Monte Capanne, some five miles in a straight line but ten by road.

The rock formation in this area is granite, with porphyry and eurites. The hills near Procchio range from 200 or 300 feet to 1,000 or more and 2,000 foot slopes are reasonably within walking range. To the west they rise to the Monte Capanne massif, the upper parts of which are largely bare rock, in some areas forming a loose scree of gigantic fragments.

The ascent of Monte Capanne on foot is not difficult for there are well marked paths, but a 'bus takes the less energetic to the terminus of a recently completed chair-lift which covers the last 2,000 feet to the sound of piped music; fortunately this is only audible within close range of the actual pylons.

Throughout our stay the weather was hot, with day temperatures up to the high eighties, and blazing sunshine, except for two days of mist and one of strong winds and continuous rain.

Elba with the other islands, such as Corsica and Sardinia, is much older geologically than the mainland of Italy, and may represent the remains of a submerged continent which extended to the Balearic Islands and the Iberian Peninsula.

RHOPALOCERA

In all, 34 species of butterfly were seen and captured, with one additional species seen as larva only.

Papilio machaon L., the swallowtail. Fairly numerous throughout the area, especially near the sea. Abundant on the outskirts of the village of S. Piero in Campo at an altitude of 800 feet near the southern coast.

Papilio podalirius L., the scarce swallowtail. Common on the beach at Procchio; not frequent elsewhere. Several almost full-fed larvae found feeding on cherry.

Papilio (?). One larva on fennel near Procchio. It failed to pupate. Very similar in appearance to *P. machaon* but pale grey ground colour instead of green.

Pieris brassicae L., the large white. Widespread but not abundant. A large well marked race.

Pieris rapae L., the small white. Scarce, some with pronounced grey dusting on the upper side.

Pieris napi L., green-veined white. Very scarce.

Pieris manni Meyer. Very like the small white but with a squarer black spot. Only one taken.

Pieris daplidice L., the bath white. Common on the beach; occasional elsewhere; some very worn, others freshly emerged throughout our stay.

Pieris sinapis L., the wood white. Scarce, single specimens in a number of areas. The local form appears somewhat smaller than the British.

Colias croceus Fourc., the clouded yellow. Common, especially on Monte Capanne up to 2,000 feet. Many more females than males, and 1 in 4 f. *helice* Hübner.

Gonopteryx cleopatra L., the mediterranean brimstone. Occasional fresh specimens, mostly on foothills near Procchio. The orange patch on the males is very conspicuous in flight.

Charaxes jasius L. The aristocrat of the island. In July I had spent three weeks in Uganda, Kenya and Tanganyika and had seen a number of *Charaxes* sp., but this was my first experience of seeing *C. jasius* in flight.

The butterfly is extremely fast on the wing, reminiscent of *A. iris* L. It is pugnacious and frequently appeared to attack *A. pandora* L. and other species. It is also inquisitive and greedy. The first specimens I saw were flying at great speed round a tree of a Pyrus species. They seldom came below fifteen feet but occasionally settled on the branches and on the ripe fruit, always well out of reach.

Jasius is very common on Elba, on several occasions a dozen or more were in sight simultaneously. The twin tails on the hindwings are fragile and, owing to the speed of flight and its habit of roosting at night and during cloudy intervals in the heart of a cork oak or amongst similarly dense foliage, undamaged specimens are not easily found.

Gradually I learnt how to capture this fine butterfly without difficulty. Ripe, growing figs, preferably black and split, have a great attraction for males and females, and they feed so greedily on these that on more than one occasion I was able to select a perfect specimen and remove it between my finger and thumb. Others were netted as they fluttered slowly searching for the choicest (by their standards) fruit.

When my straw hat was well soaked with sweat it too served as bait. The second specimen I caught settled on my hat and I saw its shadow added to my own. Catching it was more difficult, but I finally swung my net straight down over my head and shoulders. Several others were caught as they investigated the hat which I had displayed on a convenient bush.

Along some of the more open paths *jasius* flutters about comparatively slowly and sometimes settles on arbutus and the taller heathers. This habit is much more pronounced between 10.30 and 12.30 when the morning sun is at its hottest. It is reluctant to fly at all unless the sun is shining, and the markings on the underside are an effective camouflage so that it is extremely difficult to see when at rest with the wings closed.

The most successful method of catching a large number of specimens, without the risk of damaging them, was to walk along the paths cut through the heather and shrubs which form a wall on either side about six to eight feet high. *Jasius* loves to fly along these paths just above the level of the bushes, and can be caught quite easily by sweeping the net over one's head from front to rear in the direction of the insect's flight. By this method the fabric of the net is moving with the insect and not against it and, as the butterfly does not see the net, it cannot take the avoiding action which it does so skilfully that a stroke towards the butterfly's head is seldom successful unless it is done so violently that damage is almost inevitable.

I was using a net made of very light, fine mesh nylon with the largest bag that could be handled in the rather confined area.

In all I captured over 200 specimens of *jasius*, including one spell when I caught 22 in half an hour. I was able to select some 30 perfect, or almost perfect, insects. Badly damaged specimens were released at the end of each session to avoid the likelihood of catching the same individual more than once.

Jasius appears to fly over almost the whole of the island from the seashore up to at least 1,800 feet on the slopes of Monte Capanne. The largest female has a wing span of just over 4 inches; the males are half or three-quarters of an inch smaller than the females.

Limenitis rivularis Scop. Widespread, but not plentiful. Its flight is very similar to our own white admiral, but this southern European species has a distinctly blue irridescence.

Vanessa atalanta L., the red admiral, only half a dozen seen.

Vanessa cardui L., the painted lady, very few seen and all these on the beach.

Argynnis pandora L. This large fritillary, so like our own silver-washed fritillary, but with imposing red markings on the underside of the forewing, was locally abundant, though mostly past their best. It was to be seen in dozens on a large bed of African Marigolds in the hotel gardens, and was numerous on the slopes of Monte Capanne up to 2,000 feet. One specimen with large, confluent black markings on the underside was taken. The majority of the females were greenish, similar to ab. *valezina*.

Argynnis lathonia L., the queen of spain fritillary. Only seen on Monte Capanne at 1,500 feet where about a dozen were observed, but only five taken owing to the difficulty of movement except on the path.

Neohipparchia statilinus micromaritima Verity. This large well-marked satyrid has almost black ground colour. Although very numerous on all hills, especially Monte Capanne, very little variation was observed.

Hipparchia aristaeus Bonelli. A large and beautifully marked species of the Grayling group. Only found on the hillsides and local. Not many fresh specimens and difficult to catch. The form found on Elba seems the same as that on Corsica and Sardinia.

Pararge megera L., the wall brown. Abundant, usually on hillsides, some females very pale.

Pararge aegeria L., the speckled wood. Locally abundant.

Epinephele jurtina L., the meadow brown. Abundant. Females much more frequent than males. A very brightly and well-marked race. On Elba this butterfly has very secretive habits. It seldom appears at all in the sunshine and prefers dense shade where it flies under bushes only a few inches above the ground.

Epinephele tithonus L., the gatekeeper; females only, sparse and very worn. Probably at the end of its flight period.

Epinephele ida Esp. Very similar to the gatekeeper except on the underside. A few very worn females.

Coenonympha pamphilus L., the small heath. Only one specimen taken.

Coenonympha corinna elbana Staudinger. Rather like the small heath, but this race is found only on Elba and adjacent islands. Attractively marked, particularly on the underside. It was very abundant almost everywhere in all stages of wear. Flies in sun and shade alike.

Zephyrus quercus L., the purple hairstreak. Several seen flying high round trees, but only two captured.

Lampides boeticus L., the long tailed blue. Only two seen, a female at 1,000 feet, a male at sea level.

Calastrina argiolus L., the holly blue. Very common in wooded areas.

Lycaena phlaes var. *eleus*, F., the small copper. Not common, less than thirty seen in all, but widely spread. Ground colour variable but a preponderance of dark specimens with well pronounced tails.

Lycaena telicanus Lang. A few of this little tailed Blue in the hotel grounds and several a mile away on flowers of a vetch. Not seen elsewhere.

Lycaena agestis Hub. Common in restricted localities.

Polyommatus icarus L., the common blue. Abundant at lower levels.

Spilothyrus alceae Esp. An attractive Skipper with lighter build than many. Only seen in the hotel grounds.

Gegenes pumilio Hoffmsgg. A dark brown Skipper, the female with a few light markings, only five taken.

HETEROCERA

I had no equipment for night collecting but quite a large number of species were found flying by day or at rest, were stirred up or were captured at lighted windows in the hotel or village shops. The following are a few of the more interesting species so far identified:—

Sphinx convolvuli L., the convolvulus hawk, one at rest on a tree. A very large female flew into the hotel dining room during dinner and created considerable alarm and chaos before I captured it with the help of a waiter.

Macroglossa stellatarum L., the humming bird hawk moth. Very common at the hotel around bougainvillaea (which was also attractive to *P. machaon* and *P. podalirius*). Very seldom seen elsewhere.

Lasiocampa quercus L., the oak eggar. Males very common flying by day. A well marked race. Several females at lighted windows. Some males of a form without bands taken.

Lasiocampa trifolii Shiff., the grass eggar. Two males and two females taken at lighted shop windows.

Gastropacha quercifolia L., the lappet. Four males at lights. A small, pale form, Also five ova found on the edge of a cherry leaf on which a larva of *P. podalirius* was feeding. One of the resultant larvae fed up rapidly and pupated in November 1963, the other four are hibernating.

Coscinia striata L., the feathered footman. Common in one area of waste ground, flies freely in the sunshine. Two males taken with black hindwings.

Coscinia cribrum L., the speckled footman. A few specimens of a large, pale form taken at light.

Deiopeia pulchella L., the crimson speckled footman. Only one, found in a field of stubble.

Phragmatobia fuliginosa L., the ruby tiger. Occasional at light, large and rather pale.

Plusia gamma L., the silver y. Frequent by day and at night.

Plusia ni Hübn., the scarce silver y. A few seen.

Catocala dilecta Hübn., a large crimson underwing larger than *C. sponsa*. One found at rest on a tree.

Catocala conjuncta Esp., a considerably smaller red underwing. Several disturbed during the day and these caught. Very lively and take to the wing easily.

Pseudophia tirrhaca Cram., a large moth with pale greenish yellow forewings and yellow hindwings marked with brown. Three disturbed. A very fast and erratic flier and only one captured. I also caught this species in Nairobi in July 1963. It is related to *P. lunaris*, the Lunar Double Stripe.

Acontia luctuosa Schiff., the four-spotted. Several taken in a patch of waste ground.

Sterrha sacraria L., the vestal. Common but local. In some specimens the red diagonal streak is replaced by very pale brown, in some the whole forewing is pinkish.

Although our visit was made comparatively late in the season, insects were very numerous. An expedition in June or July would probably prove very rewarding.

A car is not necessary, but it would be a useful aid to hire one, at least for part of a visit, so that the south-east and western corners of the island, which are poorly served by buses, could be more easily reached from a centre such as Procchio.

The standard of hotel is good, the people friendly and helpful and, if a holiday without elaborate night clubs (which will probably soon appear) and large shops is acceptable, I would recommend a visit; with or without entomology as an objective.

My thanks are due to Dr. de Worms for his help in identification.

Woodcote, Horsell Park, Woking, Surrey.

Entomologists will note with pleasure the appointment of Professor O. W. Richards, D.Sc., F.R.S., to the Scientific Policy committee of the Nature Conservancy; they thus have one of their own fraternity on this important committee.

Some Notes and Observations on the Life History and Habits of the parasite *Psychophagus omnivorus* (Wlk.) and its attacks on the pupae of Lepidoptera

By A. T. Postans

The parasitical insect enemies of the lepidoptera are as varied as they are numerous. Almost every lepidopterist becomes acquainted with this fact quite early in his career. But while the perfect insects themselves are often well known and conspicuous enough yet of their earlier lives and habits many of us know but very little.

When we consider, for a moment, how closely associated with the lives of the lepidoptera these parasites are this fact seems all the more surprising. It is a subject that seems to attract but little attention even from our leading entomologists; for we seldom hear of it being discussed at any of the meetings, and articles or notes on the subject are few and far between in the various entomological magazines. Why this should be it is difficult to imagine, for in the whole world of insects there are few more interesting creatures to watch, and the problems they sometimes present are a joy to the observant naturalist and an entertainment to the curious.

I propose, in the course of this paper, to give an account of a few personal observations concerning the life history and habits of one of the chief insect enemies of the lepidoptera; but, before proceeding with this subject, a few details about lepidopterous parasites in general and the position they occupy in scientific nomenclature may be of interest. In the first place, then, the numerous species may be grouped into three distinct orders, viz.:—Hymenoptera, Diptera, and Synaptera—or wingless parasites. To the latter order belong the various species of mites which infest the bodies and wings of some butterflies and moths—sometimes in considerable numbers. It would be interesting to know what influence these particular parasites have on the lives of their victims. It is possible that they only cause inconvenience. It is equally possible—nay, much more probable—that the sustenance which they derive at the expense of their hosts must inevitably tend to make those brief lives still shorter. But upon these problems, interesting though they may be, we will not linger at the present moment.

Larval parasites are usually either Hymenopterous or Dipterous, but some species of noctua larvae frequently fall victims to the Synaptera as well. The embryos of this order do not live within the bodies of their victims but sap their vitality while attached to the outer surface of the skin. The ultimate result however is the same in all cases for feeding is continued until nothing but the shriveled skin of the host remains.

Pupal parasites are very few, only about four or five being known to occur in this country. All are Chalcids; and at least one species, *Psychophagus omnivorus* (Wlk.), is common everywhere. It is this species which so frequently attacks the pupae in our breeding cages—although not many of us are perhaps aware of the fact; for, so insidious are its attacks that its depredations may be carried on for years under the very nose of the collector without him being any the wiser as to the real cause of the mischief among his stock even in the breeding cages. My attention was first attracted to this parasite some years ago when I discovered unmistakable evidence of its work upon the cocoons and

pupae of *Cerura bifida* which I happened to be breeding in some numbers at that time. The knowledge gained of its habits then imbued me with a desire to know still more about it, and it was not long before I discovered that its activities were not confined to the pupae of *C. bifida* alone but included also the pupae of almost any fair sized moth as well as those of some butterflies.

To give some idea of the wide range of choice open to this parasite in its selection of a victim I will here give a short list of species from which I have, on more than one occasion, actually bred it.

From the pupae of *Smerinthus populi*, and *S. ocellatus*; *Endromis versicolor*, and *Saturnia carpini*; *Arctia caja*, *A. villicae*, *Spilosoma menthastri*; *S. lubricepeda*; *S. fuliginosa*; and *S. mendica*. Of the "prominents"—*Stauropus fagi*; *Cerura bifida*; *C. furcula*: *Dicranura vinula*: *Notodonta dictaea*; *N. ziczac*; *N. dromedarius*; *N. trepida*; *N. chaonia*; *Pterostoma palpina*: *Lophopteryx camelina*; and *L. carmelita*: many species of noctuae, including *Acronycta psi*; *A. tridens*; *A. aceris*; *Hadena glauca*; *H. pisi*; *H. oleracea*; *H. thalassina*: *Nonagria typhae*; etc., etc. Also from the pupae of *Boarmia gemmaria*; *B. abietaria*; *Tephrosia biundularia*; *T. consonaria*; *Biston hirtaria*; and *Selenia tetralunaria*—especially the spring brood—these of course having been attacked in the autumn. But the geometrae, as a whole, seem fairly immune; and the same may be said of the butterflies.

Pupae of the *Vanessids* are, however, an exceptional attraction, and are sometimes attacked wholesale. Entire broods of *V. io* and *V. urticae* will often produce this particular parasite in vast numbers.

The wonderful instinct and almost human intelligence displayed by this species, when seeking a victim, is something to marvel at. I will take the case of *C. bifida* for example. Here the objective—the pupa of course—is completely hidden from view, cleverly concealed, and protected on all sides by hardened walls of gum and wood chips closely amalgamated together to form an apparently impregnable casket. That a lilliputian insect, which is smaller even that a grain of teazel, should be capable of detecting that hidden morsel and of piercing those tough walls to get at it seems almost incredible. Yet, to the female *omnivorus*, the problem presents no difficulties. Without hesitation it flies straight to its hidden prey, and with deadly sureness settles down to the task of patiently biting a hole in the wall of the cocoon. The operation may take several hours to accomplish, but eventually the hole is large enough for the parasite to squeeze through—it enters and is lost to view, to complete its mission on the helpless pupa within. It never makes a mistake; even before it has pierced that outer barrier it knows what lies beyond, for it will make no attempt to enter a cocoon if it does not contain a healthy pupa.

Another interesting fact concerning this species is, that although it never attacks larvae, yet it will linger in the vicinity of some species for days, patiently waiting for them to change to pupae.

I once had in my possession some half grown larvae of *V. polychloros* from the New Forest. These were sleeved on a bush of *Salix caprea* in my garden and within a few hours I observed several female *omnivorus* crawling about over the foliage and examining the larvae, having obviously made their entrance through the leno sides of the bag. I at once removed the larvae and resleeved them in another part of the garden, but the parasites were not long in marking them down and again made their appearance inside the sleeve. This time I allowed them

to remain undisturbed, as it occurred to me that it would be a good opportunity to observe more of their work and to see what they would do on this occasion. Right up to the time when the larvae were full fed there was always parasites moving about in the sleeve; sometimes more, sometimes less, but they never deserted it altogether. Eventually the larvae slung for pupation—some to the undersides of leaves and others to the top of the leno bag. I noticed that as soon as this happened the parasites immediately ceased their restless roving and took up positions on the suspended larvae—but not more than one on each. When I touched one with a grass stalk it made no attempt to fly off but moved sluggishly about over and around the larva, but never leaving it unless absolutely forced to.

I repeated this experiment on several others, but the result was always the same; the flies were obviously there with some special object in view and from which they were not easily to be turned aside.

At times the larva would make frantic efforts on its own account to get rid of its unwelcome attendant—contorting itself and lashing round in all directions but all to no purpose—the fly always maintaining its hold and seeming but little disturbed.

Just before pupation took place I carefully removed the larvae that were suspended from leaves to a safe place indoors—having first picked off and killed the flies attached. The larvae suspended from the top of the leno bag were allowed to remain undisturbed.

All pupated shortly afterwards and by noon of the next day the parasites in the sleeve had disappeared and were seen no more.

No further incident occurred until a couple of weeks later when the pupae in the indoor cage commenced to develop rapidly and in due course produced butterflies—perfect in every way.

Meanwhile there was no apparent change taking place in the pupae of the sleeve. They were, in appearance, perfectly healthy; but they failed to respond to a gentle touch, and a few days later became marked with uneven crimson stains. At this stage I removed them for closer examination and in every case found the well developed grubs of a parasite which I had no difficulty in recognising as those of *P. omnivorus*.

I will now explain how and when the eggs of the parasite were deposited. The way in which this important operation is carried out, as well as the events leading up to it, may well deceive all but the most observant.

In the case just dealt with, for example, all the facts would seem to indicate that the larvae were the victims of attack and not the pupae.

I have shown what an irresistible attraction they seem to possess for the female parasites—for days all were closely associated together. But as soon as the larvae had pupated the attraction was gone and the parasites no longer remained. What more conclusive evidence could there be than this?

And yet, for all that, there is one important thing which could not be overlooked. For why did some pupae produce butterflies and others only parasites?

There was a significance about this fact which could not be ignored, and therefore I was forced to accept the only other logical alternative, which is, that the pupae *were* the victims after all; and the following explanation will prove that this was actually the case. First of all, the

female *omnivorus* intent on egg laying has but one concern—the welfare of her future progeny. When she finds a possible pupa victim it matters not at all whether that pupa is soft and but newly formed or weeks old, its skin toughened from exposure and by the passing of time—so long as it can provide sufficiently for a brood of grubs until they are full fed.

Also the eggs must be deposited in such a way that the tiny grubs when they hatch out shall have no difficulty in reaching the nourishing juices so vital to their existence and development. There must be no obstacles in the way or they must inevitably perish as soon as they are born—for the sucking mouths are useless for any other purpose but the sole one of taking in liquid nourishment.

For this reason, then, it is plain that the eggs cannot be laid at random on the pupa skin—nor are they. But there are vulnerable parts which the parasite does not overlook—the mouths of the breathing tubes—the spiracles, and it is in these that the eggs are deposited. Now, in the case of the *polychloros* larvae, the victims chosen for attack belonged to a group of butterflies which only remain for a short period in the pupal stage and it was essential for the parasites to be close at hand in order to deposit their eggs the moment a favourable opportunity presented itself —no time had to be lost if their project was to meet with success. For this reason the prospective victims once found were always kept in sight and never left. Yet, while they remained as larvae, they were not molested; or at any rate no real harm was done them. But it was obvious that their actions were being closely watched all the time, for as soon as the larvae slung for pupation it was the signal for the parasites to draw closer—the opportunity for which they had been so patiently waiting was close at hand. As soon as the larval skins were cast off and the pupae were exposed the moment for action had arrived—eggs were quickly secreted and the parasites disappeared for good, their object achieved. The eggs are so minute that only with the aid of a strong lens would it be possible to ascertain the exact number deposited in any particular case; but I have obtained fairly correct estimates by carefully noting the number of parasites bred from various pupae on different occasions. The number certainly varies according to the size of the species. Thus from a pupa of *Hadena glauca* I have bred 89 flies—58 males and 31 females, but a pupa of *D. vinula* or *E. versicolor* will produce nearly twice that number although I am convinced that but one female is responsible in every case. So tightly packed are the grubs when full fed that they occupy the whole space of the interior of their victims from which the last vestige of liquid has been drained. Development is so rapid that the entire transition from ovum to imago occupies less than a month.

The perfect insect is continuously brooded from April to the end of October; the last brood hibernating as full fed grubs in the empty shell of the host.

The remarkable difference in the two sexes, both as regards size and in colour, is very striking and might easily lead one to suppose that they represented two distinct species. The head and thorax of the male is glittering metalic green; body black with a yellow longitudinal stripe beneath. The female entirely black with an almost imperceptible coppery sheen and is fully twice the size of the male.

A peculiar characteristic of both sexes, but more especially of the male, is the strong perfume which is discharged when one is touched or crushed between the fingers. The life story of this insignificant looking little

creature is not without interest as I have shown: but as a lepidopterist I have come to recognise it as an enemy with an evil reputation, and one not lightly to be despised, and lepidopterists in general will do well to be on their guard against it.

Common as it is yet it is all too frequently overlooked, or ignored, as I know well and it is for this reason that I have selected *Psychophagus omnivorus* as the speciel subject of my paper to-day in the hope that the few details concerning it which I have been able to supply may prove not only interesting but helpful to fellow readers of the "Record" and lepidopterists in particular.

'Broadmayne', 13 Stanfield Road, Winton, Bournemouth.

Conservation of Insect Life in the New Forest

NOTE OF MEETING HELD AT LYNDHURST IN THE VERDERERS' HALL

ON MONDAY, 23rd MARCH 1964, AT 2.30 p.m.

Present:—

Mr. W. A. Cadman Mr. D. Bevan Mr. E. G. Parker	Forestry Commission
Dr. J. F. D. Frazer Mr. M. J. Woodman Mr. C. R. Tubbs	Nature Conservancy
Mr. R. B. Benson	British Museum
Dr. T. R. E. Southwood Mr. C. Mackworth-Praed	Royal Entomological Society
Dr. A. M. Massee, O.B.E., D.Sc.	South London Entomological and Natural History Society
Mr. R. W. Watson	Hampshire and Isle of Wight Naturalists' Trust
Dr. H. B. D. Kettlewell	Oxford University
Mr. H. D. Bessemer	
Mr. R. Mere	
Mr. H. Symes	

Apologies for absence were received from Captain R. A. Jackson and Mr. I. R. P. Heslop.

I. *Introduction*

Mr. Cadman welcomed the company and thanked them for giving up their time and coming so far in order to be present. He then read the attached prepared statement outlining the object of the Meeting.

Meeting 23/3/64—Conservation of Insect Life in the New Forest

Opening Statement by Mr. W. A. Cadman

Object of the Meeting

I have called this meeting because I am perturbed by the many changes in the abundance, and in some cases distribution too, of many species within the New Forest.

Now we all know that the prime reasons for the sudden change in the status of any one species may be quite outside our control: I refer, of

course, to the climatic factors of warm or wet summers, and mild or cold winters.

We all know that since the Second World War man has developed devastating means to control pests both on the broad acres of the farm lands and on the small plots of the allotments. No-one knows where the side effects of these sprays will end, nor how many innocent species will become victims. But here in the forest we have a greater measure of freedom from these sprays than many other areas in Britain.

The argument has been put forward that because sprays do ten times more harm than anything else, everything else should be permitted: and because motor car head lamps kill thousands of insects, mercury vapour lamps are harmless. There is no logic in this argument. It is because of all these additional losses which are occurring that we must consider how we can best make up for their adverse effects.

Now the other causes of change are:—

Land Use: I am using that term to cover the major activities within the forest; broadly three things are included, in ascending order of intensity of impact these are:—

(1) The ever increasing numbers of the public who spill out onto the forest for recreation.
(2) The grazing activities of the Commoners' animals.
(3) The work of the Forestry Commission.

This last, we all know, can have nearly as great an effect as climatic conditions. At this stage, all I want to say about this is that our work has to go on: we've got a very definite job to do (not an easy one, either!). But, when we know what the effects of any course of action will be, then we can often 'bend' our activities so as to favour a particular ecological set-up. Sometimes we can alter our work completely in order to assist some species—not necessarily insects—in need of help. We are anxious to do these things where it is a practical proposition: we haven't always got the knowledge, or the advice to know what is needed.

Lastly, I come to the question of collecting. Here I must say that I have been dumbfounded at the number of letters I have received:
"Dear Sir,

I hear there is a move afoot to ban collecting . . . . ".

Then follows a long list of the writer's prowess, and the letter ends with a strong plea that he, at any rate, should be allowed to collect.

These letters have left me with the impression that a large number of collectors must have very bad consciences!

Let me put this question of collecting into proper perspective. A very great deal of the collecting which is carried out does no harm at all. But, human nature being what it is, there are greedy collectors; there are collectors who do it for financial gain; and therefore there are certain insects which are particularly vulnerable by one or other of the many means available to collectors. On the other side there are many species which can be collected, bred up by carefully controlled conditions in parasite-free environment, and released to help build up a weak colony. Obviously, gentlemen, all these aspects must be considered, but collecting is only one of the many considerations which we must examine in order to arrive at a course of agreed action which will, we hope, promote conservation of Insect Life in the New Forest. I know no-one who has suggested a total ban on collecting!

Now the object of calling this meeting is to set up a *small* working committee who will advise me on desirable conservation measures to be adopted in the future in the New Forest. I cannot commit myself to accept this advice. But I will undertake to give it very close and sympathetic consideration.

But before we appoint this committee, which I now think should be the last and not the first item of the agenda, I think we should consider the main lines on which we should work.

What, I think, we must do, falls into three headings:—

(i) We must know, and record, what is happening, so far as we can.
(ii) We must decide what species are in the greatest need.
(iii) We must formulate a positive policy in order to help these species in particular, and others in general. There may well be two broad courses of action required—long term and short term.

I have talked for a long time. I only want to make three more points:—

(1) I am not prepared to open a discussion on fees for insect collecting permits. But there are three amendments which I want to announce: Day permits at 2s. 6d. will be available, schoolboy permits will be 5s. 0d. a season or 1s. 0d. a day, and bona fide scientific collectors are given a free permit.
(2) Please don't take up the time of this meeting by making an impassioned plea on behalf of collectors. That can be taken as read. We are not here to ban collecting (unless the panel recommends that, which is unlikely). Whether or not we shall need to control the collecting of certain species, or the means by which collecting is done, must be considered, the main emphasis being on those insects which may be in danger—and not on which collectors may be endangered!
(3) My last plea I make with all due humility. It is truly said that "a little learning is a dangerous thing". Unfortunately my personal knowledge of the latin names of lepidoptera is limited. I would ask that the learned company I am with to-day should first use the English names (which I do know for all butterflies, but not, I regret to say, for all moths) for my special benefit.

II. *Agenda*

It was agreed that Item 1 be deferred till last. Discussion then followed in general terms:—

2. *Species to be given Protection*

Mr. Bessemer felt that all butterfly species were in need of protection.

Dr. Kettlewell mentioned the extremely rare New Forest Burnet.

Dr. Massee mentioned various colonies of beetle species unique in this country and quoted instances where such colonies had been destroyed in the past.

3. *Measures to achieve Protection*

It was unanimously agreed that habitat was by far the largest single factor in conservation.

Mr. Bessemer referred to the spread of bracken in the Forest. Bracken kills off violets and consequently fritillary populations are reduced. It was agreed that a reduction of bracken growth would aid butterflies, moths and beetles. On the other hand bracken (and no burning) was essential for cicadas.

Mr. Bessemer also referred to the general disappearance of brambles from the Forest. He understood the cause to be a virus attack. It was agreed that the Committee would look into this, and should it be decided that research was desirable this would seem to be a matter for the Nature Conservancy.

The question of leaving sallow bushes for the eggs and larvae of the Purple Emperor (Iris), and for many other species, was mentioned. Mr. Cadman confirmed that there was a long-standing instruction to all foresters to do just this.

Mr. Watson mentioned a patch of nettles on the Forest about half a mile from the Hampshire County Council dump at Setley. These had been killed last year, apparently by a toxic spray. Mr. Cadman remarked that the use of toxic sprays on the Forest was not permitted.

4. *Methods of Collecting*

Mr. Cadman said that he was considering the long standing ban on sugaring. He had looked into its origin and as long ago as 1935 it was said to be responsible for serious losses amongst certain species.

Dr. Kettlewell commented that the current ban on *Sugaring* had been imposed probably 50 years ago because of the unsightly mess on trees.

Mr. Cadman stressed that Keepers should be informed when lights were going to be used at night. He agreed to permit sugaring experimentally.

It was agreed that the *Mercury Vapour Lamp* if properly used need not be a serious threat to conservation, but it should not be left as an unattended trap overnight.

It was pointed out that the use of Mercury Vapour Lamp for several nights in succession could wipe out a single local colony.

5. *Records*

Mr. Cadman stated that detailed records, including localities, of all species in need of protection were essential.

It was agreed that records be kept jointly by the Nature Conservancy and Forestry Commission and it is hoped that societies and individuals will co-operate by supplying information.

1. *Advisory Committee on Insect Conservation*

A Committee was appointed as follows:—

Mr. C. R. Tubbs (Chairman)
Dr. H. B. D. Kettlewell
Dr. A. M. Massee
Mr. C. Mackworth-Praed
Mr. R. W. Watson

Dr. Massee suggested that Mr. Gardner be co-opted.

It was agreed that the Committee should have the power to co-opt as desired.

Mr. Cadman undertook to make the Verderers' Hall available for Committee meetings.

Mr. Watson placed his house and office facilities at the Committee's disposal, free of charge.

It was decided that the first meeting of the Committee would be held in the Verderers' Hall, Lyndhurst, on Monday, 6th April 1964, at 2.30 p.m.

Mr. Mere, on behalf of those present, thanked Mr. Cadman for arranging this initial Meeting.

The Meeting closed at 3.45 p.m.

GOWAN C. G. CLARK

Obituary

GOWAN C. C. CLARK

Although the entomological work of the subject of this short notice was confined almost to South African insects, it is felt that some account of his great achievements in this field could fittingly be placed on record in the United Kingdom.

Gowan Creswell Coningsby Clark was born at Port Elizabeth, Cape Colony, on 19th April, 1888, and was by profession a civil engineer on the South African Railways. From an early age he had shown a keen interest in natural history, particularly butterflies, and even as a schoolboy, in the Western Cape, made discoveries relating to the early stages which would have been considered noteworthy had they been made to-day. In later years his Railway work enabled him to visit a wide range of localities and procure a very large number of interesting butterfly specimens, most of which, in order to save space, were retained as scale-impressions only, with the bodies and antennae meticulously painted in between the impressions of the wings.

In the early thirties he turned his attention to the painting of the immature stages (at that time, those of both moths and butterflies). These were at first drawn to the size of the originals, but on acquiring Frohawk's magnificently illustrated book on the British Butterflies he realised the necessity of including the more important details under magnification, and from then onwards produced most beautiful sets of paintings of the life-histories of South African butterflies, very many of which had not been previously known. It should be mentioned too that some helpful advice was given by Dr. A. J. T. Janse at about this time.

In all, about 260 life-history paintings of butterflies, each set on a single sheet, were completed before ill-health compelled him to lay aside his brushes towards the end of 1963. Numerous other species were represented by partially completed records, while the complete life-histories of several moths had also been done, as well as other paintings which represented Lepidopterous parasites, depicted under high magnification in most cases. The full life-history of one British butterfly, *Colias croceus* (Fourcroy) (the Clouded Yellow), was painted by him, from living material. All essential data accompanied each painting and very many original observations were made on the subjects covered, especially in connection with the honey-gland and retractile tubercles in the larvae of the Lycaenidae. Some of his publications were based entirely on such observations, amongst them a comprehensive paper on the proposed classification of the South African Lycaenidae from the early stages. This close study of the early stages threw fresh light on relationships and indicated specific differences till then not appreciated, examples of the latter being present in the Lycaenid genus *Heodes* and in the *thyra*-group of the genus *Aloeides*, of the same family. Besides many individual papers published elsewhere, a great deal of his work has been and is being reproduced in Dr. G. van Son's volumes of "The Butterflies of Southern Africa". Some twenty years ago he was awarded the Senior Captain Scott medal for his butterfly life-history work.

He was also a talented woodcarver, and his collection of models of fish, accurately carved in every detail and coloured as in living specimens, numbering over one hundred and housed in the Port Elizabeth Museum

and Snake Park, is unique.

As an entomological draughtsman, he possessed, to a very marked extent, the ability to retain in his mind's eye what he had seen under the microscope and accurately transfer this to paper, without referring frequently to the object itself; and this was probably the secret of his high output of work and his being able to record six or more life-histories, on occasion, all at the same time. He was a man of restless activity and retained his full vigour until very late in life. In spite of his remarkable gifts, he was always modest about his accomplishments and, with his kindly nature, always ready to assist, and help in any way, others who had a similar interest in Lepidoptera.

After a prolonged illness he passed away, at Port Elizabeth, on 26th January, 1964. His death has been a severe loss to South African entomology and he has been sadly missed by all who were associated with him.

C. G. C. D., Cape Town.

Notes and Observations

THE FOODPLANT OF IDAEA LINEATA (SCOP.).—With reference to Mr Craufurd's note (antea: 115) I do not think that this moth feeds on *Genista tinctoria*. I have in the past found it in four places in Kent, and I know that in two of these no *Genista tinctoria* grew, and in one, even the common broom was absent.

Dr. Cockayne asked me in 1954 whether I knew on what the caterpillar fed, and I told him I did not know; it was popularly supposed to feed on grass, and indeed, some collectors thought that it fed on a grass that only grows on the chalk. In a criticism of Dr. Ford's "Moths" I pointed out (*Entomologist*, **88**: 194) that *lineata* was not confined to chalk, as it was formerly found on Leigh cliffs, Essex (London clay) and on heavy wet clay at Chattenden, both localities being too near to London for such an easily caught insect to survive. I saw it at Chattenden in 1901 and 1903, but it was then very rare; in Essex it was exterminated between 1850 and 1860.—H. C. HUGGINS, F.R.E.S., 65 Eastwood Boulevard, Westcliff-on-Sea.

POCOTA PERSONATA HARRIS AND CRIORRHINA SPP. (DIPTERA, SYRPHIDAE) IN THE LONDON AREA.—Some of my captures of Syrphidae were recently identified by Mr. L. Parmenter and these included a ♀ *Pocota personata* Harris taken in a woodland clearing on Wimbledon Common, Surrey, 2.vi.1951. Previously this species seems to have been noted only three times in the London area viz:—Palewell Common, East Sheen, Surrey, 20.v.1939, A. M. Low; Bexley Woods, Kent, 16.v.1945, H. Aducent; and Epping Forest, Essex, pupae, 11.iv.1947, emerging 23.iv.1947 and 1.v.1947, and 26.iv.1947 emerging 9.v.1947, J. F. Shillito.

Species in the closely allied genus *Criorrhina* were: 2 ♂♂ *C. ranunculi* Panz. hovering round birch in a wood on Wimbledon Common, 18.iv.1949, ♂ *C. floccosa* Mg. woodland ride, Wimbledon Common, 13.v.1950; ♀ *C. berberina* F. woodland clearing, Epping Lower Forest, Essex, 2.vii.1951; 2 ♂♂ *C. berberina* F. var. *oxyacanthae* Mg., hazel copse, Marden Park, Surrey, 19.v.1963, and ♀ near Four-Wents Pond, The Holmwood, Surrey, 26.vi.1959.

These specimens were recently exhibited at meetings of the London Natural History Society and of the Croydon Natural History and Scientific Society.—A. W. Jones, 15 Suffolk Road, South Norwood, London, S.E. 25. 20.iv.1964.

Dates of Appearance of the Parts of British Flies, **6**: Empididae by J. E. Collin.—As the Cambridge University Press omitted to give the dates of the publication of the Parts of this volume which also appeared in a single bound volume, Mr. Collin has asked us to state that the relative dates were as follows:—

Part I, June 30th, 1961.
Part II, August 25th, 1961
Part III, October 27th, 1961

L. Parmenter

Current Literature

Recent papers on Conopidae.

An interest in this family has been encouraged in Gt. Britain by the publications of Mr. J. E. Collin and Mr. K. G. V. Smith. As illustrations are useful when named specimens are not available it is worth mentioning that papers have been received recently that are in English, by Dr. Milan Chvála on "Czechoslovak species of the subfamily *Conopinae*" and "A Review of the Conopid Flies of the genus *Sicus* Scop." published in *Acta Universitatis Carolinae–Biologica*, vol. **1961** and **1963**, respectively. The papers contain keys, descriptions and figures of many species that occur in Gt. Britain. The first mentioned also has distributional maps. Another paper with figures of Conopidae that include some of the genera *Myopa* and *Zodion* is by Leif Lyneborg entitled "Danske acalyptrate fluer 1. Conopidae, Micropezidae, Calobatidae, Megamerinidae og Tanypezidae (Diptera)", appeared in *Entomologiske Meddeleiser*, **31**. 1962. The keys are in Danish but the English summary gives the known distribution and flight periods for Denmark.

L. P

Ecology of some Asilid species (Asilidae, Diptera) and their relation to honey bee (Apis mellifica L.). Zivko R. Adamovic. Museum d' histoire naturelle de Beograd. 1963. 1-104.

This has 31 figures mostly showing the diurnal rhythm and proportions of the types of prey of the Asilidae of Yugoslavia. These include the species *Philonicus albiceps* Mg., *Asilus crabroniformis* L. and *Leptogaster cylindrica* Deg. that occur in Gt. Britain. There is an English summary which deals with the hunting and feeding habits, pairing, mating and egglaying behaviour, daily rhythm, population and territorial matters. The natural enemies which include several species of dragonfly are discussed as is the ecological niches of each species of Asilid. Detailed lists of prey appear in a second paper of the author published in *Archives des sciences biologiques*, **XV.** 1963.

L. P.

A Synonymic List of the Nearctic Rhopalocera. By Cyril F. dos Passos. Published by the Lepidopterist's Society. Memoir No. 1, 1964, pp. 145.

The author, one of N. America's leading lepidopterists, in his introduction draws attention to the fact that it is just over a quarter of a century since the last check-list of the lepidoptera of Canada and the United States by McDunnough was published, which is reason enough for the present publication. In this list, 682 species are enumerated together with their subspecies, forms and aberrations making in all approximately 3,850 names and it is pleasing to say that no errors are apparent amongst this vast assemblage. However, it is felt that the author should have defined the southern limits of the area dealt with in order to clarify the status of approximately 15% of the species as they are of doubtful occurence in North America. Coupled with this it is a great pity that the author did not include the type locality where known for in the introduction he mentions that nearly all the names were checked with the original references and this extra information would have much enhanced the value of this list and would have been well worth the small amount of extra work involved.

As the title suggests, the author has included the synonymy and has given the type citations for the genera. The date of publication for each name is given but in many cases there are two, the first in parenthesis, the second in square brackets. It is assumed that the former is the published date and the latter the actual date of publication. It would have helped the reader to have had a simple key to the abbreviations, signs etc. and general set-up regarding the treatment of the synonyms, both objective and subjective, which would have saved time searching, sometimes vainly, through the introduction. This could easily have appeared on page 'vi' which at the moment is blank, together with a list of Families and their pagination.

The index is slightly confusing as the numbers given refer to both the pagination of the genera and the individual species numbers and though in different columns the significance of the dashes after each generic name is not at first apparent. At the beginning of the index on p. 107 this is clarified by the word 'page' appearing above the appropriate column but not on the other pages thereafter.

The review copy when received was very badly damaged about the spine so that many of the pages were loose which would indicate that the Lepidopterist's Society would do well to consider having their Memoirs, this being their first, more strongly bound, particularly in this and similar cases as it should receive a great deal of use by the student of North American *Rhopalocera* and it should be able to stand up to years of hard wear before re-binding is needed.

Apart from these few rather minor criticisms, both the author and the society are to be congratulated, the latter for beginning this new enterprise, and the former for the painstaking and industrious manner in which this long-awaited list has been compiled.

T. G. Howarth.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

COLLECTING *ZYGAENA* FABRICIUS (LEP., ZYGAENIDAE) IN SCOTLAND IN 1963. W. G. TREMEWAN and B. L. MANLEY 149

BUTTERFLIES AT GIBRALTAR, MARCH 1964. Major General Sir GEORGE JOHNSON, K.C.V.O. 153

MELANISM IN LEPIDOPTERA IN THE WEST OF IRELAND. H. C. HUGGINS, F.R.E.S. 155

NOTES ON THE MICROLEPIDOPTERA. H. C. HUGGINS, F.R.E.S. 158

COLLECTING IN ELBA. J. A. C. GREENWOOD, O.B.E., F.R.E.S. 159

SOME NOTES AND OBSERVATIONS ON THE LIFE HISTORY AND HABITS OF THE PARASITE *PSYCHOPHAGUS OMNIVORUS* (WLK.) AND ITS ATTACKS ON THE PUPAE OF LEPIDOPTERA. A. T. POSTANS 165

CONSERVATION OF INSECT LIFE IN THE NEW FOREST 169

OBITUARY 173

NOTES AND OBSERVATIONS 174

CURRENT LITERATURE 175

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (169)

TO OUR CONTRIBUTORS

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Some Wayside Collecting in Andalusia, April 1964

By R. F. Bretherton, C.B., M.A., F.R.E.S.

I spent a fortnight's holiday with my wife and daughter in Andalusia from 6th to 20th April, 1964. Collecting was only one object among several, but I hoped to meet with a number of the spring butterflies, some of which are found in Europe only in southern Spain. This hope was only partly fulfilled, as it turned out to be a very late season there, and most of my *desiderata* had clearly not yet emerged. We were told that, after a good February, March had been cold and sunless; and, though we had three really good hot days ourselves, the weather was mostly unsettled right to the end of our stay, with cool winds, cloud, and much hesitant sunshine. Besides the total absence of many kinds of butterflies which we had hoped to see, we were struck by the great scarcity of hibernated species and of the early Whites, Green Hairstreaks, etc. One could go for miles, both along the coast and in the mountains, without seeing anything at all; and, even in water-courses and fallow fields, which were the best localities, it was unusual to have more than half-a-dozen butterflies in sight at once. This made collecting very hard work. I only recorded 33 species, and set about 100 specimens, besides about 20 moths. Some, nonetheless, were of interest.

We flew to Gibraltar by an evening 'plane on 6th April, and picked up our hired car there the next morning: a stout Morris Oxford which served us without a hitch over Spanish roads which often deteriorated without warning from a first-class surface to no surface at all for several miles on end. We spent the rest of the morning exploring the upper part of the Rock. There was a fine display of flowers, and one of the apes kindly presented himself for a photograph, sliding down a steep wall on his very bare behind. These beasts share the top of the Rock with the garrison and the tourists, and seem to have developed a commendably detached attitude to both, showing neither fear nor excessive interest. The only lepidoptera seen were two or three *Zerynthia rumina* L., of which one fine example was caught. We saw this butterfly in almost every locality we tried in the coastal zone of Andalusia, though it was never numerous. It varies greatly in size, in the extent of the red markings, and in the shade of the ground colour, which ranges from pale primrose to rich chocolate. Some of the females have a wing-span of $2\frac{1}{2}''$, and are really magnificent creatures; but all are larger and brighter than the ssp. *medesicaste* Illiger which I had found two years earlier on the French Riviera.

After lunch we crossed into Spain and drove along the coast road eastwards to Estepona. We saw no butterflies, and the only incident was provided by two cocked-hatted Guardias Civiles, who stepped out into the road with their hands raised to stop the car. I reviewed mentally all the driving offences which we might be committing, but they only wanted a lift, and made themselves agreeable company. We were told that asking for lifts is a custom of the country for Guardias Civiles!

We spent four nights at the Hotel Santa Marta, a little beyond Estepona. The rooms here are formed by a number of separate bungalows, attractively arranged in the garden. Though the nights were decidedly cool, there was a fair assembly of moths at our bungalow lights: an *Arctia villica* L., several "Wainscot" Noctuae, and many Geometers, mostly "Waves" and "Pugs" but including the familiar immigrants to Britain,

Nycterosea obstipata F. and *Rhodometra sacraria* L. The coastal strip is at this point fairly wide and intensively cultivated, and there were few butterflies immediately round the hotel except for *Z. rumina* and the very rich brown southern form of *Pararge egeria* L., though a nearby scrub-covered hill yielded me single specimens of *Euchloe ausonia* Hb., *Pyronia pasiphae* Esp. and *Chrysophanus rubi fervida* Stdgr. On the morning after our arrival we drove some twenty miles further along the coast, beyond Marbella, to Calahonde. There are fine pinewoods here with good shelter, and we know that Mr. J. A. C. Greenwood and Baron de Worms had found these productive at the same season in earlier years. But now there was the familiar scarcity of butterflies: a couple of *Z. rumina*, a torn *Papilio machaon sphyrus* Hb., and four male *Anthocaris euphenoides andalusica* Ribbe being the only captures. The next morning we did rather better when, in stronger sunshine, we visited a limestone outcrop, rich in flowers, on the west side of Estepona. *A. euphenoides* was quite common, and I caught one female—always difficult to get with this species; there were plenty of *P. megera* L. and *P. egeria*; and I secured a newly emerged male of the pretty Lycaenid *Tomares ballus* F., whose European distribution is, apart from a very limited colony on the French Riviera, confined to Spain. But the following day, 10th April, was again disappointing. We drove over the beautiful but rather hair-raising mountain road to Ronda, a town which is neatly divided into two by a sheer gorge several hundred feet deep. But the sky was grey and the wind cold, and we found some Spanish friends on whom we called huddled round an electric brazier. In the one gleam of sunshine we could only record *Pieris rapae* L. and *P. brassicae* L. and a number of very worn and presumably immigrant *Vanessa cardui* L.

We left Santa Marta early on 11th April to drive to Granada, going along the coast through Malaga and on to Motril before turning inland across the edge of the Sierra Nevada. The weather, poor at first, improved steadily. We made a stop at Calahonde, and this time succeeded in catching single specimens, just emerged, of *Agapetes ines* Hffmsg. and *Maniola jurtina hispulla* Hb., neither of which we saw elsewhere. After another stop at Malaga, to look at the fascinating Alcazaba (Moorish castle), we settled to eat our picnic lunch on a sunny bank near the sea some miles further on. Our attention was first caught by a number of *Colias crocea* Fourc., mostly worn but including several f. *helice* Hb. But there were also fast flying Whites careering over a fallow field full of *Biscutella*, and when, after much exertion, one was caught, it proved to be the much desired *Euchloë belemia* Esp., which is only found (in Europe) in south Spain and Portugal. It took an hour's hard work to get five more, as the insects hardly ever settle, fly faster than one can run, and dodge like a Rugby half-back. Seeing my activities, a Spaniard in a nearby garden took his cap to the chase in the hope, presumably, of earning a few easy pesetas; but he soon gave up in heat and anger. These *E. belemia* were all of the first (usually February) brood, but still in fair condition. Four days later I came on another colony inland, near Jaen: of five taken there, three were of the first brood, and two, obviously newly emerged, were of the very different second brood form. Finally, on our last day, 20th April, I secured two more near Algeciras which were also of the second brood form. It would be interesting to know if this overlapping of the broods (or forms) is normal, or was perhaps the result of unusual weather conditions this spring.

After this interlude we had to press on to reach Granada, and had all too little time to enjoy the magnificent stretch of mountainous coast between Torre del Mar and Motril, or the fine scenery on the mountain road beyond it. Given time and season, both should give good collecting. We stayed four nights in Granada. Most of the first day was devoted to studying the Alhambra, which must not be rushed; but in the late afternoon, and also on the two succeeding afternoons, I explored the slopes beyond it, which are the classical ground for *Zegris eupheme* Esp. But I did not find it, perhaps because it was not yet out, perhaps because most of the *Biscutella* which it is supposed to haunt almost exclusively, has now disappeared as a result of close grazing by sheep and donkeys and the planting of large areas with conifers. There were, however, a few welcome *Euchloë tagis* Hb. and *E. ausonia*, many *Pontia daplidice* L., a few *Coenonympha pamphilus lyllus* Esp., *Polyommatus icarus* Rott., *Lycaena phloeas* L., and a single *Syntarucus pirithous* L.; and I collected a short series of a Skipper which I hoped might be *Reverdinus marrubii* Rambur but which turned out to be only *Carcharodus alcaea* Esp., in poor condition. The migrants, *C. croceus*, *V. cardui* and *V. atalanta* were also in evidence, and I saw, but could not reach, a couple of *Iphiclides feisthameli* Dup.

On the morning of 13th April we drove up the beautifully engineered road to the snows of the Sierra Nevada, reaching the lower ski hut, at about 7,000 feet, in 50 minutes. The weather was brilliant and the views magnificent; and several worn *Aglais urticae* L. and *Inachis io* L. were circling over the snow, with some *P. megera* at its lower edge. But on the descent, though we stopped at several apparently suitable spots, we saw hardly a butterfly. The next morning we were more fortunate when we drove east through the Sierra Harana to see the cave-dwellings and fantastically wind-eroded rocks near Guadix. Pausing on return by a mountain stream near the Puerto de la Mora we found butterflies more numerous than anywhere else on our journey. *T. ballus* and *P. daplidice* were quite common, and we added to our list a *Pieris* which is probably the spring brood of *P. dubiosa* Rober, *Colias australis alfacariensis* Ribbé, *Gonepteryx cleopatra* L., *Nymphalis polychloros erythromelas* Aust., and *Lycaenopsis argiolus* L. Unfortunately we had too little time to do full justice to this admirable locality.

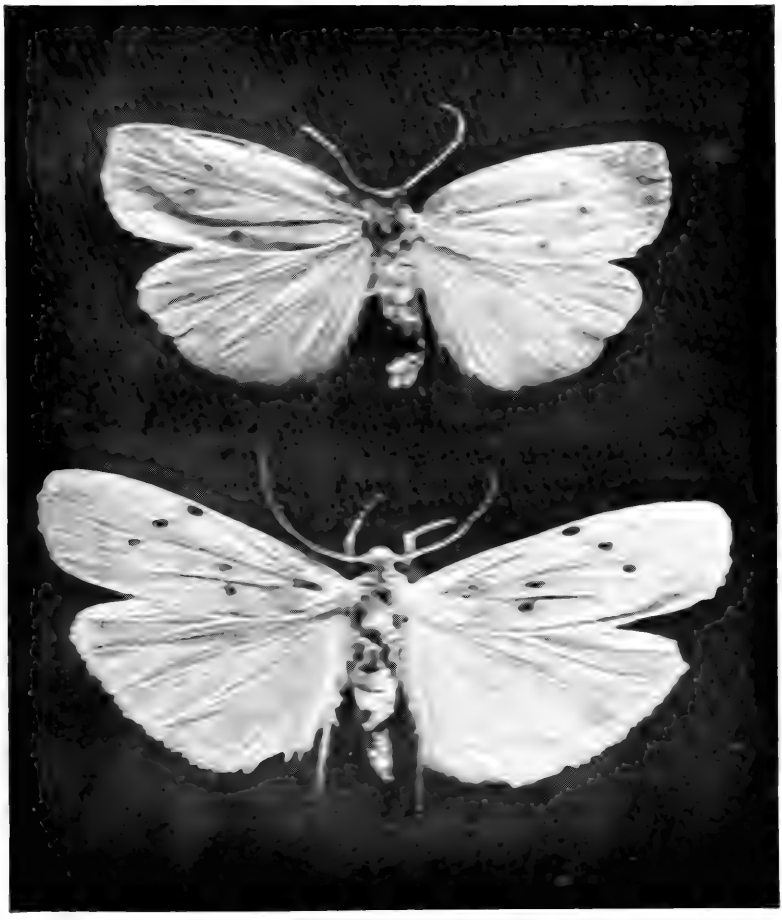
We left Granada for Cordoba on 15th April, travelling by Jaen through pleasant hilly country; but, apart from the *E. belemia* already mentioned and a few *E. ausonia* and *E. tagis*, we saw no butterflies of note. We devoted the 16th April wholly to the Great Mosque and other glories of Cordoba, and did no collecting: incidentally, there were showers and much wind. On 17th April we set off early in cloudy weather for Jerez-de-la-Frontera. We saw no butterflies, but it was definitely our bird day. In order to avoid traffic jams in Sevillia, where the *fiesta* was just due to begin, we took a cross road which passed through very marshy land near Marchena. First, we saw several Hoopoes (*Upupa epops*), one of which politely raised its crest for us as we passed. Next, we had a fine view of a flock of Little Egrets (*Egretta garzetta*) standing and feeding in a swamp, as well as of various kinds of duck and moor-hens. A little further on we saw many White Storks (*Ciconia ciconia*), some of them sitting in enormous untidy nests balanced on the tops of poles and chimney stacks. Shortly after that a great Imperial Eagle (*Aquila heliaca*) rose off the road immediately in front of the car carrying a mouse or some other small

creature in its talons. Finally, after a late lunch at our hotel in Jerez, we went out to the nearby hill-town of Arcos. The town is built on the edge of a high, rugged cliff, which proved to be inhabited by at least three pairs of Griffon Vultures (*Gyps fulvus*), about twenty Lesser Kestrels (*Falco naumanni*), and a number of Jackdaws (*Corvus monedula*), co-existing in apparent amity. We watched—and photographed—this assemblage from a small tower above the town hall, soaring and circling in the void in front of us. The vultures are prodigious birds: "muy grande: dos metres", as the door-keeper put it. They have apparently been there for time immemorial. The local legend is that, when the mediaeval lords of Arcos went forth to war, the vultures always went too. Later, they had a claim on the bodies of the horses killed in the local bull-fights, which used to be thrown over the cliff for their benefit. How they get their living at the present time we did not discover.

The next day we first of all visited a "bodega" in Jerez and sampled several kinds of excellent sherry, and later drove round the marshes of the Guadalete to Cadiz, coming back through another interesting hill-town, Medina Sidonia, from which the commander of the Armada took his title. But the weather was cool and windy, and my hopes of finding the little Blue, *Zizera lysimon* Hb., in the marshy ditches were disappointed: nor did we see many birds. Next morning we set off southwards for Algeciras in improving weather. After a short detour to the interesting Moorish hilltown of Verjer-la-Frontera, we explored some flowery ground among pinewoods just across the Rio Barbate, but without notable success. We were disappointed to find that the large Laguna de la Janda, where we had hoped to see more marsh birds, had recently been totally drained and converted to cattle pastures; and we had to content ourselves with the sight of a number of Cattle Egrets (*Ardeola ibis*), standing almost between the legs of the new bovine colonists, one or two to each beast. We lunched beside the fine beach at Tarifa, the southernmost point of Spain, and then devoted some time to exploring a romantic-looking glen in the Sierra de la Luna. This produced several *Z. rumina*, *T. ballus*, *C. rubi* and *P. egeria*, but nothing that we had not seen elsewhere; so we pushed on to spend our last night at the beautifully situated Hotel Reina Cristina on the outskirts of Algeciras.

Our last day, 20th April, was the sunniest and hottest we had. While my wife and daughter sun-bathed in the garden of the hotel, I spent a long morning by the railway line which goes from Algeciras toward Los Barrios. I was looking primarily for a reputed locality for the very local Fritillary *Melitaea aetherie* Hb., though I realised that in this late season it was unlikely to be yet on the wing. If I found the right place, it did not look very suitable for that insect; but there were fair numbers of butterflies on flowery banks by the railway, and I took some *P. machaon* and female *A. euphenoides* as well as two *E. belemia*, and completed my series of *Z. rumina* and *T. ballus*: a bag of eighteen insects in all. In the late afternoon we drove round the semi-circular Bay of Algeciras to Gibraltar, thus completing a round trip of about 900 miles. After watching a magnificent sunset and having dinner, we caught the midnight 'plane for London, and drove home from the airport in the small hours through a deluge of chilly English rain. This ended a most interesting and enjoyable expedition, though for good collecting we were clearly, this year, something like three weeks too early.

Folly Hill, Birtley Green, Bramley, Surrey. 26.iv.64.



Pelosia obtusa Herrich-Schäffer and *P. muscerda* Hufnagel (× 3·3)
Norfolk specimens.

Pelosia obtusa Herrich-Schäffer (Lep. Arctiidas), a species overlooked in Britain?

By C. J. Cadbury,
Department of Zoology, University Museum, Oxford.

The first British specimen of this Lithosiid was netted at dusk on 31st July 1961, by A. L. Goodson at Barton Broad, East Norfolk (Goodson, 1961). At the time he and J. Read were working the reed beds for *Pelosia muscerda* Huf., the Dotted Footman. The moth (a male) was taken some 40 yards from their light. It was not until later, however, that it was recognised by C. G. M. de Worms as *P. obtusa*, a species which was already known to be very local in scattered localities on the Continent (de Worms, 1963).

In spite of a search, no further specimens were obtained at Barton the following year. In 1963 I therefore tried another Norfolk locality several miles away, and, on the calm and overcast night of 3rd-4th August, I captured the second British example of *P. obtusa* (another male). This footman was taken in a mercury vapour light trap together with a large number of other moths, including four *P. muscerda*, *Comacla senex* Hübn., the round-winged muslin footman, the wainscots *Arenostola phragmitidis* Hübn. and *A. brevilinea* Fenn, and unexpectedly a specimen of *Enargia paleacea* Esp., the angle-barred sallow, a local species usually associated with more northern counties. The trap was situated in an open marsh amongst reed, *Phragmites communis* Trin., and the sedge *Cladium mariscus* (L.) Pohl. There were several small bushes of sallow, *Salix cinerea* L., scattered about the swamp. Nearby there was a denser growth of sallows, great water dock, *Rumex hydrolapathum* Huds. and comfrey, *Symphytum officinale* L. Beneath the bushes I noticed rotten logs covered with the moss *Acrocladium cuspidatum* (Hedw.) Lindb. and a considerable accumulation of dead sallow leaves. This may be where *obtusa* is breeding as the reed and sedge bed in which I captured the specimen is frequently flooded. The type of marsh in which I was working was, however, much less wooded than that round Barton Broad, where there are large areas of alder and birch carr. The locality is isolated from Barton by several miles of well-drained land, quite unsuitable for this fen species.

P. obtusa differs from *P. muscerda*, found in similar habitats, by its shorter and relatively broader fore-wings, which are more rounded at the apex. Furthermore, the ground colour is browner and the wings lack the silvery costal stripe that is characteristic of fresh specimens of the larger species. The best distinguishing feature, however, is the arrangement of dark spots on the fore-wings (see plate). A. Seitz's work (1913) has a good illustration of *obtusa*, and there are excellent photographs of both species in Goodson's 1961 paper.

The genitalia of *P. obtusa* and related species are beautifully illustrated by E. Urbahn (1932, plate 2). Compared with those of *P. muscerda* the claspers of *obtusa* are considerably shorter and more spade-like. The uncus is also shorter and strongly recurved to form a hook. Furthermore, the antennal segments, which Urbahn figures in the same plate, differ in the two species, those of *obtusa* having smaller tubercles.

According to Urbahn (1932) *P. obtusa* was first described from a specimen taken in 1840 near Pratovecchio in Toscana, Central Italy. In 1870

F. Schmidt obtained a female that hatched from a pupa found in a reed stem near Wismar in Mecklenburg, North Germany . This specimen was, however, passed over as *P. muscerda* until 1894.

In addition to these areas, O. Staudinger and H. Rebel (1901) give the distribution of *obtusa* as East Hungary, Galicia (part of which is now Poland and the rest in the Ukraine), Sarepta in the vicinity of Volgagrad (until recently Stalingrad) in South Russia, and Armenia. Staudinger described *P. sutschana* from three males taken by the Ussuri River on the U.S.S.R.-Mongolia border (Romanoff, 1892). However, as Urbahn points out, this is in fact a small race of *P. obtusa* with genitalia differing but slightly from those of European specimens.

Between 1870 and 1931 no further specimens of *obtusa* were taken in North Germany. In 1931 Pfau and Schmidt rediscovered the species in the Peene Valley, Mecklenburg. These two collectors returned to the locality with the Urbahns and Dunkel the following July. They took a series of males and also a single female that were attracted to a powerful light in the dense reed beds (Urbahn, 1932). In 1933 *obtusa* was not only taken in some numbers in the original marsh, but also lower down the Peene River, and in what is now North-west Poland, where six males were captured by Haeger and Rathje (Urbahn, 1933). Bishop A. S. Hoffmeyer (1937) mentions that *obtusa* occurs in Brandenburg (now in East Germany) on Urbahn's authority. Furthermore, he adds the Danish island of Lolland in the Baltic to the known distribution of this species.

Since 1950 *P. obtusa* has been discovered in at least 14 localities in Holland, from Friesland (3 places) in the north to Noord Brabant (5 places) and Lemburg in the south. A number of specimens have been captured at Kotenhoef (between Amsterdam and Hilversum) in Noord Holland (Lempke, 1961).

In France *P. obtusa* was first taken in 1932. Vicomte H. de Toulgöet (1945) states that this species had been found in 7 departments of France:— l'Aisne and l'Oise in the north; les Deux-Sèvres, la Charente-Maritime and la Vendée in the west; and les Bouches du Rhône on the south coast; as well as his own locality in Loir-et-Cher in the centre. Between 15th July and 5th August he captured 20 specimens at light in a room overlooking a lake over-grown with reed and lesser reedmace, *Typha angustifolia* L., near Millançay. He indicates that the species must be local as it was apparently absent from two suitable areas nearby which had previously been well worked by entomologists.

At the time of writing, the British Museum (Natural History) in London has only 16 specimens of *obtusa*. A number of these were taken in 1911 close to the present eastern border of Hungary. There are also specimens captured in 1950 by Dr. Kaszeb in the vicinity of Lake Balaton, West Hungary, as well as a few from France. I suspect it will be found in the extensive marshes of the Neusiedler See on the East Austrian-Hungarian border, and in the Danube and Volga deltas.

It is possible that a melanic polymorphism exists in *P. obtusa* as in *P. noctis* Butler, a related species known from Japan and the U.S.S.R.-Mongolian border. The two British specimens of *obtusa* and all those from Hungary and France in the British Museum have tawny-brown fore-wings. two of the four imagines from North Germany that are figured by Urbahn (1932: plate 1, figs. 1*a* and 1*d*) appear to have dark wings with the spots somewhat obscured. In fact, he mentions that *obtusa* can be recognised

by its chocolate-brown colour from moths like *Comacla senex*, *Chilodes maritima* Tausch., the silky wainscot, and *Chilo phragmitellus* Hübn., a Pyralid, that may also be attracted to the light at the same time. Melanic forms of several fenland wainscots including *Nonagria typhae* Thunb. and *N. dissoluta* Treit, are well-known in certain parts of England. These melanics may well be more cryptic than the light form when at rest on the dark stems of plants like the great water dock, *Rumex hydrolapathum* or on old reeds, which, in some areas, such as East Anglia, become blackened with industrial pollution (Kettlewell, 1958).

As practically nothing has been published in English on the habits and life history of *P. obtusa*, I propose to quote fairly extensively from Urbahn (1932 and 1933). This species was bred for the first time in 1932 by a Berlin collector, H. Meinicke, who obtained eggs from les Deux-Sèvres in France. Eight larvae hatched on 10th August and were fed on dandelion, *Taraxacum* spp. Six of them died in the first instar; the seventh grew rapidly and pupated in late September. The remaining larva had reached the third instar by mid-October when it came into the hands of Dr. Urbahn, who both described and illustrated it (Urbahn, 1932: plate 1, fig. 7). He noticed that it was very sensitive to changes in humidity. In the later stages of its development the larva hid in a dry reed stem, feeding only on the lettuce and dandelion leaves that it could reach from there. On attaining full growth (when it was 1·5 cm. long) the larva spun a light cocoon in a fragment of reed and formed a reddish-brown pupa with the larval skin adhering to it. The imago emerged in mid-December, 16 days after pupation. It is of interest to note that the first German *obtusa* was reared from a pupa discovered in a reed stem in the wild. Urbahn was unable to describe the earlier stages in the life cycle until he had obtained eggs from the female taken in 1933.

According to Urbahn, the eggs of *obtusa* are at first pale yellow and become darker brown, while those of *P. muscerda* are greenish-grey. Furthermore, young *obtusa* larvae have yellowish-brown heads, while those of *muscerda* are black and shiny. In *obtusa* the integument of the third instar larva is glossy and generally sand-coloured or greenish with various dark longitudinal stripes. The dorsal stripe is narrow and interrupted. The broader sub-dorsal stripes are lilac-brown in colour. The dark spiracle openings are picked out by a line of arcuate (curved) spots. Along the dorsal surface of each abdominal segment there are two pairs of wart-like protuberances which bear tufts of light-brown hairs. There are additional hairs in the vicinity of the spiracles and below them where they are longer and darker. Though the head remains pale, the integument of the last instar larva becomes blackish-brown so that the stripes are no longer conspicuous, and the hairs become darker.

Vicomte de Toulgoët (personal communication) has two specimens of *obtusa* in his collection which (from information on the data labels) were reared in 1937 and 1940 from eggs of Hungarian origin by Pinker in Vienna. This may be the only other occasion when *P. obtusa* has been bred in captivity. Larvae have never been discovered in the wild, neither indeed have those of *P. muscerda* as far as I can ascertain from the records.

W. Buckler (1889) describes the life-history of *muscerda* and figures last instar larvae. His *muscerda* fed on the mosses *Camptothecium sericeum* Kindb. and *Dicranoweisia cirrata* Lindb., the lichen *Diploicia canescens* (Dicks) Massal, as well as on decayed sallow and bramble leaves. Dr. H.

B. D. Kettlewell (personal communication) has reared larvae of this species on dandelion in a screw-top jar. No fresh food was added when he noticed that the larvae thrived on the decaying leaves.

The emergence of *P. obtusa* imagines appears to begin in the second or third week in July, but the species can be found until the first week of August. Extreme dates given by Lempke (1961) from Holland are 23rd June and 14th August. Goodson took his male specimen at Barton Broad while it was flying at dusk. According to Urbahn (1932) the one female that he took in 1932 came to light at 22.30 hrs. while the males did not appear until an hour later and continued to fly until 01.00 hrs. This suggests that the female may have a precopulatory flight on occasions. The males did not appear to be attracted from any distance but they "buzzed" actively round the lamp. The female taken in 1933 was captured at 02.00 hrs. (when perhaps it was on an oviposting flight). De Toulgoët (personal communication) also claims that both sexes of *obtusa* are attracted to light. Barrett (1895) states that in the case of *P. muscerda* there may be three periods of flight on favourable nights—at dusk, at midnight, and again at dawn. Though *muscerda* may be attracted freely to traps, more frequently it is the habit of this species to remain resting on the illuminated vegetation outside.

In spite of its fairly wide-spread distribution on the Continent, *P. obtusa* is represented in comparatively few collections. Is *obtusa* really so local and rare, or is it overlooked because of its retiring habits? Barton and Sutton Broads, and the marshes round Ranworth and Horning have been well worked by entomologists for a century, and many *muscerda* have been taken in these localities. There is no doubt, in my opinion, that *P. obtusa* is indigenous in Norfolk, and may possibly be found elsewhere in Britain (e.g. Suffolk and Kent). I believe that it has been overlooked because it is sluggish in its behaviour and does not fly far. Its short, rather rounded wings give the impression that *obtusa* is, like *Comacla senex*, a weak flyer. *P. obtusa* apparently rarely leaves the shelter of dense reed beds.

With the evidence provided in this paper that an extremely local species exists in the fens of Britain (not necessarily associated with its relative *P. muscerda*), it is hoped that new localities for *Pelosia obtusa* will be recorded. It is also hoped that further dates on the ecology and life history of this species will be forthcoming in the near future.

It is my intention that the second Norfolk specimen of *obtusa* will be preserved in the National (Rothschild, Cockayne, and Kettlewell) Collection of British Lepidoptera in the British Museum (Natural History) at Tring.

SUMMARY

1. Details of the first two British records (1961 and 1963) of *Pelosia obtusa* H.S. (Lithosiidae) are given. Both specimens were taken in the Norfolk Broads.
2. The distinguishing features between *P. obtusa* and *P. muscerda* Huf. are described briefly, together with some details of the genitalia which are quoted from E. Urbahn (1932).
3. *P. obtusa* was first described from an Italian specimen taken in 1840. This species is now known to occur on the Continent in France, Holland, on a Danish island in the Baltic, North Germany and Poland, and from Hungary into South Russia. A small race is found in East Asia.

4. It is possible that a melanic form occurs in North Germany.
5. The moth has been bred successfully only three or four times in captivity. Details of the life history, including a description of the larva, are taken from Urbahn (1932 and 1933). The larva has not been found in the wild.
6. The imagines usually first emerge in the second and third weeks of July, but they are still to be found in the first week of August. Some details of times of flight are given. Both sexes are attracted to light, but the majority of specimens taken in such a way are males.
7. It is suggested that *P. obtusa* is indigenous in the Norfolk Broads, but has been overlooked because of its sluggish habits and the fact that it rarely leaves the dense reed beds.

ACKNOWLEDGMENTS

It was Dr. H. B. D. Kettlewell who encouraged me in the first place to search for *P. obtusa*. I am therefore most grateful to him and to Professor E. B. Ford for reading this paper and making valuable comments.

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Thoughts on Rearing *Stauropus fagi* L. (The Lobster Moth)

By H. Symes

A great deal has been written about the remarkable larva (which, of course, alone bears some fanciful resemblance to a lobster) of this species, and there is a long and fascinating account of it in Buckler (Larvae, II., 63/72). Moults at every stage nearly always take place at night, and I once sat up until nearly 2 a.m. watching a final one. In its earliest stages the larva resembles an ant, and later a spider. Dr. E. B. Ford

(Moths, p. 110), after remarking that it may often be saved by this deception, goes on to point out that it can eject formic acid from a gland in its thorax, and that this acid may be a protection against ichneumons. If this is so, I must say that it is not very effective, for of all the larvae that I have beaten or found, something like 25% had already been "stung". I remember once cutting a larva in half with my beating stick, and my initial chagrin was soon ended when I saw a parasitic grub inside the body.

The best year I have known for the larvae (and not of this species only) in the New Forest was 1934. I beat fourteen of them, nearly all from oak, and found a very dark one on a hawthorn as I was walking along a path: so closely did it resemble a couple of withered brown leaves that I walked past it and then turned back for a second look. Unfortunately it turned out to have been "stung". The late Mr. Rippon, who wanted two or three larvae, motored down from Newbury for a day with me, and soon beat four or five from oak.

About twenty-five years ago, I went down to east Kent with a friend for a week, mainly to get *Melitaea athalia* Rott. One day we were invited to join a party of local entomologists on a visit to a beech wood where *fagi* was regularly to be found on the tree trunks. It was pouring with rain and we wandered through the wood under the partial shelter of the trees for a long time without seeing anything. Then someone found a *fagi*. It was an extremely worn specimen. One by one, the members of the party came up and inspected it. "What a pity it is a male", they said, "you can tell that by the antennae". When they had all rejected it and passed on their way, I came back and had another look at it. Was it really a male, I wondered, and the possibility of eggs began to form at the back of my mind. I boxed the insect and took it back to my quarters, where I put it in a large pill box and covered the top with a piece of gauze. Next morning, I found that twelve eggs had been laid. What had been assumed to be male antennae were really, as I had suspected, the hairy forelegs extended in front of the moth on the tree trunk. I believe that when resting, *fagi* keeps its antennae tucked back over its shoulders, where they can hardly be seen. Forty eggs in all were laid, of which a dozen did not hatch, and eventually I bred twelve moths.

For success in rearing *fagi* from the egg, certain precautions are advisable. If the eggs are laid on a suitable foundation, such as gauze or paper, the material should be cut up into small pieces, with not more than two or three eggs on each, and placed separately in small boxes. Then, when the larvae hatch and each stands guard over its own egg, there will be no danger of the larva being driven away from its egg in a free fight. All through their life, they should be kept in very small numbers in separate boxes, for they are restless, quarrelsome beasts, and when two meet, they seem to be spoiling for a fight, in the course of which they bite off one another's legs, or bits of them, and tail filaments. Such injuries very often lead in the end to the wounded larva's death, but this is not necessarily the case. One morning after a very stormy night, I found a larva at the foot of a large beech tree near Wantage. It was in its last instar and was just starting on the long climb back to a leafy branch. I doubt if it would have succeeded, as several bits of leg were missing. However, it survived to complete its growth and pupate, and next year a very nice moth emerged.

To illustrate the disastrous effects of overcrowding, I must cite the case of an acquaintance who found himself with about two hundred eggs. When these hatched, he tried to rear the whole lot of the larvae. I heard afterwards that five had pupated.

During the eight months or so of its existence, the pupa must be exposed to plenty of moisture, or its contents will dry up. In 1934, after one or two deaths and losses from parasites, ten of my larvae pupated. I kept the pupae through the winter just inside the open window of a very cool room facing north, but when the time came, only three moths (and two ichneumons) emerged. I was disappointed, but the remaining five pupae looked perfectly healthy, and thinking that they might perhaps, like other Notodontidae, go over for a second year, I put them aside in a cool place, but when I eventually opened them a year later, I found that each pupa contained a dried-up moth. I mentioned this to the late F. W. Andrews, and he said: "You must keep *fagi* pupae in a place exposed to the rain". How right he was. The cocoon, usually enclosed between two leaves, is made of a transparent material that looks like thin polythene, and is presumably waterproof. When my East Kent larvae pupated, I put the leaves containing the cocoons in a flower pot and covered the top with wire gauze as a protection against mice and birds, but not against the rain, and kept the pot out of doors, exposed to all weathers. Twelve moths emerged from, I think, fourteen cocoons. This year I kept four pupae through the winter under similar conditions, and four moths have emerged. They came out about 11 p.m. B.S.T., an inconvenient habit, since they must be allowed enough time to dry their wings before being killed. Females will generally remain quiet until morning, but males are apt to damage themselves. Other members of the prominent family, notably *Pheosia tremula* Clerck, also emerge at this time of night. The first time I bred a swallow prominent, I found in my breeding cage one morning a battered and almost unrecognisable male.

Fagi is one of those species that have been taken in much larger numbers since the introduction of the mercury vapour light. But I think that a dozen specimens taken in this way would be the source of much less satisfaction to a real entomologist than three or four that he had bred from the egg and had the pleasure of observing through all the stages of their life history.

52 Lowther Road, Bournemouth, Hants. 3.vi.1964.

Greece, April 1964

By Major General Sir GEORGE JOHNSON, K.C.V.O., C.B., C.B.E., D.S.O., D.L.

After reading Baron de Worms's account of spring butterflies in Greece (*Ent. Rec.*, **75**: 233) I decided to visit that country on the first opportunity. I took the plane to Athens on 6th April. The following day I went to Crete and stayed a week in Heraklion. The weather was mixed; four days overcast and a little rain on one of them. I investigated the country within about 50 miles of Heraklion by car so far as the rather limited roads permitted. Butterflies were a little disappointing. Twelve species common in England were observed. Of others, *Papilio machaon* L. and *Iphiclides podalirius* L. were common. *Pieris ausonia* Hübn. was common

in a form with a much yellower green on underside of hindwing and a considerably larger expanse of white generally on this wing than in Greek mainland or in Spanish forms. *Gonepteryx cleopatra* L. was common but worn (hibernated). *Turamana vicrama* Moore (a small form) was common on some strong scrubby ground adjoining Heraklion airport. One *Polyommatus thersites* L. with very small underside spots was obtained, and several skippers, apparently all *Spilothymus alceae* Esp.

There were fine flowers in the hills, in particular a very large dark purple *Arum*, a most spectacular improvement on our own "lords and ladies".

Of birds, Cetti's warbler was not uncommon and very noisy with its loud and distinctive song. Collared flycatchers were seen at Knossos, perhaps on migration.

On 14th April I returned to Athens, and next day motored the hundred odd miles to Delphi where I stayed until 26th April. The weather throughout my stay, except for one overcast cool day, was perfect, brilliant sun, temperatures 65°-75° by day with cooler nights. The village of Delphi and the famous ruins lie at about 1700 feet above sea level on steeply sloping ground between two enormous precipices, one above and one below, each over 1000 feet in height. I stayed in a hotel where I had the rather unusual experience of taking the lift *down* to the bedroom, the hotel being built down from the road on to the brink of the lower precipice. The view from my balcony was spectacular—over an enormous gorge, its bottom a valley covered with olives, which extended in a gradually widening plain to Itea on the Gulf of Corinth, five miles as the raven flies, but perhaps fifteen miles by road. Numbers of ravens soared past my window, playing in the thermals rising from the precipice. A pair of Egyptian vultures often came sailing past, and griffons, which were breeding in the second tier of precipices above the hotel, were usually in evidence. Once I had the wonderful sight of a lammergeier (one of the rarest birds in Europe) soaring past at quite close range.

Flowers round the ruins were abundant in quantity but rather disappointing in quality. Crucifers, scabious, Papilionaceae, etc., were predominant. Higher up on the plateau above the higher tier of cliffs (3500 feet) there were species of delightful small irises, blue anemones and a scarlet Adonis.

My experiences with the butterflies were similar to de Worms's, to whom I am most grateful for his lucid article and personal advice. There were a few points of difference worth recording. *Papilio alexanor* L., first seen 20th April, subsequently common, particularly on a slope below the village of Hrisos on the road to Itea at about 300 feet. Here, where the vegetation was obviously earlier than at Delphi, I found a patch of big purple thistles on which *alexanor* frequently settled and was easily caught. It is less wary than *machaon* or *podalirius,* which flew with it. *Pieris krueperi* Staud., first seen 15th April (on arrival), later common about half a mile of the Castalia Spring on the higher precipice. I never saw it more than a few feet from the sheer cliff and its capture was a question of standing on the undercliff at a suitable corner within net range of the cliff itself. At one point, half the whites that came past were *krueperi* and more could be seen flying up and down the rock faces above. No doubt the foodplant (of which I am ignorant) grows in clefts on the precipice.

Pieris ergone Geyer. I found this most commonly above Delphi on the way up to the higher plateau above the highier tier of cliff.

Polyommatus thristes L. de Worms records this as the predominant blue on the undercliff. I found it very scarce, whereas *P. icarus* L. and *Aricia agestis* Schiff. swarmed.

I saw all the butterflies recorded by de Worms except for *Aglais urticae* L. and I add the following:—*Aporia crataegi* L. (one ♂ at 3400 ft.); *Pieris napi* L. (one ♂ on 18th April); *Leptidia sinapis* L. (one ♂ on 17th April at the Castalia Spring); *Pararge egeria* L. (one ♂ at the Castalia Spring); *Thestor ballus* F. seen near St Luke's Monastry above Gulf of Corinth; *Spiolio orbifer* Hübn., one fresh specimen on the ruins, 18th April.

Apart from birds already mentioned, the following species, unfamiliar in north-west Europe, were observed:—Red-footed falcon, roller, pratincole, lesser ringed plover (all from Itea), black-throated wheatear, blue rock thrush, subalpine warbler, Rappell's warbler, Orpheim warbler, rock nuthatch, sombre tit, red-rumped swallow, crag martin, alpine swift and Cretschmar's bunting.

15.v.1964.

A Note on *Leto venus* Stoll. (Lepidoptera: Hepialidae)

By A. J. Duke and J. S. Taylor

Popularly known as the silver moth or the silver-spotted ghost moth, this magnificent hepialid is described and illustrated by Janse (1942-48) while the same author has also described the larva (1939) and the pupa 1940). In 1945 Dr. Janse gave an account of the occurrence of the species and what was then known of its life-history based upon notes made by members of the Newdigate family of Forest Hall, near Plettenberg Bay, C.P.

For many years this family held the monopoly (so to speak) of *Leto venus* and maintained a strict secrecy about its occurrence and whereabouts, as they feared if these became widely known the species might become in danger of extinction through over-collection. However, they supplied collectors with specimens for a small fee, all the monies received being devoted entirely to charitable purposes, and it has been recorded that a mission church was erected with some of the funds thus raised. As Janse (1945) mentions, most of the specimens now in museums were obtained from the Newdigate family.

Both the present writers have at different times (1956 and 1964) and independently carried out investigations on *L. venus* and this paper is the result of their combined efforts.

No precise locality was given when the species was first described by Stoll in 1780 except that it was from the Cape of Good Hope. Neither did Walker mention any particular locality when he produced a further description in 1856. However, from correspondence between Mr. W. N. Newdigate of Forest Hall and Mr. Roland Trimen, Curator of the South African Museum, Cape Town, it seems that an adult specimen was sent from Forest Hall to the Museum in 1869, while in 1878 the insect was first found in association with its larval host, the keurboom (Janse, 1945).

Leto venus is apparently confined to the Tzitzikama Forest area, and, as stated in the Newdigate notes (Janse, *op. cit.*), is found from Witelsbos in the east to George in the west. More recently it has also been recorded from the Longkloof.

The larval host, keurboom or *Virgilia oroboides*, formerly *capensis*, is found from van Stadens westwards right down into the Western Province of the Cape although some botanists state that the species of *Virgilia* occurring from George eastwards is another species *divaricata* and that *oroboides* is the more western species. However, opinions seem to be divided as to whether they are one or two species, and because of this technical botanical problem we have assumed that the keurboom of the area in which *L. venus* occurs is *Virgilia oroboides*.

That *Leto venus* is not found west of George is not surprising as the nature of the country is vastly different, the continuous indigenous forest belt ceases, while keurboom is found in only isolated patches here and there. It may also be mentioned in this connection that the adult insect, especially the female, is not particularly mobile and is therefore unlikely to travel far.

It has been found that this hepialid is of much commoner occurrence than was at one time thought. Almost every sizeable keurboom is infested by the larva and practically all ultimately die as a result of its depredations. It is said that the early settlers in the area described it as "the tree that blocks the path", indicating that fallen trees were then as now, often met with. There seems to be little doubt that *L. venus* was responsible for the fallen trees. Indeed, if the keurboom was a cultivated species, this hepialid might well be regarded as a serious pest. Fortunately the seed germinates easily and the young trees spring up everywhere. So long as the keurboom remains as common as it is today, there seems to be little likelihood of there being any scarcity of *L. venus*.

Although the adult itself is apparently seldom seen, signs of larval feeding such as frass and mucilage on the trunks of affected trees, with empty pupal cases protruding during the emergence season, can be found throughout the area, and, as stated previously, there is hardly a sizeable tree which does not exhibit such signs or indications.

The exact duration of the immature stages of *L. venus* has not been determined but the estimates for the larval and pupal periods as "several years" and "at least a year" as given in the Newdigate notes and quoted by Janse (*op. cit.*) are probably at least approximately correct.

The adult, like other hepialids, has vestigial mouth-parts and is incapable of feeding; hence its period of life is short. At Wilderness, a male lived for two days in captivity and a female for five days.

From a keurboom stump obtained at Knysna on 5th February 1964, and removed to Wilderness, adults emerged from 10th February until 31st March (the second emergence did not take place until 3rd March). Twenty individuals in all, of which nine were males, were obtained from the same stump. Three stumps obtained near Plettenberg Bay in 1956 and taken to Cape Town, produced four adults, of which two were males, from 21st to 29th March between 7.30 and 10.15 p.m. At Wilderness, the moths usually emerged early in the evening from about 6.45 p.m., but sometimes considerably later. It was noticed that as the days shortened emergences tended to occur earlier in the evening, indicating that dusk or nightfall has some influence upon the time of emergence. It was

likewise observed that emergences were more liable to take place when the weather conditions were damp.

At Wilderness, attempts at breeding from the adult were unsuccessful; also attempts at "assembling" with the female; this possibly because of the distance from the forests where the host tree is normally found.

Eggs were obtained from the female kept in captivity: all proved to be infertile. The egg is round and seed-like, dull black with a matt surface and measures some 1·5 mm. in diameter.

The period of emergence, according to the Newdigate notes, is from February to March, as was the case with the more recent collected material already referred to. Under natural conditions, however, the emergence period probably extends well into April, as apparently fresh pupal cases have been found on growing keurboom as late as 24th April. It has been found that the empty pupal cases do not normally remain for more than a day or two *in situ* as they are very soon removed by ants or disappear through some other cause. Possibly emergence was accelerated by the cutting down of the trees and the removal of the stumps indoors. It is understood that the Newdigate material was also obtained in this manner.

As described in the Newdigate notes, the larva pushes its frass out through a hole in the upper end of its tunnel and, on reaching maturity and preparatory to pupation, it seals this hole with a cap of gummy sawdust. These caps are visible and denote the presence of the pupae within. Immediately prior to the emergence of the adult the cap cracks open and the pupa forces its way through. An account of this as observed in one of the stumps removed to Cape Town follows.

The first indication of an emergence appeared on the evening of 21st March when a slight crack was noticed at the top of one of the sawdust caps. This was at 7.30 p.m. An hour later the crack had widened sufficiently to enable the head of the pupa to be seen. The method employed was that the pupa exerted a steady pressure until the crack had widened slightly. It then moved back down the tunnel to rest there for several minutes before moving up to resume the pressure on the cap once more. These operations continued until 9 p.m., by which time the cap was split wide open at the top, and then, with a crackling noise, the pupa worked itself out of the tunnel until the wing-cases were free, and it was held only by the abdominal segments. It remained still for a minute or two and then broke open, the moth (a male) pulling itself free and, half-turning, it clutched at the trunk and walked rapidly to the top. It then walked round and round the top of the stump obviously desiring to proceed higher, but it eventually settled down and hung quietly while its wings commenced to expand. The drying process occupied only twenty minutes and then the moth folded its wings into the normal resting position. The moth was not interfered with and it eventually flew around the room at 10.15 p.m. The flight is peculiar as it beats its wings very rapidly like a locust, and with its abdomen trailing out behind.

In one instance the pupal tube was opened in order to observe the pupa moving up and down within it. It was found that the pupa can move very rapidly by wriggling the abdominal segments which are provided with ridges and protuberances for the purpose. As Dr. Janse (1940) has pointed out in his description of the pupa the abdominal segments are also provided with spines and setae which are designed to

hold the pupa firmly in the tunnel while the adult pulls itself free. To this end it is also assisted by the silk at the top of the tube. When the pupa first moves up the tube to exert pressure on the cap it forces the silk to the sides. The setae and spines cling firmly to the silk lining when the pupal case is forced half-way out of the tube preparatory to the moth's emergence.

In the case of the keurboom stump kept at Wilderness and from which twenty adults were obtained, the majority on emergence climbed rapidly to the top of the stump and considerably higher if and when provision was made for this. One or two, however, were content to climb only a few inches.

In 1956, before the three stumps, already referred to, were removed to Cape Town, some time was spent by one of the present writers (A.J.D.) on the farm Longridge, near Plettenberg Bay, then belonging to Mr. J. Newdigate, a grandson of the owner of Forest Hall, who supplied Trimen with his specimens, and whose daughters obtained most of the material now to be found in museums. Nearly all the larger trees on and around the property were found to be infested by *L. venus*, and many showed signs that more than one larva was at work within, while a considerable number also had galleries sealed with the saw-dust cap indicating that pupae were present.

Searches were made in the evenings and at night in the hope of obtaining adults but were hampered by rain which fell constantly and the results were completely negative. Inspection of the trees in the mornings, however, revealed that moths had emerged during the night as fresh pupal cases were found protruding from the trunks. From this, as well as from the fact that moths ex stumps apparently prefer to climb to a considerable height after emergence it would seem reasonable to conclude that under natural conditions they climb high up the trees where in the semi-darkness they would be most inconspicuous, their silver spots assisting them to merge into the background of keurboom leaves.

Unfortunately, no proof of this has been obtained as no specimens were taken on trees (in fact the moth is rarely seen, hence its apparent rarity), although a female came to a 300 c.p. paraffin pressure lamp between 8 and 8.30 p.m. one evening, indicating that like some other species of hepialid, *L. venus* is also attracted to light. If this is the case, however, it seems strange that no other specimens have been attracted in this way.

The locust-like flight of the male moth has already been mentioned. The female, as described in the Newdigate notes, is probably too heavy and clumsy for sustained flight and just flops about. As suggested earlier this may at least partially account for the restricted distribution of the species.

Both larva and pupa have been described by Janse (1939 and 1940); all that can be added about the larva here is that when the stumps removed to Cape Town in 1956 were eventually opened one living half-grown specimen was found. It had a strong and most unpleasant smell which the writer concerned (A.J.D.) is at a loss to describe, as he knows of no other odour with which it can be compared.

According to the Newdigate notes the chief enemies of *L. venus* are bats and ants, while the practice of cutting down keur trees for fencing poles and firewood destroys many in the developmental stages. That the larval frass is attractive to ants soon became evident in Cape Town where,

when the stumps were left unattended for a short period, they were soon swarming with Argentine ants.

Birds, such as woodpeckers, owls and nightjars also probably prey upon the insect.

The stump obtained at Knysna and kept at Wilderness as well as producing twenty adults of *L. venus* also brought forth, but before the emergence of the hepialid commenced, many hundreds of alates of *Porotermes planiceps* Sjostedt. This termite nests within dead and decaying wood in or in contact with the soil, and its infestation of the keurboom stump was doubtless secondary to that of *L. venus* and was not in any way competitive with the latter.

Summary

An account, supplementary to that based upon data obtained by the Newdigate family (Janse, 1945) is given of the occurrence, life-history and habits, so far as they are known, of *Leto venus* Stoll. (Hepialidae). The insect, although not rare, is seldom seen, except for the empty pupal cases, and it has a restricted distribution, being apparently confined to the Tzitzikama forest area from Witelsbos to George. The larval host is *Virgilia oroboides*, popularly known as keurboom, and almost all the older and sizeable specimens are infested by the larva. The adult or moth emerges from February to April.

Acknowledgments

The writers are much indebted to Mr. J. Newdigate and Major C. H. F. Woolley for their ready and enthusiastic assistance in obtaining material; to Dr. W. G. H. Coaton for the determination of the termite as well as for information thereon; and to Mr. C. G. C. Dickson for helpful criticism and advice in the preparation of this paper.

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Early Migrant Lepidoptera in 1964.—A male *Heliothis peltigera* and two *Nomophila noctuella* came to my light trap at Arundel, Sussex, on 9th May. The *peltigera* was of the palest yellow form (not worn) and had evidently developed quickly under warm conditions in its country of origin. There were two *Plusia gamma* L. and a female *Agrotis ipsilon* in the trap on 15th May and the same species again on 17th May. A female *Nycterosea obstipata* came on 16th May. On 12th May I watched *Nymphalis atalanta* L., the red admiral butterfly, at Lyndhurst, Hampshire.—G. Haggett, 1 Torton Hill, Arundel, Sussex. 18.v.1964.

Meliana flammea Curtis at Arundel Sussex.—A very fresh male of this species came to my light trap at Arundel on the night of 17th May 1964. This is apparently the first record for this species in Sussex.—G. Haggett, 1 Torton Hill, Arundel, Sussex. 18.v.1964.

The Larval Taxonomy of the British Trichoptera

By Allan Brindle

4. The Sericostomatidae

Although in general the identification of caddis larvae presents some difficulties, certain families are relatively easily distinguished. The Sericostomatidae are one such family for many of the larval cases are distinctive and unlike those of any other family. The kind of case is even more useful, for in the Sericostomatidae, which is a small but rather heterogeneous family, there are four subfamilies, each of which has a different kind of larval case. The cases of this family can be summarised as follows:—

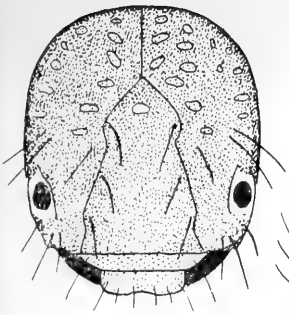
1. Case tubular, smooth, of mineral material (fig. 10) .. Sericostomatinae
2. Case tubular, of silk only, without added material .. Brachycentrinae
3. Case quadrangular, of vegetable or mineral material (fig. 11) ..... Lepidostomatinae
4. Case elliptical, of mineral material and with larger stones arranged along the side (fig. 9) ..... Goerinae

Since the number of species in each subfamily range only from one to four, the type of case used by the larvae is most useful. This summary would serve for both the larvae and the pupae since the pupal stage is spent within the larval case. The only exception to the above is *Lasiocephala*, which belongs to the Lepidostomatinae but makes a tubular case (fig. 12).

Of these four kinds of cases, the first kind is the one most liable to be confused with other caddis cases, certain Limnephilid larvae, for example, making a similar case, but these can be distinguished by features of the thorax. The case of the Brachycentrinae is distinctive, but Lestage (1921) reports that occasionally the case may be partly of vegetable material, and may be quadrangular in young larvae. This illustrates the caution which should be used when identifying caddis larvae from their cases, but these are most useful provided their limitations are recognised and other characters used as well. The quadrangular cases of the Lepidostomatinae are distinctive, no other caddis larvae making such a case, though the young larvae sometimes make a tubular one. When this occurs the later constructed parts of the case are quadrangular, i.e. the posterior part is tubular and the anterior part is quadrangular. No reservations are needed for the cases of the Goerinae; this type is easily recognised and appears to be constant and restricted to this subfamily.

The key to the larvae of this family given in Lestage (l.c.) has been partly superseded by more recent descriptions of British larvae. Hanna (1956) when describing the larva of *Notidobia*, included some distinguishing features between this larva and that of *Sericostoma*. Baker (1963) has revised the larvae of the Goerinae and has given a key. Both these publications have been referred to in the compilation of the present keys, as well as Hickin (1943) on the larva of *Brachycentrus*. The pupal keys are based on those in Lestage (l.c.). The spines mentioned in the key are those at the apex of the tibiae of the pupae; they are conspicuous and large, and the numbers are given in order for the first, second, and third pairs of legs.

The four subfamilies of this family have previously been separated in the larval and pupal stages in earlier papers (Brindle, 1961a, 1961b) but a modified key is given below.



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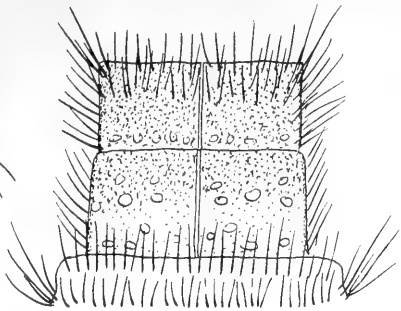

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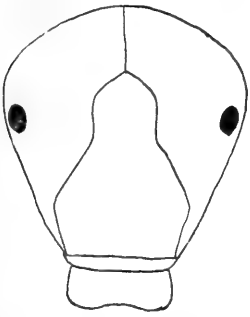

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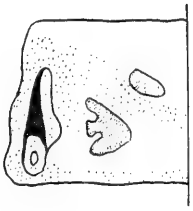

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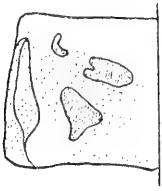

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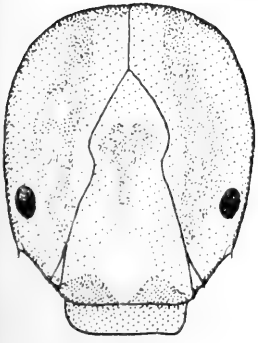

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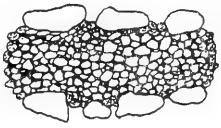

9

10

11

12

S. personatum : 1, head; 3, pupal labrum; 10, larval case. *N. ciliaris* : 2, thorax (after Hanna); 4, pupal labrum. *Silo* : 5, head; 7, left half of metanotum; 9, larval case. *Gocra* : 6, left half of metanotum. *B. subnubilus* : 8, head (after Hickin). *C. irrorata* : 11, larval case. *L. basalis* : 12, larval case. (Figs. 6, 7, after Baker.) (Figs. 3, 4, 12, after Lestage.)

Key to subfamilies (larvae)

1. Cases characteristic (fig. 9); head triangular in front view (fig. 5) .... Goerinae
— Cases otherwise; head elliptical in front view (figs. 1, 8) 2
2. Cases tubular, smooth, of mineral material, slightly curved (fig. 10); head dark brown, almost blackish (fig. 1) ..... Sericostomatinae
— Cases otherwise; head lighter in colour 3
3. Cases usually of silk only, without added material; head with longitudinal darker bands (fig. 8) ..... Brachycentrinae
— Cases quadrangular (except *Lasiocephala*), of vegetable or mineral material; head without darker bands ..... Lepidostomatinae

Key to subfamilies (pupae)

1. Anal appendages short and blunt, consisting of rounded lobes; spines 2. 4. 4 ..... Lepidostomatinae
— Anal appendages long and slender 2
2. Pupal mandibles with apical half narrow and tapered, basal half very broad; spines 2. 3. 3. ..... Brachycentrinae
— Pupal mandibles not so shaped; spines otherwise 3
3. Anal appendages widely divergent; pupal mandibles triangular in shape; spines 2. 4. 4. ..... Goerinae
— Anal appendages not diverging; pupal mandibles almost parallel-sided; spines 2. 2. 4. ..... Sericostomatinae

Sericostomatinae

Two species in two genera; cases as fig. 10; head very dark brown with pale spots, which are sometimes indistinct (fig. 1); pronotum and mesonotum dark brown, the former with numerous black setae on anterior half; mesonotum with lateral black setae; metanotum whitish with two rows of black setae (fig. 2).

From Limnephilid larvae, which make similar cases, those of this subfamily can be distinguished by the thorax; in Limnephilid larvae the metanotum has always about three pairs of small dark sclerotised plates and is never entirely whitish. The numerous dark setae also are not found in Limnephilid larvae.

Larvae

1. Mesonotum more heavily sclerotised, with a prominent longitudinal suture (fig. 2). Length 15 mm., case 17-18 mm. Local, in slow running water or in canals ..... *Notidobia ciliaris* (L.)
— Mesonotum less heavily sclerotised and without a longitudinal suture. Length 13-14 mm., case 15-16 mm. Widely distributed, typical of fast running rivers, but also occurs in slower water ..... *Sericostoma personatum* (Sp.)

Pupae

1 Anal appendages longer, without a complete fringe of hairs on dorsal edges; labrum shaped like a blunt equilateral triangle (fig. 4). Length 11-14 mm. ..... *N. ciliaris* (L.)
— Anal appendages shorter and with a complete fringe of hairs on dorsal edges; labrum wider and transverse with a median projection (fig. 3). Length 12 mm. ..... *S. personatum* (Sp.)

GOERINAE

Three species in two genera; cases characteristic (fig. 9); head yellowish to dark brown or almost blackish; the separation of the two species of *Silo* is based on features of the thorax: Baker (l.c.) uses the term "clear areas" but in the present paper this is modified to "light patches". The pronotum is dark brown with these areas or patches yellowish in colour, contrasting with the dark colouring.

Larvae

1. Metathorax with six small sclerotised plates (fig. 6); Length 13-14 mm., case 14-16 mm. In slower running water, e.g. where the bed of the river or stream is sandy. Common and widely distributed ..... *Goera pilosa* (F.)
-- Metathorax with eight such plates (fig. 7); Length 8-10 mm., case 10-12 mm. In faster running rivers and streams, e.g. where the bed is stony ..... (*Silo*) 2
2. Pronotum with three large elliptical lighter patches, one median, the others lateral. Common and widely distributed .... *Silo pallipes* (F.)
— Pronotum without large lighter patches, but with very small ones near posterior edges. Local ..... *Silo nigricornis* (Pict.)

Pupae

1. Cases larger, 14-16 mm.; anal appendages longer than the last two segments of abdomen. Length 10-12 mm. ..... *G. pilosa* (F.)
— Cases smaller, 10-12 mm.; anal appendages only about as long as last abdominal segment. Length 8-9 mm. (*Silo*) 2
2. Anal appendages entire at apex ..... *S. nigricornis* (Pict.)
— Anal appendages divided at apex ..... *S. pallipes* (F.)

BRACHYCENTRINAE

One species only; head yellowish-brown with darker bands (fig. 8); widely distributed in slow rivers. Length 10-12 mm.; case 12-13 mm.; pupae 8-9 mm. ..... *Brachycentrus subnubilus* Curt.

LEPIDOSTOMATINAE

Four species in three genera, of which one species, *Lepidostoma fimbriatum* (Pict.) is unknown as larva or pupa. Usually easily recognised by their quadrangular cases. That of *Lepidostoma* is apparently always made of vegetable material but that of *Crunoecia* may be mixed, of vegetable and mineral material. The case of *Lasiocephala* is always of mineral material and is tubular with a prominent curve towards the end (fig. 12) which Lestage describes as typical. Head more or less unicolorous except for a light patch around the eyes, but marked with spots in *Lasiocephala*. The colour of the head varies from reddish to brown.

Larvae

1. Mesonotum completely sclerotised; metanotum with three pairs of small sclerotised plates. Length 11 mm., case 16 mm. ..... *Lepidostoma hirtum* (F.)
— Mesonotum only partially sclerotised; metanotum with less than three pairs of plates 2
2. Case tubular; head dark brown or brown, with lighter spots. Length

11 mm., case 15 mm. Local in fast running rivers ..... *Lasiocephala basalis* (Kol.)

— Case quadrangular (fig. 11); head unicolorous, reddish. Length 6-7 mm., case 7-9 mm. In rivers; but in the north it is more typical of small rivulets in woodland or streams on higher ground; often in marshes where a current of water passing. Common ..... *Crunoecia irrorata* (Curt.)

Pupae

1. Anal appendages with four long setae; smaller, 6 mm. ..... *C. irrorata* (Curt.)
— Anal appendages densely hairy; larger, 8 mm. 2
2. Cases quadrangular ..... *L. hirtum* (F.)
— Cases tubular ..... *L. basalis* (Kol.)

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Chlorops (Cetema) myopina Loew [Dipt., Chloropidae], deletion from "British List" and the addition of *neglecta* Tonn.

By L. Parmenter

In G. H. Verrall's *List of British Diptera* of 1888, *myopinus* was included with *cereris* Fln. in the genus Centor. In the 2nd edition of 1901 *nudipes* Lw. was added and in 1911 Mr. J. E. Collin in *Ent. Mon. Mag.*, **57**: 146 drew attention to the new name *Cetema* given by Hendel in 1907 to the genus as *Centor* was preoccupied in the Coleoptera by Schoenherr, 1947. O. Duda reduced *Cetema* to subgeneric rank in 1932-3. *Chloropidae* in Lindner. *Die Fliegen der Palearktischen Region.*

In W. J. Wingate's *Durham Diptera* of 1906 *myopina* was keyed out as having a dark arista, and long haired mid tibiae in the male. The name *myopina* has appeared in various lists since then:—by J. Murray (Dumfriesshire), H. Audcent (Bristol), J. W. Carr (Nottinghamshire) etc., and in my own first list for Bookham Common, Surrey, (*London Naturalist for 1949*). In 1921 A. Tonnoir described a new species *neglectus* in *Bull. Soc Ent. Belg.*, **3**: 131-3 contrasting it with *myopina* in the male, as the females could not be distinguished, with the 6th abdominal segment shorter than the 4th whilst *myopina* has these segments equal and the genital forceps strongly bent in *myopina* but only slightly bent in *neglecta*. Figure drawings of the genitalia of both species were given by

Tonnoir and E. Séguy has line drawings of the same genitalia from a different viewpoint, in his *Muscidae Acalypterae et Scatophagidae*, 1934. The slightly curved end of the forceps of *neglecta* are omitted in Tonnoir's figure as printed in the copy of the *Bull. Soc. Ent. Belg.* in the library of the Royal Entomological Society of London.

Recently when going through my undetermined specimens of Chloropidae, I found that I had males from Surrey, Herts., Hants, Kent and Suffolk that agreed with Tonnoir's description of *neglecta* as repeated in O. Duda's work, but had no specimens of *myopina*. Mr. J. E. Collin has kindly confirmed that he has "entirely failed to find any British specimens referable to *myopina* as described by Loew".

Notes and Observations

Additional Records of Prodenia litura Fab.: The Mediterranean Brocade (Lepidoptera: Noctuidae).—Further to the note on the occurrence of this species in 1963 (*Ent. Rec.*, **76**: 59-60), Mr. P. Aikenhead (Plant Pathology Laboratory, Harpenden) has written (*in litt.*) that there have been two definite records in Scotland, one near Glasgow and the other in Lanarkshire, both on the authority of Dr. Cameron (Dept. Agriculture & Fisheries for Scotland). It is also necessary to correct an error that appeared in the above published note, wherein it is stated that the species is not mentioned in South (Moths Br. Isles (1907)), and Barrett (Lep. Br. Isles), because in fact both authorities do include it under *Prodenia littoralis* Boisduval. Thus Barrett (*op. cit.*, **5**: 45) refers to a specimen in S. Webb collection, " taken by Mr. C. S. Gregson in a fruit warehouse in Liverpool", and adds that others have been reported in this country from larvae found in tomatoes.

Three specimens, in the R.C.K. collection at Tring, are labelled as follows:—(1) "Found in Boldes [illegible, perhaps "Brothers"] Jones fruit warehouse 1871. Gregson Liverpool" (this is presumably the specimen referred to by Barrett (*loc. cit.*); (2) "From larva found in Boscombe district by Major R. B. Robertson. Moth emerged July 16, 1905"; (3) "Cromer, 17.ix.1960. G. Todd". Finally, there is an early capture (though evidently not the first British occurrence as stated) recorded in A. H. Turner's *Lepidoptera of Somerset*, p. 18, on the authority of Chas. Bartlett, for Brockley, Somerset: "a female larva taken June 1897; moth emerged August 1897. First occurrence in Britain".—J. M. Chalmers-Hunt, St. Teresa, Hardcourts Close, West Wickham, Kent.

Melanism in Bournemouth.—From two larvae of *Biston betularia* L. that I found here last September, I bred a typical male and a *carbonaria* female. Soon after these had emerged, a *carbonaria* male was found in this road.—H. Symes, 52 Lowther Road, Bournemouth. 2.vii.1964.

Delayed Emergence of Apatele tridens Schiff.—On page 21 of the January "Record", Mr. M. J. Leech reports the emergence of one of Mr. Carr's dark daggers on 18th October, noting that the emergence period extended over 37 weeks. But the last word rests with me, for on 8th June I found a small *tridens* which had emerged from the touchwood in which it had pupated, and where it had spent two winters. Presumably this is really the last of the brood.—H. Symes, 52 Lowther Road, Bournemouth. 2.vii.1964.

VANESSA CARDUI L. IN SOUTH-EAST KENT.—In view of the relative scarcity of immigrant Vanessids in recent years, it is, I think, worth while to record my having seen two worn and tattered painted lady butterflies near Little Cheyne Court, Walland Marsh, Kent, between 5 and 6 p.m. on 12th May 1964.—J. F. BURTON, B.B.C. Natural History Unit, Broadcasting House, Bristol, 8. 22.v.1964.

VANESSA ATALANTA L. IN CENTRAL LONDON.—It might be worth recording that yesterday morning, 22nd June, 1964, I saw a female *Vanessa atalanta* L. (red admiral) flying across Piccadilly into Green Park. It settled for a moment on the gravel path just in front of me, and then flew off rapidly in a southerly direction.

During last September, several were seen in gardens around Wandsworth Common for the first time for several years.—F. R. SUTTON, 20 Lyford Road, Wandsworth Common, London, S.W.18.

UTETHEISA PULCHELLA L. IN THE NEW FOREST.—On 4-5th June, 1964, a fresh male *Utetheisa pulchella* L. came to my mercury vapour trap here. It is the first bit of excitement I have had this year, but it makes up for the drab spell.

I was at Hod Hill on the 5th and there was not a *bellargus* to be seen. There were still a number of fresh *minimus*, some *cardamines*, some fresh *agestis* and only two or three *icarus*. So it may be that the season there is is very late; I hope the *bellargus* colony has not disappeared. *Aurinia* was well out, many worn, but still some fresh females.—L. W. SIGGS, "Sungate", Football Green, Minstead, Lyndhurst, Hants. 6.vi.1964.

MIGRANT LEPIDOPTERA IN HAMPSHIRE.—On the night of 13-14th June, 1964, a male *Laphygma exigua* Hübn. came to my mercury vapour light trap at Minstead. On 14th June I saw *Vanessa cardui* L. and *Colias croceus* Fourc. (one of each), come in from the south at Keyhaven Marshes. —L. W. SIGGS, "Sungate", Football Green, Minstead, Lyndhurst, Hants. 15.vi.1964.

Current Literature

Lepidoptera Palaearctica. I have received from Mr. Hans Reisser of Vienna a proof copy of the preface to this major work, which I print herewith. This project should open up world study to the Micro-Lepidopterist as Seitz did for the Macrolepidopterist. I have also seen proofs of Dr. Gregor's plates, and Dr. Amsel's praise of these is in no degree overstated. The first volume should be appearing towards the end of the summer, and those interested in the work at subscription rates should contact Dr. H. G. Amsel, Landessammlungen für Naturkunde, Ernprinzenstrasse 13, (75) Karlsruhe, Germany; Dr. F. Gregor, Zemedelska 1, Brno, Czechoslovakia, or Mr. Hans Reisser, Rathausstrasse 11, Vienna I, Austria, or Mr. E. W. Classey.

Preface

The death of EDWARD MEYRICK in 1938 was a turning point in the study of Microlepidoptera, signifying more than the passing of a famous and respected author. In 420 publications MEYRICK had described some 16,000 species of Microlepidoptera, thereby putting in the shade, from a purely numerical point of view, the descriptive work of any other single personality in the biological sciences. His breadth of scope was as amazing

as the volume of his work: he alone envisaged the Microlepidoptera Fauna of the entire world, of which he formed a single collection numbering about 100,000 specimens and in most cases his sure eye pointed the right way. But already during his lifetime it had become clear that the science of Microlepidoptera would enter a blind alley sooner or later unless new methods of study were found. The volume of new descriptions increased to such a degree that gradually the comprehensive mastery failed, which at the beginning of our century still resided in a few such brains as MEYRICK, WALSINGHAM or REBEL, and it became clear that, ever more exact, and indeed, in some groups, extremely refined methods of investigation were already in use, so in Lepidoptera too a completely new way must be trodden.

Although at the turn of the century authors were still to some extent able to work generally and independently, the volume of the literature and material made obligatory a strong specialisation, which naturally led to co-operation. The methods which are now scientifically requisite intensified this process, if only because of the time involved. But the decisive step forward was made when the value of the genital morphology was appreciated as being of fundamental importance. From year to year it became more generally recognised that the current method of taxonomic work was not merely inadequate but must inevitably lead to incomprehensible chaos. MEYRICK's view that a species could be so clearly described that it could be recognised from the description proved to be a serious error. Numerous species can indeed only be distinguished in the morphology of their genitalia, and indeed the depiction of the genitalia almost always provides the truly unambiguous method of recognising a species. In particular the works of many authors, which have appeared since World War II, have shown that revisions of systematic groups furnished a quite new picture of the situation. For instance, PETERSEN established, in the relatively small Palearctic Tineidae group, the existence of sixty synonyms, and made such generic changes that hardly one stone of the old system remained on another. In the Crambinae, a comparatively small subfamily of the Pyralidae, BLESZYNSKI proved that sixty-seven species, from various regions, belonged to quite different subfamilies or even families, and also established countless synonymies.

In view of this situation, the present author was forced more and more to contemplate a new and fundamental work on the Palearctic Microlepidoptera, and his decision to publish "Microlepidoptera Palaearctica" was reached nine years ago. After protracted negotiations with authors, publishers, and scientific institutes, it was finally possible to overcome the almost insuperable difficulties in the path of this undertaking. Not least among the reasons for this final success was a particularly favourable combination of circumstances such as have rarely occurred in literary history. Never before was so large a number of internationally outstanding specialists of East and West available simultaneously to undertake such a task: never before had there been such a Microlepidoptera-specialist such as Dr. GREGOR, combining the highest scientific and artistic qualifications: seldom, too, had a publishing firm been prepared to issue so comprehensive a work, at the same time so specialised and so wide in scope, and with the barest prospects of profit: never before, too, had the happy circumstance occurred, of one of the leading personalities of a great and capable printing works being an experienced lepidopterist and

delighted to give his personal and unremitting attention to such a project. Finally, both the German Exploration Corporation and the Baden-Württemberg Ministry of Culture evinced an extraordinary comprehension for our efforts and enabled the almost insuperable financial difficulties to be overcome. In this many personalities played a valuable rôle, but it would take too long to mention them all by name.

At the XIth International Congress of Entomology at Vienna the meeting of a large number of contributors to "Microlepidoptera Palaearctica" was first possible, and the plotting of the general scheme which the enterprise was to follow. This scheme was the subject of further prolonged correspondence, with the following results:

1. All scientific work on the Palaearctic Microlepidoptera will be co-ordinated into the framework of "Microlepidoptera Palaearctica"; such co-ordination has hitherto been lacking, and this lack was one of the main causes of the present impossible situation in the systematic field. In the course of this co-ordination, individual authors will be enabled to work through respective groups as represented in the greatest Museums and also the principal European private collections.

2. The study of each species will begin with an examination of the type specimen or series*). Specific determinations, hitherto made on the sole basis of literary studies have often led to the most grotesque mistakes. An investigation of types will provide an indisputable proof of what is really meant by a described species. The lot of synonyms and uncertain species can thus be compared and their identity resolved, thus providing a sober foundation for all future scientific work. All purely compilatory work is to be avoided; instead all conclusions will rest on material that has been investigated.

3. In order to achieve the indisputable identification of all the species, the study of each one will begin with the establishment of the genitalia-morphology of both sexes, with due regard to all the characters of systemic value. Black and white drawings of the genitalia, coloured reproductions of water-colour drawings of the right side, made from the actual specimens, with pictorial representation of systematically important details (e.g. neuration, antenna, frons, or palp-formation) should provide a maximum of comprehensibility through the eye. Vague uncertain statements about the palp-form antenna-ciliation, or cornutus-length, such as "end segment of palpus long" will be replaced by unambiguous statements, e.g. the length of the third segment will be related to that of the second, and the length of the entire palp to the diameter of the eye, thus: "3 palp-segment, $\frac{1}{3}$" means that the last segment is one-third the length of the second; and "palp 3" means that the palp is three times as long as the diameter of the eye. Likewise for the antenna-ciliation, "antenna ciliation 2" means that the cilia are twice as long as the breadth of the antenna shaft, relating the longest cilia to the broadest part of the shaft. Similarly, "cornutus 1" means that the cornutus is as long as the aedeagus. Thus even a beginner will be enabled to work in a new field of study: and Institutes of Applied Entomology will be provided with a rapid means of orientation.

*) As far as ascertainable, the data of the labels of the types will be quoted *verbatim* with a special indication at the relevant place of the work.

4. The clearing up of synonymies and systematic errors will result in the final termination of nomenclatorial chaos. We urgently need durable names, names that will remain valid for all time. By applying paragraph 23b of the International Rules of 1961 for Nomenclature, the preservation of established names can be achieved, and the principles of Priority and Continuity can be intelligently combined. Such a result is of great importance for Applied Entomology.

5. The specific description will be as brief as possible, and preferably should give what the illustrations leave out, e.g. variability, comparison with neighbouring forms, and stressing of the diagnostically important characters. Data regarding larvae and imagines' phenology and ecology, foodplants, and biological peculiarities, are part of the description of the species. On the other hand, the larva will not be described, as such descriptions are only of use if scientifically exact, that is if they not only give the chaetotaxy but illustrate it too. As the larvae of 90% of all Palaearctic Microlepidoptera are still unknown, only a reference to the literary sources for the chaetotaxy of such larvae as are known, need be given. An exception, however, may occasionally be made to this rule, e.g. economically important species.

6. Neuration indications should follow the COMSTOCK system, with a subdivision into Costa, Subcosta, Radius, Media, Cubitus, Analis and Axillaris. This division combines what belong together and separates what do not, while the HERRICH-SCHÄFFER principle of enumeration is purely mechanical in nature and scientifically unsatisfactory. The technical terms for genitalia-parts are so different from group to group, and the question of homologies, etc., so disputed, that a special explanation should be given for each systematic group.

7. Distribution data will be given after the specific description, all countries and districts being named from which the author has seen material, and special value being accorded to the limits of the distribution, and also, in disjunct ranges, to the accurate definition of the localities inhabited. These data will thus definitely be reliable. The author may then add the names of the countries in which he knows of the occurrence of these species from literature only, and only in these cases need the references be cited. Doubtful literary records can be marked with a "?", or a critical remark. Localities will be rendered as given in the literature and specimen-labels, for instance the name Sarepta will be given rather than Krassnoarmejsk. Political conceptions, of which the boundaries vary more or less according to the political developments, should as far as possible be avoided and replaced by geographical conceptions. The general zoogeographical heading will, in principle, contain only verified facts about the distribution of the species, genera, or groups; as a consequence of this principle, there should be no reference to faunistic elements, and similarly the probable origin of the species should not be discussed as most publications about such are more or less speculative. The aim of "Microlepidoptera Palaearctica" is to provide only indisputable scientific facts.

8. The principles mentioned under 1 & 7 above will greatly simplify the problems of literary citations. It is evident that the method hitherto often used, of mentioning the entire literature on any one species, is superfluous, as it occupies much too much of the author's time and takes up too much space. It is now sufficient to give the original citation, fol-

lowed by the synonyms, and thereafter only such references *as provide more information than will be found in the text or the illustrations of "Microlepidoptera Palaearctica"*. For instance, such additions might be the illustration of the species in its resting position, biological data, chaetotaxy, illustrations of mines, pattern of eating, etc. On the other hand, if an imago is somewhere illustrated or described in the usual way, it is superfluous to cite the reference, as the "Microlepidoptera Palaearctica" illustrations are at least as good as any previous figure. Superfluous too are all references to the distribution of a species, if the author, on the basis of his own studies, is able to give the same information. For individual species, only a minimum of prior literature need be cited to supplement any gap in the data provided. The alphabetical general literary index at the end of every volume, on the other hand, should in addition give the reader a view of previous literature and at the same time indicate what the author has found especially valuable as a source.

9. In order to avoid the possibility that any author might write something in conflict with what appears in literature, the editor is pleased to put his own card-index at the disposal of all collaborators. This covers all literature since 1901, i.e. since the appearance of REBEL's Catalogue of the Lepidoptera of the Palaearctic Region. The possibility will thus be virtually ruled out that any important literary source will be overlooked.

10. Determination keys for the genera and species will guide the enquirer downward to the species, but in certain cases, when it has been proved that a systematic unit cannot intelligently be forced into any key, may be omitted.

11. In accordance with the recommendations of the International Commission for Nomenclature, all abbreviations of authors' names will be avoided. Abbreviations will only be used as a distinctive mark in the Indices and Tables. In the course of the current systematic text authors' names will be entirely omitted, except where this would cause obscurity.

12. Every specimen painted by Dr. GREGOR will be distinguished with a label "Painted by Dr. GREGOR for Microlepidoptera Palaearctica", as in future it will be useful to know which specimen served as a model for the published picture. The data of all such examples will be given in the explanation of the Plate, and particularly the place of custody. In principle, the typical series will provide the specimens used as models for the painter. In cases, however, where, owing to poor preparation or preservation, the type by itself does not suffice for the satisfactory reproduction of the appearance of the species, the painting may be adjusted for aesthetic reasons, as long as this does not involve scientific inaccuracy. Here particularly, in cases where an abdomen is missing, the artist may add the missing part, observing the correct proportions by reference to the holotype and other typical material. In all cases where such a procedure was necessary, the fact will be mentioned in the explanation of the figures.

13. In order to show as exactly as possible all the individual characters, the coloured illustrations of the moths are reproduced, in principle, on a scale larger than life-size. However, in order to show the relative size of congeners, species belonging to the same genus will be, as far as possible, shown on the same scale. The actual scale will be indicated in the explanations of the plates. Deviation from this rule, however, could not be avoided in a few cases for various reasons, and where this occurs the figure in question is always marked with an indication of the variant

scale of magnification. The scale mainly used for the genitalia illustrations, being that suitable for most of the drawings, is stated on the intermediate titles before the genitalia plates. If a few figures deviate particularly from the general scale of enlargement, this is indicated beside the figure in question.

It is well-known that the scale of enlargement is fairly unimportant in genitalia illustrations because the preparations are usually examined at different powers of magnification under the binocular.

14. Limits of the Region. The following districts will be the Regional frontiers: Canary Is., Madeira, Iceland, Sahara and Arabia as far as latitude 20 N. about, West Pakistan as far as and including Karachi, the High Himalayas down to about 3000 m., the Yangtse-Kiang and Japan. Disputed frontiers such as Sikkim, Bhutan, or the further Chinese frontier, will be entirely included or excluded. For instance, if a tropical genus is only represented by one species in Sikkim, it may be omitted, but all species in Sikkim belonging to Palaearctic genera will be included. In many cases the inclusion or exclusion will be at the author's discretion. In districts with distinctly more than 50% Palaearctic species, all species occurring should be included, even including the tropical species. Where, on the other hand, a transitional area has distinctly less than 50% Palaearctic species, all tropical species will be omitted. The south border of the Sahara appears to be partly inhabitated by Palaearctic species, and parts of Arabia far south of the tropic seem likewise to be Palaearctic. The boundary is for that reason fixed at 20 N. latitude, while in the East Asiatic region the boundary will be distinctly further north, being far less distinct and more complicated than in the African-Arabian region.

15. The work will consider all Monotrysian lepidoptera as Microlepidoptera, with the sole exception of the Hepialidae, which have been already studied in the works dealing with the Palaearctic Macrolepidoptera. In addition all Ditrysian families usually considered the Microlepidoptera, and so treated in the Rebel 1901 Catalogue, will be included, with the addition of the Psychidae. This addition is made because in this family particularly the division between Macro- and Microlepidoptera has had the most unfortunate results. Furthermore, a new work dealing with the Microlepidoptera will doubtless lead to general changes of views on systematic definitions. But as the new picture of the systematic definitions will only emerge after a decade or two, it is best to continue for the present with the usual division into Macro- and Microlepidoptera, despite its being scientifically unsatisfactory.

16. Numbering and other references will be made on a system that will reduce the need to refer to indexes considerably, and so greatly lighten the task of any reader using the work.

17. As the work will appear in German, each part will be preceded by a table giving the most important recurrent technical expressions with their meanings in English, French and Russian. We are convinced that this will enhance the international usefulness of the work.

18. An alphabetical list of the less-known localities and geographical terms, and a general map of Central and Eastern Asia, will be given to assist geographical orientation.

With the above aims, we hope to give a new impulse to microlepidopterology; we believe that not only will "Microlepidoptera Palaearctica" be a revision of all that exists in this field of science,

whether in literature or collections, but we are convinced above all that a sure foundation will be laid down for all future work in this field. We anticipate further through this work and the application of its principles, microlepidopterology will achieve a new power of attraction which will lead to a deepening and widening of our fair science. To this the water-colour drawing of Dr. GREGOR especially will contribute, constituting a unique event in entomological history. Not only might one say of them what was said of the great models of Ter Meer, that each drawing is at one and the same time both type and individual, but the drawings are, in most cases a first documentation of an unprecedented kind. Text and illustration merge to form an organic unity, serving to open to a wider public what threatened to become an obscure and specialised corner of the entomological field. At present it is virtually necessary for one specialist to concentrate on one taxonomic group, and we find but one worker qualified to determine the species of that group, with the result that there is but one person to whom to entrust all material of that group for determination. Hereafter, however, this state of affairs will undergo a radical improvement, at least as far as concerns the Palaearctic Microlepidoptera. Every entomologist capable of scientific work will be able relatively quickly to determine his own material. The separate volumes of "Microlepidoptera Palaearctica" will enable him to find his way with speed and accuracy, and will also be of particular assistance to all branches of applied entomology. The works in this field have hitherto been grievously hampered by the want of a simultaneously organised systematic reference work; by the constant changes of nomenclature, and the impossibility, without reference to specialists, of determining the pests with which they are dealing. But this will cease to be so, owing to the remarkable clarity of "Microlepidoptera Palaearctica" with its combination of coloured figure of imago, black and white drawings of all important morphological details, and textual summary of the facts. The publication of the first volume of this work marks the completion of the first step towards this scientific goal, and I feel a particular need to thank all those who have served in this enterprise. First and foremost I thank all my colleagues who joined me in launching the project and provided the prerequisite conditions for the co-ordination which the work will evince. The decision to proceed with this enterprise fell lightly on none of us, as in most cases it amounted to an obligation extending over many years, indeed in many cases for a whole decade, or in the case of Dr. GREGOR, for a whole life-time. To him therefore are due the greatest and deepest thanks; without him "Microlepidoptera Palaearctica" would have been unthinkable. Further I thank Herr HANS REISSER of Vienna, whose great and many-sided initiative and practical counsel on many matters helped the work forward, and who, for his part, obtained the consent of publishers GEORGE FROMME & Co. to publish it. I thank the publishers for their great understanding and also for the care devoted to the printing and setting up of the work; in such an enterprise this is of the utmost importance. In particular I wish to express my gratitude to Professor CARL WURSTER of Ludwigshafen, who devoted his constant efforts towards the success of the project. Without him, it must be duly said, it would not have been possible to overcome all the difficulties involved in the planning of so great and unusual a work. "Microlepidoptera Palaearctica" can consequently be said to be his work too. Mr. KURT SCHÄFER of Ludwigshafen, Professor

MARTIN E. HERING of Berlin, Dr. WALTER FORSTER of Munich, Dr. OBRAZTSOV of New York, Messrs. CHARLES BOURSIN of Paris, and E. P. WILTSHIRE of Geneva, and my friend Dr. E. OBERDORFER, Director of the Museum of Natural History at Karlsruhe, have all stood by my side and assisted me.

Dr. B. ROSSICKY of Prague was also of great assistance to our enterprise; and lastly, the German Institute of Exploration and the Baden-Württemberg Ministry of Culture gave from the outset such support to all our efforts that finally the foundations of the work were successfully laid with the issue of the present Volume I. My greatest thanks to all!

H. G. AMSEL.

Pests of Field Crops. F. G. W. Jones, M.A., and Margaret Jones, M.A. Edward Arnold (Publishers) Ltd. viii + 406. Buckram Boards, 50/-.

This book is primarily intended for the use of students, but it should be of great interest to all those interested in agriculture and horticulture who are willing to approach the subject in an intelligently scientific manner.

The authors open with a most interesting chapter whose title is "Origin and Nature of Pest Problems". This is followed by one dealing with insect structure and classification, which subjects are dealt with adequately for the purpose, but detail unnecessary to the subject is cut to a minimum. Thereafter come nine chapters dealing with "Orders of minor Importance (Collembola, Orthoptera, Dermaptera and Thysanoptera)", Hemiptera, Lepidoptera, Coleoptera, Hymenoptera, Diptera. Arthropoda other than Insects, Mollusca, and Vertebrata.

In addition to these are chapters on Pests of Stored Grain, Crops and their Pests, Control Measures, and Pesticides. There is a list of references to books and papers approaching 600 entries and, finally, a comprehensive index.

The book is adequately illustrated by a double coloured plate of slugs, many photographs of pests and typical damage, and good line drawings of various species and their anatomical details, and also conventional drawings showing such things as wing pattern in the moths and other anatomical details. There are also some distribution maps, graphs and charts.

The quality of the paper and print is good, and the binding is strong as is required for a reference book. Unnecessary detail is avoided throughout without any apparent curtailment of necessities. S.N.A.J.

The Principles of Agricultural Entomology. C. A. Edwards and G. W. Heath. iv + 418 pp. + 36 plates. Chapman & Hall Ltd., London. 80/-.

The foreword by Professor Wigglesworth stresses the need for putting the differences between pest control experts and the agricultural entomologist on to a logical footing, and expresses the opinion that this book is an efficient instrument to that end.

The book, like other recent publications, shows a pleasant tendency to treat the reader as neither an expert entomologist nor as a complete ignoramus, but as an intelligent person interested in the question of agricultural and horticultural damage by invertebrate pests, and its treat-

ment. Following the line that a knowledge of the particular pest, its life history and habits will show the stage at which it is most vulnerable, the reader is enabled to keep the expense of treatment and the damage to innocent and beneficial life as low as possible.

The authors have divided the book into three parts, Part I being General Principles, Part II deals with the identification of the pest and is entitled Descriptions, Bionomics and Control of Pests, and remedial Measures. Part III consists of six keys for the identification of pests.

Part I consists of eight chapters; chapter I gives adequate coverage, without going into unnecessary detail, of general entomology, including anatomy, physiology and life cycle, and finishes with systematics and a list of the 29 insect orders with a short description of each. Finally the non-entomological pests are outlined, including Nematodes, slugs and snails, Myriapods and mites, ticks and spiders. It is stated in the preface that Nematodes will not be included in this work as they have been dealt with adequately in another work recently published. Chapter 2 deals with the ways in which insects are important to the farmer, and after general remarks, deals with the effect of pests on crops and animals, while Chapter 3 gives a short account of how pests arise. Chapter 4 deals with the economics of pest attacks; Chapter 5, pest assessment and forecasting; Chapter 6, methods and principles of pest control; Chapter 7, practical chemical pest control, and Chapter 8 is on insects and viruses in agricultural crops, with a table of some known viruses with their insect vectors.

Chapters 9 to 14 deal with the individual species of pests. These six chapters each cover an insect order or group of orders, and the accounts of each species are divided into general remarks, distribution, damage done, description and life cycle, with recommendations for control.

The six chapters of Part III consist of keys, one per chapter, to pests attacking farm animals, stored grain, cereals, grasses and flax, common fodder crops, root crops, and farm-grown vegetable crops. Finally there is a useful table for dilution of liquids and solids. There follows a comprehensive index.

The paper, print and binding are good and durable as is required for standing up to the handling accorded to a reference book; illustrations include many good line drawings to illustrate species, and the 36 plates each show from two to four subjects. It is a book which may usefully find its place on the bookshelf of all farmers and horticulturists, and, it is hoped, will tend to rationalise the presently indiscriminate use of pesticides which is causing so much concern to so many of us at the present time. S. N. A. J.

Centipedes, Frederick Warne: We regret that the price of 63/- was omitted from the publisher's advertisement of the book.

CORRECTION.—I much regret having misnamed *Melolontha melolontha* L. (*vulgaris* L.) in my note (*antea* 102) on the use of vernacular names. I hasten to correct this and apologize for my lapse. The insect is the common cockchafer or buck buzzard, or May bug and probably many more local names.—S. N. A. J.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

SOME WAYSIDE COLLECTING IN ANDALUSIA, APRIL 1964. R. F. BRETHERTON, C.B., M.A., F.R.E.S. 177

PELOSIA OBTUSA HERRICH-SCHAFFER (LEP., ARCTIIDAS), A SPECIES OVERLOOKED IN BRITAIN? C. J. CADBURY 181

THOUGHTS ON REARING *STAUROPUS FAGI* L. (THE LOBSTER MOTH). H. SYMES 185

GREECE, APRIL 1964. Major General Sir GEORGE JOHNSON, K.C.V.O., C.B., C.B.E., D.S.O., D.L. 187

A NOTE ON *LETO VENUS* STOLL. (LEPIDOPTERA: HEPIALIDAE). A. J. DUKE and J. S. TAYLOR 189

THE LARVAL TAXONOMY OF THE BRITISH TRICHOPTERA. ALLAN BRINDLE 194

CHLOROPS (CETEMA) *MYOPINA* LOEW [DIPT., CHLOROPIDAE], DELETION FROM "BRITISH LIST" AND THE ADDITION OF *NEGLECTA* TONN. L. PARMENTER 198

NOTES AND OBSERVATIONS 199

CURRENT LITERATURE 200

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (177)

TO OUR CONTRIBUTORS

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Solenobia triquetrella Hübn.

By A. G. Carolsfeld-Krause

I have read Lempke's article on "Looking for Micro-psychids (*antea*, p. 31) with some interest, for years ago I worked a little with the common *Solenobia triquetrella* Hübn., which in Denmark is a parthenogenetic species as males are not present.

As far as I can make out from Lempke's article, there is still some confusion regarding the food of these species, which most often are said to feed on lichens. Now I only know *triquetrella* in detail as regards its biology, but this species is unfortunately only mentioned in a side note. It does not, however, feed on plants, but is necrophagous; I have reared many on a diet of small dead insects. The confusion as regards the food may be due to the fact that the case of the larva is found on trunks of trees in the spring for pupation, while the larval state in reality is spent among moss on the forest-floor mostly at the foot of the trunk.

The female leaves the extruded pupa in a way very normal to a lepidopteron, but after this the normal ceases. Due to the curved shape of the adult female, it is only able to move on a cylindrical surface, and only sideways on that, as this is the only way in which it is able to use its prolegs. It moves thus up the extruded pupal skin to the hind end of the case (the case is placed with the ventral side towards the trunk and with the head of the larva upwards). It now inserts its very long ovipositor, which is just as long as the rest of the female. The ova are placed in the case, about sixty of them; they are nearly ovoid in shape, nearly colourless and transparent with a very slight yellowish tinge, and they are partly enveloped in thin colourless silk. I do not know the origin of this silk for certain, but there is not much doubt that it follows the ova during oviposition from some source in the female abdomen.

Unfortunately, I have no exact data of this part of the female's life, but it is very short, and must be reckoned in minutes. As soon as she has left the pupal skin, she moves sideways up to the case and oviposition starts immediately; it only lasts a few minutes during which time the plump female looks like a balloon losing its gas. As soon as the last ovum is laid she loses her foothold and drops to the ground dead as a door-nail. She is now laterally as thin as a sheet of thin paper and cannot be pinned normally, but must be mounted laterally.

When one now opens the case, one is met with an amazing sight. The case is entirely filled with the ova, which in the few minutes have expanded very considerably, like the eggs of a frog, so that they take up more room than the total volume of the living pregnant female herself. I do not know the reason for this, and the most obvious explanation that they should have absorbed water seems to be impossible due to the shortness of time.

The life of the adult is the shortest I have ever met, and I think it may be the shortest in the world, at least to-day.

An Unusual Flight of *Aporophila luneburgensis* Frr.

By A. J. Wightman, F.R.E.S.

In late August 1963. I made a short visit to Aviemore with Messrs. D. Odd and A. A. Myres. The weather on arrival was not too good, and although we braved the elements, trying both sugar and mercury vapour lights, little was seen.

On the 27th of the month we tried a spot to the north of Aviemore, where in previous years I had taken a few *Aporophila luneburgensis* Frr., never more than eight or ten in a single night, even when conditions seemed right, and on this occasion, as conditions did not seem to be anything like right, a chilly wind of good strength and a full moon, which, however was rather misty and red in tone, we expected little.

Sugar produced nothing at all and little came to the light until after 11 p.m., and we were almost ready to go home when a few of the desired species, *A. luneburgensis*, appeared at the sheet in fairly quick succession, and this continued without a break until after 1 a.m., by which time we had taken about a hundred moths, seventy-five per cent. of them being this species. They were nearly all males and for the most part fresh, but as is ever the case, a good number were chipped and damaged, and as only perfect insects were required, these were released the following day in Aviemore proper, and cannot have been recounted when that night, at a similar spot in the same area, we met with an exactly similar flight on an exactly similar night as regards weather conditions.

The ground conditions of both these spots were similar, and we felt sure that they were right for a ground-feeding species like this, and that we were at the place where the larvae had actuaaly fed up, but although I carefully examined the ground around the lamp in ever widening circles, neither I, nor either of my companions could find a pair in copula, nor were any examples found that appeared not to have flown; all those we found were certainly on their way in to the light.

It was obvious that this species flies freely in weather conditions that keep most species of lepidoptera grounded, and that it on occasion breeds in colonies where the conditions suit it, as does the allied *Aporophila australis*, and like that species, is likely to be common for a few years in any given area where the conditions are favourable and then, as conditions alter, disappear from the area, possibly for years. This June (1964), we again visited the area and on several nights worked in these same spots near Aviemore, and as we had anticipated, the larvae of *A. luneburgensis* were about in all sizes, not thickly in any given spot, but spread over a wide area where the conditions were the same, but becoming rare and few and far between where the special conditions merged into normal heather moorland.

These larvae were no more heavily parasited than is usual with this species in all the places where I have found it in the past in small numbers. These larvae were green for the most part, when small, but most of those we found that were approaching full growth had some reddish marking, and some were brilliant with red.

67, The Spinny, Pulborough, Sussex.

A Trip Through France and Northern Italy in June 1964

By S. N. A. Jacobs

This being the season of the year when only the professional entomologists find time to write, the amateurs being too fully occupied in collecting, I might as well fill space with an account of our holiday through France and northern Italy to the Mediterranean, between 10th and 25th June.

We set out in perfect weather from Lydd, landing about mid-day at Le Touquet airfield and setting out by the familiar road round the northern side of Paris and on to Montmirail where we spent the night. So far, Pierids had been the major part of the lepidoptera seen, and on an after dinner walk round the town, the customary evening species were flitting about the available herbage patches. After taking leave of the very charming "Old School" Madame of "Le Vert Gallant" hotel we pushed on towards Geneva via Dijon. On the way down, we took a course which we had for many years intended to take, and turned off at the notice board indicating the road to the source of the Seine, and made the detour through leafy lanes to the site of the spring giving rise to the main stream of the river, and we were also rewarded by the sight of *Limenitis populi* L. flying in the sunny spots. We reached La Foucille, just inside France, overlooking Geneva, with the peak of Mont Blanc showing in the distance over the rather heavy clouds shrouding the lower levels. Here again, an evening walk showed a pleasing flight of moths flying over the rough herbage of the hillside, but nothing out of the way was netted.

The following day saw us through the corner of Switzerland and back into France, via Chamonix and the Forclaz and up the Grand St. Bernard pass with a halt at the summit to look at the monastry, though we did not stop to see the famous dogs. We then descended the pass into Aosta, and, after collecting Italian petrol coupons at the Italian Automobile Club, took the road up to Courmayeur, our first objective. The evening was spent in settling in and a short walk round the town, which was suffering from the all too familiar manifestations of "Progress", including the building of many hotels and the diversion of the main street, and next morning we revisited places first encountered on our visit in 1962. On the whole, the country was rather disappointing, for the dust from the Mont Blanc tunnel and the new road was on everything, and although we were almost a week earlier than on our 1962 visit, the bank which then was a magnificent display of gentian and a sulphur coloured Orchis had little to show other than a few gentians well past their best. Exploring the narrow leaved willows growing amongst the rocks of the wide river bed, we found larvae and pupae of *Stilpnotia salicis* L. and spun shoots were collected in the hope that they might produce micros. Nearly all of these, however, proved to be macros, a noctuid species and a geometrid, probably *Hydriomena furcata* Thunb. which were released when they left the spinnings and their identities were disclosed. Here too, many butterflies were seen, including both *Iphiclides podalirius* L. and *Papilio machaon* L., and *Parnassius apollo* L., which had been seen in fair numbers all along the higher parts of our travels. To these may be added a few *Colias*

and a *Pieris* approaching *P. bryoniae* O. was seen beside the more usual *P. napi* L.

Beating spruce produced a series of *Borkhausenia nubilosella* H.-S., and a large patch of *Epilobium* had spun shoots infested by colonies of a white-spotted black larva, reminiscent of an *Ethmia* species. Some of these were taken, but as our journey took us through dry country when fresh food was required, there was no Epilobium to be found, and when, a week too late, I was able to find suitable food the few larvae left alive had lost the will to feed, and soon joined their brothers. A sharp thunder storm put further collecting of larvae out of the question, but it did wash away the all-pervading dust for a little while, and it was pleasant to find oneself once again in a green world.

On Monday we left for the south by way of the Petit St. Bernard pass, and here, at the pass, we did see some of the famous dogs displayed by the roadside. We proceeded by way of the Iserian pass, the highest in Europe, we are reminded by a notice at the crest, which we passed in a snow shower, to the Galibier pass, through the tunnel and out to the Lautaret. Here, on joining the main road south, we were delighted to be able once more to pick the pheasant-eye narcissus by the roadside and enjoy their scent, which brought memories of our first experience of this beautiful road some years earlier.

We spent the night at Gap and set out again via Digne, Castellane and Grasse to Nice and then along the coast (after we had disentangled ourselves from the motor road on to which we had been trapped by misreading a notice) through the end of Cannes, St. Maxime, and on to Cavalaire, beloved of the late William Fassnidge. Digne was the disappointment of this journey; on our last visit it had been a pleasant, typical southern French country town, but we found it built up out of all recognition. Possibly we would have found some of our old spots had we stayed, but our impulse was to shake the dust from our feet. On further thought one can understand that after the leaving of Algeria the country has been faced with a suddenly increased population to be accommodated both as regards housing and work, but it was sad to see Digne sacrificed to Progress with a capital P. The Durance had also been dammed to form an immense lake and reservoir, together with a canal system.

On our way across the arid stony hills with their random plantations of lavender, I had a short look round during our lunch halt, and found a solitary *Nepticula* mine on wild rose which encouraged me by spinning up in the usual position on the leaf stalk, and then, after being cosseted and cared for on the way home, rewarded the care by eventually producing an unmentionable Chalcid fly. I also found an example of the helical case of a Psychid and a single *Thiodia citrana* Hübn. At another halt nearer to Grasse, several *Aporia crataegi* L. were noticed slowly flying round and settling on the twigs of a dead oak bush.

We stayed at Cavalaire for a week, and though we spent most of the mornings in idleness on the beach and swimming, we made several expeditions in the afternoons. One to the forest behind Bormes, mostly cork scrub with a few *Quercus pubescens* interspersed with the odd fir tree was exceedingly interesting as we saw many of the creatures about which Henri Fabre wrote so understandingly; the black-winged *Anthrax* fly, and many species of crickets, from the respectable green tree cricket to

bloated creatures which would probably weigh a full ounce. The green European locust was also seen, also stick insects such as my children bred in hundreds many years ago, and one or two small mantis. I searched the *Q. suber* for mines, full or empty, of *Nepticula suberivora* Stt. but found no trace of any Nepticulid. The main moth on this ground was *Tortrix viridana* L. with *Archips xylosteana* L. a close second. I took one *Caloptilia sulphurella* Haw. and one *Acrobasis fallouella* Rag., and two Pterophorids, probably *Oxyptilus distans* Zell. and *Stenoptilia zophodactyla* Dup. while green larvae were beaten from *Cistus*, one of which finally produced a blackish Gelechiid which is so far undetermined. I also beat an immense Geometrid larva from a spiny *Cytisus* bush: this was best part of three inches long and almost as thick as a lead pencil, finely striped longituninally with pale snuff brown and pale yellow, these colour areas being finely bordered by a darker sooty brown. I could not find a suitably matching figure in Spuler.

Another expedition was made to the salterns near Hyeres and here, on the high point at the seaward end of the road, many *Nymphalis cardui* L. were noted feeding on the flowers growing in the ruins of a wartime strong point. The open hillsides which were a feature of Hyeres is now either built up or under cultivation.

Several visits were made to the scrub land inland from St. Tropez, and empty Nepticula mines were found in the leaves of *Quercus pubescens* which Mr. Carolsfeld-Krause has kindly identified as *Stigmella ruficapitella* Haw., *St. atricapitella* Haw. and St. Hering No. 4244 (*samiatella*) and some still undetermined as they do not fit in with anything known from *Q. pubescens*. Young Nepticulid mines were also found in *Alnus* leaves, but these had died too young to be determined. *Lithocolletis* mines on *Q. pubescens* produced *L. quercifoliella* Zell., *L. cramerella* Fabr. and *L. parisella* Wck. This last named species has a distinctive mine which is considerably more extensive than the mines of the other species, and the leaf is strongly contorted towards the under side. A Tischeria mine was also found on the *pubescens* leaves and these produced moths, probably *T. complanella* Hübn. Both *Lithocolletis* and Tischeria have an annoying habit of rocketing vertically when the box is opened instead of flying towards the window light, and I regret that several specimens were missed through a combination of this habit, a granular ceiling, and ageing eyesight.

The more open slopes produced *Ematheudes punctella* Treits. in some numbers, together with *Crambus cespitellus* Hübn., *C. culmellus* L. and two specimens of the *C. craterellus* complex, also singles of *Bucculatrix crataegi* Zell., *Euchromius superbella* Zell. and *Selagia spadicella* Hübn.

A large *Satyrus* species (? *circe* Fabr.) was a frequent visitor to the hotel outdoor dining space, and was not above investigating open wine bottles when these were not too closely attended.

We left Cavalaire on 23rd and worked northwards via Aix en Provence through the hills to Chambery where we spent the night. The road was brightened by butterflies in fair numbers; both swallowtails were in good supply and *Gonepteryx cleopatra* L. added flashes of brilliant colour, while large Satyrids and Argunnids tended to draw the driver's eye from full concentration on the road, fortunately without ill results. At one roadside halt, a slightly damp place was patronized by about twenty *Aporia crataegi* L. After Chambery, we pressed on to Chatillon sur Seine by way

of Geneva, La Foucille and Douelle, and from thence we reached Le Touquet in the evening of the following day. We had the pleasure of a close view of a female *Apatura iris* L. which, after the habit of its kind, was attracted to the sun-warmed roof of our car during a halt in the Compeigne forest. Here we also gathered a few *Lithocolletis* mines in the hope that they might produce *roboris* Zell., though in fact I did not get more than I had really expected, *L. meessaniella* Zell.

Leaving Le Touquet about 9.30 the following morning, we were leaving Lydd before 10.30, and we stopped to look at Dungeness before making our way home.

Notes and Observations

LITHACODIA DECEPTORIA SCOP. IN GLOUCESTERSHIRE.—On 26th May of this year, a fresh male specimen of *Lithacodia deceptoria* Scop. came to my mercury vapour trap in my garden at Tetbury, Gloucestershire. The species has not previously been reported from this county, and I believe that only about eight examples have so far been recorded as being taken in Britain. These were from Kent, Surrey and Sussex. Photographs of the one taken by Mr. M. V. F. Tweedie, near Rye in 1956, appeared in *The Entomologist's Gazette*, **8**: 29 (1957).—J. NEWTON, 11 Oxlease Close, Tetbury, Glos.

THESTOR BALLUS FAB.—In his article in the June *Record* (antea 154) on butterflies at Gibraltar, General Johnson refers to *Thestor ballus* Fab., thus suggesting that the generic name of *Thestor* is now recognized as applying correctly to a south European butterfly.

Kirby, in *A Handbook to the Order Lepidoptera*, **2**: 127 states, under the genus *Tomares*: "This genus is generally called *Thestor*, but Dr. Scudder has shown that *Papilio protumnus* Linn., a South African species, is the true type of the genus *Thestor*". Van Son, in *Jour. Ent. Soc. S. Afr.*, **IV**: 185 (1941) also agreed that the name applied to our South African group of Lycaenid butterflies which must represent an entirely distinct genus from the one which includes *ballus* and allied species) and for many years now we have been placing our species under *Thestor*.

It would therefore be very interesting to know whether more recent investigation has shown that *Thestor* is, in fact, the correct generic name for the *ballus* group—in which case it could no longer be used for the South African complex, of which *protumnus* is the type.—C. G. DICKSON, Blencathra, Cambridge Ave., St. Michael's Estate, Cape Town.

EUCOSMA PUPILLANA CLERCK IN KENT.—Towards the end of August 1963, I noticed a number of worn imagines of this very local moth on Dartford Marshes. Visiting the spot again on 2nd August 1964, I counted some thirty examples between 8.30 and 9 p.m., mostly in fresh condition. Many were disturbed from the foodplant, *Artemisia absinthium*, but towards 9 p.m., a number were seen flying naturally as dusk set in. So far as I am aware, the only other record of *pupillana* in Kent is in the Victoria County History (1908), in which Folkestone is given as the locality.—J. M. CHALMERS-HUNT, St. Teresa, Hardcourts Close, West Wickham, Kent. 23.viii.1964.

NEPHOPTERYX HOSTILIS STEPH. AND BRACHMIS INORNATELLA DOUGL. NEW TO SUFFOLK.—A single male *N. hostilis* was taken by me at light at Thorpeness on 16th July 1964, and considering the late date it is in remarkably good condition. During the period 5th/14th July 1964, several *B. inornatella* were taken in marshes at Thorpeness and Walberswick by Mr. S. Wakely and myself. Mr. H. E. Chipperfield has confirmed that both species are new to the county.—J. M. CHALMERS-HUNT, St. Teresa, Hardcourts Close, West Wickham, Kent. 23.viii.1964.

NOLA TRITUBERCULANA BOSE (CENTONALIS HÜBN.): SCARCE ARCHES, IN SUFFOLK.—Five examples of *N. trituberculana* were taken at light at Thorpness by Mr. S. Wakely and myself in July 1964; three on the 14th, one on the 15th, and finally one whitish example conforming to ab. *atomosa Brem.* on the 16th. Always rare or extremely local, this is the first time in Britain for over seventy years that this species has been taken in such numbers.—J. M. CHALMERS-HUNT, St. Teresa, Hardcourts Close, West Wickham, Kent. 23.viii.1964.

WHICH DAGGER ARE YOU.—It was the note by the Rev. F. M. B. Carr (*Ent. Rec.*, **74**: 267) under the above title which led me to decide that it was time I had a series of authentic "daggers". Early this season I promised myself that I would obtain eggs from every female dagger I could find and at least raise a series of *Apatele psi* L.

I found four daggers in all, three of which were females, all at rest on tree boles. Only one dagger appeared at my light trap. The first female was found on 28th May. It laid about fifty eggs and the resulting larvae proved to be *psi*. A portion of them were reared to the pupal state without difficulty. The second female was obtained on 30th May; it laid a similar number of eggs which again produced *psi* larvae. The third female was found on 5th June, resting on the same tree as the second female. This one laid only fifteen eggs, but these in due course produced fifteen larvae of *A. tridens* L! The larvae seemed very weakly at first, four of them dying in the first stage, but the remaining eleven began to make rapid progress and eventually all pupated. All the dagger larvae were fed throughout on apple leaves, and I now have a batch of *psi* and a batch of *tridens* pupae, well labelled and confined in separate rooms of the house. After all, it would be pretty awful if they got mixed up now.—T. D. FEARNEHOUGH, 26 Green Lane, Shanklin, Isle of Wight.

MACROGLOSSA STELLATARUM L. in Sussex and Kent. While collecting with Mr. J. L. Messenger on Duncton Down on 27th June 1964, a very fine day, I was pleased to see the humming-bird hawk again. I saw another over flowers on the downs near Maidstone three days later on 30th.—C. G. M. DE WORMS, Three Oaks, Woking, Surrey. 18.vii.1964.

APATELE ALNI L. AT WOKING.—1964 seems to have been a record year for the alder moth, with as many as fifty being noted in a single night. It may not therefore be surprising that one graced my mercury vapour light here on the night of 10th June. I had previously taken one on the edge of Chobham Common on 30th May, another remarkable night. This insect seems to be very scarce in this area since Mr. R. F. Bretherton obtained it once in his trap at Ottershaw during his seventeen years, 1946 to 1963.—C. G. M. DE WORMS, Three Oaks, Woking, Surrey. 18.vii.1964.

HAMPSHIRE MIGRANTS.—A male *Heliothis peltigera* Schiff. came to my light trap here on 13th June; it was a pale form in good condition. On 15th August one male and one female *Enargia paleacea* Esp. were in my trap, and a further male on 18th August. Mr. C. J. Cadbury mentions the capture of one specimen of this moth in "an open marsh amongst reed" in Norfolk (antea 181). Mr. Ian Lorimer has recorded this species twice at Chandler's Ford in Hampshire. Can it be that *paleacea* is an occasional immigrant from the continent?

On 16th August one female *Herse convolvuli* Linn. and one *Eurois occulta* L. both in fair condition, were in the trap.

On 26th May I saw in my garden a fresh but small *Nymphalis atalanta* L. and have seen a considerable number lately. I have also recorded six *Vanessa cardui* L., one in early June and the remainder since 26th July.

Although my postal address is Berkshire, my house is situated in Hampshire; I mention this fact to eliminate misunderstanding.—SIR ROBERT SAUNDBY, Oxleas, Burghclere, Nr. Newbury, Berks. 23.viii.1964.

MELANISM IN THE NEW FOREST.—With reference to Mr. Symes's note (antea 199) regarding *Biston betularia* L. in Bournemouth, the following figures of the numbers of *B. betularia* taken in my mercury vapour trap at Minstead may be of interest.

Year	Typical	*insularia*	*carbonaria*	Total
1962	243	6	18	267
1963	250	29	14	293
1964	197	18	10	225

—L. W. SIGGS, "Sungate", Football Green, Minstead, Lyndhurst, Hants. 21.viii.1964.

MIGRANTS IN THE NEW FOREST.—The following have appeared in my mercury vapour trap at Minstead this year:—

22.vii.1964, a male *Rhodometra sacraria* L.
25.vii.1964, a male *Nycterosea obstipata* Fabr.
30.vii.1964, another male *N. obstipata.*
4.viii.1964, a female *N. obstipata* which laid a number of eggs. The larvae are at the point of pupating.
6.viii.64, 138 *Plusia gamma* L., 134 *Agrotis ipsilon* Rott., and one *Herse convolvuli* L.
19.viii.1964, another *H. convolvuli.*

—L. W. SIGGS, "Sungate", Football Green, Minstead, Lyndhurst, Hants. 24.viii.1964.

APATURA IRIS L. IN HAMPSHIRE.—On 12th July a purple emperor butterfly was found in this village by a relation of mine. Not being sure just how rare this butterfly is, nor to whom the matter should be reported, I wrote to the Natural History Unit of the B.B.C. and Mr. Burton of that unit advised me to write to the *Record.*

Unfortunately, the specimen was not kept. It remained in the same spot in my sister-in-law's garden for two days, showing no desire to move. At the end of that time it died and subsequently disappeared, presumably taken by a bird. However, it was seen and identified by our local naturalist, Mr. Cooper of Greywell, Nr. Odiham, who is usually called in on such occasions, and I hope that the report will be of some interest.—P. SHORT (Miss), The Cottage, Strip, Up Nately, Nr. Basingstoke, Hants. 9.viii.1964.

COLIAS CROCEUS FOURC. IN SOUTH DEVON.—My colleague, Mr. Richard Brock informs me that he saw a clouded yellow butterfly on the cliff top at Prawle Point, South Devon, on 3rd August 1964, and another there on 16th August.—J. F. BURTON, B.B.C. Natural History Unit, Broadcasting House, Bristol, 8. 23.viii.1964.

Current Literature

Biological Control of Insect Pests and Weeds. Chapman & Hall Ltd. Pp. xxiv + 844, 8 plates, 120/-.

This book is written by sixteen authors, each a specialist in his subject, and is edited by Paul de Bach, professor of biological control in the University of California, and it brings before the public work commenced by the late Professor C. P. Clausen in the Department of Biological Control, University of California some thirty years ago.

The book is organised in eight sections, and Section I, by the editor, is entitled the Scope of Biological Control, and explains natural and biological control and their place in the balance of nature. The author goes on to explain the field of biological control with suggestions for basic study and the importation of natural enemies of the various pests and their augmentation and preservation. He mentions certain control enterprises and sets out the financial gain resulting from them. Chapter 2, by Richard L. Doutt gives the historical aspect with accounts of some of the early experimenters and their projects, and the development of biological control.

Section II covers the ecological basis of biological control, and Chapter 3 covers population ecology and historical development. Chapter 4, The Concept and Significance of Biological Control deals with the physical factors; population balance, host and parasite relations and reactions, and opposing views on natural control are carefully set out and explained. The kinds of balance and the mechanics of natural control are discussed with illustrative charts, and genetic factors are also taken into account. Chapter 5 discusses control concepts and questions requiring investigation, and covers natural enemies including parasites, predators and hyperparasites and the importation of these from outside areas. Attention is drawn to the fact that the more spectacular results have occurred on islands, and that one meets with more difficult circumstances when dealing with continental areas, which contain a large number of different biotopes whose populations can overlap.

Section III is on biology and systematics and Chapter 6 discusses biological characteristics and mentions interesting examples where parasites have been "educated" in captivity to turn their attention to other hosts than their natural host, and to take this new habit into the open. Chapter 7 discusses the early stages of parasites with many line drawings of these and various means of parasitisation are mentioned. Chapter 8 covers the place of systematics in the study of biological control and gives keys to the entomophagous species in the various natural orders of insects.

Section IV (Chapters 9 to 17) deals with the finding of foreign entomophagous species of parasites and predators, the necessity for a quarantine

period so that one may be assured that no ill consequences will follow their importation, the culture of these insects and their hosts and natural and artificial diets for both hosts and predators. Apparatus and equipment found necessary for breeding predators prior to their release, and methods of putting them out and the recovery of specimens after release are discussed together with the evaluation of their success.

Section V is entitled the Conservation and Augmentation of Natural Enemies and discusses the problems encountered and means for overcoming these. The modification of environments and the relations of agricultural changes with field conditions and the various relations between chemical and biological control are discussed from the aspect of selectivity so that predators will not be killed with the pests, as is so often the case nowadays.

Section VI is devoted to the subject of insect pathology, covering bacterial, fungoid, and virus diseases and also protozoan and nematode infections together with the diagnosis of these conditions, with photographs and line drawings to illustrate the subject. Epizootiography (the corelation of host population, pathogen population and environment) is dealt with in chapter 19 dealing with the infectious agent, the host, and methods of transmission, and the interrelation between pathogens, parasites and predators. Chapter 20 is on the mass production of insect pathogens and 21 the use of micro-organisms in pest control.

Section VII (Chapters 22 and 23) deals with the biological control of weeds and discusses the problems and risks encountered. Many projects on biological control of weeds in many parts of the world are set out.

Section VIII concludes the work with Chapter 24 which sets out the successes, trends and possibilities of biological control with a long table of insects and their uses.

The bibliography covers 100 pages, and is followed by an index of scientific names.

The print and paper are excellent and the book is strongly bound in buckram boards. The photographic plates give good illustrations, but these are definitely subservient to the letterpress and not, as has so often been the case in recent times, the main purpose of the book.

As is to be expected of a text book written by people concerned with teaching, the language is clear and concise and should be easily understood by the reader, be he student or amateur. A very pleasing feature is that the authors do not hesitate to explain unusual technical terms, a thing so often omitted for fear lest the reader should be offended. This is a really excellent text book on a subject which has been held back for too long behind chemical control (extermination) of insects and it is to be hoped that this intelligent use of natural controls by man will have the desired effect of preserving crops vital to man's existence without upsetting the balance of nature as has so often been the case when chemical control has been invoked by ignorant and uneducated hands. Let us hope that this may serve to check the destruction of useful insects in the destroying of destructive ones; that the useful ones may continue to pollinate our crops and flowers, and that the many neutral species may be left to give pleasure to the eye and stimulate intelligent study.

It may be presumptuous on my part as a mere amateur, but I would like to congratulate the editors and authors on having done an excellent job and to thank them for this book. S. N. A. J.

The Life of Insects. Profesor V. B. Wigglesworth. Pp. xii + 360, 12 coloured and 24 black and white plates. Weidenfeld & Nicholson, 55/-.

In this book Professor Wigglesworth sets out to give an account of insect physiology as understood from the many revolutionary discoveries of the past fifty years. In his introduction he points out that Charles Darwin's theory of Natural Selection and Survival of the Fittest is still the most widely accepted by biologists, but that the phylogenetic tree is given less credence in view of the fact that during the past 350 million years, so many forms of insect must have flourished and disappeared, of which fossil remains of a pitiful few have been found by us, that we cannot imagine that we have anything like enough data to allow us to dogmatise on the subject; the missing links are far too many.

We can, of course, see similarities between certain natural orders of insects which prompt us to credit them with a common ancestor, but we cannot have enough evidence to describe this ancestor. A brief description of the natural orders of the insect world with line drawings of representatives of most of them is given as an appendix which may be compared with the phylogenetic tree, modern version, on page 5.

Insect physiology is the basis of the book and each chapter treats an aspect of the physiological development of insects. There are seventeen such chapters, to quote from the index, dealing with such subjects as movement on land, in the air and in water, eggs of insects, growth and metamorphosis, mating and reproduction, luminous insects, and the chapters on insect senses give evidence of much skilful and painstaking research as also do such abstract subjects as the wisdom and the organisation of insects, which form the subject of two other chapters.

The book should be of the greatest interest to the student and to the advanced entomologist alike, but it should also provide interesting reading for the amateur as well. S. N. A. J.

Centipedes of the British Isles. E. H. Eason. Pp. x + 294, coloured frontispiece and 4 half-tone plates. Frederick Warne & Co. Ltd. 63/-.

This book sets out to fill a gap in our literature by bringing under one cover an account of the British centipedes. Much of the information contained may be found in the many papers contained in periodicals and other general publications if the student has the time and means to make the search, but the author has added much original observation to this account.

The introduction is certainly not a part to be skipped, as it will bring the descriptions of species which follow, into the understanding of the interested reader as well as that of the student. It is divided into History, structure, reproduction, biology, distribution and habitat, classification and nomenclature, finishing with a systematic table of the species to be found in this country.

This list is then described in the following chapters with a full description of the genus and a key to the species contained, with good camera lucida drawings accompanying the specific descriptions, which will be of far greater assistance than an illustration of the complete centipede. A minor criticism here is that I would have thought it better to name the insect in bold type, and the sections of the description in italics, instead

of which the reverse order has been adopted, but a very good point in this portion of the book is that each species is described under the same list of headings in the same order throughout.

The appendix is divided under the headings: collection, preservation and examination; this is followed by a glossary, a bibliography and an index.

The book, which is a full octavo, fills a great want for the centipede specialist, but it is also a welcome addition to the library of the general naturalist who likes to be able to place anything he sees, and to the ecologist, for all of whom it is intended. S. N. A. J.

The Naturalist's Riviera. By A. N. Brangham. Pp. xi + 339, 45 half-tone illustrations; Phoenix House Ltd., 42/-.

Mr. Brangham has produced a book which should be both interesting and stimulating to the ever-increasing numbers of naturalists and nature lovers who find their way down to the delectable departments along the French Mediterranean coast which go together to form the Riviera.

After giving a general description of the whole area, the author gives a short account of the many British naturalists who have, from the sixteenth century onwards, made the journey southwards and have written accounts of the flora, fauna and general life of the district. He then gives a chapter entitled Anatomy of the Riviera Climate, which speaks for itself, and is finished with charts comparing temperature, rainfall and sunshine throughout the year with the corresponding figures for Venice. The following chapter gives an account of how this area has adapted itself to survive the arid period during the summer months.

The next chapter gives an account of the products of the district from vines and olives to silkworms, and the following chapter deals with the butterflies and moths. This chapter gives many interesting details of the probable origin of the important species, which seem to have come in by several routes which species may be described as "Specialite de la Maison"!

By way of variety, the next chapter deals with the intriguing little tree frog, and then on to the beasts with which this district literally abounds, grasshoppers and crickets, followed by a chapter on the cave dwellers from aestivating and hibernating insects to the bats and insect inhabitants of this dark world. A Mediterranean account would certainly be incomplete without the praying mantis and its place in local superstition and medicine.

Termites are next given consideration, and these are followed by an account of the ants, of which the area can boast a very different fauna from the more northerly parts of France, and also the economic effects of various species, some beneficial, some deleterious, and mention is also made of that pest of the lepidopterist, the Argentine ant.

The larger inhabitants have attention in the next chapter, which is on snakes, lizards and geckos, and after that a chapter on land snails and parasites, another on ant-lions and the last one is on the French naturalists of the district. There follows an interesting appendix listing the museums and exhibitions of interest to naturalists available at the various towns, a bibliography, and finally an index. On the back cover is a folding map showing the country from the Rhone to the Italian frontier.

Beside its interest to the visiting naturalist, this book offers material on which one may browse in idle moments to recapture the sights and creatures that made one's visits so delightful and unexpected.

S. N. A. J.

Current Notes

BRAUNTON BURROWS NATIONAL NATURE RESERVE, DEVON.

Braunton Burrows, which extends northwards for three and a half miles from the estuary of the rivers Taw and Torridge to Saunton Down, is one of the largest sand-dune systems in Great Britain. It is internationally famous for its rich plant and animal life, and since the seventeenth century, when the botanist John Ray collected and recorded there, the area has continually attracted scientists and naturalists.

The importance of Braunton Burrows was noted by the Society for the Promotion of Nature Reserves in 1915 when they included it in their original list of potential Nature Reserves, and in 1947 it was officially recommended as such by the Wild Life Conservation Special Committee.

During and since the last war Braunton Burrows has been used for military training. This will continue in certain areas under a lease to the Service Departments by the Trustees of the Christie Estate, who are the owners. A sub-lease from the Service Departments has enabled the Nature Conservancy to declare about 560 acres in the southern third of the dune system as a National Nature Reserve which will be managed entirely for nature conservation purposes. Facilities for scientific research have also been arranged, subject to training needs, in a further 932 acres. These form the main training zone which includes Crow Point and Broad Sands.

On the seaward side of the Burrows the fore-dunes are about fifty feet high and other ridges behind them rise to more than one hundred feet in places. The dune structure is most fully developed in the central part of the training area, where three main ridges are separated by wet "slacks" (known locally as "pans") lying parallel to the shore.

Some of the outstanding plants for which Braunton is famous include the Club-rush which John Ray first recorded there, probably in 1662. Elsewhere in Britain a few specimens are known to exist only in one small area in North Somerset. Other note-worthy plants are the Water Germander (for which Braunton is the best locality), Sea-knotgrass, Sharp Rush, Shore-dock and Sand Toadflax.

Free access to the Reserve by foot will continue. The land was searched before it was released but owing to the intensive war-time use of this area for military training with live ammunition the public are asked not to touch any unidentified objects which may be lying on the ground but to report their presence to the local police.

By agreement with the Service Departments and the Devon County Council access by foot will also be allowed to the central training zone and to Broad Sands except when exercises with live ammunition, or demolitions, are being carried out. Notification of closure at Broad Sands and in the central training zone will be given in the local press and also indicated on the ground by red flags.

The Annual Exhibition of the Amateur Entomologists' Society will be held on Saturday, 24th October 1964, at the Hugh Myddleton Secondary School, Corporation Row, London, E.C.1 (near Farringdon station). All interested in entomology will be welcome.—H. D. HILLIARD, 42 Normandy Avenue, Barnet, Herts. 11.viii.1964.

We much regret to announce the death of Colonel SIDNEY HARDINGE KERSHAW, D.S.O., late Fifth Fusiliers, who died at his home, Alderman's Lodge, Apsley Heath, Buckinghamshire, on 12th July 1964, after a long illness. A lepidopterist who had a host of friends and correspondents, and a contributor to the *Record*, he will be sadly missed by the older ones among us.

It is regretted that this issue is of smaller size than usual, but it must be borne in mind that the editor relies mainly on the readers for the material published. Copy is always short at this time of year when readers are out in the field, and have no time for writing, but I trust that they will not lose the opportunity for setting down notes that may later on be worked into an article on any points of particular interest that have come before them in the field or elsewhere. It is also to be hoped that they will not sit too long on these notes, but will write them up while the events are still reasonably fresh in the memory.

The copy goes to the printer on 23rd of each month, and matter for early publication should reach me by that date, if it is to be included in the next issue.

S. N. A. J.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

SOLENOBIA TRIQUETRELLA HÜBN. A. G. CAROLSFELD-KRAUSE 209

AN UNUSUAL FLIGHT OF *APOROPHILA LUNEBURGENSIS* FRR. A. G. WIGHTMAN, F.R.E.S. 210

A TRIP THROUGH FRANCE AND NORTHERN ITALY IN JUNE 1964. S. N. A. JACOBS 211

NOTES AND OBSERVATIONS 214

CURRENT LITERATURE 217

CURRENT NOTES 221

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (185)

TO OUR CONTRIBUTORS

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AND JOURNAL OF VARIATION

Edited by S. N. A. JACOBS, F.R.E.S.

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Ireland 1964

by H. C. Huggins, F.R.E.S.

I decided this year to make a longer trip to Ireland than usual and arranged to spend from 3rd June to 25th July at Dingle, and from 25th July to 19th August at Ballynalacken Castle, Co. Clare. As usual, I took my favourite Fishguard Cork route. The outward journey on 2nd June was not propitious, the Paddington train was over two hours late at Fishguard. However, the "Innisfallen" waited for us and although we did not sail until 2.15 instead of 12 midnight, the catering staff provided a good cold dinner at that hour. As a contrast I may mention that on 20th August I caught the 4.40 a.m. at Fishguard, reaching Paddington between 10 and 11, the restaurant car was unattended and the buffet locked on the whole journey, leaving us to subsist like bears by licking our paws.

On the whole, the long trip was not so productive as I had hoped. the weather was the worst I have encountered in Ireland since 1948, when my wife and I stayed five weeks at Glengarriff and did not have a day without rain.

We had an abnormal amount of the fine rain from the sea, locally called "fog", at both Dingle and Ballynalacken, and also a great amount of wind. I made three attempts to cross to Inishvickilaun in the Blaskets, besides a fourth that never left the harbour; twice we had to turn back and on the occasion when we succeeded in landing we had to depart prematurely as the wind was rising, and we had some difficulty in getting back to the motor launch in the dinghy.

The first trip on which we had to turn back was, however, not wasted except from the entomological point of view. We saw a great northern diver, doubtless a non-breeding bird, in full summer plumage, and also passed through a large raft of Manx shearwaters.

I am glad to say that the stonechats have completely recovered from the disastrous winter of 1962/3; I saw more this time than in any previous year. I had several opportunities for looking at these at close range, and decided that the opinion expressed by some ornithologists that the Kerry ones approximate to the Hebridean race is erroneous, and I am glad to say Mr. Frank King agrees with me.

The feature of the year was the abundance at both localities of *Arctia caja* L. I have never seen so many before anywhere as in the mercury vapour light trap on this trip. At Dingle I caught a fresh ab. *schulzei*, the only one I have seen alive; unhappily it was a male.

Immigrants were very scarce, except *Pyrausta martialis* Guen. which occurred in ones or twos on a good many nights at both localities, but on 15th August at Ballynalacken I took a very large pale grey *Eurois occulta* L. Only two other Irish specimens are recorded in Donovan, but in 1960 Mr. E. S. A. Baynes got four at Glenageary. He referred three of these to Mr. French at Rothamsted, who replied that they were the immigrant continental form. Mine was undoubtedly also of this form, as I have several times taken it in Essex. As the *occulta* was a female I kept her for eggs and she ruined herself though she laid a few which have not yet hatched (1st September) and I am rather sorry now that I did not kill and set her, as previously I have found *occulta* eggs to hatch in under a fortnight.

Cryphia muralis Först. was out at Dingle on 14th July, as usual it was rare, and I did not see a typical specimen, which I am satisfied does not

occur there. I took no ab. *nigra* Huggins this year, but five of the greenish black form that so closely approaches it. Some little while ago I mentioned the dates in Ireland for *muralis*. On 19th August I had a couple of hours to wait at Cork, so decided to go to one of my favourite *muralis* walls, the one on which I found 17 in three-quarters of an hour on 16th July 1952. I did not find a single specimen, even in worn condition, so the moth was evidently finished for the year. This matter of Irish dates is puzzling. I have pointed out on more than one occasion Dr. Ford's error in blaming the late discovery of *Argynnis euphrosyne* L. in Ireland to the supposition that collectors went to the Burren too late, as they were concentrating on Zygaena purpuralis Brün. Not only does *purpuralis* emerge at least as early as *euphrosyne*, I have seen it in May, but this year I saw two *euphrosyne* on 26th July, and did not see a single purpuralis during my stay, so it was over before the butterfly.

On 25th July I moved to Ballynalacken, where Mr. Baynes joined me for the first week. On the 26th we ascended what Mrs. O'Callaghan calls the "Khyber Pass" and found plenty of larvae of *Thera juniperata* L. on the prostrate juniper. As the day was hot, we went out again in the afternoon and succeeded in catching several quite good *Phothedes captiuncula* Treits. Mr. Baynes also found, and kindly gave me, a rather remarkable *Abraxas grossulariata* L. in which the upper wings from the central band to the base are almost entirely black. This aberration is not uncommon, but whereas in those I have taken here and elsewhere the cilial spots have been rather larger than usual, in this Burren one they are much diminished in number and size on all wings, giving these a very white appearance in striking contrast to the basal part of the forewings. Although *grossulariata* is commoner on the coastal road two miles below Ballynalacken than I have ever seen it elsewhere, this is the only aberration I have seen there. The caterpillar in this locality feeds almost entirely on hazel.

My mercury vapour trap gave queer results at Ballynalacken, on 8th August, when there was a strong, cold wind, it did not contain a single insect, an experience I have happily never had before in eleven years. From 11th August to 14th, when it was hot and warm, there were over 1000 moths every night, too many to please me as they bashed each other about in some cases.

On my return journey on 19th August I saw a most beautiful female *Gonepteryx rhamni* ss. *gravesi* Huggins fluttering on the other side of the railway line whilst I was waiting at Limerick Junction. It looked nearly as yellow as *Colias hyale* L., and had not my nets been packed in my trunk, I would have chanced it and crossed the line as no train was due, particularly as Irish officials sympathize with the erratic more than the English do.

I now append notes on such insects as seem worth a comment.

Dingle

Atolmis rubricollis L. Two on the Connor Pass road, new to me at Dingle

Eilema complana L. There were several larvae on the rocks at Slea Head; I reared a couple on *Anthyllis vulneraria*.

Ammogrotis lucernea L. A jet black male, the darkest I have ever seen, in the trap at Dingle, and a very light female, quite like the Portland light form, at Ballynalacken. There were also a number of dark grey ones at Dingle.

Mamestra brassicae L. Once again there were a number of the little insect I recorded last year; I should put these at about one in twenty. Apart from Dingle, I have only seen one as small in my life.

Caradrina taraxaci Hübn. In addition to the nearly black form I have already recorded, I took several intermediate ones this year.

Plusia bractea Fab. Very common, I must have seen 100. One of these in dreadful condition, unfortunately, had the spangle reduced to a thin sliver: I released it. The spangle, of course, varies considerably in size, but in this insect the marking was almost linear. Bad *bractea* were still coming to the trap in Clare in mid August.

Orthonoma lignata Hübn. Two in the trap, rather dark.

Euphyia bilineata L. On the only occasion I succeeded in landing on Inishvickilaun I saw two ssp. *isolata* Kane and caught one, the only female I have ever taken. Unhappily she was very small, no bigger than a large male, and as the one taken by Mr. J. E. Flynn in 1953 and the one I saw in 1962 were both big insects, and I was pretty tired after a roughish journey, I mistook her for a male and killed her. However, she was perfect and Mr. Baynes has pointed out that it was probably a blessing in disguise, as we both have several times failed to get eggs from *ab. hibernica* Prout.

Eupithecia venosata Fab. All the pupae that Mr. Baynes and myself obtained from Slea Head larvae in 1963, as well as those I have from Inishvickilaun, proved to be ssp. *plumbea* Huggins, and Mr. Haggett tells me that two moths he bred from the Burren were the same. Mr. Baynes bred, amongst his Slea Head ones, a startling aberration in which the ground colour was dark sepia instead of leaden black.

E. distinctaria H.-S. I found a very dark specimen of this on a rock face, which in rough weather would be covered in spray, near Slea Head.

E. jasioneata Crewe. Not uncommon in the bohireens north of Dingle. I also took two on the beach near Slea Head, one on a rock face and one in a deep cave, both subject to showers of spray in rough weather. On the cliff face at Inishvickilaun I found the biggest female I have ever seen, and got her into a box, but bungled putting on the lid and she escaped.

Chloroclystis rectangulata L. All Dingle specimens are a brilliant green, a refreshing change after the black ones which are all I see at Westcliff. In the Burren the same green form is the only one, but there it feeds on sloe.

Schoenobius forficellus Thunb. Not uncommon in the trap, most were smaller and more heavily marked than Kent or Essex ones, but oddly enough, nothing like the peat form found in the New Forest.

Platyptilia calodactyla Hübn. I wished to obtain a few more for friends, but the weather was so cold and wretched when the moth was out that I only took two in nine visits. Last year, Mr. Baynes and I took over 30 in two visits, and could have trebled the number had we wished. This shows the danger of theorising about a moth by those unacquainted with the weather and climate.

Oidaematophorus tephradactylus Treits. One in a bohireen off the Connor Pass road, a very light specimen.

Hepialus lupulina L. Common in the trap, perfectly ordinary in appearance.

H. fusconebulosa Deg. Not uncommon, very large and well marked, ab. *gallicus* equally common.

Burren

Diarsia rubi View. Very dark smoke coloured ones were not uncommon at Ballynalacken. All second brood *rubi* were rather larger than our first brood ones in Essex, although the reverse is the case here, possibly the Burren first brood is larger still.

Triphaena comes Hübn. A much larger proportion than usual had reddish forewings. I saw no heavily marked ones as in the Isles of Scilly.

T. interjecta Hübn. Two in the trap: usually rare in Ireland.

Calamia tridens Hufn. A wasted male came to the Ballynalacken trap on 15th August. This moth, I think, wanders a great deal; the first one I ever saw was sitting at the base of the high rocks on the coastal road about three miles from the castle drive. This was on 27th July 1953; it was in very bad condition, but as it was a male and I wanted one of my own taking, I kept it. It is still in my curiosity box. I do not know of any colony near, but of course all the Burren around may contain pockets of the moth, as most of it is far too dangerous to work at night. 1953 was a very early year, four nights later I saw a hundred or so near Ballyvaughan. I believe this 1953 insect is the only one ever found by day searching, excepting Captain Wright's original specimen.

Procus literosa Haw. Not uncommon, smaller and not so rosy as in Eastern England. Usually rather local in Ireland.

Celaena leucostigma Hübn. One, of the *fibrosa* form, it was obviously only just emerging when I left. It was rather small and dark, appearing to me midway between the English and Scottish forms.

Hydraecia sp. In almost endless variety and beauty on the four hot nights, unfortunately, a large number were scratched in the trap. They are certainly not *oculea* L. and *paludis* Tutt is non-Irish. I should say the majority, great burly insects, are *lucens* Frey. but some may be *crinanensis* Burrows, they must await further examination.

Arenostola pygmina Haw. Common in all colours from red to white.

Perizoma minorata Treits. This year, the commonest I have ever seen it, literally in hundreds in mid-August.

Eupithecia icterata Vill. I netted a most curious variant of the *oxydata* subspecies at Clooncoose, and subsequently several more turned up in the trap at Ballynalacken. The ground colour in these was chalky, instead of dull grey. Unhappily, only one of the Ballynalacken ones was worth keeping.

E. palustraria Dbld. On the side of the road just past the drive to the castle.

Gnophos myrtillata Thbg. One was sitting on the wall outside my bedroom window at the Castle, it is usually confined to the bare rocks.

Pempelia dilutella Hübn. Several of the large west of Ireland race with the heavy white markings. In the Burren the ground colour is brown, giving the moth a close resemblance to *P. ornatella* Schiff., which it equals in size, at Dingle it is deep crimson. I have never flushed this moth by day in either locality, whereas on the Kentish downs it rises freely in the late afternoon.

Tortrix paleana Hübn. On the first night the trap was set I took three males, almost certainly of this species, but I set them in the hope they may be the newly differentiated *unitana* Hübn. The weather then turned so cold I saw no more.

Cnephasia chrysanthemama Dup. Two lovely aberrations came to

the trap, pale chalk grey with nearly black markings. These were the only two I saw.

Endothenia antiquana Hübn. Common, but all ordinary; at Dingle a number of melanics are interspersed with the normal.

Olethreutes schulziana Fabr. Three in the trap, rather small but brightly coloured crimson and silver, quite unlike the Mayo specimen given me by Mr. Baynes. This was captured by Captain C. Q. Parsons, it is small, but the ground colour very dull greyish silver, and the markings chocolate.

Notocelia incarnatana Hübn. I think this is found throughout the Burren, but it is difficult to disturb by day. Burren specimens are smaller and darker than those found in the South Wales sandhills by Sheldon and Metcalfe. I believe this moth at times feeds on garden roses as well as the burnet rose, I took half-a-dozen in my Ballynalacken trap, and I do not think it likely that all flew the one-and-a-half to two miles from the nearest burnet roses. It seems much more probable, especially as they were dead fresh and spread over several nights, that they were infesting some domestic rose in the shrubbery.

The pleasure of my stay was greatly enhanced by the company of Mr. E. S. A. Baynes, Mr. Frank King, Mr. Sylvester Nolan, Mr. G. Haggett and Mr. A. J. Wightman; unfortunately, the last named only arrived a couple of days before I left.

In the Record (76: 156) the Aran Islands are, by a printer's error, spelt Arran. This is the Scottish name. As I was travelling, I did not correct the proof, so it is my own fault.

Hibernation and Pupation of *Cossus cossus* Linn. (Lep., Cossidae)

By Commander G. W. Harper, R.N. (Retd.), F.R.E.S.

I have recently been reading Dr. H. B D. Kettlewell's excellent and stimulating little book "Your book of Butterflies and Moths" published by Faber and Faber in 1963. One short paragraph in this book has stimulated me to write this paper. As an illustration of the rewards awaiting the keen and observant entomologist in the field, Dr. Kettlewell cites the recent and important observation that *Cossus cossus* Linn. pupates in the tops of molehills. Apart from a comment that perhaps the reason for this is the avoidance of excessive moisture, he has understandably in a short book, not been able to amplify this statement with details of records, quantitatively and qualitatively sufficient to justify such a generalization on the pupation habits of this species. I am sure we need all the information we can get; for a start will Dr. Kettlewell give us the records, which I do not personally remember having seen? I have tried unsuccessfully to trace them.

My own experience with this interesting Moth is certainly not statistically significant, but is, I think, illuminating. It quite definitely confirms the oft-repeated observations and records of our respected predecessors of the last century that the full-fed larvae of *C. cossus* leave the tree in the Autumn, make cocoons in the earth where they hibernate *as larvae*. These observations were all made in early numbers of our own highly

respected and reliable *Ent. Rec.*, and summarised by the late Editor, J. W. Tutt in his useful compendium "Practical hints for the Field Lepidopterist", 1901. My own small contribution to this experience is that, when enclosed in a large biscuit tin with a few inches of earth *and* one or two billets of soft wood in the Autumn, they invariably make their hibernating cocoons in the earth, and in April they leave these and enter the wood, where they bore a vertical gallery, make a "window" like a Nonagria or any other self-respecting internal feeder, and make another cocoon therein where they pupate.

While therefore there is no doubt at all that the fully-fed larvae leaving the trees in the Autumn hibernate in cocoons made in a suitable site in the soil and rotten wood etc., we need some more evidence of the pupation sites and habits of this insect in the wild state. I venture to prophesy that my opinion that the larvae prefer solid wood for this highly important function, and that molehills, soil, or other sites are only used under compulsion of local circumstances, will stand the test of time.

I think that probably the greatest British expert on *C. cossus* at present is Mr. P. B. M. Allan. As well as the delightful hilarity with which he writes of the Apocryphal exploits of this species, there is a wealth of practical observation and deep scholarship in his books. Particularly noteworthy is his full quotation of Harris (1766) on the life history of *C. cossus*. This is on Page 196 of Allan's "A Moth-hunter's Gossip". As Allan says, this is a marvel of accuracy, but the interesting point to me is that Harris fails to mention that some at least of the full-fed larvae leave the tree in the Autumn and, as I believe without any true evidence, return to it or to another one, in April. Why do they leave the tree? That is my question, for I am not aware that any other internal feeders do so. Mr. Allan (*in litt.*) agrees with me that in captivity, securely confined in a large biscuit tin with both earth and wood, they do indeed hibernate in the soil and enter the wood in April where they pupate as would be expected of them. This brings me to my last point. The pupa of *C. cossus* has adapted its structure over countless aeons of time to the nature of the habitat inside solid wood. Its abdominal somites are strongly ridged, and armed with stout spines to enable it to propel itself out of its pupal cocoon and to protrude from the "window" firmly held for emergence. I have watched eclosion in captivity with great interest on more than one occasion. This structure *C. cossus* shares with most other internal feeders. Surely such a pupa will not normally pupate therefore in such a site as a molehill?

Neadaich, Newtonmore, Inverness-shire. 2/9/64.

PHLYCTAENIA CILIALIS HÜBN. (LEPIDOPTERA: PYRAUSTIDAE) NEW TO KENT.—My friend Percy Cue to-day showed me a fine female of this moth that he took in his garden at Ashford, Kent, on 18th August 1964. It had evidently been attracted to light for when he took it, it was at rest on some grass beside his mercury vapour light trap. This is the first record of *cilialis* for Kent to my knowledge. It is noteworthy that the date is very late, the normal time of appearance being June-July. A worn example was taken by S. Wakely and myself at Thorpness, Suffolk, about 10th July this year.—J. M. CHALMERS-HUNT, St. Teresa, Hardcourts Close, West Wickham. 18.ix.1964.

The Isle of Arran, 1964

By M. J. Leech

Islands have, for me, a strange fascination and if they happen to be those lying off the Scottish coast then this is all to the good as Scotland itself, no matter which part, is a place to visit at least annually if at all possible.

Tentative plans were made towards the end of last year with my friend Mr. Stuart Coxey to spend a week, in August, on Arran. Mr. Austin Richardson's interesting article on the Island (Ent. Rec., **72**: 112-5) gave us a very good insight into what we could expect provided the weather was favourable. In correspondence Mr. Richardson gave us the address at which he stayed and naturally we wrote with a view to obtaining accommodation. Unfortunately the good lady had left the Island and now resides on the Mainland. We were, however, put in touch with her sister. She and her husband manage a farm and take in guests during the summer months. Arrangements were therefore made for us to stay at their farm from the 8th to 15th August. The next step was to book the car ferry. Arran is a popular resort with the Glasgow people and on most days in the summer months it would appear as if the s.s. Glen Sannox sets out from Ardrossan with a full complement of cars and passengers.

With everything arranged well in advance therefore we left Lancashire early on the morning of the 8th and arrived in Arran in the afternoon after a very smooth crossing. Having made a few purchases in Brodick we headed inland for our farm. The farm house occupied quite an imposing position with high land at the back covered in bracken and heather. On this area we placed our plug in trap which was to operate each night of our stay.

Setting out on our first evening we headed for the Ross Road which, from the Ordnance Survey map, we saw in parts rose to over the necessary altitude for one of our main *desiderata*—*Dysstroma truncata* Hufn. ssp. *concinnata* Steph. Within ten minutes of getting the car into a suitably placed spot off the road we had netted our first *concinnata*.

Moths were everywhere and before dusk was over we had each taken a nice series. At light, in the same spot, there was an abundance of *Diarsia festiva* Schiff. ssp. *conflua* Triets. and a few of the dark purplish form of *Lygris populata* L. We found that the best method of obtaining this species was to wander amongst the herbage and box the freshly emerged specimens as they sat on the heather stems. A single specimen of *Xanthorhöe munitata* Hübn. also came to light; apparently a scarce insect on Arran as we only saw two specimens all week and it will be noted that Mr. Richardson did not record it during his visit.

With the exception of rain one morning the weather was ideal from an ordinary holiday point of view. Some of the nights were clear and rather windy which, as we all know, are not conducive to good flying conditions.

In the main, our after-dark operations were concentrated on the coast; the areas were varied however, sometimes in rocky areas on other occasions, on the sand. Sugar was unproductive, due no doubt, to the heather being in full bloom. Searching the heather flowers in the area of our lights produced certain insects and, in particular, we took *Rhyacia simulans* Hufn. by this method.

Larvae beating and searching after dark was not without reward as we obtained several fully grown *Orthosia gracilis* Schiff. which were feed-

ing on Bog Myrtle. It is hoped that they will produce interesting specimens next spring.

It would be pointless listing all the species we took as this would, in the main, simply be a repetition of the list recorded by Mr. Richardson. Those not recorded by him appear below. We recorded 112 species; one of these, a member of the *Geometridae*, was in larval form, beaten off sallow. The larva was a distinctive creature being green above with a pinkish flush along the sides. It has since pupated. The pupa is also distinctive as it possesses a bloom similar to that found on *Cosmia trapezina* L. I am unable to put a name to the species, so will wait until such time as it emerges.

Clostera pigra Hufn.
Achlya flavicornis L.
Saturnia pavonia L.
Rhyacia simulans Hufn.
Paradiarsia glareosa Esp.
Eurois occulta L.
Euschesis comes Hübn. (ab. *curtisii* Newman)
Orthosia incerta Hufn.
O. gracilis Schiff.
Xylena vetusta Hübn.
Procus furuncula Schiff.
Caradrina blanda Schiff.
Plusia iota L.
Geometra papilionaria L.
Xanthorhoe munitata Hübn.
X. designata Hufn.
X. montanata Schiff.
Perizoma alchemillata L.
Venusia cambrica Curt.
Abraxas grossulariata L.
Biston betularia L.
Alcis rhomboidaria Schiff.
Hepialus fusconebulosa de Geer.

*Larval stage only.

The Cottage, Hallgates, Cropston, Leicestershire.
September 1964.

Notes on the Microlepidoptera

by H. C. Huggins, F.R.E.S.

Tortrix viburniana Fab. In June Mr. E. S. A. Baynes, O.B.E., sent me some larvae, pupae and imagines for checking, which had been submitted to him by Mr. de Brit of the Irish Forestry Division. 22 Upper Merrion Street, Dublin. They had been found feeding on Sitka spruce and on *Pinus contorta* at Guresalia property, Glenamoy forest, Co. Mayo, in an experimental area which was planted last spring. I at once saw that the larvae did not belong to the *Evetria* genus, whose larvae burrow in pine buds and shoots, and belonged to the *Tortrix* group, and at first I thought that they might prove to be *Pandemis cinnamomeana* Treits., whose larva is known to feed, amongst other trees, on larch. The larvae were spun externally on the bud and were boring into it.

When, however, the pupae and moths arrived, I saw that although they were rather small, they appeared to be a form of *T. viburniana*. They were like the race of this insect which feeds on the edge of bogs on dwarf sallow, bog myrtle, and various low plants, the males being pale olive brown with a darker costal spot and a confused band towards the cilia, and the females bright red-brown with, in most cases, a darker median bar. As at this time I had never heard of viburniana as a pine feeder, I sent specimens to Mr. J. D. Bradley for dissection, who confirmed my

identification and said that he also had no knowledge of the moth as a pine feeder.

Through the kindness of Mr. Baynes, I have now seen a letter from Mr. de Brit from which it appeared that *viburniana* has in the past twenty years been found feeding in Ireland on Scots pine, European and Japanese larch, and occasionally on Pinus contorta, Corsican Pine and Douglas fir, and further that Mr. Neil Chrystal in his book, Insects of the British Woodlands (F. Warne, 1937) states that it occasionally changes from its normal food plants to spruce, Douglas fir and Scots pine.

In 1960 a plantation of Sitka spruce at Cahirciveen Forest, Co. Kerry was attacked by *viburniana*. The trees were then about five feet high and the attack apparently only lasted for a year, but in 1961 a further infestation took place in a different part of the same forest.

Finally, Mr. G. Haggett informed me that *viburniana* had been reported ocasionally on young spruce plantations in England.

Mr. de Brit thinks it may be said that there is no indication of pest proportions being reached at present, and I incline to the opinion that it will not attain to this status. *Viburniana* as I have seen it, seems to stick to low bushes and herbage and I should say that once the trees begin to run up to a fair height it will forsake them.

It may be of interest to run over the various known forms of the moth in these Isles:

(i) The commonest race, which I have already mentioned, with the pale olive-brown male and reddish female, which feeds in the drier parts of bogs on dwarf sallow, bog myrtle, bilberry, and in the absence of these, on almost any low plant.

(ii) The heather race with an almost uniform reddish-brown male and female. This is found on almost all dry moors on heather and other plants.

(iii) The salt-marsh race. This is very large indeed, the male when fresh, creamy buff with some scattered grey scales, but no markings, and the female, which is twice the size of that of any other race, reddish-grey with a marked central band. The larva of this feeds on *Aster tripolium*, *Artemisia maritia*, *Statice limonium*, *Inula crithmoides*, and other salt-marsh plants, usually keeping to those that grow on the side of sea walls or other raised ground. This is the race referred to in Tutt's Practical Hints II, 59, as probably a distinct species from the moorland *viburniana*. In 1922 I determined to clear this up and found the males flying freely at dusk on Iwade Saltings near Sittingbourne. I referred these to Sheldon and Durrant who declared them to be *T. paleana* Hübn. (this gives some idea of the colour of the male). I was not satisfied with this and sent some to Pierce for dissection, and he wrote that they were *viburniana* The next year I bred the female, and of course this robust, reddish-grey insect bore no resemblance to the small pallid female of *paleana*.

(iv) The form formerly known as *teucriana*, also mentioned in Practical Hints I, 12. This used to feed, and probably still does, on *Teucrium scorodonia* on the Folkestone Warren. The male was uniform shining drab, and the female of duller colour than in most races.

My thanks for information are due to the Irish Forestry Division, to Mr. G. de Brit, Mr. E. S. A. Baynes, Mr. J. D. Bradley and to Mr. G. Haggett.

Reminiscences of Cornwall

By F. W. Byers

Many holidays spent in this delectable Duchy have provided not only successful collecting experiences, but also some rather amusing and interesting incidents. Not being a car driver, it was my usual practice to go to a reliable local man, explaining my chief object in wanting to be driven occasionally to many out of the way places in search of insects. In every instance I found them most co-operative, and keenly interested.

In fact they all wanted a net to try their hand, and I owe my first *L. arion* (large blue) to one agile individual who calmly came to me and said, "Is this what you want".

Whist at Tintagel the local taxi man would not miss a day if he could help it, and when my wife in the course of conversation asked him what was his great ambition in life he replied to her astonishment, "to see the Cup Final at Wembley". Well, I was able to help in this respect due to the kind offices of one of my friends high up in the F.A., so was pleased to send him two 25/- tickets on my return home. I learnt from his letter of thanks (which also enclosed the cost) that he and his wife spent a right royal time, and that he was the envy of the village.

It was at Fowey when I first met Col. Rossel, a most charming man, retired from the Indian Army, and a very enthusiastic collector. He went out of his way to entertain us both at his delightful house at Bodinnick, and we went on many excursions collecting, including some delightful trips in his boat up the river. One day I insisted it was our turn to be hosts, and we packed up lunches to go over Bodmin Moor, where it is possible to obtain many nice specimens on the dozens of posts dotted about the Moor.

During our break for lunch, the Colonel wanted to know if we were anywhere near the "large blue country". I told him we were many miles away, and thought this was the end of the matter, but oh no, as at several stopping places he repeated the request.

I therefore thought that as he had been so very decent to us, it was only fair I should try to oblige, so pledging him to secrecy, we started off on a very long trek.

Eventually arriving at the ground, the Colonel within a few minutes netted a beautiful specimen, then packing up his net remarked, "I shall only *take one*, this has made my day". What an object lesson for some of those murderous individuals who take all they can see, and then discard more than half.

On another holiday in the area my wife and myself had tramped over quite a considerable area of Bodmin, when I spied a beautiful valley, which promised to be productive. Halfway down we were confronted by a rather burly individual complete with leather gaiters and stick who demanded to know what I was doing with a net. Not quite liking his tone, I requested to know what it had to do with him and he then explained he was the River Bailiff and on the look out for people with nets who poached the fish. I set his mind at rest by showing him some specimens I had caught, and then said: "Now you have had your say, where can we get a cup of tea". He replied that if we would accompany him to his cottage his daughter would do the needful, and we had a most gorgeous repast, for which, despite my protests, he refused payment.

Another example of Cornish generosity was experienced later on. Whilst at Fowey my wife had a fancy to see Lands End, and I arranged with our taxi man to take us, saying we would provide the lunch. We got to very near Penzance, where we found the ideal place for a picnic. Before settling down the driver said: "Wait a moment", and then proceeded to lift up the bonnet of the car, emerging with grease proof paper packets. They contained three real Cornish Pasties, which he had kept hot on the engine all the way, and we were informed that his wife had specially made them that morning. It was just as well we had this pleasant surprise, as we found Lands End a much over-rated and dismal place.

One stay was at Poundstock Farm, where the Farmer used to regale us on any wet evening with tales of the old smugglers and wreckers. The setting in an oak panelled room, in dim light, with a roaring fire would have provided enough material to warrant authors like Daphne du Maurier, or L. A. Knight writing a most thrilling yarn.

Knowing I was a collector, the farmer told me that years ago he was commissioned by a dealer (who shall be nameless) to send him all the larvae he could find of *craccae* (Scarce Blackneck) which feed on the blue vetch. He volunteered to show me the place, which happened to be down a frightfully steep cliff, likely to try the stoutest nerves. When I remarked that the place seemed a trifle hazardous, the farmer calmly said: "Oh this is easy, I used to go down here on my pony". I wondered at the time what payment he got for risking his neck.

It was in this area that I saw larvae of *Verbasci* (mullein shark) feeding on *Buddleia*, which is the only instance I ever have found. I think this rather upsets the text books.

Both on the coast and inland there are good hunting places for black banded moth (*xanthomista*), red necked footman (*rubicollis*), cream spot tiger (*villica*), as well as most of the fritillaries, and my friend, Colonel Rossel has told me that with his light trap perched on the top of the cliffs, he has had great success including some of the choice immigrants.

One's enthusiasm never wanes when investigating the haunts of the insect world, although the young man in the humourous story by F. W. Thomas would not agree.

This individual had spent a lovely day in the fields with his fiancee, and when safely in the train on the journey home, discovered he had been sitting on an ant hill. He was obliged to go down to the place where they used to keep the soap and towels, to find his trousers full of black ants.

To get rid of these he conceived the brilliant idea of shaking his trousers out through the narrow window, whereupon a passing train took his garments clean out of his hand.

I leave the reader with the youth standing in his bowler hat and pants, to discover what happened afterwards, as I do not wish to be guilty of plagiarising the laughable tale of "The Misogynist".

St Albans, Herts.

LEUCANIA LOREYI DUP. IN CORNWALL.—On 14th September I took *Leucania loreyi* Dup. (cosmopolitan) in my mercury vapour light trap at Bodinnick, and I think that this is worth putting on record.—Colonel H. G. ROSSEL, The Old School House, Bodinnick. Lanteglos by Fowey, Cornwall. 18.ix.1964.

Aviemore in August 1964

R. G. Chatelain and B. F. Skinner

For some time, we have wanted to return to the Highlands to sample the insects for which we have previously been too early, and this year we decided that the third week of August should be reserved for these Scottish specialities. This turned out to be a wise choice as, although some species were showing signs of wear, an earlier visit would have caused us to miss others which were just appearing during our stay. Nothing extraordinary fell to our lot but, in view of the popularity of the area, we hope this note will be of some small assistance to future visitors.

We left London on the afternoon of Friday, 21st August, and arrived at Aviemore at 6 o'clock the following morning, when we repaired to the foot of the Burma Road for a catnap and a wash in the stream. We found the village much changed since our last visit with a row of new shops and a pleasant restaurant. We heard horrifying tales of further changes, with plans for ten hotels on the golf course, curling and bowling alleys and a flyover to connect the A.9 with the road to the ski lift.

On this occasion we stayed with Mrs. Tully and ran two traps in the extensive wooded grounds of Craigiellachie House. Fortunately, we had over 200 yards of cable with us and were thus able to place the traps well within the wooded area.

One of our main quarries was *Aporophyla luneburgensis* Fr. although we realised that we were a little late to get the bug in its prime. Accordingly, we repaired to a likely spot near Granish Moor on the night of 22nd and were rewarded by nine moths of this species, some of which were still fresh. Later visits to this and nearby localities produced more but we should have had some difficulty in obtaining enough good specimens to complete our series had we not taken one or two examples nightly in the traps. Both sexes appeared to frequent light in equal numbers.

Our second objective was *Lithomia solidaginis* Hübn. and, although only odd specimens came to light, we found the moth in numbers on posts with its head tucked under the wire and its posterior airing in the breeze. One morning's searching produced sixteen moths in perfect condition and others were found throughout our stay.

Antitype chi L. was worrying us slightly as, after three nights with the lamp and industrious searching, we had only found three moths. However, on 25th August we called on Commander Harper whose first words were to ask whether we wanted any *chi*. He then pointed out two sitting in his garden and during tea a knock at the door produced a third. Newtonmore moths are well trained in Naval discipline. During the next two mornings we visited the Kingussie-Newtonmore area and collected as many as we wanted from stone walls, including some which had not fully expanded their wings.

An attempt for *Tiliacea citrago* L. was abortive as the weather was hopeless and sugar unproductive. However, the lights in a nearby marsh produced four rather worn *Calaena haworthii* Curt. to add to two others taken at Granish and in the trap. Two days later the area on which we had run the lamps was completely under water.

Enargia paleacea Esp. was another moth on which we had set our sights but, although fairly plentiful, it was well past its best and we had some difficulty in obtaining a respectable series. We had almost given up

hope until we ran the lights at the foot of the Burma Road on 28th when several good specimens turned up. We have a few ova and hope to breed the beast.

Few other Noctuids of note were seen. On 24th August, on Granish Moor, we took a female *Eurois occulta* L. who obliged with a sizeable batch of eggs, and a fairly nice *Apamea furva* Schiff. *Paradiarsia glareosa* Esp. was fresh and common everywhere and *Amathes agathina* turned up fairly regularly but in small numbers as did *Stilbia anomala* Haw., *Diarsia dahlii* Hübn. and one or two *Plusia interrogationis* L. The "ears" were widespread but sporadic in appearance and we took a long series. As soon as those have been determined we will publish a note on their identity. Three *Plusia bractea* Schiff. were seen in the trap but all were males and badly worn. Surprisingly, *Eugnorisma depuncta* L. was common in the traps in far better condition than those we had taken early in August 1960, when we were too early for the majority of the other moths mentioned above. *Aporophyla nigra* Haw. was just coming out during our visit but quickly became worn. An unexpected visitor to the trap was *Amathes ditrapezium* Schiff., a rather uncommon moth in the area.

The Geometers were thin on the ground but nearly all of interest. *Dysstroma citrata* L. swarmed practically everywhere with many beautiful forms and, towards the end of our stay, we took half-a-dozen fresh *Chloroclysta miata* L. and one *C. siterata* Hufn. *Oporinia filigrammaria* H.-S. was also well out when we left. The *Thera* species were represented by one *cognata*, one *variata*, two *obeliscata* and several *firmata*. One *Plemyria rubiginata* ab. *fumosa* Prout was taken at the Burma Road, together with a female *Gnophos obfuscata* Schiff. which died without laying.

Because of the abominable weather, we were unable to devote as much time as we should have liked to larva searching, although we did obtain a number of *Hydriomenia ruberata* Fr. from sallow. Odd larvae of *N. ziczac*, *E. adusta*, *A. myrtilli* and *L. callunae* were noted and one gigantic larva of *E. versicolora*.

The highlight of the visit was undoubtedly a trip to the Findhorn sandhills on 26th August. We commenced by getting the car bogged in the sand. After digging her out and plastering the marram with sugar, we settled down to a steady stream of moths consisting of one *A. secalis*, one *A. tritici* and three *vestigialis*. The gale then abated sufficiently to allow a torrential downpour when we decided that discretion was the better part of valour. Returning across a desolate stretch of moor which made Dartmoor look like Kew Gardens in comparison, the car gave up the ghost. Arriving eventually at the hotel we found we had been locked out It was little consolation that London was enjoying the warmest day of the year.

However, the trip was most enjoyable and we returned home with all setting boards occupied and the knowledge that we had been well rewarded for our efforts.

THUMATTA SENEX HÜBN. IN SCOTLAND.—Perhaps the two *Thumatta senex* Hübn. which I took at Aberfoyle, Perthshire, on 8th and 12th July of this year are worth recording, since "South" states that there is only one previous record of this species from Scotland.—Colonel H. G. ROSSEL, The Old School House, Bodinnick, Lanteglos by Fowey, Cornwall. 18.ix.1964.

A Scale Defect in *Lysandra bellargus* Rott.

By Dr. Neville L. Birkett

During the last week of August this year I was on holiday in the Istrian Peninsula, Yugoslavia. While there, I collected a moderate number of butterflies and among these a series of a 'blue' which gave some diagnostic difficulty. These blues had the chequered fringes and underside markings much as in typical *bellargus* but the colour of the upper surface of all the wings was a dull rather leaden hue. I finally decided these must be either ab. *pallida* Tutt or ab. *suffusa* Tutt as detailed in Seitz (1909). I finally decided to examine the wings under a magnification of 76X with the binocular microscope and was quite surprised to find that nearly all the scales on the upper surface were twisted and deformed—this anomaly accounting for the abnormal colouration observed.

This curious condition of the scales in some Lycaenids has been well described and illustrated by the late Dr. E. A. Cockayne (1917) and reference to his paper and plate will show exactly the condition found in my specimens although he was describing *Agriades thetis* Rott. (? *icarus* Rott., *thetis* Esp.). He refers to other blues also showing the defect but does not mention the condition as having been observed in *bellargus*.

It would appear that the cause of this abnormality is quite unknown. In the localities where I took my specimens quite normal coloured males were also flying but these seemed to be in smaller numbers than the deformed forms.

I do not know whether or not Tutt, when describing the forms mentioned, examined his specimens microscopically but I suspect that had he done so this scale deformity would have been observed because the condition is most striking and obvious.

REFERENCES

Cockayne, E. A. The condition of the scales in the leaden males of *Agriades thetis* Rott. and in other Lycaenids. *Trans. ent. Soc., Lond.*, 1917 : 165-168 with plate.

Seitz, A. Macrolepidoptera of the World. Vol. I : 115.

Lithosia quadra L. in Wales and Bristol.—Whilst on holiday in Wales in 1962, I took a fresh male specimen of *L. quadra* at mercury vapour light near the village of Corris, on the Montgomery-Merioneth border. The date was 31st July. I took a second specimen of this species away from the south coast this summer. On this occasion the moth, another male, was taken on 17th July at Bristol. It would be interesting to hear from those more expert than myself whether these were merely immigrants which had penetrated inland.—R. Hayward, 41 Suffolk Road, Southsea, Hants. 26.vii.1964.

Hyloicus pinastri L. in Portsmouth.—The year 1964 has seen a continuation of the establishment of *H. pinastri* (pine hawk) in the Forest of Bere, just north of Portsmouth, a very welcome addition to the moths of this superb area. Even more exciting, however, was the finding of a fine specimen of this moth in the centre of the city of Portsmouth about the middle of July 1964.—R. Hayward, 41 Suffolk Road, Southsea, Hants. 26.vii.1964.

The Coleoptera of a Suburban Garden

6 Brachelytra (Part 2)

By A. A. Allen, B.Sc., A.R.C.S.

(*Continued from Vol. 71, page 44*)

A new feature of the garden, having a bearing on this and still more on the supplementary part of the list, yet to come, should be mentioned here: viz., a very small artificial pond, only about 6′ by 4′ in area, constructed in the middle of a lawn in the autumn of 1958.

As before, rare, uncommon or very local species in our fauna, without reference to the garden, are marked with an asterisk (bracketed in 'borderline' or arguable cases).

Tachyporinae

The members of this group, often of more or less conical form and relatively bright colours, tend as a whole to be more in evidence from autumn to spring than in high summer.

Mycetoporus brunneus Marsh. (=*lepidus* Grav.).—Scarce and always found singly. The first on an outside doorstep, 20.iv.55; swept off mint flowers, viii.57; floating on pond, 28.iv.59; and the last amongst grass at edge of pond, 12.vi.64. Also once crawling up a wall from a moist spot beneath.

Mycetoporus longulus Mann.—Still rarer here, or more seldom seen; one under a stone at base of fence, and another among dead leaves on soil under a bush, 22.iv.62.

**Mycetoporus angularis* M. & R.—Only a solitary example has occurred, which was sifted out of loamy soil mixed with humus and debris of straw, 19.iv.53.

Mycetoporus splendens Marsh.—Most uncommon. First found settled on a wall of the house in hot sunshine, iv.40; twice from remains of old grass heaps, 10.vii.52 and 26.x.53; one by sweeping over a similar site, 11.iv.55; running on freshly-turned earth, 20.iv.53; two under a stone in a torpid state in grass by fence, 20.iv.56.

Mycetoporus splendidus Grav.—Like *longulus*, only twice captured up to the present: by sweeping in a rough overgrown corner in the vicinity of a compost heap, 8.v.56; and resting in the evening at base of wall above a tile placed as a trap, 29.viii.59.

Lordithon (=*Bolitobius* auct.) *trinotatus* Er.—A stray specimen of this fungus-feeder occurred by sweeping grass beneath apple trees in sultry weather, 30.vii.58.

Bolitobius (=*Bryocharis* auct.) *analis* Payk.— Extremely sparing, never more than one at a time, though seen more often since 1951 except just recently. At roots of grass and other herbage, in moss and litter, occasionally under stones, etc.; spring and autumn. This bright, elegant insect is very quick in its movements.

Conosomus littoreus L.—Another species which has occurred but twice: in rotten stems of cabbage (30.iv.53), and in rubbish left where there had been a bonfire (23.iii.59).

Conosomus testaceus F. (=*pubescens* Grav.).—In dryish refuse, humus and dead leaves, at grass roots, and once swept up; infrequent, but seems to be increasing. Oftenest, of late, in grass traps in spring.

Conosomus immaculatus Steph.—In similar situations, but more sparsely, though, again, less rare in the last two or three years; often with the preceding. First noted 17.x.52, whereas *testaceus* was detected some time before 1949.

Tachyporus hypnorum F.—Exceedingly common; at roots of herbage, in moss, humus, dead leaves and grass, vegetable litter, and indeed all refuse except such as is actively decaying; sometimes on the wing or by sweeping; found throughout the year. (These habitats apply equally, in general, to the succeeding species of the genus, some or all of which may occur in company.)

Tachyporus chrysomelinus L.—As for the last; but on the whole, and as a rule, perceptibly less abundant. Least common between late June and early August, when many of those met with are immaturely coloured; this evidently being the main emergence period, which is also true of at least the next species.

Tachyporus solutus Er.—Common, in similar situations but generally in slightly moister conditions, and (apart from special flight periods) markedly oftener by sweeping. Not noticed before 18.viii.51, when one was shaken from golden-rod flowers.

Tachyporus pusillus Grav.—Also common; habits about as *hypnorum* and similarly eurytopic. Unlike its congeners it varies much in colour from brownish-yellow to all black (the latter however being infrequent and the former perhaps immature). A pure colony of the species was found under a tile, 14.x.59.

Tachyporus nitidulus F. (=*brunneus* F.).—Easily the least common of the genus in the garden, but cannot be called rare; it tends, however, to occur singly. Sometimes under stones, tiles, etc., in damp places against a wall of the house.

Tachinus humeralis Grav.—Very rare indeed; first found in a manure heap as far back as May or June 1927. In cat-dung, 18.x.52; in dead grass, 27.x.55. All three were single specimens.

Tachinus subterraneus L.—Quite frequent from late autumn to early spring (but only casual at other times) in decaying herbage such as heaps of fermenting grass or compost; also in carrion, rotting apples or fungi, and (once) cat-dung. A typical winter species.

**Tachinus scapularis* Steph.—Rare, though occasionally in some small numbers in much-decayed grass heaps, etc., nearly always in late autumn; one under decomposing fish, 26.x.53.

Tachinus rufipes Deg.—Common without being abundant, and not noticeably gregarious, often found singly or by twos or threes. Habitat wider than the last three, more as the species of *Tachyporus*, and but little attracted by fermenting substances; often, for instance, at grass roots or in moss and under stones.

Tachinus marginellus F.—As the previous species, but a good deal less frequent and of far less regular incidence. Mostly in grass traps in spring and autumn in one or two fairly recent years; has occurred in mid-winter in dead grass litter. First recorded 6.vi.51.

**Tachinus laticollis* Grav.—Found twice only, in grass litter: 14.x.58, 23.iv.59. Very possibly passed over at times as *marginellus*.

Leucoparyphus silphoides L.—This pretty little species is confined to rotting plant material, especially grass mowings. Erratic and never at all common, but occasionally several together when it does occur.

Habrocerus capillaricornis Grav.—A great rarity here; single examples in identically the same spot 12 years apart (28.v.52, 27.iv.64)—under a piece of board at the base of a wall of the house where the ground is kept damp by the outflow of the kitchen sink.

Cypha (=*Hypocyptus*) *longicornis* Payk.—Not uncommon in comparatively dry vegetable refuse, grass litter, etc.; at roots of herbage, by sweeping, and in flight. More or less throughout the year.

Aleocharinae

A very large assemblage including many of the smallest and most obscure Staphylinidae. Many can be found almost throughout the year in their proper habitats. For the nomenclature and notably the subgenera of the huge genus *Atheta,* I follow Hansen (*Danmarks Fauna,* 1954) who to a great extent adopts the classification of Brundin, the chief modern authority on the systematics of the group.

Oligota inflata Mann.—Apparently rare, unless passed over as one of the commoner species—though I do not think this has often happened. I have an undoubted example from cut grass, 3.viii.38, and believe there have been one or two others.

(*)*Oligota parva* Kr.—This species is sometimes plentiful in a particular grass heap when discovered, but is most irregular in occurrence; found on and off since 1935.

Oligota atomaria Er.—In similar conditions; not common, and rarely found of late, but perhaps partly confused with *pusillima.* (The presence of *O. punctulata* Heer requires confirmation.)

Oligota pusillima Grav.—Certainly the commonest of the genus in the garden, but still erratic and far from abundant; sometimes with *parva.*

**Oligota flavicornis* Bsd. & Lac.—Scarce, only found two or three times singly at long intervals; swept or beaten from foliage of pear trees growing along a wall (8.vi.48, 22.ix.53). Recorded as preying on mites which attack fruit trees

Encephalus complicans Westw.—This curious little species, a newcomer to the garden, first turned up in the early spring of 1959, sparingly, in grass traps in one area only; taken most years since at the same time and place, so that it is evidently established. Also once by sweeping near this spot.

Bolitochara bella Märk.—One by sweeping long grass under apple trees, 11.v.53. There seemed to be no fungi near, so it was probably a wanderer —cf. *Lordithon trinotatus* above.

Autalia rivularis Grav.—Often occurs copiously in grass mowings, rotting straw, and various kinds of decaying vegetable matter.

Cordalia obscura Grav.—Plentiful as a rule in like situations; on the whole more regular and less periodic than the preceding.

Falagria sulcata Payk.—Also similar in habits, but very much less common and often taken only singly. First found in April 1933 in old dahlia roots, with the last two species.

Bohemiellina paradoxa* Mach.—An example of this small but interesting species, sifted out of a warm, actively fermenting grass heap on 8th August 1953, is one of the only two yet known as British—the other having been taken by the Rev. C. E. Tottenham near Cambridge. (Cf. *Ent. mon. Mag.,* 1955, **91: 296-7).

Gnypeta carbonaria Mann.—A solitary specimen at the muddy edge of the pond, 10.ix.64. This is the typical habitat of the beetle.

Callicerus obscurus Grav.—Very scarce indeed; one in a grass or compost heap, iii.35; another by sweeping long coarse grass, 5.v.60—a very warm day. (Generally found between March and May in grass tufts or flood rubbish, also by sweeping on moist low ground, and suspected of living in the runs of small mammals.)

Amischa analis Grav.—Extremely common and quite general at roots of herbage, in litter, moss, humus, etc.; often in numbers by sweeping in warm, close weather, flying and settling on one's clothing, etc.; but not attracted by decomposing substances.

Amischa decipiens Sharp.—The only record I have for the garden is of a specimen at grass roots at base of fence, 5.iii.51; it surely, however, must be far commoner than implied by this, being no rarity, and easy to overlook among the hordes of *A. analis*.

Atheta (*Aloconota*) *gregaria* Er.—Most infrequent; odd examples by sweeping or on the wing in early summer, and occasionally in a damp place by the house under bricks or other cover; a few under fish bait when nearly disintegrated, viii.53. Not certainly noted earlier than 1952.

Atheta (*A.*) *sulcifrons* Steph.—Very seldom met with and always singly, in the damp environment just mentioned (at least once beneath a large flagstone); not more than three times in 25 years.

Atheta (*Philhygra*) *luridipennis* Mann.—Found only twice up to the present; one in a small amount of rotted-down grass mulch placed around the roots of a rose tree, 11.v.57; and one crawling up a wall at the base of which was a quantity of well-decayed straw, 27.iv.64. (A species—like *elongatula*—of very varied biotope.)

Atheta (*P.*) *halophila* Ths. (=*tomlini* Joy).—A ♀ apparently referable to this species was taken at the edge of the pond, 7.v.60; but it is possible that it belongs rather to *hygrobia* Ths. (=*malleus* Joy), of which I have ♂♂ from a pond (no longer existing) not far away—♀♀ of the group being difficult to name with certainty.

Atheta (*P.*) *elongatula* Grav.—Not common; met with under the same conditions as *A. gregaria*, but less seldom; also sometimes in cut grass (perhaps only casually), and recently in small numbers at grass roots round the muddy edge of the pond, notably in the past summer. First in 1938.

Atheta (*Dinaraea*) *angustula* Gyll.—Sporadic; a few times since 1951 at roots of grass along a fence; in debris of moss and leaves, 17.iv.53; under remnants of putrid fish, 16.vii.52; at the pond-edge, 17.v.60.

Atheta (*D.*) *linearis* Grav.—One taken at base o ffence, 19.v.52, is the only record for the garden; the species mostly lives under bark and in rotten wood.

Atheta (*Plataraea*) *brunnea* F.—Very rare. Singly in remains of dry cat-dung, 8.viii.52; in humus (cat-dung being again in the vicinity), 15.x.53; swept under apple trees, 17.vi.54; and by sweeping ivy on wall and ground in shrubbery, 2.vii.64.

Atheta (*Bessobia*) *occulta* Er.—Not at all uncommon in autumn in rotting grass and straw, even plentiful at times; but in other seasons only odd specimens are met with. (One running on kitchen step, 10 or 11.iv.55.) The summer is normally spent in the larval and pupal stages—to judge

from a specimen taken in the garden as a young larva, and bred out by Mr. W. O. Steel. I cannot agree that the species is rare, as both Fowler and Joy state in their books.

Atheta (*Microdota*) *inquinula* Grav.—This, the smallest of the genus, is quite scarce, having occurred singly only some half-dozen times since 1937—or perhaps a little oftener. Probably, from its size, much overlooked. In heaps of cut grass, etc.

**Atheta* (*M.*) *benickiella* Brund. (=*validiuscula* auct. Brit.).—A rarity of which I obtained one example by sifting the latter material, 10.iv.48.

Atheta (*M.*) *amicula* Steph.—Frequent, in vegetable refuse of various sorts, in a moist place beneath bricks and tiles, and at times by sweeping grass or over rubbish heaps.

Atheta (*M.*) *atricolor* Shp.—Not common, and usually found singly, but taken at intervals from about 1940 up to the present time. In heaps of rotting grass or other herbage, and at least once on the wing near a pile of freshly-mown grass. (The known distribution is remarkable: England and Scotland, Calabria and Algeria. Joy wrongly omits the species from his book.)

Atheta* (*M.*) *alpina* Ben.—A rare and supposedly boreo-alpine species, known as British only on a few specimens from Devon and one from the New Forest, until a female was detected amongst material sieved from a small pile of rotting straw in the garden, 14.v.62. (Cf. *Ent. mon. Mag.*, 1963, **99: 63, where, however, I mentioned 'the first Scottish record' in error—this should be deleted—and 1962, **98**: 48.)

**Atheta* (*M.*) *indubia* Shp.—Three examples in loamy soil mixed with remnants of old straw, etc., and a fourth from bonfire ashes in which there remained some unburnt vegetable matter, March 1959; two further ♂♂ by sweeping widely over the garden, late April 1964. (I have not been able to check the few records of captures earlier than the former date.)

**Atheta* (*M.*) n.sp.?—A ♀ taken at the time and place first mentioned under *indubia* is indistinguishable externally from that species, but has an entirely different spermatheca; the species appears to be undescribed.

**Atheta* (*M.*) *perexigua* Shp.—In grass-mowings; rare, though in the period when first found (iv-v.37) a short series was obtained. Since then, however, it has been very seldom seen, the latest being one swept from a lawn (5.v.60)—probably in flight—where mowing was in progress, on a very warm day. Also two from rotten stems of cabbage, 20.iv.53.

Atheta (*Atheta*) *nigricornis* Ths.—In nests of thrushes and blackbirds; single specimens taken three times in the last few years, the first 6..iv.61. It is not, however, restricted to this habitat.

(*)*Atheta* (*A.*) *divisa* Märk.—Several times under the remains of decomposed fish and other carrion in 1952-3, once or twice in some small numbers; the first from a grass heap, 3.x.37, and a few later from similar loci; one shaken out of old cabbage stalks, 10.v.53. (Hardly rare as the books suggest.)

Atheta (*A.*) *coriaria* Kr.—From time to time in cut grass and other rotting herbage, occasionally in small numbers, but far from common; one brushed from pear foliage, 14.viii.64.

Atheta (*A.*) *crassicornis* F. (=*inoptata* Shp.).—Fairly common in most kinds of vegetable refuse, once or twice in fungus and rotten fruit; also at carrion (where, indeed, several of the Athetae attracted to rotting herbage

may well occur, but this material has not been closely worked for the genus in the garden).

Atheta (*A.*) *xanthopus* Ths.—Very sparingly by sweeping in suitable weather, at roots, in moss, straw, humus, plant litter and dead-grass traps; never more than one specimen at a time.

Atheta (*A.*) *trinotata* Kr.—Found chiefly of late years (first recorded 13.iv.51) and by no means common. In compost and decomposing herbage, especially in foul straw.

**Atheta* (*A.*) sp.?—A single ♀ sifted out of loamy earth rich in various organic debris (4.iii.61) is apparently very close to *trinotata* and to *hybrida* Shp., but has a strikingly different spermatheca from either; the species cannot yet be determined.

Atheta (*A.*) *triangulum* Kr.—So far rare and only found a few times, singly, in recent years; habitat about as the last two species; the first in grass litter, 30.iii.59. (Tends to be commoner near the coast.)

Atheta (*A.*) *aquatica* Ths.—One by sifting an accumulation of dead leaves under a buddleia bush, 19.i.62.

Atheta (*A.*) *pertyi* Heer.—One example from a pile of dead grass, 26.x.58.

**Atheta* (*A.*) *hypnorum* Kies.—A male in debris of hay, 20.iv.55. (A woodland species).

Atheta (*Liogluta*) *longiuscula* Grav. (=*vicina* Steph.).—Peculiarly scarce for a species regarded as common. Occasionally in past years, on the wing, on a wall of the house, under sods and pieces of board or tile lying on moist earth, etc. The most recent is one sieved out of dead grass, 18.x.58.

Atheta (*Dimetrota*) *atramentaria* Gyll.—Rather uncommon, but found from time to time over a long period of years in grass heaps, mulch, compost and decaying herbage in general; casual examples also under carrion. (A very common species elsewhere in dung).

**Atheta* (*D.*) *setigera* Shp. (?).—A specimen was swept off pear foliage, 13.iv.61, possibly attracted by the blossom. The spermatheca, however, differs in one important respect from that of *setigera* as figured by Brundin and of another ♀ in my collection, so that—whilst in any case nearest to this species—the identification is provisional.

Atheta (*D.*) *nigripes* Ths.—At fairly long intervals and very sparsely or singly as a rule, but at one period (18-21.v.59) it was present in some numbers. Always in heaps of rotting grass-mowings.

Atheta* (*D.*) *cauta* Er. (=*parvula* auct. Brit.).—Occasional only from 1956 (earlier records doubtful). In dead leaves and moss, on the wing and settling in fur of white cat, and in remains of compost in late November; the most recent is from old straw, 11.v.63. (Joy's 'common' for this species and 'rare' for *ischnocera* Ths. is an error of transposition—cf. Williams, 1930, *Ent. mon. Mag.*, **66: 51).

Atheta (*Datomicra*) *canescens* Shp.—Found sparingly in fermenting cut grass; rather erratic in occurrence but less so than some of the other species; may easily be passed over with the next.

Atheta (*D.*) *sordidula* Er.—In the same circumstances but considerably commoner, and of comparatively regular occurrence; and not infrequently by sweeping over or near grass heaps, especially in spring.

(*to be continued*)

Notes and Observations

COLIAS CROCEUS FOURC. IN ANGLESEY.—I saw one *Colias croceus* Fourc. (clouded yellow) in the island of Anglesey. The specimen was a male in very fresh condition.—J. A. C. GREENWOOD, Woodcote, Horsell Park, Woking, Surrey. 1.ix.1964.

COLIAS HYALE L. IN ESSEX.—On the 2nd September I took three fresh male *Colias hyale* L. (pale clouded yellow) in a lucerne field at Upminster, quite near to the Purfleet/Dartford tunnel, and two male *Colias croceus* Fourc. (clouded yellow) were also seen. I noted this latter species in good numbers along the Purbeck Hills, Swanage, and also odd specimens at Weymouth and Bournemouth during August.

I took a further *C. hyale* on 7th September at Bradwall-on-Sea, Essex.—R. R. COOK, 164 Collier Row Lane, Romford, Essex. 9.ix.1964.

COLIAS HYALE L. IN ESSEX.—During the morning of 5th September, in a lucerne field near Upminster, I captured a male specimen of *C. hyale*. As this specimen was in mint condition, it seems quite clear that it was of local emergence.—ANDREW M. FREEBREY, 29 Springfield Gardens, Upminster, Essex.

STIGMELLA ULMIFOLIAE HERING IN KENT.—On 19th September 1964, while examining bush elm for Nepticulid mines, I found several examples of the mine of *Stigmella ulmifoliae* Hering. Unfortunately, the mines had all been vacated by the larvae, and as the elms were on the edge of a building site in the middle of Bromley town, they are likely to disappear before another generation can make use of them. I examined other elm trees in the near vicinity without finding the species, but my time was limited and this does not mean that the species was not in fact there.

I first found the mine on 12.ix.1950 in the Stratford-on-Avon district and reported it as a species new to Britain (*Ent. Rec.*, **74**: 122) after Mr. A. G. Carolsfeld-Krause had identified the mine for me. Mr. R. H. Richens reported the mine (*Ent. Gazette*, **14**: 37) from Essex in three widely separated districts: Rayleigh, near Southend-on-Sea; Stebbing, near Braintree; and Stifford, near Tilbury. It would therefore seem that, like many other small and obscure species, *ulmifoliae* is probably to be found over a wider area if sought after carefully enough.

The mine is easily distinguished by the fact that the frass lies in a thin central line throughout the course of the long thin gallery, the frass in all other elm species is spread at some part of the course of the mine.—S. N. A. JACOBS, 54 Hayes Lane, Bromley, Kent. 21.ix.1964.

EROMENE OCELLEA HAW. IN HAMPSHIRE.—On 13th June 1964, I took here at light a specimen of *Eromene ocellea* in very good condition. Beirne's British Pyralid and Plume Moths gives Timoleague, Co. Cork (1932) as his last record.—C. H. DIXON, Northbrook Farm, Micheldever Station, Hants. 30.viii.1964.

LEUCANIA UNIPUNCTA HAW. IN KENT.—On the 21st September 1963, I took a male specimen of *Leucania unipuncta* Haw. at Lydd, Kent. I believe that there are only two previous records of this species having been taken in Kent during the past eighty-five years.—R. HAYWARD, 41 Suffolk Road, Southsea, Hants. 26.vii.1964.

WIDESPREAD IMMIGRATION OF EUROIS OCCULTA L. IN AUGUST.—I have had several pale grey specimens of the continental form of this fine Noctuid in my trap (mercury vapour) beginning on 16th August up to the end of the month. I also have news from Air Marshal Sir Robert Saundby, near Newbury, and from Mr. J. L. Campbell in the Isle of Canna in the Hebrides, that they took the moth also on 16th and later. I have not, however, heard yet whether their moths are also of the pale grey race, but I strongly expect so. This race is a regular immigrant with me, but I think the widespread nature of this year's occurrence is noteworthy.—Commander G. W. HARPER, R.N., Retd., Neadaich, Newtonmore, Inverness-shire. 2.ix.1964.

VENILIA MACULATA L. IN SEPTEMBER.—I would like to record a specimen of *Venilia maculata* L. (speckled yellow) on the wing at Grayswood, Surrey, on 18th September. It was quite typical, but I kept it as a curiosity of Spring in Autumn.—E. E. JOHNSON, Wood Pigeon Hotel, Witley, Surrey. 21.ix.1964.

ENARGIA PALEACEA ESP. NEW TO SUFFOLK.—Some very good weather for collecting lepidoptera at the beginning of August culminated on 6th August when between dusk and 1.45 a.m. I observed 148 species, the best being *Arenostola brevilinea* Fenn (Fenn's wainscot), at Harmony Hall, Weston, near Beccles, Suffolk. The weather then cooled off until 14th August (86 species) and 15th August (103 species). It was at 12.30 p.m. on the 15th that I saw attracted to the blended mercury vapour bulb and progressing up the red brick wall, a moth that in flight reminded me of *Apamea sublustris* Esp. (reddish light arches). The creature soon settled down and I was able to inveigle him within reach by means of my net. In the box his true identity was revealed as *Enargia paleacea* Esp. (angle striped sallow), and a further female specimen followed shortly after 1 a.m. I maintained the vigil until 3 in the morning, but there were no more *paleacea*.

I did not have my reference books with me on holiday, but I thought the insect might be a new county record, as I associated it mostly with Scotland. The moth is, in fact, new to Suffolk and, interestingly enough, three specimens were taken in Surrey on 14 and 15th August. Apparently the Surrey specimens were of a continental form and it seems likely that mine also will prove to have been immigrants, particularly as I captured four specimens of *Eurois occulta* L. (great brocade) the same week.

The native populations of *paleacea* seem to range through Cumberland, Yorkshire, Lancashire, Shropshire, Staffordshire, Derbyshire, Nottinghamshire, Worcestershire, Gloucestershire and Somerset. The species has been noted casually in the south in Hampshire, Surrey and London. In the east it has been taken rarely in Lincolnshire, Huntingdonshire, Norfolk, Essex, and now Suffolk. It seems, however, that most collectors travel to Scotland to take the species. *Paleacea* is Suffolk's 1572nd species of lepidoptera and may be added as the first species on page 23 of the "Final Catalogue of the Lepidoptera of Suffolk", published by the Suffolk Naturalists' Society in 1937. A list of additions to the county list from 1937 to 1960 was published in the Suffolk Naturalists' Transactions (IX: 479-488) adding 62 species, since when there have been seven further additions.—ALASDAIR ASTON, 15 Pickwick Road, London, S.E.21.

EUROIS OCCULTA L. IN SUFFOLK.—I was surprised to capture a good specimen of *Eurois occulta* L. (great brocade) at Harmony Hall, Weston, near Beccles, Suffolk, on 14th August. The insect came to blended mercury vapour light at 12.30 p.m. The next night brought two more, both after midnight, in company with *Enargia paleacea* Esp. The weather then turned very windy and I was not able to take a fourth and last specimen until 18th August, by which time the full moon was proving a nuisance to collecting. *E. occulta* is scarce in Suffolk and the possibility of an immigration is strengthened by the capture of *occulta* at Winchester the same week.

Suffolk records are mainly coastal: before 1890 near Ipswich (Harwood), Bentley (Morley) and Beccles (Crowfoot); July 1907, Waldringfield, on gate post (Waller); 31st July 1918, on Paling, Gorleston (Doughty); 8th August 1926, 3 on pine trees at Aldeburgh (incog.); Fritton Lake on sugared oak, Aug. 1934 (Morley); Sep. 1936, Pakefield (Goddard); 1st May 1938, Bury St. Edmunds (Allen); 1938, Beccles (Goldsmith); 18th August 1938, Oulton Broad, sugar (P. J. Burton); Aldringham, 13th August 1932 (J. and G. Burton); 30th August 1955, Waldringfield (Waller). Harmony Hall, where I took my four specimens, is only some six miles inland.

Apart from Scotland and certain northern haunts in England, it would be interesting to know whether *occulta* has a permanent home in Britain. It is recorded casually from Somerset, Oxford, Hampshire, Isle of Wight, Sussex, Kent, Surrey, London, Essex, Suffolk, Norfolk and Lincolnshire.—ALASDAIR ASTON, 15 Pickwick Road, Dulwich Village, London, S.E.21.

1964 NOTES.—I would like to put on record two interesting captures here at mercury vapour light; on 20.viii.1964. I took a very pale specimen indeed of *Enargia paleacea* Esp. in quite good condition, and on 3.ix.1964, two *Heterographis oblitella* Zell.

I went to Aviemore with Mr. Hare, 28.v. to 3.vi.1964, and we did quite well. Pupae of *Amathes alpicola* Zett. were not too difficult, *Anarta melanopa* Thbg. were flying in numbers at the top of the "Burma Road" and about half-way up we found a few *Apatele euphorbiae* ssp. *myricae* Guen, sitting on rocks fully exposed to the sun.—DAVID MORE, The Little House, Hockley Road, Rayleigh, Essex. 6.ix.1964.

MORE MIGRANTS IN THE NEW FOREST.—The following have appeared in my mercury vapour trap at Minstead:

28 Aug. *Rhodometra sacraria* L. ♂
29 Aug. *R. sacraria* ♂
7 Sep. *R. sacraria* ♂
12 Sep. *R. sacraria* ♀ ab. *sanguinaria* Esp.
13 Sep. *Acherontia atropos* L.

—L. W. SIGGS, Sungate, Football Green, Minstead, Lyndhurst, Hants. 14.ix.1964.

UNUSUAL APPEARANCE OF MALACOSOMA NEUSTRIA (THE LACKEY).—On 9th September an *M. neustria* ♂, in perfect condition, was taken at Wyke Regis, Weymouth, by Mr. V. W. Philpot, who kindly gave it to me. What was this moth doing at such a date? Could it have been one of a second brood, such as sometimes happens with *Diacrisia sannio* L. and *Euproctis similis* Fuessl. (I mention these two species from personal experience) or was it merely a delayed emergence of the normal brood.—H. SYMES, 52 Lowther Road, Bournemouth, 22.ix.1964.

AGLAIS URTICAE L. AT LIGHT.—It is of interest to record that a specimen of *Aglais urticae* L. (small tortoiseshell) came to the electric reading lamp in my room at Bentham House School, Purton, Wilts., at 11.20 p.m. B.S.T. on 20th July. There appears to have been no case of fortuitous disturbance. There was definitely an attraction to the light as I have noted occasionally with *Vanessa atalanta* L. (red admiral), *V. cardui* L. (painted lady) and *Apatura iris* L. (purple emperor) (and in Africa with *Charaxes* species). The butterfly played and basked around the lamp for several minutes until I boxed it for release on the following day.—I. R. P. HESLOP, "Belfield", Burnham-on-Sea, Somerset. 5.ix.1964.

A NOTE ON STAPHYLINUS STERCORARIUS OLIV. (COL. STAPHYLINIDAE).—In a previous note concerning his personal records of this genus, Allen (*Ent. Rec.*, **64**: 126) writes of this species: "Despite its name, it does not frequent dung". Whilst I would agree that *stercorarius* does not *usually* frequent dung, I should mention that my first experience of the species was in August 1959, when I took a specimen in cow dung in New Mill quarry near Penzance, W. Cornwall. Fowler (*1888, Col. Brit. Isles.*, **2**: 251) writes about the species: "In carcases, *dung*, *dungheaps*, etc., but mostly found on the wing or running in pathways". My own limited experiences bear out Fowler's observations on the species: on paths, by sweeping, on the wing, and beneath stones, and of course the dung record mentioned above.—COLIN JOHNSON, Dept. of Entomology, Manchester Museum. 10.ix.1964.

CHLOROPS (CETEMA) NEGLECTA TONN. IN HUNTS.—Mr. R. L. Coe recently showed me a copy of the 1940 Handbook of the Society for the Promotion of Nature Reserves. On page 5 in the report on Wood Walton Fen Reserve, Mr. H. M. Edelsten recorded Mr. Coe's capture, in 1939, of this species as new to Britain. Mr. Coe, *in litt.*, informs me that in 1940 Dr. F. W. Edwards and he realised that the specimens standing in the British Diptera collection at the British Museum (Nat. Hist.) under the label of *Chlorops* (*Cetema*) *myopina* Lw. were misnamed and were really *neglecta* Tonn. and were accordingly relabelled. Owing to his leaving the Museum on war service, Mr. Coe omitted to publish the facts in an entomological journal, and by his return in 1946 the matter had slipped his mind.—L. PARMENTER, 94 Fairlands Avenue, Thornton Heath, Surrey. 15.ix.1964.

On Saturday 31st October, The South London Entomological and Natural History Society will hold its Annual Exhibition in the libraries of the Royal Society and the Royal Geographical Society at Burlington House, Piccadilly. From 11.30 a.m. until 5.30 p.m. Visitors are welcome.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

IRELAND 1964. H. C. HUGGINS, F.R.E.S. 223

HIBERNATION AND PUPATION OF *COSSUS COSSUS* LINN. (LEP., COSSIDAE). COMMANDER G. W. HARPER, R.N. (Retd.), F.R.E.S. ... 227

THE ISLE OF ARRAN, 1964. M. J. LEACH 229

NOTES ON THE MICROLEPIDOPTERA. H. C. HUGGINS, F.R.E.S. 230

REMINISCENCES OF CORNWALL. F. W. BYERS 232

AVIEMORE IN AUGUST 1964. R. G. CHATELAIN AND B. F. SKINNER ... 234

A SCALE DEFECT IN *LYSANDRA BELLARGUS* ROTT. DR. NEVILLE L. BIRKETT 236

THE COLEOPTERA OF A SUBURBAN GARDEN 6—BRACHELYTRA (PART 2). A. A. ALLEN, B.Sc., A.R.C.S. 237

NOTES AND OBSERVATIONS 243

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (195)

TO OUR CONTRIBUTORS

All material for the TEXT of the magazine must be sent to the EDITOR at 54 Hayes Lane, Bromley, Kent.

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In The Welsh Hills

By An Old Moth-Hunter

In central Wales there is a tract of mountain moorland more than 200 square miles in extent which has never yet—so far as I have read—been trodden by the foot of entomologist. There is no road across it nor even a track, and the distance from the road which bounds it on the north (that from Yspytty Ystwyth to Rhayader) to its southern limit (a line drawn from Lampeter to Llanwrtyd Wells) is about 18 miles. From west to east the average width is roughly twelve miles.

It is a desolate place indeed, peopled chiefly by scraggy hill sheep, ravens, buzzards, and, in summer, curlews. The going is hard—heather clumps and tussocks of fescue and moorgrass, with patches of cotton-grass and small sedges marking the bogs. But there are many green valley bottoms with chattering streams, and much bilberry and mountain plants—butterwort and *Viola tricolor*, and stonecrops in clefts of rock, and many another interesting plant too. On the steep hillside of a narrow valley on the fringe of this area—a lonely spot where I wished I had a companion in case I fell, for I was many miles from help if help were needed and it was only once in a blue moon that anyone passed that way—I once netted *Procris statices* (Forester) and found that handsome singing dipteron *Sericomyia borealis* in plenty on the tall marsh thistles.

Si Jupiter referat annos I would fit out an expedition to explore that territory. There should be four of us—lepidopterist, coleopterist, dipterist and botanist. We should engage two ponies to carry the equipment, and a man to lead them and perhaps cook, and we should take provisions for fourteen days; for we should travel slowly and perhaps camp in a likely spot for a day or two while exploring the country round about. The lepidopterist would sugar every night (having provided himself with a reel or two of broad white tape with which to mark the herbage sugared, for of course there are no trees nor fences) and light the petrol lamp as soon as the moths had finished visiting the sugar. By day we should walk about and sweep the heather and bilberry and examine every insect that we saw—for I am sure our Editor would like to have an account of the expedition, And we would make a representative collection of all the Orders.

I don't suggest that we should find anything to 'write home about'; but we *might*. You never know. We might—if it were early July—find the Marsh Ringlet; for although *tullia* has not yet been recorded as ranging so far to the south in this island, in Ireland it flies in a south coastal county, south indeed of Latitude 52°N. We might also find *ashworthii* and a mountain Geometer or two. Perhaps even the larva of a Small Lappet. When I lived in Montgomeryshire I refused to believe that the Feathered Footman (*grammica* or *striata*, according to the book you use) was extinct and diligently I searched those limestone hills and valleys; but I never found one, not even a wing in a spider's web.

Alas, it is now too late for me to join the expedition, for I am in 'the sere, the yellow leaf'. But if you, reader, being young and enthusiastic and possessed of sturdy legs would allow me to drop my mantle, lightly, upon your shoulders, I can assure you that such an expedition—supposing you went about it in the right way—would ensure for you and your three friends a very happy and healthy holiday—provided of course that it did

not rain every day, that the tent did not leak, and that you had not forgotten to pack the corkscrew. . . .

All the same it is not an expedition that anyone—especially anyone without previous experience of the Welsh moorlands—should undertake lightheartedly. It sounds ridiculous to suggest getting 'lost' in this little island of ours; but I can assure you that it would be very easy indeed to get into trouble, serious trouble, in those hills. Even in the height of summer, mists, real dense mists, sometimes roll down from the peaks with disconcerting suddenness, often too suddenly for 'avoiding action' to be taken. Believe me, I am speaking from personal and unpleasant experience. To go on walking in one of these mists is the height of folly: it is likely to end in disaster. In a mist one could quite easily walk over the edge of a shelf beneath which was a drop of twenty feet.

Once on the Plinlimmon range at about 2,000 feet I was caught in a real corker; so instead of trying to climb down I climbed *up*, and presently I was sitting in blazing sunshine, smoking my pipe and looking down over what was apparently an obliterated world. I started to recite Cowper's lines—

"I am monarch of all I survey,
My right there is none to dispute,
From the centre all round to the sea,
I am lord of the fowl and the brute".

At this point there was a loud *ba-a-a* beside me, and the brute, in the shape of a very untidy sheep, joined me for company. It was followed by the fowl, a raven, which alit on a rock about thirty yards away, and croaked. The sheep distrusted it, and moved nearer to me. I threw a stone at the raven, which said *bah!* and flew away. Half an hour later a breeze arose, and sheep and I marched downhill together at our ease.

So if you put some chocolate and a sizeable flask of sherry in your haversack on leaving camp you will not find your temporary segregation from mankind so unpleasant if caught in a mist, for it is possible that a breeze may not spring up until the evening.

Shouting is no use on these occasions even if a companion is only a hundred yards away: it is impossible to locate the source of a sound in mist. If you decide to go on walking, very slowly and carefully, you will walk in a circle. To trust to a compass is to make certain that you will land in a bog or walk over a shelf of rock.

Sometimes the mists come low and fill the valleys. And if on such an occasion you have lost your way and you should catch sight of a cow, and it be afternoon, you will know that all is well with you; for the cow will be aware that milking-time is approaching and she will graze nearer and nearer home; and after a while you will hear, through the mist, the welcome cry of "Co, co, co", and your cow will make her way towards the cry, and soon you will catch sight of a farmer leaning on a gate, calling his herd back to the milking-shed. Ravens and crows dislike mist, and if one flies past you going uphill, follow his example and most likely you will be clear of the mist presently.

Get into the habit of scrutinising and memorising the shapes of the surrounding peaks and their position in relation to the camp when you go out in the morning, and look at them occasionally while you are doing your field work. If your pursuit of an insect carries you over and beyond a ridge, go back to the top of the ridge when you have boxed your capture

and take your bearing afresh. Remember that distance as the crow flies is of no significance in those hills: it may be far easier to travel twelve miles in one direction than three in another. Some of the bogs cover nearly an acre and you may find that the one you are skirting ends right up against a wall of rock which it is impossible to climb. *Never attempt to cross a bog.*

Stout ankle-supporting boots (and waterproof at that) are essential: with shoes you would become a casualty (and thus a nuisance to your friends) before the first day was out. Let them be well shod: steep dry grassy hillsides are sometimes as slippery as glass. A waterproof sheet is necessary: you cannot roll yourself up in a blanket and sleep on the ground in the Welsh hills.

But these things are mentioned only to prepare you for a possible contingency and it is unlikely that in settled weather you would be troubled by mist. In a fine summer there is really no risk at all; for the hills do not exceed 1,800 feet above sea-level; most of them are only from 1,400 to 1,700 ft. Normally the atmosphere is so clear that one can see peaks ten and more miles away. With ordinary precautions the danger of losing one's way is negligible and with a one-inch Ordnance map and a reliable pocket compass one can readily identify every hill. Of course if you have been collecting in the Cairngorms you already know all about hills of this nature. Anyhow, good luck to you—and please report to our Editor in due course.

Lastly, don't forget that you are the guests of the landowners. For although the law of trespass does not exist in these pasts of Wales the landowners are as susceptible as any of us to the virtue of courtesy and the nuisance of *litter* (especially sharp-edged tins where sheep are liable to tread). Treat your hosts, if you meet them, as you would like to be treated yourself and you will be received with a warm-hearted hospitality, a ready welcome, and offers to do anything that will be of assistance to you. I know, for I lived in those parts for five years, and kinder folk I have not met anywhere in this island.

Rearing The Jersey Tiger—A Third Attempt

By L. P. J. Waddington

Those readers who have followed my fortunes in the September issue of the Record—1963—may have their interest stimulated by a recital of the happenings this year.

Although a modicum of success attended my efforts last year, I felt that given a reasonable amount of luck, freedom from illness and better weather conditions, I could, profiting by previous experience, achieve better results.

I decided therefore, instead of imposing on the good nature of my friend in Plympton by a request for more eggs, to make the journey to Paignton, thus enabling me to have the pleasure of meeting my friend and acquiring the know-how of collecting the moths from an experienced exponent of the art.

Alert to the fact that 25% of present day motorists have no more road sense than a cow, I decided to take my car by train ferry from Sheffield to Exeter and so minimise the risk of being an unwilling party to accident statistics.

Thus it came about that at midnight on 19th August 1963, I was on my way to Exeter. On arrival there I was kidnapped by a hotel scout who whisked me off to a welcome and delectable breakfast.

Having fortified my constitution I proceeded at a leisurely gait to the Park Hotel at Paignton, where my friend called on the Wednesday morning.

The weather was warm and sunny and we lost no time in sallying out in search of the elusive tigers.

We wandered on the south side of the town, examining the ivy growing on party walls in hotel grounds or drooping over garden walls in the residential areas.

They are not easy to see but in the course of the morning we managed to box 8.

Eggs were laid by three of the moths the same night, thus solving the difficult problem of sex determination.

By the following night I had about 130 eggs, so all the moths were released in a park at the rear of the hotel.

Unsettled weather with strong winds prevailed during the rest of my stay, and having obtained as many eggs as I required, further excursions were somewhat perfunctory and met with no success, probably due to the fact that it was now getting late in the season.

Grouse and jersey tiger shooting both open on the same date.

Back in Doncaster the eggs were all distrbuted in four 3″ plastic boxes and kept in a bedroom.

By 10th September all had hatched and were fed on stinging nettle, and most of them had moulted for the first time by the 19th.

The bulk of them were transferred to three glass cages and housed in the garage, while the remainder, about 40 in number, were put in a plastic sandwich case and put on top of the 'frig in the kitchen, the idea being to compare progress with those in the garage.

On 28th September they were transferred to a 4th glass cage but still kept in the kitchen.

In the previous article I described how, in inserting nettle in the glass cages, I cut the stems to such a length that the leaves just impinged on the muslin cap where they were instantly available for the larvae clustered there.

It was just about this time that I noticed with alarm that the caps on the three cages in the garage were clear of the glass; on examination it transpired that the nettle had proceeded to grow and pushed the caps off, so they were duly pruned.

By 11th October 11 had died in the kitchen and four in the garage, but it was now clear that the larvae in the garage were making far more progress than those in the kitchen, so I brought the kitchen cage into the garage.

The move had little effect on the mortality as casualties continued to mount and by 7th December there were only four survivors, so these were put into one of the other cages.

Cold weather now supervened so I deemed it avisable to bring all three glass cages into the kitchen and install them on top of the 'frig.

All larvae appeared to be very healthy.

Keen frost occurred on 18th to 20th December and ruined all available stinging nettle, so recourse was had to dead nettle.

By 9th January this year 15 larvae had died and I suspected overcrowding was partly to blame, so once more I used No 4 glass cage and put about a score of the most advanced larvae in it; they were all about 1" long.

Severe frost occurred on the 16th and dead nettle was unobtainable so the ever dependable lettuce was used.

By Jan 23rd many larvae were full fed, so about 30 were transferred to a breeding cage; pupation took place daily.

Four, however, after abortive attempts to spin up at the top of the cage, gave it up as a bad job, and pupated on top of the moss—more about these anon.

By 13th February another 30 were put in a second breeding cage and the last instalment of 10 in a small wooden muslin covered box about 9" × 6" × 4" with about 2" moss pressed down on the bottom; this small box had to be tilted to prevent the water running out of the food-plant bottle.

Dead nettle was available all during February but from time to time supplemented by lettuce.

By the end of the month all larvae had pupated.

The first emergence took place on 20th March, and thereafter occurred practically every day, no less than seven emerging on 27th March.

The last emergence took place on 11th April, bringing the total to 51; of these two were badly crippled, two were slightly crippled, but to off-set this there were four fine specimens of lutescens.

General Observations

This year I had no trouble with larvae eating their way out of the muslin covered cages.

As soon as pupation commenced I sprayed the moss daily in the cages with tepid water; the four pupae referred to previously lying exposed on the moss were left in situ and suffered spraying till they glistened like iced lollies.

Apparently they suffered no ill-effects, since in due course the wing pattern showed up clearly and they looked ripe for emergence, but all four dried up; I feel confident that had I buried them in the peat they would have survived, but being exposed they lost the benefit of sustained dampness.

The ten larvae which had spun up in the moss in the small wooden box all emerged safely and colour the suggestion that a layer of peat is not absolutely necessary for pupation purposes; ample moss will fit the bill.

As of yore, the bulk of the emergences took place in the morning, usually between 8 a.m. and 11 a.m. and transferred to the porch as soon as they became restless; it was quite a job at times to get them to settle down on the framework; some persistently flew back on to my hand or sleeve, but patience prevailed, and once they closed their wings they stayed put until I returned home for tea.

One was 'lost' for ten minutes until it was finally located on my trousers, quite happy to be carted about in the meantime.

It is interesting to compare some the 1963 features with 1964; 20th April 1963 saw larvae still feeding, while this year all had pupated by the end of February.

The first emergence took place on 12th March in 1963, and 20th March this year, while the corresponding last emergences took place on 15th June and 11th April this year.

I think the most significant factor in this third shot at rearing the moth was the high mortality rate of the batch of larvae reared at the outset in the warm kitchen; I doubt if any survived.

It would appear therefore that undue warmth in the early stages is inimical to success; fatalities also arose through overcrowding in the glass cages and coupled with this, the growth of mould on the foodplant when owing to harsh weather conditions, changing the foodplant was deferred a few days.

I had visions of getting a pairing and rearing a second brood this August, but although I kept several alive for some days, I was unsuccessful.

I may have a fourth go at rearing the moth, as my friend has promised me another batch of eggs next year providing I can stave off the undertaker.

One last word—the bulk of the specimens bred were exceptionally fine, and on the average larger than caught ones.

9 Greenleafe Avenue, Doncaster.

Madeira in the Spring, April 1964

By C. G. M. de Worms, M.A., Ph.D., F.R.E.S.

Having visited the Canaries in 1961, I thought that the spring of 1964 would be an appropriate period for spending in the sister island of Madeira, situated some three hundred miles north west of them. A good deal has been written about the natural history of this delightful island and its lepidoptera, particularly of recent years, largely due to the visits and researches of Messrs E. W. Classey, A. E. Gardner, W. H. T. Tams and R. W. Uffen. The results of their sojourn there in December 1957 is embodied in two papers in the *Proceedings of the South London Entomological and Natural History* (Part I, 1959: 184-206 and Part II, 149-159).

I set out by air in a Caravel jet about mid-day on 2nd April, and after a brief stop in Lisbon we reached the island of Porto Santo by 4 p.m. Although an airstrip on Madeira has been in preparation for some time it was not yet serviceable and we had to resort to the small coastal steamer for the forty miles to Funchal. We were landed there after 10 p.m. having endured three hours of a very unkind sea, but the sight of the thousands of lights of this fine city of 90,000 inhabitants, stretching up the steep slopes was most impressive and cheering. Most of the hotels are situated to the west of the main centre, and mine, the Miramar, near Reid's, was most comfortable, with a large garden and excellent cuisine, run by a former English family. But I was told what a very fickle and cool spring was in progress and when I looked out towards the mountains towering up to 5,000 feet, I could see a heavy coating of snow still lying.

However, the first morning proved warm and sunny, and after visiting Mr. Jerry Maul, the well-known director of the Museum, I found a piece of ground just overlooking the harbour, but right in the centre of the city, which had been allowed to go derelict with a luxuriant growth of yellow daisies and other flowers. I soon discovered that it was attracting most of

the butterflies in the vicinity, the first of which I noted being *Pyrameis callirhoe* Mill., the Indian painted lady which was also so common in the Canaries. But I soon found that the whole area of about four acres was alive with *Colias croceus* Fourc. and I have seldom seen it more abundant in a confined space, but shortly afterwards I missed a specimen of the only butterfly peculiar to the island, *Pararge xiphea* Fab. which looks rather like an outsize speckled wood, of which it was at one time considered only a race, but is now regarded as a good species. It flies in shady places, as a rule round bushes even in the city gardens, and is extremely dodgy and difficult to catch when in full flight: it has usually to be stalked when at rest. *Lampides boeticus* L., the only blue on Madeira, was also in this restricted area on medick.

4th April was a dull and showery day when I took the 'bus to Monte, lying at 2,000 feet above Funchal, of which a magnificent view is to be had from the steps of the church where Emperor Karl, last of the Hapsburgs is buried. Thence I wended my way on foot up the excellent main road a further 1,000 feet up to Terreiro da Lucta where there is a very pleasant restaurant, but the only interesting capture was *Heodes phlaeas* L., actually the only one I saw in the whole period. The 5th was again a very unsettled day which only produced a few more *C. croceus* and a *L. boeticus* on the town site. The next day I embarked on one of the many excursions that are run daily to the various show places of this enchanting Island. On this occasion we went westwards to Camara de Lobos, a delightful fishing village, just to the west of which is the second highest sheer cliff in the world. One looks down straight into the sea from a height of 2,000 feet. Another on Formosa only just beats it. Thence we travelled further along the rugged coast road and struck inland up the Serra d'Agua to the Encumeada Pass which is the watershed at 3,000 feet, and when clear, both coasts of the island, north and south can be readily seen. Nearby is a special hostel and a power station.

The next three days were spent in the vicinity of Funchal in mixed weather. *P. callirhoe* and *P. xiphea* appeared in allotments to the west of the city on the 7th, as they did also in the fine garden of Quinta de Palheiro belonging to the Blandy family on the high ground to the east of Funchal on the 9th. That afternoon I went by coach to the Grand Curral, an amazing round bowl, a former crater, in the heart of the mountains, looking rather like a miniature Grand Canyon since you look down on it from some 3,000 feet. *P. xiphea* was also flying here, as it also was on the following day which was spent on an excursion to the north east of the island. We went up through the thick fir forests to Poiso, where the road reaches a height of 4,500 feet. *C. croceus* was again everywhere with a few *P. callirhoe*, especially round Ribeiro Frio where we lunched under very warm conditions, returning through Porto da Cruz and over the pass at Portela and Machico on the eastern peninsula.

On the last four days, April 12 to 15, I paid daily visits by 'bus to the high ground in the neighbourhood of Monte, since this seemed the most productive area. Just below this small town, near the Sanatorium, I came upon a flourishing colony of *L. boeticus* on a steep sunny bank with a luscious growth of vetch, but not an easy spot to try to net *P. xiphea* which frequently flitted past, usually singly. The 13th was an especially fine day when both these insects were well in evidence, and I also saw a female of the endemic form of *Pieris brassicae* L., *f. wollastoni* Butler, which unfortunately just eluded me. My final morning on the 15th, I spent

in the deep barranco to the east of Monte, but a dull day prevented any interesting captures. I was much disappointed not to see anything of that fine butterfly, the local brimstone, *Gonepteryx cleopatra medarensis* Felder, virtually a separate species. but getting very hard to come by in recent years.

During my fortnight's stay, I had made almost daily visits just after dinner round the street and other lights in the immediate vicinity of the hotel, and on occasions these proved very fruitful. But some of the lights were out of reach of my net and these were often the best patronized, especially by the pugs. I also saw a large hawk-moth, probably *Deilephila tithymali* B.W. on a lamp overhanging the deep barranco that carries the main road into the city. However, I had some interesting captures, though quite a number were "old friends", especially among the Noctuids which included *Leucania loreyi* Dup., *L. unipuncta* Haw., *Prodenia litura* Fab., *Plusia limbirena* Guen., *P. orichalcea* Fab., *P. chalcites* Esp. and of course *P. gamma* L., also *P. circumflexa* L., *Leucania scirpi* Dup. and *Hypaena obsitalis* Hübn.

Most of the Geometers were more specialized. These comprised *Sterrha atlantica* Sttn., *Scopula irrorata* Bethune Baker, *Cosymbia maderensis* B-Baker, *Xanthorhöe centrostrigaria* Woll. and *Gymnoscelis lundbladi* Prout. *Palpita unionalis* Hübn. was quite numerous.

I left Madeira with a heavy heart on the morning of 16th April by the sea route, which was even more uncomfortable than the previous journey. After a five-hour stop on Porto Santo, we flew to Lisbon, arriving at 1 a.m. I stayed in this grand and most picturesque city until the 22nd, visiting several famous resorts such as Sintra to the north, Estoril to the west and Setubal south of the Tagus, but hardly saw any lepidopterous life, only a few *Pieris napi* L. at Sintra on the 18th, also *Zerynthia rumina* L. and *Anthocharis cardamines* L. at Estoril the next day. So ended yet another very enjoyable few weeks spent in southern climes in the height of spring.

Three Oaks, Woking. 6.ix.64.

Who Was Coleman?

By Dr. R. G. Ainley

"British Butterflies; figures and descriptions of Every Native Species. By W. S. Coleman". So reads the title page of a little book which will provide hours of entertainment for those who have a taste for things Victorian. I found this book a joy to read, and have met few collectors who have encountered it—hence this article.

The date given in the Preface is 1860, thus antedating by a few years the works of Newman and Kirby. The layout is conventional, begining with chapters on anatomy, metamorphosis and hints on collecting, followed by a systematic account of each species. The information given is accurate as far as it goes, and the standard of colour printing is good, considering its date.

The real attraction of the book lies in its style, and in little snippets of information that so vividly highlight the contrasts between the time in which it was written, and our own. Its whole atmosphere is that of a more leisurely age (when, we are told, a 14″ × 10″ storebox cost half a crown). The style is of the ripest Victorian "literary-rhetorical"—discursive, and full of picturesque analogies and Classical allusions, with the usual curious

capacity for stating the obvious at great length. And, of course, every story points a Moral.

Chapter III has a splendid beginning, in which more than a page is devoted to the proposition that "*no butterfly can either sting or bite in the least degree*", followed by the story of "a murderous onslaught made by a Privet Hawk-Moth on the neck of a lady". Having, at some length, argued the case for the moth's innocence, Coleman concludes that he (the moth) ". . . might have been pardoned for mistaking the fair neck for one of his favourite flowers (a *lily*, perhaps), while the utmost harm he contemplated was to pilfer a sip of nectar from the lips he doubtless took for rosebuds". I am sure Freud would have made something of this.

Chapter V begins with four pages of justification for the killing of butterflies, presumably to soothe the conscience of the squeamish. The message is that you aren't necessarily a Bad Chap merely because you kill a few butterflies. But having calmed the fears of the sensitive young reader, the author then risks breaking his heart by the following harrowing footnote, the pathos of which is somewhat marred by a spot of surreptitious advertising. He describes an apparatus for carrying chloroform as "A very ingenious and neat contrivance—the invention of my friend Dr. Allchin, of Bayswater. It may be procured from Mrs. Foxcroft of 3 Union Yard, Oxford Street (near Orchard Street), the widow of an assiduous collector and dealer in insects, who, I regret to state, has lately fallen a victim to his entomological labours in the deadly climate of Sierra Leone. Mrs. F. also keeps a stock of excellent entomological apparatus and specimens of all kinds". One cannot but feel sorry for both Mr. and Mrs. F.—but what a shining example to us all!

Setting is, of course, to be done with cardboard braces on a saddle board. And the following advice struck a familiar chord, remembering the recent controversy in the Record (*vide* Messrs. Irvin and Waddington): ". . . . don't waste time in trying to puzzle out the meaning, the why or the wherefore of butterflies' scientific names; . . . . in general there is no more connection between the name and character of a butterfly, than there is between a ship's name . . . . and the moral disposition or personal appearance of the vessel that bears it".

It is saddening to think that in 1858, two years before the book was published, larvae of *Aporia crataegi* L. were recorded near Cardiff as " feeding by thousands on shrubs of Prunus spinosa". And the Chequered Skipper (here called *Steropes paniscus*) is recorded as occurring at Charlbury, in Oxfordshire—its old Wychwood Forest haunts. However, one's credulity is somewhat strained by a record of the Lulworth Skipper "in great abundance" near Lichfield in 1835, and the Glanville Fritillery at Falkland in Fifeshire.

The final chapter, very properly, deals with Reputed British Species, namely, *Papilio podalirius*, *Parnassius apollo*, *Erebia ligea*, *Argynnis dia* ("taken by Mr. Richard Weaver at Sutton Park, near Tamworth"), *Chrysophanus chryseis* (*i.e. Lycaena hippothoe*), and *Polyommatus boeticus*, (first recorded the year before the book was published.) *Danaus plexippus* L., *Everes argiades* Pall., and *Thymelicus lineola* Ochs., none of which had yet been recorded in Britain, are not mentioned.

Only a shadowy picture of the author emerges from all this. Coleman was a member of the Entomological Society of London, lived in Bayswater, and appears to have been a close friend of a Dr. Allchin, also of Bayswater,

who shared Coleman's liking for Lepidoptera. He was an enthusiast, who obviously enjoyed writing his book, and may well have been a good all-round naturalist (for example, he is insistent that "Nasturtiums" should be called Tropaeolums; and he has written another book entitled "Our Woodlands, Heaths and Hedges".) Can any readers of the "Record" throw any light on the problem; who was Coleman?

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7.x.64.

Heliothis peltigera Schiff. (The Bordered Straw) in Wessex

By H. Symes

This migrant makes frequent but somewhat irregular appearances in the southern counties. A favourite locality for it is Dungeness, where in some years (this was one) the larvae have been found in large numbers on sticky (or stinking) groundsel (*Senecio viscosus*). Both the English names are well deserved. In July I found this plant growing freely in a fire break near Wareham, and was looking forward to searching it for larvae of *peltigera* in due course, but before 11th August it had all been cleared away. In Dorset, 1906 was a particularly good year for this species (W. P. Curtis, Lepidoptera of Dorset).

The first time I saw the moth alive was on 23rd August 1945, in the New Forest, when one suddenly appeared from nowhere, and settled on a forest track almost at my feet, where it was promptly captured by D. R. M. Long, then on holiday from school. In 1950, that great *convolvuli* year, the Rev. F. M. B. Carr found a larva in his butterfly net after taking a swipe at a convolvus hawk on his tobacco plants at Sandbanks. He told me that he could find no suitable foodplant in his flower bed (perhaps it had fed on the buds of *Nicotiana*), but the larva went down almost at once, and was probably under-nourished, as the moth which emerged about a month later was a very small one.

On 10th June 1958, Brig. Warry, Miss Pengilly and I saw two *peltigera* beside the Chesil Beach, of which one got away. That evening Brig. Warry and I took five specimens at mercury vapour light in a garden at Lodmoor, where Sir Billy is to open one of his holiday camps. They are very lively on the sheet, and one, after the briefest of visits flew off to a neighbouring *Cypressus macrocarpa*, and settled there about twelve feet from the ground, where it tantalizingly remained, clearly visible against the background of dark foliage, until it was time for us to pack up. We were hoping all along that it might come down to the sheet again. In the same year, Captain R. A. Jackson took two *peltigera* at Codford (The Macrolepidoptera of Wiltshire, ed. Baron de Worms: 64).

On 12th June this year, I glanced casually at a vase of mixed flowers that my wife had brought in from the garden and saw a dull, dark-green larva about half an inch long in the middle of a marigold (*Calendula officinalis*) I immediately remembered reading in "South" that these flowers are a useful food for the larvae in confinement. I put the larva in a box and went out into the garden, where I found two more, a good deal smaller than the first. They all fed only on the inner florets in the middle of the bloom, and did not touch the large outer ones. As these soon closed when the flowers were brought indoors and remained closed,

they hid the larvae from view. I did not wish to disturb them, and in the case of the largest larva, pellets of frass were soon extruded and showed that all was well. I had never seen the larva before, and still had a disquieting suspicion that these might after all belong to some common polyphagous species, and indeed on 29th June I did find one such larva (*Orthosia incerta* Hufn.) on a marigold flower. It was not until 20th June, when No. 1 changed into its final instar, that I was convinced that they really were *peltigera*, for this beast was exactly like fig. 2d on plate XCIX in Buckler. It grew rapidly and ate immature green seeds as well as the florets. After spending barely a week in the last instar, it stopped feeding on 26th June and went down on the 27th. Meantime, on 22nd June I had found three more larvae on marigolds in my garden. All these, when full fed, were light green, exactly the same shade as the marigold stems, with three darker green lines along the back, harmonising with the ribs on the stems, and a white line along the spiracles: they were sparsely covered with inconspicuous short hairs, and the head, which had been black in the earlier stages, was now the same colour as the body. I found another larva on 1st July: it was in its last instar and was stretched out on a marigold stem where it was almost invisible, and attacking a flower from below. All seven larvae had gone down by 6th July, but on the 8th, I found two half-grown larvae on the same marigold plants, and when they were in their last instar, their ground colour was pale pink, rather like fig. 2c in Buckler, but somewhat lighter. On 17th July I found yet another larva, of the green form, like the first seven. It went down on 22nd July. These three larvae must have had a different parent from the first seven.

On 25th June, Brig. Warry took a very worn *peltigera* on the Chesil Beach, which died during the following night, but not before it had laid about twenty eggs: these, unfortunately did not hatch. They were round, creamy-white, laid singly or in pairs on rest-harrow (*Ononis ripens*), and they were small for the size of the moth, noticeably smaller, for instance, than those of *Diacrisia sannio* L., with which I was able to compare them. But more than a month before this, Capt. J. Ellerton tells me, his son Hugh took a specimen in his light trap at Sherborne on 23rd May, a foul, wet night. An even earlier specimen, though not quite in Wessex, was taken by Mr. G. Haggett at Arundel 9th May (supra: 193).

To return to my Bournemouth brood, the first moth emerged on 26th July, a large, richly coloured dark specimen, and four more, of which the last was paler than the others, emerged by 3rd August. From the three later larvae I had two moths, which emerged on 13th August and 22nd August. They were similar in colour to the last of the earlier lot, but not nearly so pale as those figured in "South". All seven moths were fine specimens, larger than wild ones I have taken. The period that elapsed between the going down of a larva and the emergence of the moth varied between 26 and 31 days. On turning out the pupating material, I found one pupa containing a dead moth, one slightly malformed pupa, and the remains of a larva. The pupa is fragile, pale brown, and semi-transparent. From the somewhat blunt tail end, there projects a very fine hair-like spine or bristle.

In conclusion, I will mention that Mr. F. R. Clafton, the warden at the Portland Field Centre, took four *peltigera* at his mercury vapour light during the summer. These specimens are all of the pale form.

52 Lowther Road, Bournemouth, Hants.

The Microlepidoptera

By B. W. Weddell

Reading through the notes on Current Literature in the July/August issue, on Microlepidoptera Palaearctica, I was struck afresh by the magnitude of the task facing the students of micros.

As a humble lepidopterist who has for over thirty years been keenly interested in micros *and* macros, I have always been puzzled by the mysterious tradition which has always obsessed the great majority of our fraternity. I refer, of course, to the concentrated study of the 850 species of macros, to the complete exclusion of the 1450 species of micros. For generations, all but a handful of enthusiasts have shrugged off as "only a micro" any moth found in the net, which could not be indentified in the sacred 850 species of South.

There cannot be much still left to be discovered about the macros after all this continual and assiduous study. On the other hand, the micros still hold many secrets, and indeed, I believe there are still new species waiting to be discovered.

It is a great pity that such a wealth of beauty and interest should be neglected through this arbitrary division of the order—"above and below the salt", so to speak.

Turning to other orders studied by naturalists, can anyone imagine an ornithologist only being interested in birds over (or under) the size of say, a lark? Would any botanist confine his interest exclusively to plants over, say six inches high, or bearing a flower over half an inch in diameter?

While it is probably too much to hope that the older members of our fraternity would ever be persuaded to jettison the present "apartheid" practice, one hopes that the younger element amongst us might become aware of the rewarding pleasure and almost unlimited scope that is awaiting them in the study of Microlepidoptera.

I have always thought that ideally one ought to start collecting at the micro end of the scale while the eyes are young and sharp, and able to focus closely. There is plenty of time, when the finding and handling of micros becomes difficult, to move on to the macros. Setting these presents little difficulty even for octogenarians!

An incidental advantage to be gained from this approach is that a collection of micros takes up very much less room, and is consequently a lot less expensive to house that the usual macro collection.

11 The Halve, Trowbridge, Wilts.

While I fully agree with the sentiments expressed by Mr. Weddell, I think it only fair to point out that during the past twenty years, the number of members of the South London Entomological and Natural History Society interested in the Microlepidoptera has shown a very substantial increase. I have little doubt that this increase is not limited to members of that society alone, and some of these young men have done serious work, and have added considerably to our knowledge of these interesting insects.—Ed.

Rhodometra sacraria L.—A male specimen of *Rhodometra sacraria* L. was taken at mercury vapour light at Lee, south east London, on 9th September this year.—C. G. Bruce, 16 Harland Road, London, S.E.12, 8.x.1964.

Abisko Revisited

By Major-General Sir GEORGE JOHNSON, K.C.V.O., C.B., C.B.E., D.S.O.

In 1960 I visited Abisko in Swedish Lapland from 7th until the 18th July. It was an early season and although I did well with some of the later butterflies, I failed to secure the earlier species in good condition (*Ent. Rec.*, **72**: 203). This year (1964) with Lt. Colonel C. Mackworth Praed, O.B.E., and his son, Mr. H. Mackworth Praed, I went again to this interesting area, north of the Arctic Circle (Lat. 68° 23′).

We arrived off the night sleeper from Stockholm on the afternoon of 24th June. It had been raining steadily all the way north, but Abisko itself was in sunshine. On a short walk in the late afternoon, we found a few *Clossiana freija* Thnbg. and *Pyrgus centaureae* Rbr., which satisfied us that some butterflies anyhow were on the wing. We also found the nesting hole of a pair of three-toed woodpeckers about ten feet up in a small birch trunk, being attracted thereto by the very noisy young inside. The old birds showed little fear of us and we were able to watch their frequent visits with food at very close quarters. On our way back to our hotel we found a Tengmalm's owl on a low bush in a sallow thicket, which allowed approach to within a few feet. After photographing it we withdrew without disturbing it.

The next day was cold, wet and windy with nothing flying. Indifferent weather pursued us throughout our stay, which ended on 3rd July. During this period we only had two full sunny mornings, and on the other days an hour or so of intermittent sun, usually best about mid-day. Shade temperatures did not rise much above 60° F. (in 1964 when I arrived and for several days afterwards they were over 80° F.) and on occasion at 1 a.m. dropped to below 40° F. even though the sun, albeit obscured by cloud, did not of course, sink below the northern horizon. Snow wreaths and patches, which on my previous visit were confined to north-facing slopes of the higher hills, this year extended down into the upper limits of the birch zone only 300 feet above our hotel. Nevertheless butterflies flew freely directly the sun came out and we secured a very fair sample of the earlier species in good condition.

Our collecting was mostly confined to areas round Abisko Ost, just outside the nature reserve in which our hotel itself was situated. At this stage in the season it was useless to go up high, and we did not, in fact, attempt anything above the tree line except two walks by the Praeds up Nuolja, the hill immediately above the hotel, and a lower hill to the south, to look for flowers.

The first really fine morning (28th June) I took the early train to Stordalen, the next station east of Abisko, and worked the mosses immediately north of it. I was successful in finding *Erebia disa* Thnbg., of which I took seven, though some were worn. In addition, a few *Clossiana frigga* Thnbg. and *Proclossiana eunomia* Esp. f. *ossianus* Hebst. were flying on the mosses. We all revisited the mosses on 1st July, but only got three more *E. disa*, a very cold wind with cloud springing up about mid-day.

Notes on the species found by us are as follows:—

Pieris brassicae L. One only, 28.vi.1964.

P. napi L. One ♂ caught by the Praeds south of Abisko Ost, 2.vii.1964.

Colias nastes Boisd. Fairly common and widespread in all areas flying the moment the sun appeared. Some of the ♂♂ were already a little worn.

Erebia disa Thnbg. Only on the Stordalen mosses and not numerous. By no means easy to catch, partly from their ability to dodge the net and partly from the boggy nature of the ground, which afforded them refuge where one could not follow.

E. pandrose Esp. Flying quite commonly in a number of places in the birch zone, usually on the edge of bogs. On my previous visit it was only to be found well above the birch zone.

Oeneis norma Thnbg. Only found in one area about two miles south of Abisko Ost, where it was flying on a bog and in the drier birch zone surrounding it. In fresh condition, but curiously ♂♂ were very scarce. Not very numerous.

Euphydryas iduna Dalm. In small numbers in widely scattered areas in the birch zone. Very fresh and just emerging, no doubt more numerous later.

Proclossiana eunomia Esp. The local form *ossianus* Herbst. is very different from the Pyrenean race. It was in small numbers on the Stordalen mosses and in a bog next the railway line between Abisko Ost and Abisko Turiststation (our hotel).

Clossiana euphrosyne L. Just emerging, only one or two taken. It is a nice dark form.

C. freija Thnbg. By far the commonest fritillary, occurring practically everywhere, though preferring dry ground to bogs. Fresh to start with, but going over towards the end of our stay.

C. frigga Thnbg. Only in bogs or mosses. Not uncommon and very fresh. The best places for it were the bog between Abisko Ost and Abisko Turiststation, and the Stordalen mosses.

Lycaeides idas L. Only beginning to emerge at the end of our visit. Two or three taken by the Praeds.

Vacciniia optilete Kn. One only taken by the Praeds on our last day. In 1960 it was already going over by this date.

Pyrgus centaureae Rbr. Fairly common in most places in the birch zone —not seen on the mosses. In good condition.

Castlesteads, Brampton, Cumberland. 11.x.1964.

PATRICK BUXTON MEMORIAL PRIZE

The Patrick Buxton Memorial Prize, endowed by his relatives in memory of the late Professor Patrick Alfred Buxton, C.M.G., F.R.S., Director of the Department of Entomology at the London School of Hygiene and Tropical Medicine from 1926 to 1955, is open to competition among past or present students and staff of the London School of Hygiene and Tropical Medicine.

The Prize of £150 will be awarded for the best essay relating to medical or veterinary entomology or an allied subject based on a candidate's published or unpublished research. Essays should reach the Dean, London School of Hygiene and Tropical Medicine, Keppel Street (Gower Street), London, W.C.1, not later than September 30, 1965.

The Coleoptera of a Suburban Garden

6 - Brachelytra (Part 2)

By A. A. Allen, B.Sc., A.R.C.S.

(*Continued from Vol. 76, page 242*)

Atheta (*D.*) *arenicola* Ths. (=*germana* Shp.).—Sporadic, though probably less so than it seems, as it can easily pass in the field as the very common *A. nigra*. In the same conditions as the two preceding, and singly in flight, in fur of white cat, and by sweeping.

Atheta (*D.*) *nigra* Kr. (=*zosterae* auct. Brit.).—Quite general, usually plentiful and often in profusion in cut grass, old straw and most kinds of vegetable rubbish and litter; the most regularly occurring of the smaller species in such biotopes, and found from early times.

Atheta (*Chaetida*) *longicornis* Grav.—A common and often abundant species in similar situations; on the whole the most frequent of the larger Athetae in the garden, though, like most, varying much in numbers.

Atheta (*Acrotona*) *sordida* Marsh.—This bright-looking species (at least in life, and despite its name) is often met with in the same habitats as *longicornis*, but as a rule far more sparingly.

Atheta (*A.*) *aterrima* Grav.—Moderately common in decaying herbage etc., sometimes in considerable numbers, and like the last two it has been captured by sweeping; one at mercury-vapour light (5.ix.59), the only specimen of the Aleocharinae I have so taken. Abundant in straw, 16.iii.61.

(*)*Atheta* (*A.*) n.sp.—A species confused by some authors with the next, only separable by the quite different aedeagus of the male, and which it is proposed to describe elsewhere. I know of it from several localities and it is probably not much less common in Britain than *pygmaea*. Scarce in the garden; a ♂ from a grass heap much rotted down, 3.iii.57, and another from foul straw, 10.iv.64.

Atheta (*A.*) *pygmaea* Grav. (*sensu* Brundin).—Equally seldom found; a ♂ with the preceding in grass mulch, with two ♀♀ which may belong to either or both species. I have also noted it previously but cannot at present trace the specimens.

Atheta (*A.*) *muscorum* Bris.—Seemingly rare here; one sieved from humus with debris of straw, where refuse had been dumped the year before, 1.iii.59; and another from moss at edge of lawn, 4.iii.61.

**Atheta* (*A.*) *exigua* Er.—Of this, formerly thought to be an *Oxypoda*, one captured on the wing over a lawn (20.iv.60) is the sole record hitherto.

Atheta (*A.*) *fungi* Grav.—Very general and plentiful throughout; perhaps the commonest Aleocharine, even outnumbering *Amischa analis* which has similar habits. At roots of herbage, under any sort of cover on soil, in humus, moss, dead leaves and sometimes freely by sweeping. Often profusely in vegetable litter or traps of dead grass; not however, in actively decomposing material, except casually. Very variable; the small forms with more transverse joints to the shorter, darker antennae can be most confusing and easily mistaken for the rare *A. orphana* Er.

Atheta (*A.*) *laticollis* Steph.—Decidedly erratic; but tends to be more or less gregarious and often present in some little quantity when found. In various kinds of decayed plant material, usually with several of the other species.

Atheta (*Rhagocneme*) *subsinuata* Er.—Not common, in similar environments to the last; mostly by ones or twos (occasionally more) at intervals from about 1934 onwards. There is some indication that it is mainly a winter and early spring species, probably often overlooked.

**Aleuonota gracilenta* Er. (=*splendens* Kr.).—Twice taken by sweeping in May on lawns in the warm afternoon sunshine (8.v.59, 7.v.60). A great rarity which has been taken, always singly, in sand- and chalk-pits and by sweeping on downs, and once (by myself) in rotten wood with ants; the proper habitat of the genus is doubtless subterranean.

**Aleuonota* n.sp.—A species differing from *gracilenta* in having the antennae shorter and steadily thickened to apex, which Dr. G. Benick of Lübeck is studying; it appears to be certainly new. The unique specimen was obtained in sweeping long grass by a fence (where there were probably mouse-runs) while the air was very warm, still, and humid after a thunder shower, on 30th August 1958.

Zyras limbatus Payk.—Irregular and periodic in incidence but by no means rare in company with the ant *Lasius niger* (only too common in the garden); should also occur with *L. flavus*, which too now abounds here. First found in the spring of 1951 in some numbers with the ants at grass roots along the base of a fence, but perhaps commonest in 1955.

**Amarochara umbrosa* Er.—Very scarce; one in a grass heap, iv.35; occasionally under stones or bricks in moist places along a wall of the house in May and June, 1952, while the latest was swept off long grass beneath apple trees in sultry weather, 11.v.53. This is another of the small Staphylinids believed to live underground in the runs of mice etc.

Oxypoda opaca Grav.—One, 17.xi.56, in debris of dry dead grass. (I appear to have taken it previously, about three years earlier, but details of this are not to hand).

Oxypoda lividipennis Mann.—One beaten from an apple tree, 22.v.59.

(*)*Oxypoda pectita* Sharp (?*induta* M. & R.).—A little-known species because much confused with the next, and so doubtless overlooked. Not at all uncommon here in cut grass and other rotting herbage, though not of quite regular occurrence; the first as long ago as iv.35. Also swept up (a teneral one 14.iv.57, etc.) (*Note*: *induta* is now used as the valid name but I am not convinced that Mulsant and Rey's species is really the same as Sharp's—whereas our beetle, or at all events the Blackheath one, is quite certainly the latter. Donisthorpe, who compared a series of continental *induta* with our *pectita*, pronounced them 'quite different species').

Oxypoda umbrata Gyll.—Though considered common (and I have it from several localities, unlike the last) the only specimen I can record from the garden was found under a piece of board placed as a trap in a muddy spot at the base of a wall of the house, 20.iv.55.

Oxypoda nigrina Wat.—First noted in February 1952, when it occurred rather freely in well-rotted grass-mowings; since taken at intervals, in similar material and especially (lately) in decaying straw, nearly always in late winter and early spring—after which it almost disappears.

Oxypoda haemorrhoa Mann.—Tolerably common in cut grass, old straw, etc., sometimes numerous. Has also occurred by sweeping in warm weather, on house wall, under sods, and cover in damp places, at roots, and so on.

**Oxypoda ferruginea* Er. (=*misella* Fowl.).—Infrequent, but found singly or few at a time on a good many occasions in fairly recent years;

the first in grass-cuttings (1.vi.41) but subsequently at roots on turf along the base of a fence during the early '50's, March-April; more rarely since, but once lately in straw; also in the past beneath stones and suchlike traps along house wall. Has occurred in company with the next; likewise said to inhabit sandy places.

Oxypoda brachyptera Steph.—Very uncommon; single examples in spring and early summer since 1951, one or two at grass roots and on or under turf and sods along fence as above, and the rest (little in excess of half-a-dozen) under bricks and tiles in spots where the soil was light and somewhat sandy or mixed with fine gravel; 4 of these taken on one day, 19.iv.51. Not seen since one was found floating at edge of pond, 27.iii.59. (Chiefly a species of sandpits etc., whose presence here is surprising).

Microglotta pulla Gyll.—In nests of thrushes and doubtless other birds; twice only so far (30.iv.53, 11.v.61) but is probably far more frequent than this would suggest.

Aleochara curtula Gze.—Often rather numerous under any kind of carrion, to which it seems quite confined; copiously at fish bait at times; in dead sparrow, 8.v.59. Excessively variable in size.

**Aleochara lata* Grav.—Though fish etc. was put out almost continuously in the summer of 1952 (and often later) to attract carrion species, only one specimen of *A. lata* has turned up (29.vii.52). This insect has the same habitat as *curtula* but is very scarce in comparison.

Aleochara intricata Mann.—Under carrion (fish); the sole record I have is of two specimens, 14.vii.52.

(**)Aleochara tristis* Grav.—Likewise extremely rare; a single individual shaken out of the carcass of a starling, 7.viii.52. (These two species mostly frequent dung, in my experience, *tristis* being much the less common of them).

Aleochara lanuginosa Grav.—Formerly very sporadic in grass heaps, but latterly more common in rotting straw on particular occasions (e.g. 17.iv.62, when it was plentiful) but very variable in numbers. One was noted with a springtail (Collembola sp.) as prey (1962, *Ent. mon. Mag.*, **98**: 227).

Aleochara diversa Sahlb. (=*moesta* Er.).—Another species which is 'unique' in the garden records (5.viii.52 at the fish bait when much disintegrated).

Aleochara sparsa Heer.—Again only a single example has occurred, which was sifted out of loamy soil where a pile of straw had stood, 1.iii.59.

Aleochara bipustulata L.—Not altogether uncommon in the period 1952-3, and casual specimens before and since, but not found earlier than 4.iii.51. In rotten wood at the foot of a fence-buttress, once or twice swept up or on the wing, and the last in cut grass 5.v.60; otherwise at carrion—usually buried in the soil beneath.

**Aleochara bilineata* Gyll.—A few between 5th and 10th July, 1952, under rotting fish with others of the genus, the total not exceeding 5 or 6. (In my experience it is rare anywhere, at all events as compared with the last).

Tinotus morion Grav.—In various situations, but very seldom met with; except for the first (iv.33) all in relatively recent times. Twice at carrion (1952, 6.vii.53) and has been swept from lush grass under apple trees; 3 in compost, 11.v.53; and one in cut grass, 5.v.60.

This completes the body of the list, but during the course of publication —inevitably spread over a number of years—a great many additions have accumulated. Naturally, the earlier sections of the list are now very incomplete and out of date, for—quite apart from the substantial numbers of species to be added—further experience of many of the others means that some of the published data require modification in the light of this. In the supplement which it is proposed to publish in due course, therefore, not only will additional species be listed but also, where the status in the garden fauna of species already in the main list has changed considerably, the fact will be noted—along with any points of special interest.

LITHOPHANE LEAUTIERI BOISD. IN SOMERSET.—In October 1963 I was delighted to find a *Lithophane leautieri* Boisd. in my light trap in my garden at Minehead. This was, to the best of my knowledge, the first time that the species had been noted from Somerset. At that time I was living in the built-up area of Minehead, and there are a good many mature trees of *Cupressus macrocarpa* in the vicinity as well as in my garden.

Since then I have moved about four miles into the country where the *Cupressus* trees are by no means common, in fact the nearest one seems to be about one mile away in the valley, although the adjacent Selworthy woods have a good selection of mature and introduced conifers.

On 2nd October of this year I was surprised and delighted to get a further example at my mercury vapour lamp.

From what I have read about this moth, I have gathered that it is usually taken in the vicinity of mature *Cupressus macrocarpa*, and I wonder whether it may possibly prove to breed on allied species. Of course, it may have been just a wanderer, and it remains to be seen whether more will be found.—Dr. H. M. CHAPPEL, The Old Rectory, Selworthy Minehead, Somerset. 19.x.1964.

SPHECIA BEMBECIFORMIS HB. IN DERBYSHIRE.—A perfect female *Sphecia bembeciformis* Hb., was found at rest on a sallow bush growing on a piece of waste land near the abandoned colliery near the village of Tibshelf in Derbyshire at 10.0 a.m. on 22nd July 1963. It was kept alive for a few days and laid a few eggs which were attached to a sallow trunk. Unfortunately they failed to hatch. Although this is not the first record for the county, I think its appearance at any time is worthy of note.—J. H. JOHNSON, 1 Berry Street, Hepthorne Lane, Chesterfield. 15.x.1964.

APATELE TRIDENS SCHIFF., IN DERBYSHIRE.—In September 1963 a small boy brought me two larvae which were undoubtedly *Apatele tridens* Schiff., and almost fully fed. They had been found feeding on some species of small leaved elm growing in a hedgerow near a bus stop in the village of Tibshelf, Derbyshire. This is the first definite record of this species in this section of Derbyshire. I at once promised half a crown to any boy who could find another one of these caterpillars, but even that failed to produce any more. Twenty *psi* larvae were brought to me in a few days, proving that an intense search was in progress, and also that *tridens* is not very common.—J. H. JOHNSON, 1 Berry Street, Hepthorne Lane, Chesterfield. 15.x.1964.

Mrs. R. W. WATSON

Obituary

Colonel SIDNEY HARDINGE KERSHAW, D.S.O.

Colonel Sidney Hardinge Kershaw, D.S.O., who died on 12th July 1964, was born at the Rectory at Fledborough in Nottinghamshire in 1881, being the youngest son of the Reverend E. W. Kershaw. Educated at The Wells House, Malvern Wells, and Repton, he passed into Sandhurst and had a distinguished Army career, both as commanding officer of his regiment, the Fifth Fusiliers, and on the General Staff. During the Palestine campaign in 1916 he was present at the battles which resulted in the defeat of the Turkish 7th and 8th armies. Subsequently (1917) he served as G.S.O.1 on General Lord Allenby's staff and was in the famous pursuit when the Turkish Army was pushed northwards. For his services in this campaign he was awarded the D.S.O. Later came the Order of the Nile and the White Eagle of Serbia. After the war he commanded the 2nd Battalion of his regiment in India.

Kershaw began collecting Lepidoptera when at school, and throughout his life as a soldier he collected wherever he was stationed. Thus he formed a fine collection of foreign Lepidoptera, which collection has now passed, at his request, to the Nottingham Museum.

For many years Kershaw was a friend and correspondent of the late S. G. Castle Russell, and since it was impossible for anyone who knew Castle Russell intimately not to become infected by his enthusiasm for and great knowledge of the variations of the British Rhopalocera, Kershaw turned his attention more and more to this branch of collecting. His butterfly collection, a fine one which increased in interest with the years, has now passed to his youngest son, Major R. M. Kershaw, who is himself a keen collector. His moth collection he left to Mr. Sydney Humphries of Roade, Northamptonshire.

In 1932 Kershaw retired from the Army and settled at Alderman's Lodge, Aspley Heath, near Bletchley, where he continued to collect actively, visiting many of his favourite localities for both butterflies and moths. And here after nearly seventy years of collecting he succumbed to the illness which has now resulted in his death.

A man with a delightful personality, an entertaining companion, a staunch friend and a correspondent to whose letters one always looked forward, Kershaw had a strong sense of duty to his fellow men. He founded his local branch of the British Legion and was President of it up to the time of his death. He was also an active supporter of the church at which he worshipped. By his many friends and correspondents he will be sorely missed.

He is survived by his wife, two sons and a daughter. To them we offer our profound sympathy in their great loss.

Multis ille bonis flebilis occidit.

P. B. M. A.

NORA WATSON

The sudden death on April 10th, 1964, of Mrs. R. W. Watson, at the age of thirty-seven, was a grief to all who knew her. She had been the wife of Mr. Robert Watson, accountant, for seventeen years, and had taken a prominent part in building up their vast collection—all specimens perfect and most exquisitely set—of British Lepidoptera. She was

a regular exhibitor, nearly always with something startling or unusual, at the Annual Exhibition of the South London Society.

Nora Watson combined a patience for searching among myriads of insects on the wing, with an unerring eye for locality. She had also a remarkable flair in breeding aberrations; and had bred, right through, nearly every species of resident British butterfly and many of the moths —including even some of the most difficult species.

Among her major aberrations, taken or bred, were the following: a male underside of *Colias croceus* Fourc. with black suffusion, both male and female ab. *cinnamoneus* of *Lysandra coridon* Poda, a *fowleri* female of *L. bellargus* Rott., an albino *Coenonympha pamphilus* L., and a female ab. *illustris* of *Panaxia dominula* L. There were also a remarkable asymmetrical specimen of *Aphantopus hyperantus* L. taken only in 1963, and several specimens showing homoeosis of both *Euphydryas aurinia* Rott. and *Melitaea cinxia* L. There were many others, too numerous to detail here. Mrs. Watson shared also in her husband's predilection for and skill in game shooting.

Nora Watson was the third daughter of Mr. and Mrs. Alfred Hayter of Twyford, near Shaftesbury, Dorset. Her many friends remember her, apart from her qualities as an entomologist, as a charming personality and a most gracious hostess.

To Robert Watson, who owed so much to her, both in the field and in business, our deepest sympathy is due.—I. R. P. H.

Notes and Observations

HERSE CONVOLVULI L. IN SHANKLIN.—During the past three seasons I have grown a clump of *Nicotiana* for the purpose of attracting hawk moths, and at last I have had a little reward. A male *H. convolvuli* came to the light on 12th September, and another male specimen was found hovering over the *Nicotiana* flowers after dark on 25th September. On both occasions a strong breeze was blowing from the south west. The only specimen of *Macroglossum stellatarum* L. seen this year was at the *Nicotiana* flowers on 19th September at 7 a.m.—T. D. FEARNEHOUGH, 26 Green Lane, Shanklin, Isle of Wight. 27.ix.1964.

ENARGIA PALEACEA ESP. IN SURREY.—May I add the following records of the occurrence of this species in southern England to those recently reported by Mr. Alasdair Aston and Mr. David More (antea 224/5).

A specimen of *E. paleacea* came to my mercury vapour light trap here on the night of 13th August last, and was followed by two further examples on 17th August. All three were males in mixed condition and have a pale dull background colour, which suggests that they assort well with Mr. More's example, and all lack the bright colouring of the normal northern British form.

It would be most interesting if any readers could make any reliable suggestion as to their place or origin.—J. L. MESSENGER, Stonehaven, Wormley, Godalming, Surrey. 17.x.1964.

CUCULLIA VERBASCI L. ON BUDDLEIA.—A full grown larva of *C. verbasci* was found feeding on *Buddleia davidii (variabilis)* in my garden on 5th July last. My attention was attracted by the eaten condition of the leaves, and I felt sure that more than one larva had been present.

The larvae of *verbasci* have been found on *Buddleia globosa* according to South (Barrett) but some years ago I had a few larvae, and running short of mullein I offered them leaves of *Buddleia davidii*. They refused to touch this possible food plant.—T. D. FEARNHOUGH, 26 Green Lane, Shanklin, Isle of Wight. 27.ix.1964.

COLIAS CROCEUS FOURCH. (CLOUDED YELLOW) IN DEVONSHIRE.—On 21st September of this year I saw a perfect specimen of *Colias croceus* Fourch. at Start Point, south Devon, Start Point is about four miles east of Prawle Point, where Mr. Burton reports that two were seen in August (antea 217). The butterfly was flying along the coast in the direction of Prawle Point.—J. MUGGLETON, 32 Penton Road, Staines, Middlesex. 4.x.1964.

RHODOMETRA SACRARIA L.—This may well turn out to be a bumper year for *Rhodometra sacraria* L. Two specimens have come under my notice this year, the first came to a mercury vapour light operated in company with Mr. B. Goater at Scratch Wood, Middlesex, who later bred a short series from this female. The second, a male, came aboard the Marine Biological Association's research vessel "Sarsia" while trawling at forty fathoms at the Eddystone grounds. This latter was not retained, as I collect only Noctuae.—A. A. MYERS, 34 Crundale Avenue, Kingsbury, London, N.W.9.—3.x.1964.

ENARGIA PALEACEA ESP., A CORRECTION.—I made a slip in my note on Hampshire migrants (antea 214) when I said that Mr. Ian Lorrimer had recorded *Enargia paleacea* Esp. at Chandler's Ford. It was, of course, Mr. Barry Goater who did so.

May I take this opportunity of recording the capture at light at Camber, Sussex, of one *Leucania unipuncta* Haw., in good condition, on the night of 4th-5th October last.—AIR MARSHAL SIR ROBERT SAUNDBY, K.C.B., Oxleas, Burghclere, near Newbury, Berks. 10.x.1964.

HADENA COMPTA FABR. IN NORFOLK.—Having seen two male specimens of *Hadena compta* at mercury vapour light in a garden at Rackheath in 1963, the Sweet Williams in the garden were left undisturbed and no seed heads were removed this summer. During August this year the seed heads were searched and forty larvae were found, in all stages from one third to fully fed. These duly pupated, the last in the third week of September, and some of these were parasitized, and the pupae of these are being bred for identification.—C. G. BRUCE, 16 Harland Road, London, S.E.12. 8.x.1964.

EUROIS OCCULTA L. IN MIDDLESEX.—As this species has been widely reported this year, I should like to record that a pale female *Eurois occulta* L. came to my mercury vapour light trap here on 17th August.—M. G. MASON, 14 Paxford Road, North Wembley, Middlesex. 17.x.1964.

THE OCCURRENCE OF ENARGIA PALEACEA ESP. (ANGLE-STRIPED SALLOW) IN WILTSHIRE.—On the night of Saturday 15th August last, which was fairly mild and dry, with the sky overcast and little or no wind blowing, I ran a mercury vapour light beside a barley field in the vicinity of Old Sarum, about a mile from the outskirts of the City of Salisbury. Ostensibly I was collecting in this particular area for the purpose of obtaining a series of *Oria musculosa* Hübn. (Brighton Wainscot), but was naturally on the look-out for anything else of special interest. Around 2 a.m. a rather large orange-coloured moth circled the light and moved away as though to escape into the night. Thinking it was probably only some common species of noctuid, perhaps an over-sized *Diarsia mendica* Fab. (*festiva* Schiff.) I netted the insect and having boxed it, was somewhat puzzled as to its identity.

Two days later, I went through my copy of R. South's "Moths of the British Isles" and the only species which my moth resembled was *Enargia paleacea* Esp. Before setting the specimen, I showed it to my friend. Mr. B. F. Skinner who has collected this species in Scotland; he confirmed straightaway that I had indeed caught the angle-striped Sallow moth.

In view of the fact that the fairly recent work compiled by Baron de Worms "The Macrolepidoptera of Wiltshire" (1962) does not enmesh the species, it is worth-while to draw readers' attention to what I hope is a new county record.—R. F. HAYNES, 29 Fairfield Drive, Dorking, Surrey. 24.x.1964.

LAMPIDES BOETICUS L. ON ASCENSION ISLAND.—In July 1964, during the course of geological field work on Ascension, a remote island in the southern atlantic (7° 57′ S.: 14° 22′ W.), *Lampides boeticus* L. (long tailed blue) was observed in large numbers above 2300 feet on Green Mountain. This mountain (2817 feet), the highest on the island, is the only one with prolific vegetation.

A search through the literature has failed to find any previous record of Rhopalocera on Ascension Island, although C. O. Waterhouse (Annals and Magazine of Natural History 1881) listed several Noctuid moths, most of which were in evidence in July 1964.—F. B. ATKINS, Dept. of Geology and Mineralogy, University Museum, Oxford. 4.x.1964.

FOOD PLANT OF LEUCANIA OBSELETA HÜBN.—I noticed in this month's Record that Mr. Chalmers-Hunt in his account of *Leucania obsoleta* Hübn. (obscure wainscot) says that the food plant is unknown. I think it is generally accepted that the larva feeds on *Phragmites*, the common reed, but it may be of interest to note that in 1949 I took a female *obsoleta* at Wood Walton. She deposited ova, and when the larvae hatched, I put them on *Phragmites*, but they would not feed. I tried various food plants and finally they started on knot-grass, *Polygonum aviculare*. I fed them entirely on this until they went into hibernation, pupated in the spring, and produced moths in the following June. I had a rather similar experience with the larvae of *Hydrillula palustris* Hübn (marsh moth). I had a large number of ova in 1954, and when they hatched I put them on *Spiraea* (meadow sweet), their usual food plant, but they would not feed. I finally got them to feed on *Taraxacum* (dandelion) and *Lactuca* (lettuce) but after about two weeks they turned to withered *Spiraea* and finally fed up on this.—R. GEOFFREY TODD, West Runton, Cromer, Norfolk, 30.ix.1964.

Current Literature

Ten Little Housemates. Karl von Frisch. 146 pp. 8vo. Pergamon Press. 12/6.

This book deals with ten insects and other creatures associated with the domestic biotope, and the subject is treated in a manner calculated to appeal to school biology classes, but this is in no way allowed to impair the accuracy of the accounts. The author has a keen sense of humour and a fund of anecdotes which impress his points on the mind.

The creatures treated are the house fly, gnats, the flea, the bed bug, lice, the clothes moth, the cockroach, silver fish, spiders and ticks. Each is the subject of a chapter and is treated from a diversity of aspects. The book makes interesting and amusing reading, and will certainly have a strong appeal in school libraries, as also in families blessed with children with enquiring minds (parents may also read it when the children have gone to bed).

It is well printed on good paper with stiff paper covers, and is copiously illustrated with good line drawings of the subjects, sufficiently enlarged to show their structure (and the scale is mentioned), and also of many other aspects of their life and activities, including the harnessing of a "performing flea", a matter which had always puzzled me.—S.N.A.J.

Wasp Farm. Dr. Howard Ensign Evans. 178 pp. and 16 half-tone plates. George G. Harrap & Co. Ltd. 21/-.

This book is full of pleasing features and can be recommended to all classes of naturalist. It gives an account of the author's field activities studying the behaviour of many genera of wasps on a small piece of wild land which he occupied for a few years. His personal observations are not, however, the sole material used, but the writings and observations of others are used in order to make the account as complete as possible.

The book is packed with fascinating details of insect behaviour, and each chapter deals with a different aspect or problem of wasp life, and each is very well ordered. A most pleasing feature is that the author does not go out of his way to simplify scientific names, but applies them naturally to the subjects of his accounts so that they may be intelligible both to the entomologist of any country, or to the layman; he does not, however, omit to mention popular names of species which are part of the ordinary life of everyone. The chapters all finish with two welcome features: "Cast of Characters," in which the scientific names mentioned are analysed and their component Greek and Latin parts translated, and "For Further Reading", in which a short relevant bibliography is given.

The author holds the reader's interest throughout and, as one would expect from a university graduate, he keeps clear of both anthropomorphism and of cold scientific inhumanity. The illustrations consist of line drawings, mostly explaining the peculiarities of certain wasp nests, and of photographs showing the various activities of the insects concerned, the taking of which must have required infinite patience. The most pleasing feature of these is that they are taken to illustrate the *activity*, and they are not merely cosmetic pictures to ornament the book, of a kind all too familiar in these days of advanced photography.—S. N. A. J.

Current Notes

HOD HILL

In years gone by, this famous collecting ground supported a large and flourishing population of both *Euphydryas aurina* L. (marsh fritillary) and *Lysandra bellargus* Rott. (adonis blue). They occurred over the whole of the top of the hill, and their numbers were not noticeably affected by the casual grazing to which their breeding grounds were subjected from time to time.

Of recent years, however, stock has been kept on much of the hill in greater numbers with disastrous consequences for the butterfly population. So much so in fact that the fritillary is now confined to a very limited area which is not subject to grazing, and the Adonis Blue has become a rarity.

In an effort to preserve both these insects by giving their breeding grounds some measure of protection the Dorset Naturalists' Trust, through the sympathetic co-operation of the owner, has recently arranged to lease an area of the hill-top on the south and west sides. These areas have now been enclosed by several hundred yards of stock-proof fencing.

Provided collectors play the game, the Trust does not propose to interfere with their activities, but at the same time they hope that the utmost restraint will be used, particularly while these two butterflies are re-establishing themselves.

The cost of this project has been considerable and should any entomologist wish to contribute towards it, the hon. treasurer of the Trust, Mr. P. A. Bentley, St. Judes, Wimborne Road West, Hayes, Wimborne, Dorset, would welcome a donation.

The Treasurer's Appeal

With the December issues of 1961 and 1962 I made an appeal to all subscribers who pay by cheque to subscribe by Banker's Order, and I have had a fairly good response. There, are, however, more than a hundred subscribers who pay direct by cheque, and I again appeal to them to save themselves and the Treasurer trouble and expense by using a Banker's Order.

I often receive in March and April charming letters of apology for having overlooked the subscription.

I hope that those subscribers not using a Banker's Order will send me their subscriptions before 1st February. If a subscription is not paid before the end of February, I have to send a reminder, and thereafter, if no reply is received, I must assume that the Record is no longer required, and must withold further issues. This applies also to those who subscribe through subscription agents.

I again assure subscribers that I am not being high-handed in this matter; the Record has to pay its way even though it is not run for profit, and your co-operation will be sincerely appreciated.

I will on request send a Banker's Order for 1965 onwards to any subscriber; it is payable on 1st February each year, and can be cancelled at any time should the necessity arise.—C.C.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

IN THE WELSH HILLS. AN OLD MOTH-HUNTER 247

REARING THE JERSEY TIGER—A THIRD ATTEMPT. L. P. J. WADDINGTON 249

MADEIRA IN THE SPRING, APRIL 1964. C. G. M. DE WORMS, M.A., Ph.D., F.R.E.S. 252

WHO WAS COLEMAN? Dr. R. G. AINLEY 254

HELIOTHIS PELTIGERA SCHIFF. (THE BORDERED STRAW) IN WESSEX. H. SYMES 256

THE MICROLEPIDOPTERA. B. W. WEDDELL 258

ABISKO REVISITED. Major-General Sir GEORGE JOHNSON, K.C.V.O., C.B., C.B.E., D.S.O. 259

THE COLEOPTERA OF A SUBURBAN GARDEN. 6—BRACHELYTRA (PART 2). A. A. ALLEN, B.Sc., A.R.C.S. 261

OBITUARY 265

NOTES AND OBSERVATIONS 266

CURRENT LITERATURE 269

CURRENT NOTES 270

THE TREASURER'S APPEAL 270

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (203)

TO OUR CONTRIBUTORS

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Holiday at Thorpeness, Suffolk, 1964

By J. M. Chalmers-Hunt and S. Wakely

It was decided to have a holiday on the Suffolk coast this year, and Thorpeness, near Aldeburgh, seemed an ideal place. Mr. Chipperfield, of Stowmarket, had stayed at a bungalow there in 1963, and we were luckily able to book the same bungalow from 4th to 18th July.

We found the bungalow ideally situated on a lovely wild beach covered with maritime flowers and plants and the sea stretching away to the horizon about a hundred yards away. The piping cries of a colony of nesting terns greeted us as soon as we prospected the beach, and several times eggs or young chicks were seen on the shingle. On the other side of the bungalow was the Aldeburgh road bordered by old fen land bordering a large mere.

Serious collecting did not begin until Sunday night (5th), when the light trap was used. On examining the trap the next morning we realised we had been lucky in our choice, and many of the species taken exceeded all our expectations. However, more of the Thorpeness captures at m.v. later.

On Monday (6th), after a busy morning setting moths taken the previous night, we explored the immediate locality in the car. By the local golf course quantities of *Chaerophyllum temulentum* (Rough Chervil) was seen in flower, and an examination of the flower heads revealed the presence of larvae of *Depressaria chaerophylli* Zell. The larvae are a bright green in colour with black longitudinal lines and were found stretched across the umbels in a kind of hammock of thin silk. Care had to be taken as the larvae threw themselves violently out of the web when disturbed.

On Tuesday (7th) a visit was paid to Southwold, where larvae of *Agonopterix umbellana* Steph. were found commonly in webs on gorse. This species was also found on gorse at Thorpeness on the 11th. The temperature had fallen considerably and the numbers in the trap that night were very low.

On Wednesday (8th) we spent an hour or two on the beach, where numbers of larvae of *Epischnia boisduvaliella* Guen. were found in the seed-pods of *Lathyrus japonicus* (*maritimus*) (Sea Pea). It was surprising to find that some of the larvae were full grown as one usually looks for the larvae of this species in September. We had arranged to meet Mr. Chipperfield at Stowmarket in the evening, when he joined us in the car for a trip to the Breck. On the way we visited the lane near Bury St. Edmunds famous for its hedge of *Berberis vulgaris*. Larvae of both *Pareulype berberata* Schiff. and *Rheumaptera cervinalis* Scop. were taken here. On a few plants of *Artemisia vulgaris* growing in the hedge hereabouts a number of the characteristic larval spinnings of *Leioptilus lienigianus* Zell. were noticed—a local species worth mentioning. Continuing our journey to the Breck, we did some collecting in the vicinity of Barton Mills and gathered a bag of seedheads of *Silene otites*. An examination of these later disclosed that a fair number of larvae of *Anepia irregularis* Hufn. were present. A single *Pseudopanthera macularia* L. was seen here, a very late date for this species. Larvae of *Lithostege griseata* Schiff. were swept from plants of Flixweed (*Descurainia sophia*) and Tumbling Mustard (*Sisymbrium altissimum*). The verges of cornfields

were the places where this plant flourishes. A fairly good specimen of *Hyloicus pinastri* L. was seen at rest on a pine trunk but left. A freshly-emerged *Ellopia fasciaria* L. was also observed. We arrived back from this trip about midnight after a very profitable day.

Thursday (9th).—Several *Heliothis viriplaca* Hufn. were seen flying over the beach and imbibing at the flowers of *Ononis arvense* and *Lotus corniculatus*, but attempts to net one were futile. This is a most difficult species to catch owing to its erratic flight and speed. In the afternoon we visited Sizewell, a few miles north. The beach and adjoining fen looked very promising, but the only species of note taken were a few *Elachista rhynchosporella* Stt. which were found among a species of Carex which grew there in profusion. At Thorpeness in the evening sugaring was tried with little success, and we found dusking in the fen more rewarding. Three local species were particularly common—*Leucania pudorina* Schiff., *Lygephila pastinum* Treits. and *Zanclognatha cribrumalis* Hübn.

Earlier in the week we had met Dr. Banner who was staying at Aldeburgh. We suggested he should bring his generator along on Friday (10th), and it was tried out in a convenient place on the fen near the bungalow. Mr. Chipperfield had previously shown us a cemented platform in the middle of the fen by the side of the mere, and this relic of the last war made an ideal place on which to run the m.v. light. It was not a good night as the temperature was low, but some fen species were taken.

On Saturday evening (11th) Mr. Chipperfield visited us. We showed him where the larvae of *Depressaria chaerophylli* Zell. occurred and both he and a friend, Mr. Charles Pierce, were able to find numbers of them. Moving on to Aldeburgh, our visitors took two *Xanthorhoe quadrifasciata* at rest on some old pine trunks. Back at the bungalow later a sheet was used instead of the trap and our visitors were able to take a few species which they wanted on the sheet and on the walls of the porch near the m.v.

On Sunday 12th we had arranged to meet Mr. Chipperfield and go on to the Breck again. Earlier in the year, on 24th May, Mr. Uffen had shown us a field north of Thetford where he had taken a few specimens of the very rare *Coleophora tricolor* Wals. We wanted to introduce Mr. Chipperfield to this field, and after picking him up at his house at Stowmarket made our way to the ground. There were large clumps of Basil Thyme (thought to be the foodplant of the larva) growing in the field and we were soon quartering the ground trying to put up our quarry. The first moth taken was a lovely *Scopula rubiginata* Hufn—incidentally the only one of this rare species seen on our holiday. Mr. Chipperfield generously gave the specimen to one of us, as he had taken the species previously. A Coleophorid was taken a little later but it proved to be *C. versurella* Zell., one of the Chenopodium-feeding species only recognised recently in Britain, and quite an interesting record. The specimen was identified by Mr. Uffen. However, two specimens of *C. tricolor* were eventually taken. Once again Mr. Chipperfield netted one of these, but insisted we should have it as it was the main object of our long journey. The similarity of this species to *C. lixella* Zell. is very pronounced. Earlier in the day a visit was made to Lakenheath, where we had been told that *Artemisia campestris* was to be found, a very local plant which we wished to see. Eventually we found it growing fairly commonly around the many houses built there in recent years by the military authorities. It was disappoint-

ing to see such a local plant on the way to being exterminated, and it is to be hoped there are other places on the Breck where it will be allowed to survive. Returning to Stowmarket, we were hospitably entertained by Mr. and Mrs. Chipperfield before undertaking the long ride back to Thorpeness.

On Tuesday (14th) we went to Southwold to look for larvae of *Euxoa cursoria* Hufn., which Dr. Banner had said he found there in numbers in the sand under clumps of *Ononis arvense*. We did not find it as common as Dr. Banner had, but we did eventually find five. During the search a number of larvae were dislodged from the plants and these were thought to be *Pyrrhia umbra* Hufn. In the evening we visited the fens at Walberswick and took several *Chilodes maritima* Tausch. as well as *Brachmia inornatella* Dougl. Mr. Chipperfield joined us on this occasion.

On Wednesday (15th) we made a long trip to Barton Broad. Arriving at Barton Turf, we walked about among the thick herbage and quickly found larvae of *Agonopterix ciliella* Stt., which were quite common in spun shoots of Milk Parsley (*Peucedanum palustre*). It was not long before one of us spotted a larva of *Papilio machaon* L. on the same plant. Before we left we had taken eight of these handsome larvae, some full grown and others in the young stage—dark with white middle band. One of these produced a fine imago a few weeks later, but the rest are still pupae. We returned home via the *Coleophora tricolor* field near Thetford but failed to find any more.

On Thursday (16th) we had arranged to meet Dr. Banner, who came over with his generator before dusk. It was a wonderful night with moths swarming at the sheet. We had already taken four *Celama trituberculana* Bosc. at the bungalow, and Dr. Banner got a nice one at his m.v. which proved to be ab. *atomosa* Brem. He admitted he would probably not have noticed this rarity had it not been pointed out to him.

On Friday (17th) we visited Dunwich in the evening. A visit to the beach was unfruitful so we went along to the cliffs near the coastguard cottages where we had a lovely view of Minsmere Bird Sanctuary. This was the last trip of our holiday as we were returning home the following day.

As already mentioned, larvae of *Epischnia boisduvaliella* were plentiful in the seedpods of the Sea Pea at Thorpeness. Some were also noticed at Dunwich and they apparently occur all along the Suffolk coast where the plant grows. We found the larvae always in the pods feeding on the seeds and never on the flowers as is mentioned in several books. To our surprise many of our larvae spun up and emerged a few weeks later. The normal behaviour of the larva is to spin up in the autumn in a round flat cocoon, the larva being coiled "head to tail" in a ring. In the spring the larva leaves this cocoon and spins another elongate cocoon in which it pupates and emerges a few weeks later. A number of the larvae we found spun up in long cocoons, which puzzled us, until the moths emerged. It was noticed, however, that some spun up in the normal round cocoons and these should emerge next year after the change to long cocoons. We can find no reference in literature to a second brood and it would be interesting to find out if July larvae often have a partial second brood in August in this country.

A list was compiled of all the species of lepidoptera seen during our stay in Suffolk. There were nearly 200 "macros" and over 100 "micros".

The publication of this list would take up too much space for this article, but some of the more interesting ones are mentioned in the following paragraphs—all being taken at Thorpeness at m.v. unless otherwise stated.

The most exciting was *Celama trituberculana* Bosc.—the *Nola centonalis* Hübn. of our older lists. We feel this species is probably mistaken for a micro by those people who do not bother with the smaller moths. Five specimens in all were taken—three on 14th, one on the 15th and one on the 16th (Dr. Banner's specimen at his m.v. by the mere) (antea: 215). Three specimens of *Nola albula* Schiff. (a much larger insect) also came to m.v.

Notodonta dromedarius L. was present on most nights and a single *Lophopteryx cucullina* Schiff. also appeared. A single male *Orgyria antiqua* L. was seen, a common enough species, but one would not expect to take such a day-flying species at light. A fine male *Dasychira fascelina* L. together with *Diacrisia sannio* L. were both rare captures for Suffolk.

Amathes ditrapezium Schiff. and *Heliothis viriplaca* Hufn. both came to light singly, but *Hadena compta* Schiff. was represented by three specimens.

The Wainscots were well in evidence but we were too early in the year for some of the better ones for which the district is noted. *Leucania pudorina* Schiff. was really common, both in the trap and at rest after dark on the reeds. *Arenostola elymi* Treits. and *Nonagria dissoluta* Treits. appeared—one of each—and *Chilodes maritima* Tausch. was not uncommon in the fen and at m.v. (also at Walberswick). A few aberrations of the latter were taken—*bipunctata* Haw., *wismarensis* Schmidt and *nigristriata* Staud. One *Plusia jota* L. was taken and *P. pulchrina* Haw. was one of the commonest species in the trap during the first week, but absent later.

Geometra papilionaria L. was seen on one occasion. The local *Sterrha ochrata* Scop. could be walked up daily on the beach by the bungalow, and as many as twenty were sometimes in the trap. Other local Geometers which appeared singly were *Euphyia cuculata* Hufn., *Cidaria fulvata* Forst., and *Chesias rufata* F. *Mysticoptera sexalata* Ret. was taken both in the trap and on the fen.

Some good Pyralides were taken, including a single *Nephopteryx hostilis* Steph. This was the handsome form with bright red markings, and proved to be a new addition to the Suffolk list (cf. *Ent. Rec.*, **76**: 215). Several male *Schoenobius gigantellus* Schiff. were taken in the trap and a few females came to m.v. on the fen. *Witlesia pallida* Steph. was plentiful in the fen—also at Walberswick. A worn *Nascia cilialis* Hübn. appeared in the trap on the 15th—a particularly interesting record for Suffolk. *Homoeosoma nebulella* Schiff. appeared once and is apparently rarely seen nowadays. *Nyctegretis achatinella* Hübn. was very common on the beach at dusk and came in great numbers to the m.v.

One of the Crambidae which we particularly wanted was the very local *Pediasia fascelinellus* Hübn., and we were delighted to find one in the trap a few days after our arrival. Their numbers increased nightly until the 17th when there were eight in the trap, bringing our total of this species up to thirty. We failed to find them at rest on the grasses as we had hoped, and it appeared to be a late-comer to light. A single *P. aridellus* Thunb. appeared on the 16th, much to our surprise as the nearest salterns were beyond Aldeburgh.

Tortricidae worth special mention which came to light included: *Hysterosia inopiana* Haw., *Phalonia rubigana* Treits., *P. dipoltella* Hübn., *Cochylichroa atricapitana* Steph., *Phtheochroa rugosana* Hb., *Acleris comariana* Zell., *A. latifasciana* Haw., *A. hastiana* L., *Gypsonoma dealbana* Frol., *Eucosma expallidana* Haw., *Lobesia abscissana* Dbl., *Hedya salicella* L., and *Celypha purpurana* Haw.

Some interesting Tineidae taken included *Brachmia inornatella* Dougl., which was taken among reeds at Walberswick as well as at Thorpeness and proved to be a new addition to the Suffolk list (*cf. Ent. Rec.*, **76**: 215). *Aristotelia palustrella* Dougl. was not uncommon at light. *Chionodes distinctella* Zell. was taken at light as well as at sugar.

Blastobasis decolorella Woll. had been recorded from Aldeburgh the previous year by Messrs. Aston and Chipperfield, and we were surprised to find examples not only in the trap but also at rest on the reeds or flying after dark. One *Agonopterix cnicella* Treits. was taken at flowers of Marram Grass on the beach. *A. conterminella* Zell. was taken at light and is worth recording for this district. Some small Coleophorids flying abundantly over *Carex* before dusk at Walberswick on the 14th have still to be identified. *Monopis imella* Hübn. was taken at Thorpeness—a rare species in Suffolk according to Morley (*op. cit.*).

The nomenclature used is that employed by Heslop in his Check List, 1962.

The sparrows were a great nuisance at the bungalow and gobbled up all the moths they could find in the porch and on the outside of the trap as soon as it started to get light.

Hadena barrettii Dbld. The Hard Way

By Major General C. G. Lipscomb, C.B., D.S.O.

I am no moth hunter, but when an entomological friend heard that my wife and I were going to Cornwall for the first week of October, he asked me to try to find some *Hadena barrettii* pupae for him. I asked how one set about this and was told that the larvae feed on the roots of the sea campion and that if one dug up the plant and gave it a shake, the pupae just fell out. It all sounded quite simple, in theory at any rate, and I said I would see what I could do. We planned to make the Headland Hotel, Coverack, our headquarters; it has a fine situation on the cliffs, with a wild rocky coast-line stretching away on both sides, and we reached it in the early afternoon of October 2nd. The day was hot and sunny, and after depositing our luggage, we began at once to explore our surroundings.

It was now that we realized that neither of us really knew what sea campion looked like, but by examining a variety of plants we decided that one that resembled *aubretia*, but with dead campion-like flower heads, must be the plant we were looking for. But all those we could find were growing in thick grass or scrub, and there was absolutely no question of digging them up with the small hand fork with which I was armed, so we gave it up as a bad job for the time being.

The next day we awoke to find the coast almost blotted out by a thick sea mist and the morning weather forecast was not encouraging. Making the best of this indifferent outlook we set off after breakfast for the Lizard, leaving our car near Housel Bay and walking along the cliff top to the lighthouse.

In spite of the lack of sun the day was warm and a number of *Pyrameis atalanta* L., were seen, all flying in an easterly direction along the cliffs. After the long drought the grass and undergrowth were tinder dry, and extensive areas of rough ground had recently been burnt and were still smouldering, and it was difficult to escape the smell of burning. Where the fires had not reached, the larvae of *Macrothylacia rubi* L. were everywhere to be seen, but many must have been destroyed. We decided that this place offered little hope of anything entomologically interesting and drove on to Kynance Cove for lunch. As we reached the cove, the sun came out and it became really hot. The beauty of being in Cornwall at this time of year is that the beaches and coast are free of trippers and one virtually has the place to oneself. Kynance Cove was no exception to this and we spent the rest of the day enjoying the scenery and sunbathing on the beach, at least my wife sunbathed while I conscientiously set off with my fork to explore the possibilities of some rough ground at the back of the tea house which was closed. There was plenty of campion here, but although I grubbed about for an hour or so, the best I could find was one old dead root with its centre eaten out. This discovery at least made me feel reasonably certain that I was tackling the right plant.

The following day we were again plagued with sea mist but nevertheless decided to explore the coast further west and after breakfast motored over to Gunwalloe. Here we parked our car on the cliff edge near a disused quarry on the outskirts of the village. As the sky was still overcast and nothing was seen on the wing, we made our way down to the beach for a walk before lunch. The only other occupant of a fine stretch of sand was a large *rubi* larva found well below high water mark and heading hard for France. I picked it up and in due course restored it to its more normal habitat. We eventually made our way to Loe Bar, a most attractive place, where the sea and a large expanse of fresh water are only separated by a narrow strip of sand. Here there is a memorial to one hundred members of the crew of H.M.S. Anson, who were drowned when their ship was wrecked on the bar in 1806. We saw it under such peaceful conditions that it was difficult to imagine the tragedy.

We returned to the car for lunch and I then noticed a large heap of loose stone and rubble thrown out from the quarry, supporting a good crop of campion. The vegetation on one side of the mound had recently been burnt, but enough plants remained to make a search worth while. After we had eaten our sandwiches I set to work with my fork, and very soon, while loosening the soil under one of the plants, I unearthed a fine pupa. No gold digger could have been more delighted with his find than I was, but in spite of further digging I could find no more, although a rather repulsive white larva from under another plant was probably of this species, but it subsequently failed to pupate.

While I was still at my excavations, the sun suddenly broke through, and at once butterflies began to appear; *atalanta*, *phlaeas*, and, what I had been particularly hoping to see, a fair number of *Colias croceus* Fourc. I exchanged the fork for a net and went off to see what I could find. The

majority of the Croceus were very fresh, probably indicating a third brood, and I was delighted to take a fine female of the golden yellow form, *chrysothome* before the mist came down again. As we drove home we felt that what with one thing and another, it had been quite a successful day.

October 5th was a miserable day with cloud and heavy rain, but we awoke the following morning to find the sun streaming into our bedroom. It was a most welcome sight as we had already planned to make an expedition to Porthcurno on the south coast, a few miles short of Land's End. On the way we visited Lamorna Cove, a well-known beauty spot, but beyond a few worn *Nymphalis cardui* L. on some flowers near the car park, nothing of interest was seen. I did, however, notice that sea campion was growing on the cliff side, but much of it was inaccessible and I did not feel inclined to risk my neck in reaching it. Porthcurno is a charming spot and we were particularly anxious to visit the open-air theatre on the cliff top, where a member of the family had taken part, during the summer, in a play put on by Cambridge University. The whole setting is most unusual, occupying as it does, a natural amphi-theatre with the sea, far below, as a back cloth. After exploring the theatre, we walked along the cliffs towards St. Leven in fitful sunshine and I noticed that all the butterflies we had seen at Gunwalloe were again in evidence but in reduced numbers, perhaps as a result of the previous day's downpour. Just as we were thinking of retracing our steps back to the car for lunch, I spotted a large plant of sea campion growing in a very accessible place. Not having my fork with me I lifted up the foliage and disturbed the soil under it in a rather half-hearted way with my fingers. Suddenly, and rather to my astonishment, a nice brown pupa appeared on the surface, and this encouraged me to return properly equipped after we had lunched. To cut a long story short, I found twelve other pupae in a comparatively short time that afternoon, seven of them under the one big clump of the food plant. The secret, for those who do not already know it, seemed to be to look for plants growing in a position sheltered from the prevailing westerly wind and then to search those that look partly dead.

Normally, the larva seems to pupate close to the surface and near to the roots on which it has been feeding. There is, accordingly, no need to pull up the plants wholesale and I found it sufficient just to sift through with my fork, the top inch or so of soil.

There was any amount of the food plant in this place, and I have no doubt that if I had had more time to spare, I could have found many more, but then, as I have said, I am no moth man, and I felt I had probably done sufficient damage to the local population as it was.

The following day was our last, and although there was a certain amount of sun between heavy rain storms, a cold and relentless gale blew all day and large seas came crashing in on the beaches. Without much hope, we went to Mullion, where years ago the late Clifford Wells used to play golf and always carried a butterfly net in his golf bag when Clouded Yellows were about. But with the weather as it was, both golf and entomology were out of the question and I regretfully came to the conclusion that the season, for butterflies at any rate, was probably over.

More About *Heliothis peltigera* Schiff.

By H. Symes

The number of *H. peltigera* that arrived in Dorset this year cannot have been large. In the whole of the summer, only four were recorded at mercury vapour light at Portland, and none were seen by Brigadier Warry at Upwey or by Mr. V. W. Philpott at Wyke Regis.

At Dungeness, however, there was a large invasion. This disparity, coupled with a similar one in reverse in 1906, when Mr. Chalmers-Hunt (p. 153 of his Kentish List appended to the February "Record") mentions only one *peltigera* as having been taken in Kent, whereas Mr. Parkinson Curtis, in his Dorset List, enumerates two dozen captured and "many others seen", suggests that the immigrants arriving in Kent and Dorset come from different parts of Europe.

Mr. Chalmers-Hunt (loc. cit.) gives much information about the occurrence of *peltigera* in Kent, mainly at Dungeness, since 1827, and of the numbers bred from larvae. In 1931, Mr. A. M. Morley, from about fifty August larvae, bred seven moths in October, and four in July-August the following year. From twenty larvae found in 1938, Mr. Morley bred eight moths between 23rd and 30th August that year, and three between August and October 1939. In 1947, Dr. H. King's diary notes that he found "two dozen or more" larvae on 31st August and a "few more" on 3rd September, when he was getting a fresh supply of the foodplant. Six moths emerged on 13th October and three on 14th, and three of them had their hindwings deformed. There is no mention in the diary of any moths emerging the following year. Finally, in 1958, Mr. Chalmers-Hunt bred two moths on 2nd and 4th September from three larvae found on 2nd August. From all these facts it appears that nearly 80 per cent. of the moths that emerged did so in the same year as the larvae were found, and that the number of moths bred was about 32 per cent. of the larvae found.

On 5th September 1964, acting on information received, I paid a very short visit to Dungeness, where in rather more than two hours' search in a very limited area, my wife and I found thirty-two larvae on stinking groundsel (*Senecio viscosus*). Most of them were in their penultimate instar, but three had reached the last stage, and went down on 8th September. I have never seen such a profusion of the foodplant, and unless we were particularly lucky in striking a particularly good spot, there must have been hundreds in the locality. Only one had been "stung", three died, I gave away four, and of the two dozen that completed their growth, three did not go down and failed to pupate properly on the surface. All the others had gone down by 15th September. These larvae showed a considerable range of colour. The majority were of a nondescript dull green (Buckler, XCIX, 2d) but some were of a darker but brighter green, with bold black lines along the back, rather like Buckler's fig. 2, but a more handsome insect, and two or three were of the pink form (Buckler's 2b).

In the light of the figures given above, I fully expected half the larvae that had gone down to produce moths about the middle of October and was very disappointed when the end of the month arrived without a single moth having emerged. At the "South London" Society's exhibition on 31st October, a few *peltigera* that had emerged in October from Dungeness larvae were on view, and I was lucky enough to have a talk with

Mr. Morley about his experience in breeding the species. He told me that the pupae should be kept dry, and I remembered rather ruefully that in ignorance of this, I had put my breeding cages out in the rain early in the month. But next morning when I had a look at the cages, I found to my surprise and delight that two moths had emerged. They were a good deal smaller than those I bred in July and August, but as far as I could remember, they looked as large as the specimens I had seen the day before. One of them was very dark. More moths emerged on 2nd, 5th, 9th and 13th November: all six had soft olive brown forewings, with hardly a trace of the large dark spot, so conspicuous in the pale form, and they were all perfect specimens. They emerged at almost any hour of the day, such as 9.15 a.m., 4.30 p.m. and 9.15 p.m.

In a good year for *peltigera* at Dungeness, hundreds of larvae must go down and pupate beneath the shingle. I wonder how many, if indeed any, of the pupae can survive a normal English winter.

Of the status of this species in Dorset, with a milder climate than Kent, Mr. W. Parlinson Curtis expresses the opinion that it cannot maintain a continuous foothold in the county, although he thinks it may do so in Devon. But Mr. V. W. Philpott informs me that a few years ago, he discovered a colony of larvae (the pink form) feeding on rest-harrow (*Ononis repens*) on the southern slopes of the Mendips, and that he considered them to be residents. If so, they must have been a tough lot, but I do not think they could have survived the winter of 1963.

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A Visit To Yugoslavia, 1964

By Dr. Neville L. Birkett

For some years I have been attracted by the thought of a holiday visit to Yugoslavia and this year we left England on 13th August with the determination to get our caravan and selves to that country. Having managed the rather long distances involved in getting to Venice the year before we were full of confidence in our ability this year, especially in view of the acquisition of a new and lighter caravan, of covering the slight extra mileage to Yugoslavia. Papers concerning the lepidoptera to be encountered in Yugoslavia seemed to be rather scarce. Mr. L. G. Higgins kindly drew my attention to two papers published in 1920 which seemed to cover both the time and places I was proposing to visit. Also the more recent papers by Major-General C. G. Lipscomb gave me some idea of the species I was most likely to find. In the event the number of species I actually observed was less than hoped for. The rather indifferent results seem to be accounted for mainly by the fact that my visit was necessarily rather late in the season and the weather in Continental Europe had been very good for some months so that many species I should have seen were probably over by the time I was in the right places. Nevertheless I feel it may be worthwhile and of interest to put on record my experiences collecting in a part of Yugoslavia where, in addition to entomology, an enjoyable holiday can be had.

We crossed to Calais on 13th August and then travelled to Bonn in W. Germany where we stayed a couple of nights and during the day saw something of the many interesting sights of the W. German capital.

Apart from a few 'whites', some *Colias croceus* Fourc. and *Vanessa cardui* Linn. butterflies were virtually non-existent at Bonn. We left our Rhine-side site on 16th August and travelled up the Rhine valley seeing many of its famous castles and other features of interest. Then after crossing the Rhine we travelled eastwards on the fine autobahn to Nuremberg where a night and more sight-seeing were spent. During our traverse of Germany we saw few butterflies and hopes of getting many species on the holiday suffered a set-back. From Nuremberg we went via Garmisch Partenkirchen and Innsbruck to reach Cortina D'Ampezzo in Italy on 18th. That evening we were treated to a monumental thunder-storm in the middle of which the caravan awning nearly took off. However, the next morning dawned fine and bright with fresh snow on the high peaks around. I went up the Tre Croci Pass, in company with a vast horde of other tourists, in order to do some collecting about the summit of the pass. There were many butterflies about but of few species. *Erebia pronoë* (Esper) was the dominant species and the only species of the genus noted. I took a fairly good series, many of which are referable to r. *tarcenta* Frhst. (of which race Tre Croci is the type-locality). One or two specimens of the ab. *subalpina* Gmppg., with much reduced spotting on the upper surface, were also taken. *Lysandra coridon* Poda was very common but exhibited little variation of note. Other species seen or taken included:— *Coenonympha satyrion* Esp., a few worn specimens; *Vanessa cardui* Linn., *Colias australis* Vty., *Boloria pales* Schiff. and *Hesperia comma* Linn. A poor list in what looked such a good collecting area and on a bright sunny day.

We had intended staying a few days at Cortina, which is a most delightful centre, but unhappily the weather broke in no uncertain fashion on the 20th so we decided to move on towards our main goal. After a two-night stay near Trieste we actually reached Yugoslavia on 22nd August and took up a caravan pitch on a rather crowded camp site at Medveja—a seaside resort a few miles down the Istrian Peninsula from Opatija. Apart from the popularity of the place—mainly German tourists—this proved a delightful spot with glorious swimming and quite a lot of interesting sight-seeing to be done. In fact the latter severely curtailed time for collecting. Major-General Lipscomb has noted that in Yugoslavia many excellent collecting areas are untouched by human activity. This is very true. The difficulty then is deciding where one will devote one's time, and that is no easy problem, coupled also with the fact that off the main roads (which are quite good in northern Yugoslavia) there are rough tracks only. Another problem here, which rarely is a factor when collecting in England, was that after about 11 a.m. the temperature was well into the nineties in the shade and all effort became a difficulty! I give below a list of insects taken here with comments regarding variation, etc.

Papilio machaon ssp. *gorganus Frhst.* A few seen about Medveja. Not so common as I should have expected.

Pieris brassicae Linn. Common.

Pieris rapae Linn. Very common. Many specimens fine and large. I took quite a lot of specimens as I was hoping that some would prove to be the less common species of *Pieris*. Although both *P. manni* Mayer and *P. ergane* H.G. are recorded from Istria I saw no signs of these in spite of careful search.

Gonepteryx rhamni Linn. Fairly common.

Colias croceus Fourc. Generally distributed in the Istrian Peninsula but nowhere really abundant.

Leptidea sinapis Linn. Very common everywhere. I did not find any f. *erysimmi* Bkh. which Major-General Lipscomb took at Rabac.

Hipparchia fagi Scop. Common and seen flying about all the roads of the area.

Hipparchia semele Linn. Very common but worn.

Hipparchia statilinus f. *allionia* Fab. Frequent throughout the Istrian Peninsula.

Brintesia circe Fab. Generally common.

Chazara briseis Linn. Not so common as the other large Satyrids but nevertheless quite frequent. The specimens are very fine and large, especially the females, and seem referable to f. *magna* Stgr.

Dira maera Linn. Frequent about Medveja. The few specimens I collected do not show any marked racial characteristics.

Maniola jurtina Linn. Common but mainly worn. They are similar in appearance but smaller than f. *hispulla* Hübn. and are perhaps referable to ab. *rufocincta* Fuchs.

Coenonympha pamphilus Linn. Common. These have a well-marked broad dark border and seem to be var. *marginata* Ruhl.

Limenitis anonyma Lewis. I caught only one and saw one other. In view of the freshness of the specimen I took perhaps the brood was not fully out at the time of my visit.

Vanessa cardui Linn. Generally frequent throughout the area.

Polygonia egea Cramer. I only saw and took one specimen.

Melitaea didyma f. *occidentalis* Stgr. A few seen and taken near Plomin. They were apparently just emerging.

Argynnis paphia Linn. Abundant throughout Istria. I caught quite a lot of large fritillaries but did not find any of the other large species which might have been expected.

Thecla quercus Linn. Abundant and of large size. They were all very worn and I did not get a really fresh specimen.

Syntarucus pirithous Linn. One worn specimen only—the species was probably over.

Everes alcetas Hffmgg. Common.

Polyommatus icarus Rott. Very common but not showing any great variation.

Lysandra bellargus Rott. Abundant. I have already noted the ab. *suffusa* Tutt associated with a scale defect (Birkett, 1964a).

Meleageria daphnis Schiff. (*meleager* Esp.). Two worn females only. Again I think the species must have been nearly over.

Erynnis tages Linn. Common and of the usual rather dull form found in warm climates.

Reverdinus floccifera Zell. (*altheae* Hübn.). One only at Medveja.

Pyrgus armoricanus Obth. One male only taken. The small black and white skippers seemed to be very scarce.

Hesperia comma Linn. Frequent.

I have few observations to make on moths or other insects. The giant blue Carpenter Bees (*Xylocopa* sp.) and hornets, noted by Lipscomb, I also noticed. After numerous chases and frustrations I caught a moth that was flying in numbers and at great pace among the woods on the

rough hill sides. This proved to be *Lasiocampa quercus* Linn. It was centainly very common.

We left Yugoslavia on 29th August and heard later that the weather then deteriorated. Apart from the collecting we had visited the wonderful caves at Postojna and the Roman remains at Pula and can endorse all that Lipscomb recounts of these places. Perhaps I should note that we were luckier with our meal in Pula!

Our route home took us again for a few days to the site we were on at Cavallino, near Venice, last year. I revisited my collecting haunts there and found all the species previously noted in good strength. In addition I took a single female *Thersamonia dispar* Haw. During the rest of our journey back to England, which we reached on 7th September, little collecting was possible due mainly to the weather being cloudy. However, conditions were quite good when we stopped on the summit of the Simplon Pass but there was only one *Vanessa cardui* seen—not another butterfly.

Yugoslavia is a country well worth visiting and a visit in July would, I think, well repay an entomologist with some interesting material. Living in Yugoslavia is cheap, thanks to a good exchange rate, there are plenty of adequate camp sites for those whose circumstances or inclinations lie in that direction, and the natives were most friendly and helpful.

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Polymorphism in N.E. Derbyshire

By J. H. Johnson, F.R.E.S.

The study of polymorphism in lepidoptera may provide the answer to the central problem in biology at the present time, which is—how exactly does a species originate? If the causes of polymorphism (the word simply means variation of some kind) were understood by the scientist, down to the smallest detail then he would be close to understanding how evolution has happened and where it is leading. The great advantage of studying polymorphism in lepidoptera is that in every acre of the world several examples of the phenomenon may be found without much searching. Every entomologist who uses a light trap must have taken scores of specimens showing polymorphism, transient or balanced or accidental, but very few have bothered to make a record of their captures, and fewer still have had them published in the journals, despite the statement of Dr. E. B. Ford in "Moths", a work which every moth collector should study, that such activity would be of the greatest value. A few people will no doubt be put off by the word polymorphism because it is too scientific, but the same number will be attracted to it for the same reason.

At the end of the last century and the beginning of this one, many entomologists spent their leisure studying the varieties of the Noctuae and the Geometers, and much erudition went into the giving of names and tracing the synonyms of a multitude of varieties and aberrations. Hy. J. Turner, for many years Editor of the *Entomologist's Record*, must have spent thousands of hours and pounds searching the literature for portraits and descriptions of moths in Latin and German and possibly Russian. His work, the Supplement to Tutt's earlier work, "The British Noctuae and their varieties", is an amazing example of patient compilation of obscure references, and yet the number of people who have even heard of it is tiny, judging by the number of times it is referred to in any entomological journal. Does anyone pay any attention to the naming of varieties of moths to-day? No doubt someone is patiently carrying on the work of Tutt and Turner, but very little use seems to be made of the names of varieties of the commoner species of moths in ecological work, where they should be really valuable. If the study of ecology is to mean anything it should show how the changes in the environment affect the individual species. The great changes in the face of England are changing the plants and the animals that live there, not only are new species coming in from other areas to occupy the new niches which are being formed but the outward appearance of the resident species is changing, very slowly perhaps, but still changing. The selective forces work on the living material, and one variety succeeds in one locality, and another variety of the same species succeeds in another. How far is this the true picture in England to-day? To find out we need records of the actual numbers of varieties and typical forms kept over long periods.

TABLE SHOWING POLYMORPHISM IN LEPIDOPTERA IN DERBYSHIRE

Species	1960	1961	1962	1963	Average
	%	%	%	%	%
Allophyes oxycanthae L.					
Typical	9·5	2·9	23·6	17·2	13·3
Melanic	90·5	97·1	76·4	82·8	86·7
Apamea crenata Hufn.					
Typical	25·0	13·9	13·6	17·1	17·4
Var. *alopecurus*	75·0	86·1	86·4	82·9	82·6
Apamea monoglypha Hufn.					
Typical	94·6	89·6	89·7	88·6	90·6
Var. *aethiops*	5·4	10·4	10·3	11·4	9·4
Apamea secalis L.					
Typical	83·2	85·6	76·2	80·7	81·4
Var. *leucostigma*	9·9	10·9	19·3	14·8	13·7
Var. *rava*	7·9	3·5	5·5	4·5	5·9
Procus fasciuncula Haw.					
Typical	35·1	23·2	20·8	18·0	24·3
Melanic	58·1	69·6	67·7	73·8	67·3
Var. *cana*	6·8	7·2	11·5	8·2	8·4
Sterrha aversata L.					
Var. *remutata*	82·4	83·0	80·4	79·7	81·4
Var. *aversata*	17·6	17·0	19·6	20·3	18·6
Gonodontis bidentata Cl.					
Typical	86·2	75·6	65·9	86·7	78·6
Melanic	13·8	24·4	34·1	13·3	21·4
Biston betularia L.					
Typical	4·0	2·7	1·7	2·2	2·6
Melanic	96·0	97·3	98·3	96·7	97·1
Intermediate				1·1	·3

Between 1959 and 1963 accurate and complete records of the varieties of moths which could be recognised in the nightly catches in my mercury vapour light trap were kept. This is an important point. Some varieties differ so slightly that close scrutiny is necessary to sort out the variety from the typical, and this is not possible for the amateur whose time is limited. He has no time to resort to microscopic technique every morning, enough time is taken up with just counting the catch. The easiest variety to recognise, of course, is the melanic. In the Chesterfield area melanism has been heavy in the past, but seems to be decreasing now. Heavy industry is leaving the district, three more coal mines are due to close down next year, and the furnaces and gas works are so modernised that they could not give off soot and noxious fumes if they tried. It is not possible to state with certainty that melanism is decreasing because no systematic records have been kept in the same place for a sufficient number of years, but the number of melanic specimens seen in one season *seems* to be smaller now than in the pre-war years. My records extend over only four years, but if anyone is able to carry out a similar survey in the same area in the future my figures should give a useful basis for comparison.

Of the many species of moths which exhibit polymorphism in this district I have chosen eight for this little survey. Five are dimorphic and three are trimorphic. All eight are fairly common and are obtained regularly in the light trap in the proper season.

Allophyes oxyacanthae L., the Green Brindled Crescent, is included among the industrial melanics by Ford, but only tentatively since Haworth mentioned the melanic form early in the nineteenth century, giving the name Dark Crescent to this species. In this area in some years typical forms are very rare but in 1962 almost a quarter of all the specimens obtained were of the beautiful green form. Judging by the figures obtained in the four years the typical form seems to be on the increase, but it is not so pale or faded looking as the southern typical form. Also no really jet black specimens are ever obtained.

Apamea crenata Hufn. (*rurea* Fab.), the Clouded Bordered Brindle is another of Ford's doubtful industrial melanics, and the melanic form is extremely rare in this district, but the reddish brown variety which South figures under the name of *alopecurus* is commoner than the typical form so that polymorphism is still present. Both forms are quite attractive.

Apamea monoglypha Hufn. (*polyodon* L.), the Dark Arches, is the commonest moth in this locality. In ten years over 10,000 specimens were taken in the light trap, showing the complete range of variation from very pale with pretty markings to sooty black without any markings at all. Only the extremely black form referable to var. *aethiops* Tutt has been counted as melanic, it is quite distinct from the merely very dark typical form. This species is frequently found at rest on tree trunks, and occasionally on brick walls. In both cases the black specimens seem to human eyes to be less conspicuous. On brick walls they are almost invisible at five paces. Sparrows find both forms equally attractive as food, judging by the way they go for them when the contents of the light trap are made available to them. The black form seems to be on the increase in this area. Since 1960 the ratio of melanics has gone up from 5% to 11%. The great abundance of this species in every year shows that it is well adapted to living under industrial and urban conditions. The

very similar moth, *Polia nebulosa* Hufn., the Grey Arches, is a complete failure under the same conditions, appearing in the trap only once in the same period, although, in Hardwick Wood, less than three miles away, it is almost as common as *monoglypha*. Although Ford classes *nebulosa* as an industrial melanic, evidence from this area suggests that it is not a very successful one.

Apamea secalis L. (*oculea* L. *didymea* Esp.), the Common Rustic is one of the most variable species known in England. Hy. J. Turner named and described scores of aberrations. Many of them are very rare or difficult to identify, so for the purpose of this investigation only three forms have been considered: the typical unexciting brown variety, the melanic form with white reniform mark referable to var. *leucostigma* Esp., and the barred form referable to var. *rava* Haw. and *didyma* Esp., which is probably the most attractive. These forms are easily separated with only occasional doubtfuls. This is also a very abundant species, its success being due probably to its variability, the melanic form comprising no more than an eighth of the total.

Procus fasciuncula Haw., the Middle Barred Minor, is a very special case, which Ford said should be left alone until more was known about it because of the difficulties surrounding it. The melanic form is not mentioned by Tutt or Turner, but there is no doubt that one occurs in this country now, and in this locality at least it is far more abundant than the typical pale form or the reddish variety referable to var. *cana* Staud.

Sterrha aversata L., the Riband Wave, shows a delicate shade of polymorphism. There are two distinct forms of this species, var. *aversata*, which has a dark band across the fore wings, and a plain form, var. *remutata* L., which has no dark band. The difference is very easily seen, but the reason for it is by no means obvious. Until I began to operate the light trap I had never seen a specimen of var. *aversata*, although the ratio of that form to the typical seems to be in the region of 1:5.

Gonodontis bidentata Cl., the Scalloped Hazel, is one of the original industrial melanics, appearing regularly in most of the early works on the subject of melanism. In this locality the proportion of melanics seems to fluctuate, usually common enough but never more numerous than the typical form. The reason for its lack of success may lie in the hiding place of the imagines, usually the underside of a leaf growing near the bottom of a bush in a hedgerow with the wing tips showing outside the edge of the leaf and seemingly part of the growing leaf. This method of camouflage means that the colour of the top surface of the moth's wings is not so important, except, perhaps to the creatures which search from below the leaves at the bottom of the bush. Whatever may be the cause, the melanic form of *bidentata* is not as successful as that of the next species.

Biston betularia L., the Peppered Moth, has almost completely assumed the jet black form in this area. The melanic variety *carbonaria* is usually the only one taken by any collecting method. Very rarely a typical specimen is taken in the mercury vapour light trap, and even more rarely an intermediate one appears. The only typical female which I have obtained in this locality laid a large batch of eggs which all produced melanic imagines, as I had expected, there was little chance that she would have mated with a typical male. The larvae of this species are invariably very dark brown, almost black, and they are not easy to rear. Some disease wipes them out when they are about half grown,

at least in captivity; what happens under natural conditions in the field is difficult to find out.

Since it is much easier to appreciate the significance of comparative figures when they are side by side, I have tabulated the percentages of the various forms of polymorphic species of moths taken in a mercury vapour light trap of a simple box-type operated in a small garden in a loosely built-up area five miles from the town of Chesterfield in Derbyshire, sometimes described as the centre of industrial England. The value of these figures lies in the possibility of comparison with other localities in the country during the same period or with the same locality at another period, say in twenty or a hundred years' time. They have some local interest as they stand, but they would be of more value if other collectors in other localities could be persuaded to carry out similar surveys.

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A New Aberration of *Xylocampa areola* Esp.

By H. C. Huggins, F.R.E.S.

In a note of mine, "Some Aspects of Melanism" (*Entomologist*, **89**: 185-7), I mentioned that on 3rd June 1955 I had taken a striking melanic specimen of *Xylocampa areola* Esp. which Mr. A. L. Goodson considered unique, but which I anticipated would recur.

On 17th April 1964 I had the good fortune to take another exactly similar specimen; the original one was sitting on the fence of the Westcliff High School for Girls, the second in my mercury vapour light trap in the garden here.

On showing these two specimens this year to Mr. Donald Down he told me he had another, captured in 1963 in Westcliff.

As this aberration seems to be a recurring one which may possibly become commoner, it appears desirable to describe and name it.

Xylocampa areola Esp. ab. ***nigra-brunnea*** ab. nov.

Forewings deep brownish-grey with the usual black markings showing somewhat darker. Hindwings, including cilia, dark brownish-grey. Thorax and abdomen uniform brownish-grey. Type: female, Westcliff-on-Sea, 3.vi.1955, in coll. H. C. Huggins. Paratype: female, Westcliff-on-Sea, 17.iv.1964, in coll. H. C. Huggins.

The feature of this aberration is the brown tinge of the ground colour, which is quite different from that of ab. *confusa* Tutt, in which the ground colour is blackish-grey and lighter, indeed at a short distance ab. *nigro-brunnea* looks unicolorous. I have taken ab. *confusa* occasionally in this district for many years.

It is quite possible that ab. *nigro-brunnea* is now commoner here than my captures suggest, as in the past two years I have only occasionally set my trap in the spring.

I have to thank Mr. D. S. Fletcher for making certain the insect has not previously been described.

A Correction.—In my account of my trip to Madeira, *Pyrameis callirhoe* (antea 253, line 2 from top) should of course be the Indian red admiral.—C. G. M. de Worms. 20.xi.1964.

Ant Records and Observations for 1964

By K. E. J. Barrett

The following species have been noted during the past season.

Tetramorium caespitum Latr.

It occurred abundantly on the Bagshot Sands in Dorset at Gore Heath, with *Lasius alienus* Först. at Rempstone Heath, Newton Heath and Warmwell Heath, and with both *L. alienus* and *Tapinoma erraticum* Latr. at Wytch Heath and Godlingston Heath. It was also found on the Lower Greensand at Longmoor, Whitehill and Liphook in N. Hants, and at Elstead Common and Tunnel Hill, near Pirbright, in Surrey.

Myrmica schencki Em.

A few workers were seen in May on earth mounds of *Lasius flavus* Fab. in a railway cutting near Helmdon, Northants This site is 500 ft. above sea-level on the Great Oolite series and some 20 miles north of known sites in Oxfordshire on the Cornbrash formation (Barrett, 1963). This rather subterranean species has a wide but very local distribution in England and Wales and must be often overlooked.

Lasius fuliginosus Latr.

I have seen this species this year at a railway-crossing near Alderbury, S. Wilts., at Tunnel Hill and Thursley Common, Surrey, and at Clophill, Bedfordshire. I am grateful to Mr. J. Cowley for specimens from Congresbury, N. Somerset.

Lasius umbratus Nyl.

Coupled winged sexes have been seen in my garden at Windsor, Berks., in two successive years. The mating flights occurred on warm evenings on the 1st August, 1963, and again on the 27th August, 1964.

Lasius brunneus Latr.

It occurred abundantly at Forest Gate, Windsor, during May in the presence of *Leptothorax nylanderi* Först. My wife took a solitary deälated female of the latter species wandering in the grounds of Beaumont College at Old Windsor in July.

Formica sanguinea Latr.

The distribution of this species has been reviewed recently (Barrett, 1964). I am grateful to Mr. J. Cowley for drawing my attention to a further published locality for N. Somerset (Parnell, 1938) from Steep Holm Island in the British Channel. Specimens have not been traced and this unlikely record might refer to *F. cunicularia* Latr. which is known to occur nearby on the mainland at Brean Down (Collingwood, 1961) and has been recorded from Lundy Island (Pontin, 1957). I have again failed to confirm the occurrence of *F. sanguinea* Latr. in N. Somerset (Monkton Combe), E. Sussex and W. Kent. I have seen it this season at Thursley Common and Elstead Common (SU 94), Tunnel Hill and Stony Castle, near Pirbright (SU 95), Surrey, and at Whitehill (SU 73) and Round Hill (SU 83) in N. Hants.

Formica exsecta Nyl.

Mr. S. C. S. Brown kindly showed me the solitary but flourishing colony in what is now the only Bournemouth locality known for this

species (Fraser 1959). *Tetramorium caespitum* Latr., *Tapinoma erraticum* Latr. and *Formica rufa* L. were also present in the area.

Formica rufa L.

I have been mainly concerned this season with a revision of the distribution of this species in Southern England. Confirmation of published localities (Nelmes, 1938; Yarrow, 1955) and new records obtained during 1964 are listed in Table 1.

TABLE 1

Localities recorded for *Formica rufa* L. during 1964

10 Km. Square	*Vice-County*	*Locality*
SX 76	S. Devon	Buckfastleigh.
SX 87	S. Devon	Bovey Tracey.
SY 78	Dorset	Redbridge.
SY 79	Dorset	Puddleton.
SY 88	Dorset	East Lulworth.
SY 89	Dorset	Affpuddle, Bloxworth.
SY 98	Dorset	East Holme, Rempstone.
SY 99	Dorset	Gore Heath, Lytchett Minster, Stony Down.
SZ 09	Dorset	Broadstone.
SZ 29	S. Hants	Sway.
ST 45	N. Somerset	Winscombe, Cheddar (J. Cowley).
ST 46	N. Somerset	Congresbury (J. Cowley).
ST 75	N. Somerset	Hinton Charterhouse (J. Cowley).
SU 00	Dorset	Colehill.
SU 30	S. Hants	Brockenhurst, Stockley.
SU 73	N. Hants	Whitehill.
SU 93	Surrey	Witley.
SU 94	Surrey	Thursley Common.
TQ 01	W. Sussex	Greatham.
TQ 06	Surrey	Sheerwater. (First taken here by B. Ing, 1956.)
TQ 19	Middlesex	Stanmore.
TQ 22	W. Sussex	Crabtree.
TQ 23	E. Sussex	Tilgate.
TQ 33	E. Sussex	Balcombe.
TQ 42	E. Sussex	Newick, Piltdown.
TQ 45	Surrey	Limpsfield Chart.
TQ 53	E. Sussex	Broadwater.
TQ 55	W. Kent	Seal Chart.
TQ 62	E. Sussex	Brightling.
TQ 64	W. Kent	Pembury.
TQ 73	W. Kent	Flimwell.
TQ 83	E. Kent	Biddenden.
TQ 88	S. Essex	Hadleigh (R. Lambourne).
TQ 95	E. Kent	Stalisfield.
TR 05	E. Kent	Challock.
SP 93	Bucks.	Bow Brickhill.
TL 03	Bedford	Clophill.

I am grateful to Mr. J. Cowley for the records from N. Somerset, to Mr. R. Lambourne for specimens from S. Essex, and to Mr. B. Ing for the Surrey locality. *F. rufa* was taken at Hinton Charterhouse, N. Somerset, by Mr. J. A. J. Smith in 1952. The locality was visited this season with Mr. J. Cowley and the species is now on the verge of extinction there. Two nests only were present near a felled larch plantation. One was a very small nest of chopped bracken and a further stronger colony was present in a hazel stump. A curious nest was seen

in a clearing in the New Forest near Brockenhurst, S. Hants. It was constructed of twigs and was about two feet high with almost vertical sides and resembled an upturned wicker waste-paper basket.

F. rufa was not found at the following published localities: Limpley Stoke, N. Somerset; Longleat, S. Wilts.; Glanville's Wooton and Blandford Forest, Dorset; Harewood Forest, N. Hants.; Ashstead, Reigate and Felcourt Heath, Surrey; Chiddingstone, W. Kent; Bolney, E. Sussex.

Formica cunicularia Latr.

A colony was present at Warmwell Heath, Dorset. It had constructed a solarium of heather bells above its nest in rather boggy ground. This habit has been observed in similar situations in the New Forest and seems to be a characteristic of this species.

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129 Smith's Lane, Windsor, Berks. 17.x.1964.

Notes on *Anabolia (Phacopteryx) brevipennis* (Curtis), and *Ironoquia (Caborius) dubia* (Stephens), (Trichoptera, Limnephilidae).

By Allan Brindle

These two species are amongst the rarest of the British caddis-flies, and the following notes are an attempt to discuss existing records and some aspects of their distribution. These notes result from the capture of a male *A. brevipennis* by the writer at Hawes Water, Lancashire (v.c. 60) on 9th September, 1964, which prompted some investigation into previous records.

I. dubia appears to be the rarer of the two species, and McLachlan (1865) remarks of this species: "The only known specimen is Stephens type, said to have been taken 'in June, in the vicinity of the metropolis'." Mosely (1939) comments: "This insect is so rarely seen by collectors that it must be very retiring in its habits. It has been taken in Windsor Forest, and Stephens' type is said to have been taken near London in June". The Windsor Forest record appears to consist of two specimens, swept by Donisthorpe from the banks of a small stream, a male on 2nd October, 1931, and a female on 18th September, 1932. To these three records, Crichton and Baker (1959) added a fourth, a male, taken at

Wokefield (Millbarn pond), Berkshire, on 2nd October, 1957.

Mr. E. C. Pelham-Clinton has informed me (in litt.) that a specimen of *I. dubia*, a female taken in Suffolk, is at present in Morton's collection in the Royal Scottish Museum in Edinburgh. He writes that this was originally recorded as *A. brevipennis* by Morton (1908) and Morton's label on the specimen reads "Stenophylax/dubius, Steph/ recorded E.M.M./ Vol. XLIV, 1908/ as P. brevipennis/ in error". It is not known if a correction was published.

There are thus only five British records of this insect, all in Southern England. Out of the five, four are in the present century and one is very recent.

There are more records of *A. brevipennis*, but all published records apparently are dated previous to the present century.

McLachlan (1865) remarks of *A. brevipennis*: "I am only acquainted with four British examples of this singular insect: one in Curtis' collection, of which I know not the locality: two in my own collection, taken by Mr. Fereday at Scarborough, in September, 1862; and one taken by Mr. B. Cooke, at Bowden, Cheshire". Mosely (1939) merely states, "a very local species which has been taken in this country in Yorkshire". The omission of the Cheshire record by Mosely was apparently on account of his distrust of records of specimens which he did not see himself, and evidently he had no opportunity to see the Cheshire specimen. The Cheshire record, and a second one from the same locality was published by Cooke (1882), and these records consisted of two specimens, both taken at Hale Moss, Cheshire, one on 10th June, 1865, and one on 5th June, 1868. These are the only records for the county.

Mr. D. E. Kimmins has informed me (in litt.) that there is a male specimen in the McLachlan collection labelled "Norfolk, Norwich and Ranworth Fen, 1871, C. G. Barrett".

Porritt (1907) wrote of this insect: "One of the rarest of British Trichoptera, there being only about half a dozen specimens known in collections. I have one from *York*, and the late Mr. Alfred Beaumont possessed two from the same locality, and the late Mr. McLachlan had one from *Scarborough*".

The latter was evidently an error for two, and this note brings the total of records of *A. brevipennis* to nine. The York specimen is in Porritt's collection, now in the Tolson Memorial Museum, Huddersfield, and Mr. E. W. Aubrook has kindly given the following details from the label on the specimen, which reads, "G. C. Dennis at York/ Probably Askham Bogs/ Given to me by C. G. D., Jany. 1890".

This is apparently the last record published of this species until the recent capture at Hawes Water.

The specimens of *A. brevipennis* listed above may be summarised as follows:—

1.	?	?	?	Curtis collection
2.	Scarborough	1862	Fereday	McLachlan collection
3.	Scarborough	1862	Fereday	McLachlan collection
4.	Hale Moss	1865	Cooke	
5.	Hale Moss	1868	Cooke	
6.	Norfolk	1871	Barrett	McLachlan collection
7.	York	(previous to 1890)	Dennis	Porritt collection
8.	York	?	Beaumont	
9.	York	?	Beaumont	

The first specimen is presumably in the Curtis collection in Australia, and specimens 2, 3, 6, are now in the British Museum (Natural History). No. 7 is, as mentioned, at Huddersfield. The whereabouts of the other four, however, are unknown.

There is one female specimen in the Manchester Museum without locality; this is apparently mounted by a former keeper, the late Mr. H. Britten, but it is most unusual for him to have omitted the locality since he was noted for attention to detail. Mr. Gorton, of Bolton Museum, has informed me (in litt.) that there are three specimens of *A. brevipennis* in that Museum, but it has not yet been possible to trace their origin.

There are thus four specimens whose whereabouts are unknown, and four specimens without localities. Whether a connection can be traced between them is uncertain. Cooke was a prominent member of the Lancashire and Cheshire Entomological Society, and his collection was sold in 1883, but I have not been able to trace its disposal. It is possible that it was retained in Lancashire, and if so, the Bolton specimens may include one or both of the Cheshire specimens collected by Cooke. Mr. A. Beaumont was associated with Mr. J. M. Brown, who was a recorder of Trichoptera for the Yorkshire Naturalists' Union, and a search through the copies of the *Naturalist* may give a clue as to the disposal of Beaumont's specimens. At the present the position is that the four specimens recorded of which the whereabouts are unknown, may represent the four specimens at Bolton and Manchester, but further investigation is necessary to confirm or confute this possibility.

It is quite likely that additional specimens of both *A. brevipennis* and *I. dubia* have been taken without having been recorded, and their rarity is probably more apparent than real. Both are widely distributed on the Continent, *brevipennis* having in general a more northerly distribution than *dubia*, a feature which is reflected in the British records.

Mr. Kimmins has shown me a note from O. Nybom in Finland, which was received by Mosely in 1947 (also quoted in Crichton and Baker, 1959), which reports that *dubia* was found along a small rivulet and a ditch near the home of Nybom. The insects could only be taken at sunset, when they flew over the water in numbers. At other times it was almost impossible to find them. Mosely (1939) states the position clearly when he remarks of *dubia*, ". . . it must be very retiring in its habits". The records, at least of *brevipennis*, suggest a wide distribution in Britain, and further searches will probably show that both these caddis-flies are local but not rare, the main difficulty is to find out the best time of day, and other circumstances, when the insects can be found most easily.

It would, however, seem that a much easier method may be to search for the larvae, and the larvae of both species are known and are described in Lestage (1921).

He describes the habitat of *dubia* as more or less static water, such as shaded ponds, or in woodland streams, in which the bed is covered with dead leaves. This agrees closely with the situation in Windsor Forest where Donisthorpe swept his specimens. The larval case is rather distinctive, consisting of pieces of vegetable material arranged rather like tiles on a roof, i.e. imbricated, but the case itself is "arched", i.e. rather curved longitudinally. The larva itself is the only one in the Limnephilidae to have the abdominal gills divided into about ten branches, most larvae of this family having single or double filamentous gills. The habitat of

brevipennis is given as ponds or lakes again with the bed covered with dead leaves, which suggests shaded habitats. The larval case is triangular in section, resembling in this feature those of *Limnephilus decipiens* and *L. nigriceps*, but that of *brevipennis* is said to be uniform in breadth whilst those of the *Limnephilus* species taper posteriorly. The case is covered with pieces of vegetable material as in the case of *dubia*.

It is hoped to search for the larvae of *brevipennis* at Hawes Water during the coming year, and also to try to find more adults by using various methods of collecting. It would be most useful if other entomologists could, in their light traps, check on the caddis-flies which often enter together with the Lepidoptera. By doing so they would certainly add to our knowledge of the distribution, and the flight period of many of the caddis, and possibly even produce additional records of *dubia* and *brevipennis*.

I wish to thank my correspondents mentioned for their kindness in supplying details.

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Coleopterous Fauna of Sand-martin (*Riparia riparia riparia* (L.)) Burrows in Ireland

By A. J. M. Claassens, M.Sc.

The beetles (Coleoptera) recorded in this paper were mostly taken from the burrows of sand-martins, *Riparia riparia riparia* (L.), but the specimens recorded from Ballycroneen strand (East-Cork) were recovered from the nests of starlings, *Sturnus vulgaris vulgaris* L. which had occupied deserted sand-martins' burrows.

The number of specimens of each species of beetle collected from the different localities is listed. The species not mentioned in Johnson and Halbert's (1902) list of the Irish Coleoptera have been asterisked.

Family CARABIDAE

Subfamily Harpalinae

Pristonichus terricola (Herbst), one specimen from Little Island (East-Cork), September 1963, and one specimen from Saleen (East-Cork), December 1963.

Abax parallelopipedus (Pi and Mitterpacher), one specimen from Little Island, May 1963.

Family STAPHYLINIDAE

Subfamily Oxytelinae

Omalium allardi Fairm, three specimens from two nests at Ballycroneen strand, June and July 1964.

Subfamily STAPHYLININAE

Philonthus carbonarius Gyll., one specimen from Little Island, January 1964.

**Heterothops nigra*, Kraatz, one specimen from Ballycroneen strand, June 1964.

**Quedius assimilis* Nord., two specimens from Ballycroneen strand, July 1964.

Quedius mesomelinus Fairm, one specimen from Ballycroneen strand, July 1964.

Subfamily TACHYPORINAE

Tachinus rufipes Degeer, two specimens from Little Island, June 1963.

Subfamily ALEOCHARINAE

Microglotta nidicola Fairm, five specimens from Little Island, June 1963; one specimen from Saleen, July 1964; 139 specimens and many larvae from Ballinaclash (Wicklow), June 1964, and 349 specimens and many larvae from five nests at Ovens (Mid-Cork), June 1964.

**Crataraea suturalis* (Salhb.), one specimen from Ballycroneen strand, June 1964.

Atheta palustris Kies, three specimens from Ballycroneen strand, June 1964.

**Atheta zosterae* Thoms., one specimen from Ballcroneen strand, July 1964.

**Atheta nigricornis* Thoms., one specimen from Ballcroneen strand, July 1964.

Drusilla canaliculata Fairm, one specimen from Saleen, July 1964.

Aleochara diversa Sahlb., one specimen from Ballycroneen strand, June 1964

Subfamily PAEDERINAE

**Sunius melanocephalus* Fairm, one specimen from Ballycroneen strand, July 1964, and one specimen from Saleen, July 1964.

Family CRYPTOPHAGIDAE

Cryptophagus saginatus Sturm, four specimens.

Cryptophagus distinguendus Sturm, one specimen, both species were taken at Ballycroneen strand, June and July 1964.

Family LATHRIDIIDAE

Subfamily LATHRIDIINAE

**Lathridius cosimilis* Mann., one specimen from Ballycroneen strand, July 1964.

Dr. J. Balfour Browne, who identified this species noted, that there is still uncertainty about *L. cosimilis* which might also be *L. minutus* (L.).

Discussion

Microglotta nidicola was the only species which was found in large numbers in the nests examined. It was the only beetle of which larvae were found. It is difficult to determine in what ways this beetle benefits by its nidicolous existence. Johnson and Halbert (1902) found *M. nidicola* in sand-martin burrows at Coolmore (Donegal) and Killiney (Dublin). Keer (1930) recorded it from sand-dunes, sand-martin burrows, nests of starlings, herons, *Ardea cinerea* L., goshawks, *Accipter gentilis*

(L), as well as from the burrows of rabbits, *Oryctolagus cuniculus* (L.), and from the nests of the ants *Lasius fuliginosus* Latr. and *L. brunneus* Latr,

The species *M. nidicola*, *C. suturalis*, *D. canaliculata* and *C. saginatus* have been recorded not only from the nests of birds but also from ants' nests, decaying matter, under leaves, etc. (Keer, 1930). Faris (1936) recorded that the beetle *Astilbus canaliculatus* (=*D. canaliculata*) attacked ants of the species *Myrmica sabuleti* Meinert in Co. Cavan. Several of the other species have been previously recorded associated with other animals

The presence of 13 species (11 Staphylinidae and two Cryptophagidae) in two nests of starlings at Ballycroneen strand is an indication that the beetles must be able to find the nests. The attractant may be decaying matter to feed on, or some beetles may be predatory on woodlice (Isopoda), mites (Acarina), fleas (Siphonaptera), flies (Diptera) and moths (Lepidoptera), or their immature stages, which were all present in these nests. The interesting coleopterous fauna and their ecology in birds' nests invites further investigation.

ACKNOWLEDGMENTS

Thanks are expressed to Dr. J. Balfour Browne, Principal Scientific Officer, British Museum (Nat. Hist.), Department of Entomology, who kindly identified all Staphylinidae and Cryptophagidae mentioned in this paper. Thanks are extended to Professor Fergus O'Rourke, Department of Zoology, University College, Cork, under whose supervision the study of nidicoles was undertaken.

Department of Zoology, University College, Cork. September 1964.

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Notes and Observations

THE HIBERNATION AND PUPATION OF COSSUS COSSUS L.—I was greatly interested in Commander Harper's note on this subject (*antea* 227). In my youth, my grandfather lived at Stanford-le-Hope, Essex, then a small country village. *Cossus* was very common there, indeed there was a disused saw-pit surrounded by willows near his house where the larvae were so abundant that they could be smelt from the road five yards away.

In the autumn of 1902, when I paid one of my usual duty visits, I was told that the gardener had dug up two goat moth caterpillars when ridging the vegetable plot for the winter, and they had been saved for me. When I got home, I emptied the tin and found they had begun to spin cocoons, so I put them back in the tin with more earth and placed them in the garden shed for the winter. Towards the end of April I emptied the tin and found they had spun tough cocoons of earth and silk and I could hear the pupa rattling when I shook these.

I accordingly re-buried the cocoons in the earth and in due course two perfect specimens of *cossus* emerged.

As I have already said, *cossus* was common in the district; C. R. N. Burrows used to take one or two at sugar in his garden every year. As *cossus* is a non-feeder, this seems very strange, but Burrows said these were always females and he thought they mistook the sugar for sap from an injured trunk when looking for somewhere to lay their eggs.—H. C. Huggins, F.R.E.S., 65 Eastwood Boulevard, Westcliff-on-Sea, Essex. 30.x.1964.

Hibernation and Pupation of Cossus cossus L. (Lep. Cossidae).—In the October issue (*antea* 226) Commander Harper expresses the belief that those larvae of *cossus* which leave the tree in the autumn, return for pupation in the spring to one tree or another. As a boy I lived in a private road in Lewes, Sussex, in front of which stretched a long row of well grown black poplars. Some of these trees were riddled by the larvae of this species, and at that time I frequently saw the full fed larvae in the roadway, far from the nearest of these infected trees, and in the summer, from time to time, noted moths on the trunks, and pupa cases protruding, but always thought it odd that I saw so few in comparision with the number of larvae seen in the previous autumn.

During the 1914-18 war, a Lewes grocer had a consignment of dried figs of Greek or Turkish origin, condemned as unfit for human consumption, and these were carted to his small walled garden just outside the town. I cannot say at what precise date this was done, but in 1921, upon my return to the town on my demobilisation, he asked me if I was interested in foreign moths, as he was finding large moths on the rotten figs, and had done so for several years. On inspecting his garden, I found it was devoid of trees, and that the figs, stacked against the wall, had formed a solid mass, from which empty pupa cases were extruding, and upon opening this material up with a spade, a great many larvae of *cossus* were found, of all sizes from very small to full fed.

Beyond doubt, these figs had been infested by this species in this country, either before condemnation, or after removal to the garden; I suspect the latter. They had bred in this strange way successfully over a period of years, so despite the obvious adaptation for pupation in a tree, they can do quite well in other surroundings.

In the early 1930s, I noted a few oak trees at Pulborough, by the marsh, which were much infested by *cossus* larvae, and here, as at Lewes, I often found larvae in the roadway in the autumn, far from these or any trees, but rarely found the moth, and never found a protruding pupa case.

From these experiences, I must express disbelief in the suggestion that the larvae which leave the trees ever return, but I think it probably true that many larvae remain in the trees to winter, and others pupate in earth or other material at the tree base. On the only occasion when I decided to breed from straying larvae, I put two in a wooden box with both earth and wood, and in the spring discovered that both had eaten their way out through the box, and could not be found at that time, despite a thorough search, but later in the year I found a freshly emerged moth on a cupboard door and the pupa case projecting from one of the floor boards at the cupboard bottom.—A. J. Wightman, F.R.E.S., 67 The Spinney, Pulborough, Sussex. 25.x.1964.

EUROIS OCCULTA L. IN 1964.—I notice two or three references to *Eurois occulta* L. in the October number of the Record. Seven examples of this species came to my trap in Sheffield between 14th and 24th August, so there would appear to have been quite a large immigration. All were of the pale continental form, five males and two females, both of which failed to lay any eggs.—W. REID, 6 Whirlow Park Road, Sheffield 11. 29.x.1964.

ACHERONTIA ATROPOS L. IN SUFFOLK.—During the first two weeks of October 1964, I had the good fortune of having four pupae of *Acherontia atropos* L. given to me. These had been found in the potato fields around Stowmarket, Suffolk.—T. M. SHIPP, F.N.D., F.N.D.S., 14 Silverdale Avenue, Stowmarket, Suffolk. 20.x.1964.

LITHOPHANE LEAUTIERI AND OTHER NOTABLE RECORDS OF MOTHS AT ARUNDEL.—A male *Lithophane leautieri* was taken in the mercury vapour light trap on 3rd October 1964, being the first record of this species in the district. The following migrant species were taken in the mercury vapour trap this year: *Lithosia quadra*, 4 on 17th July, one on 18th July, and one on 19th July; *Leucania albipuncta*, one on 13th September; *Leucania unipuncta*, one on 18th September, one on 3rd October and one on 4th October; *Leucania l-album*, one on 2nd October.—G. HAGGETT, 1 Torton Hill, Arundel, Sussex. 9.xi.1964.

THE ISLE OF ARRAN, 1964,—A POSTCRIPT.—In the final paragraph of my note on the Isle of Arran (*Ent. Rec.*, 76: 229-30) reference was made to a larva which evaded indentification. On 26th September the mystery was solved as a female *Chloroclysta miata* L. emerged. This species therefore completes the list of macro lepidoptera found on the island during the period under review.—M. J. LEECH, The Cottage, Hallgates, Cropston, Leicestershire. 26.x.1964.

ODONTAEUS ARMIGER Sp. (COL. SCARABAEIDAE) IN NORTHAMPTONSHIRE.—During a visit to Kings Cliffe, Northamptonshire, on 27th July two specimens, a male and female, of this rare beetle flew into m.v. light. Little is known about the early stages but it seems to be associated with dung. From the amount of rabbit droppings present in the area it may be that there is some relationship between the species and this pabulum.—M. J. LEECH, The Cottage, Hallgates, Cropston, Leicestershire. 26.x.1964.

AN APPARENT MIGRATION OF RED ADMIRALS.—In view of the phenomenal numbers of *Pyrameis atalanta* L. in most parts of the British Isles this summer (1964) I have thought it is of special interest to mention that my neighbour, Mr. J. A. G. Coates, tells me that whilst sailing off the coast of South Devon between 20th and 27th August, he saw on several fine days red admirals passing, sometimes two a minute, usually some three feet above the water. He was in Wembury Bay, just south-east of Plymouth Sound, about five miles off shore and says the general direction of the butterflies was north-westerly. He estimates that he must have observed several hundred specimens flying past in this way and that all the gardens along the coast were full of red admirals during the following days.—C. G. M. de WORMS, Three Oaks, Woking, Surrey. 9.xi.1964.

WHO WAS COLEMAN?—Dr. R. G. Ainley's query in the November *Record* (*Ent. Rec.*, **76**: 254) is answered in the *Dict. Nat. Biog.* (Second Supp., **1**. 382) where an account of William Stephen Coleman (1829-1904) is given.—P. B. M. ALLAN.

FOODPLANT OF CUCULLIA VERBASCI LINN.—I can confirm Barrett's record (*Lep. Br. Is.*, **6**: 64) referred to by Mr T. D. Fearnehough at page 267 of *Ent. Rec.*, **76** (November 1964) of this species feeding on *Buddleia globosa.* Some years ago I found several of its larvae on a shrub of this species growing against the wall of a farmhouse in N.W. Essex. A search of the magazines would probably disclose further records. An entry in my diary under date 11th July 1941 reads: "To-day I placed six *C. verbasci* larvae, found on 4th July on *Verbascum thapsus,* on *Scrophularia aquatica.* They began to eat the new food at once. They are from one-third to half-grown" —P. B. M. ALLAN.

APEIRA SYRINGARIA L., A DISPROPORTIONATE RATIO OF THE SEXES.—On 27th July whilst going the rounds of the sugar patches at Kings Cliffe, Northamptonshire, a female *Apeira syringaria* L. (Lilac Beauty) was netted. Not having a full series of this handsome insect it was decided to keep her for eggs. To aid ovipositing she was, on the following day, enclosed in a sleeve with some privet stems. Ova appeared in plenty and as I had far more than actually required some were given away to a friend. Approximately half of the resulting larvae retained fed up rapidly and pupated. This state of affairs was reproduced with those that were handed on. Emergence commenced in late August and continued through to the first week of September. The ratio of females to males, in both cases, is so unbalanced that it is worth recording. All my pupae emerged; these produced 24 females and one male: of those given away nine females and one male emerged. Why this peculiar state of affairs came about is perplexing. It would be interesting to have comments on this and I should be interested to know if there is any biological reason behind the uneven ratio. The remaining larvae (in both cases) have gone into hibernation and it remains to be seen if the specimens which will result next year will be predominantly of the male sex.—M. J. LEECH, The Cottage, Hallgates, Cropston, Leicestershire. 26.x.1964.

APATELE LEPORINA L. OVERWINTERING A THIRD TIME.—In a previous note (*Ent. Rec.*, 76: 29) on this species attention was drawn to the fact that in captivity pupae had gone over for a second winter. At the appointed time this year a proportion emerged satisfactorily but some failed to emerge. The remaining pupae are healthy and it now appears as if they are going over for a third winter. Since the time they originally pupated the pupae have been kept indoors.—M. J. LEECH, The Cottage, Hallgates, Cropston, Leicestershire. 26.x.1964.

MIGRANT MOTHS AT WESTON-SUPER-MARE.—The only migrants of interest that I have seen in my moth trap here this year have been a specimen of *Heliothis peltigera* Schiff. on 15th August and two females of *Nycterosea obstipata* Fab. on 10th and 23rd September respectively.—C. S. H. BLATHWAYT, 27 South Road, Weston-super-Mare. 19.xi.1964.

NYMPHALIS ANTIOPA L. IN CAMBRIDGESHIRE.—It is now sixty years since the last recorded appearance of this occasional migrant in Cambridgeshire. This year (1964) two have been reported to me, both by reliable observers who know the butterfly. There is the possibility that only one butterfly is involved, since *antiopa* is both long-lived and a strong flyer; there is less than a fortnight between the two observations and the localities are only some two miles apart. The first specimen was seen in Storey's Way, Cambridge, during the middle of August by Col. R. G. Turner and the second by Mr. and Mrs. Stevens towards the end of the same month, between the villages of Barton and Grantchester.—BRIAN O. C. GARDINER, 18 Chesterton Hall Crescent, Cambridge. 12.xi.1964.

NYMPHALIS ANTIOPA L. ON ANGLESEY.—My daughter, Mrs. M. Smith, of Dore, Sheffield, advises me that she saw a specimen of *Vanessa antiopa* L. at Llandwyn Island, on the south coast of Anglesey in August this year. I was, I am afraid, quite unimpressed at first, thinking that she had made a mistake, but her description of what she saw is exactly that of a Camberwell beauty. She is not a collector, but knows enough about butterflies to recognise something unusual when she sees it.—WILLIAM REID, 6 Whirlow Park Road, Sheffield 11, 19.xi.1964.

Current Literature

The Scientific Principles of Crop Protection (Fifth Edition). By Hubert Martin. Edward Arnold (Publishers) Ltd. Pp. viii + 376. 90/-.

This edition is mentioned by the author in his preface as introducing two new features in crop protection which were not included in the fourth edition. These two advances are the synthesis of new molecules of selective toxicity, which tend to reduce the hazards associated with general pesticides which have aroused some public opposition, and also the advances in applied biology, which has developed into a study of the relationships between host and pest, enabling methods which do not involve the use of toxic chemicals to be applied, thus giving scope for the co-operation of entomologists and mycologists with those engaged in crop protection.

The text is divided into sixteen chapters, Chapter I. being a general introduction, and giving an interesting account of man's outlook on plant diseases back to the days of Pliny and even earlier. Plant resistance is discussed in Chapter II., giving examples of the development of strains resistant to both pathogens and to insect pests, the term insect being used throughout to give the sense of arthropod. On through the chapters, the many different aspects of this subject are dealt with in a thorough, clear, and interesting manner, and there is much of great interest even for one who is not an advanced chemist, the chapters on traps and on biological control being particularly interesting.

The index is divided into an Authors index and a Subject index, and there is a very good bibliography at the end of each chapter. The paper is of good quality and the book is strongly bound in linen boards. It is essentially a book for the student and specialist, but it is one which should find a place in the libraries of scientific agricultural and natural history societies.

S. N. A. J.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

HOLIDAY AT THORPENESS, SUFFOLK, 1964. J. M. CHALMERS-HUNT and S. WAKELY 271

HADENA BARRETTII DBLD. THE HARD WAY. Major-General C. G. LIPSCOMB, C.B., D.S.O. 275

MORE ABOUT *HELIOTHIS PELTIGERA* Schiff. H. SYMES 278

A VISIT TO YUGOSLAVIA, 1964. Dr. NEVILLE L. BIRKETT 279

POLYMORPHISM IN N.E. DERBYSHIRE. J. H. JOHNSON, F.R.E.S. 282

A NEW ABERRATION OF *XYLOCAMPA AREOLA* ESP. H. C. HUGGINS, F.R.E.S. 286

ANT RECORDS AND OBSERVATIONS FOR 1964. K. E. J. BARRETT 287

NOTES ON *ANABOLIA* (*PHACOPTERYX*) *BREVIPENNIS* (CURTIS), AND *IRONOQUIA* (*CABORIUS*) *DUBIA* (STEPHENS), (TRICHOPTERA, LIMNEPHILIDAE). ALLAN BRINDLE 289

COLEOPTEROUS FAUNA OF SAND-MARTIN (*RIPARIA RIPARIA RIPARIA* (L.)) BURROWS IN IRELAND. A. J. M. CLAASSENS, M.Sc. 292

NOTES AND OBSERVATIONS 294

CURRENT LITERATURE 298

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (211)

TO OUR CONTRIBUTORS

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The Entomologist's Record and Journal of Variation

SPECIAL INDEX

VOL. 76, 1964

PAGE

DIPTERA

aeneus (Eristalis) 45
albiceps (Philonicus) 175
albimana (Ptycoptera) 46
alpium (Tipula) 46
aperta (Phylidorea) 46
austeni (Glossina) 90
autumnalis (Dicranomyia) 45, 46
berberina (Criorrhina) 174
bergenstammi (Cheilosia) 45
bifasciata (Metalimnobia) 45
bifurcata (Rhypholophus) 46
borealis (Sericomyia) 247
caesio (Myiolia) 142
chorea (Dicranomyia) 45
cinctellus (Syrphus) 45
claripennis (Tricyphona) 46
crabroniformis (Asilus) 175
cyanella (Dasyphora) 144
cylindrica (Leptogaster) 175
dentata (Gonomyia) 45
didyma (Dicranomyia) 45
dorsalis (Hydromya) 143
errans (Phaonia) 58
evansi (Apterodromia) 147
fasciata (Didea) 45
ferruginea (Phylidorea) 46
flavipes (Geosargus) 45
flavipes (Trichinomyia) 143
floccosa (Criorrhina) 174
fulva (Arctophila) 45
fulvipennis (Tipula) 45, 46
fuscicornis (Helomyza) 58
glaucus (Syrphus) 45
Glossina 89, 90
haemorrhoidalis (Rypholophus) 46
hederae (Ormosia) 46
heraclei (Philophylla) 142
immaculata (Tricyphona) 46
impunctatus (Culicoides) 58
lardaria (Polietes) 58
lineola (Phylidorea) 46
lineola (Rhagio) 45
littoralis (Crunobia) 45
lutea (Erioptera) 46
luteipennis (Tipula) 46
macrostigma (Limonia) 45
maculata (Rhipidia) 45
maritima (Anomalopteryx) 147
marmorata (Tipula) 45, 46
melanoceros (Tricyphona) 46
modesta (Dicranomyia) 45, 46
muscaria (Egle) 144
Myopa 175
myopina (Chlorops) 198, 246
neglecta (Chlorops) 198, 246

PAGE

nemoralis (Pilaria) 46
nubeculosa (Limonia) 46
ochracea (Austrolimnophila) 45
pagana (Tipula) 45, 46
parva (Egle) 144
personata (Pocota) 174
phalerata (Drosophila) 58
pomonae (Bibio) 44
quadrifaria (Nephrotoma) 45
ranunculi (Criorrhina) 174
rivosa (Pedicia) 46
rufina (Tipula) 46
scolopendrii (Phytomyza) 118
scripta (Tipula) 45
silentis (Sericomyia) 45
spinipes (Rhamphomyia) 45
straminea (Crunobia) 46
subtilis (Paradicranota) 46
sylvatica (Ula) 45
Trichina 143
Trichinomyia 143
trivialis (Erioptera) 46
varia (Rhypholophus) 46
variegata (Phaonia) 58
vomitoria (Calliphora) 58
Zodion 175

LEPIDOPTERA

abietaria (D. ribeata)
abruptaria (Menophra) 96
abscissana (Lobesia) 275
absinthiata (Eupithecia) 44
absinthii (Cucullia) 17, 22, 28, 142
accreta (Pyrgus) 12, 13
aceris (Apatele) 166
achatana (Ancylis) 94
achatinella (Nyctegretis) 94, 274
actaea (Hipparchia) 15
acteon (Thymelicus) 99
adsharica (Zygaena) 9
adusta (Eumichtis) 26, 43, 157, 235
adustata (Ligdia) 26
advena (Orthosia) 96
aegeria (Pararge) ... 69, 70, 73, 153, 163, 178, 180, 189
aegon (P. argus)
aeneella (Stigmella) 23
aeriferana (Ptycholomoides) 28, 94
aescularia (Alsophila) 68
aetherie (Melitaea) 180
aethiops (Erebia) 121, 127
affinis (Cosmia) 26, 98
affinitata (Perizoma) 26, 69
agathina (Amathes) 26, 235
agenjoi (Z. nevadensis)

PAGE
agestis (Aricia) 30, 37, 39, 69, 71, 105, 154, 163, 189, 200
aglaia (Argynnis) ... 11, 15, 37, 39, 42, 43, 70, 72, 73, 103, 105, 126
alberganus (Erebia) 104
albicillata (Mesoleuca) 25, 38
albicolon (Heliophobus) 70, 94
albipuncta (Leucania) 30, 296
albula (Nola) 93, 274
albulata (Asthena) 69
albulata (Perizoma) 26, 44
alceae (Carcharodus) 126, 163, 179, 188
alcetas (Everes) 281
alchemillata (Perizoma) 44, 230
alciphron (Lycaena) 12
alcyone (Hipparchia) 11, 14
alexanor (Papilio) 188
algira (Zygaena) 35, 131
algirica (Hipparchia) 162
alni (Apatele) 97, 215
alpicola (Amathes) 39, 245
alpinellus (Platytes) 116, 158
alpium (Moma) 25, 97
alternana (Stenodes) 94
alternaria (Semiothisa) 93
alternata (Epirrhoë) 44, 69
alveus (Pyrgus) 105, 127
amathusia (Argynnis) 103
ambigua (Caradrina) 26
angustalis (S. punctalis)
annulata (Cosymbia) 26
anomala (Stilbia) 235
anonyma (Limenitis) 281
anthyllidis (Zygaena) 8, 14
antiopa (Nymphalis) 84, 104, 119, 298
antiqua (Orgyia) 274
antiquana (Endothenia) 227
apiella (Depressaria) 91
apiformis (Sesia) 26
apollo (Parnassius) ... 11, 13, 104, 126, 211, 255
aprilina (Griposia) 98
areola (Xylocampa) 68, 69, 286
arethusa (Hipparchia) 15
argiades (Everes) 106, 255
argiolus (Celastrina) 74, 153, 163, 179
argus (Plebejus) 12, 14, 87, 106
argyrognomon (P. ida)
aridellus (Pediasia) 92, 274
arion (Maculinea) 12, 38, 63, 232
aristaeus (H. algirica)
armoricanus (Pyrgus) 281
asella (Heterogenea) 26
ashworthii (Amathes) 38, 247
assimilata (Eupithecia) 25
asteris (Cucullia) 25, 98
atalanta (Vanessa) 29, 40, 71, 73, 154, 162, 179, 193, 200, 216, 246, 276, 296
athalia (Melitaea) 104, 186
atlantica (Sterrha) 254
atricapitana (Phalonia) 275
atricapitella (Stigmella) 213
atropos (Acherontia) 29, 34, 245, 296
augur (Graphiphora) 26, 43
aurago (Tiliacea) 98
PAGE
aurantiaria (Erranis) 71
aurinia (Euphydryas) ... 17, 63, 73, 84, 88, 120, 200, 266, 270
ausonia (Euchloë) 154, 178, 179
ausonia (Pieris) 187
australis (Aporophila) 210
australis (Colias) 15, 179, 280
avellana (Apoda) 26, 97
aversata (Sterrha) 44, 283, 285
bachaga (Z. algira)
badiata (Earophila) 69
badiella (Depressaria) 92
ballus (Thestor) 154, 178, 179, 180, 189, 214
barbalis (Herminia) 26, 44
barrettii (Hadena) 275
basistrigalis (Scoparia) 20
baton (Philotes) 127
baton (Turanama) 13
belemia (Euchloë) 154, 178, 180
bellargus (Lysandra) ... 13, 15, 63, 69, 70, 74, 84, 88, 106, 127, 200, 236, 266, 270, 281
bembeciformis (Sphecia) 264
berberata (Pareulype) 271
betulae (Thecla) 74, 86
betularia (Biston) ... 44, 199, 216, 230, 283, 285
bicolorata (Hadena) 70
bicolorata (P. rubiginata)
bicuspis (Harpyia) 38
bidentata (Gonodontis) 283, 285
bifida (Harpyia) 26, 166
bilineata (Euphyia) 18, 19, 44, 157, 225
bilunaria (Selenia) 69
binaria (Drepana) 23
bipunctella (Ethmia) 94
biriviata (Xanthorhoë) 97
biundularia (Ectropis) 166
blanda (Caradrina) 44, 230
blandiata (Perizoma) 20, 44
blandina (Erebia) 121
blomeri (Discoloxia) 38
bochus (Jamides) 142
boeticus (Lampides) 154, 163, 253, 255, 268
boisduvaliella (Epischnia) 271, 273
bombycina (Hadena) 166, 168
bractea (Plusia) 20, 44, 225, 235
brassicae (Mamestra) 19, 225
brassicae (Pieris) ... 43, 60, 68, 73, 154, 161, 178, 253, 259, 280
brevilinea (Arenostola) 97, 181, 244
briseis (Chazara) 16, 148, 281
brunnea (Diarsia) 20, 43
brunnearia (Selidosema) 25
bryce (Satyrus) 15, 126
bryoniae (Pieris) 28, 212
caecana (Grapholita) 94
caeruleocephala (Episema) 71, 98
caesia (Hadena) 19, 20, 156
caesiata (Entephria) 41, 44
caja (Arctia) 41, 43, 166, 223
c-album (Polygonia) 71, 73, 87
callida (Colias) 127

PAGE
callidice (Pontia) 12, 13
callirhoë (Pyrameis) 253, 286
callunae (Lasiocampa) 235
calodactyla (Platyptilia) 18, 225
cambrica (Venusia) 230
camelina (L. capucina)
camilla (Limenitis) 28, 70, 72, 73
caniola (Eilema) 16
capsophila (Hadena) 28
captiuncula (Phothedes) 42, 43, 224
capucina (Lophopteryx) 43, 166
cardamines (Anthocaris) ... 37, 69, 73, 200, 254
carduella (Agonopterix) 94
cardui (Vanessa) 71, 73, 103, 106, 126, 142, 162, 178, 179, 200, 213, 216, 246, 277, 280, 281, 282
carlinae (Pyrgus) 105, 127
carmelita (Odontosia) 37, 96, 166
carniolica (Zygaena) 132
carpinata (Trichopteryx) 95
carpini (S. pavonia)
carthami (Pyrgus) 127
castigata (Eupithecia) 155
cecilia (Pyronia) 163
celerio (Hippotion) 28, 40
celeus (Z. romeo)
centaureae (Pyrgus) 259
centaureata (Eupithecia) 44
centonalis (C. trituberculana)
centrostrigaria (Xanthorhoë) 254
cervinalis (Rheumaptera) 26, 271
cespitellus (Crambus) 213
chaerophylli (Depressaria) 271, 272
chalcites (Plusia) 254
chamomillae (Cucullia) 17, 27, 69
chaonia (C. ruficornis)
chaos (Z. mana)
charlotta (A. aglaia)
chi (Antitype) 234
chrysanthemana (Cnephasia) ... 158, 226
chrysitis (Plusia) 44
chryson (Plusia) 86, 97
cilialis (Nascia) 228, 274
ciliella (Agonopterix) 273
cinctaria (Cleora) 96
cinnamomeana (Pandemis) 94, 230
cinxia (Melitaea) 15, 69, 266
circe (Hipparchia) 15, 213, 281
circellaris (Agrochola) 85
circumflexa (Plusia) 254
citrago (Tiliacea) 25, 26, 98, 234
citrana (Thiodia) 93, 212
citrata (Dysstroma) 39, 44, 235
clavipalpis (Caradrina) 23
clavis (Agrotis) 70
cleopatra (Gonepteryx) ... 15, 153, 161, 179, 188, 213, 254
cnicana (Phalonia) 91
cnicella (Agonopterix) 275
c-nigrum (Amathes) 28, 43
cocandica (Zygaena) 131
cognata (Thera) 44, 235
cognatella (Yponomeuta) 117
comariana (Acleris) 275
PAGE
comes (Euschesis) 43, 120, 226, 230
comitata (Pelurga) 44
comma (Hesperia) 13, 15, 105, 127, 128, 280, 281
complana (Eilema) 19, 43, 70, 224
complanella (Tischeria) 213
compta (Hadena) 60, 97, 142, 267, 274
comptana (Ancylis) 69
conigera (Leucania) 43
conjuncta (Catocala) 164
consonaria (Ectropis) 25, 166
conspersa (Hadena) 20, 155
conspersana (Cnephasia) 158, 159
conspicillaris (Xylomyges) 96
contaminei (Zygaena) 13
contaminellus (Pediasia) 92
conterminella (Agonopterix) 275
contigua (Hadena) 97
convolvuli (Herse) 163, 216, 256, 266
cordigera (Anarta) 37
cordula (S. bryce)
coridon (Lysandra) 11, 13, 15, 63, 71, 74, 88, 105, 119, 127, 128, 266, 280
corinna (Chortobius) 163
coronata (Chloroclystis) 44
corylata (Electrophaes) 69
cossus (Cossus) 227, 294, 295
costaestrigalis (Schrankia) 25, 26, 97
costana (Clepsis) 91
craccae (Lygephila) 233
cramerella (Lithocolletis) 213
crassalis (B. fontis)
crataegi (Aporia) ... 11, 105, 189, 212, 213, 255
crataegi (Bucculatrix) 213
crataegi (Trichiura) 26
craterellus (Crambus) 213
crenata (Apamea) 283, 284
crepusculella (Opostega) 91
cribrum (Coscinia) 164
cribumalis (Zanclognatha) 98, 272
crinanensis (Hydraecia) 226
croceago (Jodia) 26
croceus (Colias) ... 11, 15, 73, 106, 154, 161, 173, 178, 179, 200, 217, 243, 253, 266, 267, 276, 280, 281
cruda (Orthosia) 68
cucubali (H. rivularis)
cuculata (Euphyia) 274
cucullatella (Nola) 26
cucullina (Lophopteryx) 95, 274
culiciformis (Aegeria) 26
culmellus (Crambus) 213
cursoria (Euxoa) 98, 273
curtula (Clostera) 25, 96
cydippe (Argynnis) 15, 72, 73, 127
dahlii (Diarsia) 235
dalmatina (Z. punctum)
damon (Agrodiaetus) 15, 105, 127
daphne (Argynnis) 15
daphnis (Meleageria) 281
daplidice (Pontia) ... 106, 119, 128, 161, 179
dardanus (Papilio) 120
dealbana (Gypsonoma) 275
deceptoria (Lithacodia) 214

PAGE
decolorella (Blastobasis) 275
defoliaria (Erannis) 71
dentalis (Cynaeda) 94
depuncta (Amathes) 235
derasa (H. pyritoides)
derivalis (Paracolax) 20
derivata (Anticlea) 69
designata (Xanthorhoë) 230
dia (Argynnis) 15, 128, 255
diamina (Melitaea) 11, 103, 104
dictaea (P. tremula)
dictynna (M. diamina)
didyma (Melitaea) ... 11, 13, 15, 126, 127, 281
dilecta (Catocala) 164
diluta (Asphalia) 98
dilutella (Pempelia) 226
dimidiata (Sterrha) 44
diniana (Zeiraphera) 23
dipoltella (Phalonia) 94, 275
disa (Erebia) 259
dispar (Lycaena) 282
dissoluta (Nonagria) 94, 183, 274
distans (Crombrugghia) 213
distinctaria (Eupithecia) 225
distinctella (Chionodes) 275
ditrapezium (Amathes) 26, 235, 274
diversana (Tortrix) 17
dodoneata (Eupithecia) 26
dominula (Panaxia) 28, 95, 120, 266
dorilis (H. tityrus)
dorus (Coenonympha) 16
douglasi (Bankesia) 31
dromedarius (Notodonta) 43, 166, 274
dryas (Hipparchia) 15, 16, 128
dubiosa (Pieris) 179
dubitata (Triphosia) 26
duplaris (Tethea) 38
duponcheli (Leptidea) 16
eburnata (Sterrha) 38
egea (Polygonia) 126, 281
egeria (P. aegeria)
elegans (Zygaena) 135
elinguaria (Crocallis) 44
elongella (Caloptilia) 91
elpenor (Deilephila) 43, 69
elymi (Arenostola) 98, 274
emalea (Cirrochroa) 142
emarginata (Sterrha) 97
emortualis (Trisateles) 99
emutaria (Scopula) 26
ephialtes (Zygaena) 134
epiphron (Erebia) 12, 14, 42, 103, 127, 152
epomidion (Apamea) 26
erebaea (Z. mana)
erebus (Z. mana)
ergane (Pieris) 189, 280
eros (Polyommatus) 105
escheri (Polyommatus) 12, 15, 105
eunomia (Proclossiana) 259
eupheme (Zegris) 179
euphemoides (Euchloe) 154, 178, 180
euphorbiae (Apatele) 42, 43, 245
euphorbiana (Lobesia) 93, 159
PAGE
euphrosyne (Argynnis) ... 37, 72, 73, 224, 260
euryale (Erebia) 103, 122, 127
evias (Erebia) 14
evonymella (Yponomeuta) 94, 117
exclamationis (Agrotis) 26, 43
exigua (Laphygma) 29, 200
exiguata (Eupithecia) 26
expallidana (Eucosma) 275
exsoleta (Xylena) 26
extersaria (Ectropis) 38
exulans (Zygaena) 104, 133, 152
fagata (Operophtera) 26, 40
fagella (Diurnea) 69
fagi (Hipparchia) 281
fagi (Stauropus) 38, 96, 166, 185
fallonella (Acrobasis) 213
farfarae (Eucosma) 70
fascelina (Dasychira) 27, 94, 274
fascelinellus (Pediasia) 274
fasciaria (Ellopia) 20, 272
fasciata (Paduca) 142
fasciuncula (Procus) 43, 283, 285
fausta (Zygaena) 16, 131
feisthameli (Iphiclides) 179
felix (Zygaena) 130
ferrugalis (Udea) 29, 223
ferrugata (Xanthorhoë) 44
festiva (D. mendica)
festucae (Plusia) 44
fidia (Hipparchia) 15, 16
filicivora (Teichobia) 20
filigrammaria (Oporinia) 235
filipendulae (Zygaena) ... 13, 26, 37, 149, 153
fimbrialis (Thalera) 92
fimbriata (Lampra) 70
firmata (Thera) 235
flammea (Meliana) 193
flammea (Panolis) 95
flammeolaria (Hydrelia) 26, 70, 94
flavalis (Pyrausta) 70
flavella (Agonopterix) 93
flavicornis (Achlyia) 37, 95, 230
flaviventris (Aegeria) 26
flavofasciata (Perizoma) 25, 69
flexula (Laspeyria) 70, 94
floccifera (Reverdinus) 281
fluctuosa (Tethea) 38
fluxa (Arenostola) 97
fontis (Bomolocha) 38, 98
forficalis (Mesographe) 44
forficellus (Schoenobius) 225
formosana (Lozotaeniodes) 28
foulquieri (Pyrgus) 15
fraxinata (Eupithecia) 20
freija (Clossiana) 259
freyeri (Z. romeo)
frigga (Clossiana) 259
fuciformis (Hemaris) 26
fuliginosa (Phragmatobia) ... 36, 43, 85, 164, 166
fulvana (Eucosma) 94
fulvata (Cidaria) 44, 274
fumosella (Solenobia) 34

PAGE
furcata (Hydriomena) 44, 211
furcula (Harpyia) 166
furfurana (Bactra) 92
furuncula (Procus) 230
furva (Apamea) 42, 43, 70, 235
fuscedinella (Coleophora) 91
fusconebulosa (Helialus) ... 26, 84, 225, 230
galathea (Melanargia) ... 12, 15, 66, 70, 93, 126
galiata (Epirrhoë) 26, 69
gallica (Zygaena) 2, 4, 5
gamma (Plusia) ... 23, 28, 29, 39, 44, 60, 164, 193, 216, 254
gemmaria (C. rhomboidaria)
gemmiferana (Grapholita) 70
genitalana (Cnephasia) 93
gentianana (Endothenia) 68
gerronella (Brachmia) 94
giesekingiana (Zygaena) 2, 4
gigantellus (Schoenobius) 274
gilvaria (Aspitates) 42, 44
glandon (Aricia) 105
glareosa (Amathes) 230, 235
glauca (H. bombycina)
glyphica (Ectypa) 26
gnoma (Pheosia) 43, 69
gonodactyla (Platyptilia) 69
goossensiata (Eupithecia) 26
gorgone (Erebia) 11, 12, 13, 14
gothica (Orthosia) 68
gracilis (Orthosia) 38, 69, 229, 230
graminis (Cerapteryx) 26, 43
graslini (Zygaena) 133
griseata (Lithostege) 271
grossulariata (Abraxas) 44, 224, 230
halterata (Lobophora) 26
harpagula (Drepana) 38
hastata (Rheumaptera) 26
hastiana (Acleris) 275
haworthiata (Eupithecia) 26, 94
haworthii (Celaena) 234
hecabe (Eureme) 142
hecta (Hepialus) 26
helvola (Anchoscelis) 71, 98
hepatica (Polia) 38, 96
hera (E. quadripunctaria)
hermione (Hipparchia) 15, 16
hippocrepidis (Zygaena) 13, 134
hippothoë (Lycaena) 13, 105, 255
hirtaria (Lycia) 96, 166
hispidaria (Apocheima) 95
hortuellus (Crambus) 44
hortulata (Eurrhypara) 23, 44
hostilis (Nephopteryx) 215, 274
hucherardi (Hydraecia) 39
humuli (Hepialus) 44
hyale (Colias) 224, 243
hyperantus (Aphantopus) ... 41, 43, 73, 266
icarus (Polyommatus) ... 40, 41, 43, 69, 106, 127, 128, 154, 163, 179, 189, 200, 281
icterata (Eupithecia) 44, 226
ida (P. cecilia)
idas (Plebejus) 12, 15, 105, 128, 260
iduna (Euphydryas) 260
PAGE
imella (Monopis) 94, 275
imitaria (Scopula) 26
immaculata (Hemistola) 26
immundana (Epinotia) 91
impura (Leucania) 43, 98
incarnatana (Notocelia) 227
incerta (Orthosia) 68, 230, 257
inconspicuella (Solenobia) 33
indigata (Eupithecia) 26
ines (Agapetes) 178
inopiana (Hysterosia) 92, 275
inornatana (Ancylis) 92
inornatella (Brachmia) 215, 273, 275
insigniata (Eupithecia) 60, 96, 97
interjecta (Euschesis) 71, 94, 226
interrogationis (Plusia) 235
io (Nymphalis) ... 68, 71, 72, 74, 85, 166, 179
iota (Plusia) 44, 230, 274
ipsilon (Agrotis) 29, 39, 68, 193, 216
iris (Apatura) ... 28, 72, 74, 85, 119, 161, 214, 216, 246
irregularis (Anepia) 271
irrorata (Scopula) 254
irrorella (Setina) 42, 43
jacobaeae (Callimorpha) 116
janira (M. jurtina)
jasioneata (Eupithecia) 225
jasius (Charaxes) 161
juniperata (Thera) 224
jurtina (Maniola) ... 41, 43, 65, 71, 73, 120, 163, 178, 281
krueperi (Pieris) 188
laeta (Zygaena) 129
l-album (Leucania) 71, 296
lanestris (Eriogaster) 26, 118
lappona (Erebia) 12
lapponaria (Poecilopsis) 37
lariciana (Spilonota) 94
lariciata (Eupithecia) 26
lathonia (Argynnis) 13, 16, 126, 162
latifasciana (Acleris) 275
lavaterae (Spilothyrus) 13
leautieri (Lithophane) 98, 264, 296
lefebvrei (Erebia) 12, 14
legatella (Chesias) 69
lepida (Hadena) 19, 26, 28, 156, 157
leporina (Apatele) 29, 86, 297
leucographa (Hydraecia) 95
leucophaearia (Erannis) 68, 95
leucostigma (Celaena) 25, 26, 226
lichenea (Eumictis) 71
lichenella (Solenobia) 33
lienigianus (Leioptilus) 271
ligea (Erebia) 103, 104, 121, 255
lignata (Orthonama) 225
lignea (Blastobasis) 23
ligustri (Sphinx) 69
limberina (Plusia) 254
lineata (Idaea) 115, 174
lineola (Thymelicus) 13, 65, 255
literosa (Procus) 43, 226
lithargyria (Leucania) 43
lithoxylea (Apamea) 43
litoralis (Leucania) 94
littoralis (P. litura)

PAGE
litura (Anchoscelis) 98
litura (Prodenia) 59, 118, 199, 254
liturata (Semiothisa) 38
livornica (Celerio) 26
lixella (Coleophora) 272
lonicerae (Zygaena) ... 26, 37, 135, 149, 153
loreyi (Leucania) 233, 254
lotella (Anerastia) 93
loti (Zygaena) 133
lubricipeda (Spilosoma) 43, 166
lucens (Hydraecia) 226
lucernea (Ammagrotis) 19, 42, 43, 224
lucidella (Aristotelia) 92
lucina (Hamearis) 84
lucipara (Euplexia) 23
luctuata (Euphyia) 60
luctuosa (Acontia) 26, 164
lunaris (Minucia) 164
lundbladi (Gymnoscelis) 254
luneburgensis (Aporophyla) 210, 234
lunula (Aporophyla) 71, 235
lunula (Colophasia) 39, 93
lupulina (Hepialus) 225
lurideola (Eilema) 43
lutea (Spilosoma) 43, 166
luteata (H. flammeolaria)
luteolata (Opisthograptis) 44, 69
lycaon (Maniola) 16, 105
lysimon (Zizera) 180
machaon (Papilio) 11, 15, 16, 103, 123, 154, 160, 178, 180, 187, 188, 211, 273, 280
macilenta (Agrochola) 39
macularia (Pseudopanthera) 26, 244, 271
maculata (P. macularia)
maderensis (Cosymbia) 254
maera (Lasiommata) 103, 126, 281
malinellus (Hyponomeuta) 117
malvae (Pyrgus) 69, 74
mana (Zygaena) 8, 10
manniana (Phalonidia) 92
mannii (Pieris) 15, 161, 280
manto (Erebia) 11, 13, 14, 104
margaritellus (Crambus) 17
margaritana (P. dipoltella)
margaritata (Campaea) 44
marginaria (Erannis) 68, 71
marginata (Lomaspilis) 20, 44
maritima (Chilodes) 193, 273, 274
maritima (Eucosma) 92
marmarea (Eurhodope) 93
martialis (U. ferrugalis)
marrubii (Reverdinus) 179
meessanialla (Lithocolletis) 214
megacephala (Apatele) 70
megera (Pararge) ... 73, 126, 154, 163, 178, 179
melanopa (Anarta) 245
melampus (Erebia) 103, 104
mendica (Cycnia) 166
mendica (Diarsia) 43, 229, 268
menthastri (S. lubricipeda)
menyanthidis (Apatele) 38
meolans (Erebia) 12, 14
PAGE
meticulosa (Phlogophora) 26, 43
mi (Euclidimera) 26
miata (Chloroclysta) 70, 235, 296
millefoliata (Eupithecia) 39, 94
minima (Petilampa) 20, 26, 44
minimus (Cupido) 13, 69, 84, 86, 200
miniosa (Orthosia) 95
minorata (Perizoma) 44, 226
minos (Z. osterodensis)
monoglypha (Apamea) ... 26, 43, 60, 94, 157, 283, 284
montanata (Xanthorhoë) 44, 230
montanus (Erebia) 103, 104
mouffetella (Epithectis) 23
mulciber (Euploca) 142
mundana (Nudaria) 26, 41, 43, 68
munitata (Xanthorhoë) 229
muralis (Cryphia) 19, 156, 223
murinata (Minoa) 26, 38
muscerda (Pelosia) 181
musculosa (Oria) 98, 268
myrtillata (G. obfuscata)
myrtilli (Anarta) 26, 98, 235
nana (Hada) 156
napeae (Boloria) 127
napi (Pieris) 28, 37, 43, 73, 161, 189, 212, 254, 259
nastes (Colias) 260
nebulata (Euchoeca) 26
nebulella (Homoeosoma) 274
nebulosa (Polia) 43, 155, 285
neleus (Erebia) 12, 13, 14
neoridas (Erebia) 16, 126
nervosa (D. apiella)
neurica (Nonagria) 97
neustria (Malacosoma) 43, 245
nevadensis (Zygaena) 5
ni (Plusia) 164
nigra (A. lunula)
niobe (Argynnis) 13, 103, 105, 127
nitens (Polia) 97
noctis (Pelosia) 182
noctuella (Nomophila) 28, 29, 193
norma (Oeneis) 260
notata (Semiothisa) 26
nubeculosa (Brachyonica) 37
nubilosella (Borkhausenia) 212
obeliscata (Thera) 44, 71, 235
obfuscata (Gnophos) 226, 235
oblitella (Heterographis) 16, 94, 245
oblonga (Apamea) 43, 94, 97, 98
obscurata (Gnophos) 25, 26
obsitalis (Hypena) 254
obsoleta (Leucania) 26, 97, 268
obstipata (Nycterosea) ... 28, 98, 178, 193, 216, 297
obtusa (Pelosia) 181
occitanica (Zygaena) 16
occulta (Eurois) ... 216, 223, 230, 235, 244, 245, 267, 296
ocellata (Lyncometra) 44, 69
ocellata (Smerinthus) 69, 166
ocellea (Eromene) 243
ochrata (Sterrha) 274
ochroleuca (Eremobia) 86, 115

PAGE
octomaculana (Cnephasia) 158, 159
oculea (Hydraecia) 43, 226
oleracea (Diataraxia) 43, 166
ononaria (Aplasta) 93
oo (Dicycla) 26
ophiogramma (Apamea) 70
optilete (Vacciniia) 103, 260
or (Tethea) 26, 97
orbifer (Spiolio) 189
orbona (Euschesis) 26
orichalcea (Plusia) 254
orion (Z. romeo)
orissa (Cirrochroa) 142
ornatella (Pempelia) 226
ornitopus (Lithophane) 71, 98
osseana (Eana) 94
osterodensis (Zygaena) 1, 7, 8, 53, 75
oxyacanthae (Allophyes) 283, 284
oxyacanthella (Stigmella) 23
padella (Hyponomeuta) 117
palaemon (Carterocephalus) 255
palaeno (Colias) 103
paleacea (Enargia) 181, 216, 234, 244, 245, 266, 267, 268
paleana (Amelia) 94, 226, 230
pales (Boloria) 12, 14, 103, 104, 127, 280
pallens (Leucania) 26, 43, 60
pallida (Witlesia) 93, 274
pallorella (Agonopterix) 93
palpina (Pterostoma) 166
paludis (Hydraecia) 226
palustraria (Eupithecia) 226
palustrella (Aristotelia) 93, 275
palustris (Hydrillula) 268
pamphilus (Coenonympha) ... 41, 43, 69, 73, 106, 163, 179, 266, 281
pandora (Argynnis) 161, 162
pandrose (Erebia) 260
paphia (Argynnis) 15, 70, 72, 73, 281
papilionaria (Geometra) 44, 230, 274
pariana (Anthophila) 17
parisella (Lithocolletis) 213
parthenias (Archiearis) 37
parthenie (Melitaea) 13
pascuana (Cnephasia) 159
pasiphae (Pyronia) 178
pastinum (Lygephila) 94, 272
pavonia (Saturnia) 37, 166, 230
pectinataria (Colostygia) 69
pedaria (Phigalia) 37
peltigera (Heliothis) ... 193, 216, 256, 278, 297
pendularia (Cosymbia) 25
perla (Cryphia) 70
perlepidana (Laspeyresia) 69
persicariae (Malanchra) 23, 43
phicomene (Colias) 12, 126
phleas (Lycaena) ... 74, 163, 179, 253, 276
phoebe (Melitaea) 15, 128
phragmitellus (Chilo) 70, 183
phragmitidis (Arenostola) 181
picata (Euphyia) 25, 26
piercei (Childonia) 94
pigra (Clostera) 230
pinastri (Hyloicus) 236, 272
PAGE
pineti (Solenobia) 34
piniaria (Bupalus) 97
pirithous (Syntarucus) 106, 179, 281
pisi (Ceramica) 43, 166
plagiata (Anaitis) 44
plantaginis (Parasemia) 26
plecta (Ochropleura) 26, 43
plexippus (Danaus) 255
plumbeolata (Eupithecia) 38
plumigera (Ptilophora) 26, 98
podalirius (Papilio) ... 15, 16, 105, 106, 126, 161, 187, 188, 211, 255
polychloros (Nymphalis) 166, 179
polycommata (Trichopteryx) 95, 96
polyodon (A. monoglypha)
polysperchon (Everes) 106
populata (Lygris) 44, 229
populeti (Orthosia) 25
populi (Laothoe) 43, 69, 166
populi (Limenitis) 211
populi (Poecilocampa) 25
porphyrea (Peridroma) 29
potatoria (Philudoria) 43
prasina (Anaplectoides) 25, 38
proboscidalis (Hypena) 44, 60, 98
procellata (Melanthia) 26, 69
promissa (Catocala) 26
promutata (Scopula) 27
pronoë (Erebia) 280
pronuba (Noctua) 26, 39, 43, 99
pronubana (Cacoecimorpha) 23
protumnus (Papilio) 214
prunaria (Angerona) 26, 38, 86
prunata (Lygris) 26
pruni (Strymonidia) 86
prunivorana (Laspeyresia) 17
pseudoalpestrana (Dichrorampha) ... 92
psi (Apatele) 43, 166, 215
pudorina (Leucania) 272, 274
pulchella (Utetheisa) 164, 200
pulchellata (Eupithecia) 20, 155, 158
pulchrina (Plusia) 44, 274
pulveraria (Anagoga) 26, 97
pumilata (Gymnoscelis) 44
pumilo (Gegenes) 163
punctalis (Dolicharthria) 92
punctalis (Synaphe) 93
punctella (Emantheudes) 213
punctum (Zygaena) 1
pupillana (Eucosma) 214
purpuralis (Zygaena) ... 1, 37, 130, 149, 152, 224
purpurana (Celyphe) 275
pusaria (Deilinia) 44
putris (Axylia) 43
pygmaeola (Eilema) 92
pygmina (Arenostola) 26, 226
pyralata (Lygris) 44
pyrenaica (Polyommatus) 14
pyrithous (S. pirithous)
pyritoides (Habrosyne) 43, 70
quadra (Lithosia) 236, 296
quadrifasciata (Xanthorhoë) 26, 272
quadripuncta (Oegoconia) 93
quadripunctaria (Euplagia) ... 16, 30, 249

PAGE
quercifolia (Gastropacha) 70, 164
quercifoliella (Lithocolletis) 213
quercinaria (Ennomos) 44
quercus (Lasiocampa) 163, 282
quercus (Thecla) 74, 163, 281
rapae (Pieris) 43, 68, 71, 73, 103, 106, 154, 161, 178, 280
rectangulata (Chloroclystis) 225
repandaria (Epione) 60
repandata (Alcis) 44, 120, 155
resinea (Eudoria) 20
reticulata (Heliophobus) 25
retusa (Zenobia) 26, 98
revayana (Nycteola) 95
rhamni (Gonepteryx) 11, 73, 154, 224, 281
rhomboidaria (Cleora) 166, 230
rhynchosporella (Elachista) 272
ribeata (Deileptenia) 25, 166
ridens (Polyploca) 70, 96
rivularis (Hadena) 156
rivularis (Limenitis) 14, 15, 162
rjabovi (Zygaena) 9
roboraria (Boarmia) 38
roboris (Lithocolletis) 214
romeo (Zygaena) 1, 6, 47
roseana (Phalonia) 68
rostralis (Hypena) 26, 95, 96, 98
rotundella (Depressaria) 93, 94
ruberata (Hydriomena) 235
rubi (Callophrys) 74, 154
rubi (Chrysophanus) 178, 180
rubi (Diarsia) 26, 226
rubi (Macrothylacia) 70, 71, 276
rubi (Thecla) 37
rubidata (Euphyia) 26, 38
rubigana (Phalonia) 23, 275
rubiginata (Plemyria) 94, 235
rubiginata (Scopula) 272
rubiginea (Dasycampa) 95
rubicollis (Atolmis) 224, 233
rubricosa (Cerastis) 68
rufa (Coenobia) 97
rufata (Chesias) 274
ruficapitella (Stigmella) 213
ruficornis (Chaonia) 166
rugosana (Phtheochroa) 275
rumicis (Apatele) 43, 70
rumina (Zerynthia) 153, 154, 177, 180, 254
rupicapraria (Theria) 68, 95
rupicola (Cochylidia) 93
rurea (A. crenata)
rusticella (Monopis) 87
sacraria (Rhodometra) ... 28, 29, 60, 98, 164, 178, 211, 245, 258, 267
salicata (Colostygia) 44
salicella (Hedya) 275
salicis (Leucoma) 106, 211
salinellus (P. aridellus)
sambucaria (Ourapteryx) 44
samiatella (Stigmella) 213
sanguinalis (Pyrausta) 44
sannio (Diacrisia) 245, 257, 274
sao (Spialia) 13
satellita (Cirrochroa) 142
satyrata (Eupithecia) 26
satyrion (Coenonympha) 280
scabiosae (Z. nevadensis)
(Z. osterodensis)
(Z. romeo)
scabiosata (Eupithecia) 70
schulziana (Olethreutes) 227
scirpi (Leucania) 254
scrophulariae (Cucullia) 14
secalis (Apamea) 26, 43, 235, 283, 285
segetum (Agrotis) 91
selasellus (Crambus) 44
selene (Argynnis) 70, 72, 73, 74
semele (Eumenis) 41, 43, 73, 281
semiargus (Cyaniris) 13
semibrunnea (Lithophane) 95
semifulvella (Tinea) 94
senex (Comacla) 26, 181, 183, 184, 235
septaria (Gnophos) 14
seriata (Sterrha) 26
sericealis (Rivula) 44
serratulae (Pyrgus) 13
sexalisata (Mysticoptera) 274
sexstrigata (Amathes) 43
similis (Euproctis) 245
simulans (Rhyacia) 229
sinapis (Leptidea) 16, 38, 73, 154, 161, 189, 281
siterata (Chloroclysta) 235
solidaginis (Lithomia) 234
spadicearia (Xanthorhoë) 69
spadicella (Selagia) 213
sparganella (Orthotaelia) 94
sparganii (Nonagria) 39, 70
sparsata (Anticollix) 26
sphegiformis (Aegeria) 26
sphinx (Brachyonicha) 71
spilodactyla (Alucita) 70
spini (Thecla) 13, 16
sponsa (Catocala) 26, 164
stabilis (Orthosia) 68
staintoni (Bankesia) 31
statices (Procris) 27, 147, 247
statilinus (Hipparchia) ... 15, 126, 162, 281
stellatarum (Macroglossum) ... 69, 163, 215, 266
stigmatica (Amathes) 26
straminea (Leucania) ... 26, 41, 43, 70, 97
strataria (Biston) 28, 68
striata (Coscinia) 164, 247
strigillaria (Perconia) 25
strigula (Nola) 97
stygne (E. meolans)
suasa (Hadena) 26
subbaumanniana (C. piercei)
suberivora (Nepticula) 213
sublustris (Apamea) 23, 43, 244
subnotata (Eupithecia) 25
subocellea (Thiotricha) 94
subpropinquella (Agonopterix) 94
subsericeata (Sterrha) 44
subtusa (Zenobia) 26
subumbrata (Eupithecia) 44
succenturiata (Eupithecia) 25

PAGE

suffumata (Lampropteryx) 26
sulphurella (Caloptilia) 213
superbella (Euchromius) 213
suspecta (Parastichtis) 97
sutschana (P. obtusa)
swammerdamella (Nemophora) 69
sylvata (Abraxas) 38, 96
sylvestraria (Sterrha) 26
sylvestris (Thymelicus) 65, 74, 127
syringaria (Apeira) 38, 297

taenialis (Schrankia) 94, 98
tages (Erynnis) 69, 74, 126, 281
tagis (Euchloë) 154, 179
taraxici (Caradrina) 44, 157, 225
tarsipennalis (Zanclognatha) 20, 44
teberdica (Zygaena) 10
telecanus (Tarucus) 154, 163
temerata (Bapta) 69
templi (Dasypolia) 39, 71, 98
tenebrata (Panemeria) 26, 69
tenebrosa (Rusina) 26, 44
tenuiata (Eupithecia) 94
tephradactylus (Oidaematophorus) ... 225
terminella (Ethmia) 93
terpanda (Terinos) 142
tersata (Horisme) 26
testaceata (Hydrelia) 26
tetralunaria (Selenia) 166
thalassina (Hadena) 43, 166
thersites (Polyommatus) 188, 189
thetis (Agriades) 236
tincta (P. hepatica)
tirrhaea (Pseudophia) 164
tithonus (Maniola) 15, 73, 163
tithymali (Deilephila) 254
tityrus (Heodes) 13, 128
tityus (Hemaris) 26
transalpina (Zygaena) 134
transappenina (Z. romeo)
transversa (Eupsilia) 68
trapezina (Cosmia) 230
tremula (Pheosia) 43, 69,166, 187
trepida (Notodonta) 166
triangulum (Amathes) 43
tricolor (Coleophora) 272
tridens (Apatele) 21, 166, 199, 215, 264
tridens (Calamia) 226
trifolii (Lasiocampa) 163
trifolii (Scotogramma) 23
trifolii (Zygaena) 26, 38, 135, 150
trigeminata (Sterrha) 26, 70
tringipennella (Aspilapteryx) 94
tripartita (Unca) 44
triplasia (Unca) 26, 44
triptolemus (Z. romeo)
tripunctaria (Eupithecia) 26
triquetrella (Solenobia) 33, 209
tristellus (Crambus) 16
tritici (Euxoa) 19, 98, 235
trituberculana (Celama) 215, 273, 274
truncata (Dysstroma) 44, 229
turca (Mythimna) 26
trux (Agrotis) 19
tullia (Coenonympha) 119, 152, 247
tyndarus (Erebia) 103, 104, 127

PAGE

typhae (Nonagria) 70, 166, 183
typica (Naenia) 43
ulicitana (Laspeyresia) 69
ulmifoliae (Stigmella) 243
ultimella (Depressaria) 91
umbellana (Agonopterix) 271
umbra (Pyrrrhia) 94, 273
umbratica (Cucullia) 44
umbratica (R. tenebrosa)
unangulata (Euphyia) 70
unanimis (Apamea) 26, 70
unionalis (Palpita) 98, 254
unipuncta (Leucania) 30, 243, 254, 267
unitana (Tortrix) 226
unitella (Borkhausenia) 23
urticae (Aglais) 11. 13, 37, 43, 68, 71, 72, 103, 166, 179, 189, 246
urticae (Spilosoma) 94, 126
vaccinii (Conistra) 68
varia (Lycophotia) 26, 43
variata (Thera) 235
venata (Ochlodes) 74
venosata (Eupithecia) 19, 25, 158, 225
venus (Leto) 189
verbasci (Cucullia) 70, 96, 233, 267, 297
versicolora (Endromis) 37, 166, 168, 235
versurella (Coleophora) 272
vespiformis (Aegeria) 26
vestigialis (Agrotis) 27, 235
vetusta (Xylena) 40, 230
vibicella (Coleophora) 92
viburniana (Tortrix) 230
viciae (Zygaena) 135
vicrama (Turanama) 188
villica (Arctia) 68, 69, 166, 177, 233
vinula (Cerura) 166, 168
virens (Celemia) 40, 42
viretata (Acasis) 37
virgata (Mesotype) 26, 94
virgaureae (Lycaena) 12, 103, 104, 105
viridana (Tortrix) 213
viriplaca (Heliothis) 272, 274
vitalbata (Horisme) 26
vitellina (Leucania) 30
wailesella (Leucoptera) 92
w-album (Strymonidia) 74, 84
wauaria (Itame) 25
xanthographa (Amathes) 26, 28, 39, 43
xanthomista (Antitype) 233
xiphea (Pararge) 253
xylosteana (Archips) 213
xylostellus (Ypsolophus) 23
zelleri (Melissoblaptes) 93
ziczac (Notodonta) 19, 43, 69, 166, 235
zophodactylus (Stenoptilia) 213

COLEOPTERA

allardi (Omalium) 292
alpina (Atheta) 241

PAGE
amicula (Atheta) 241
analis (Amischa) 240
analis (Bolitobius=Bryocharis) 237
angularis (Mycetoporus) 237
angustula (Atheta) 240
aquatica (Atheta) 242
arenicola (Atheta) 261
armiger (Odontaeus) 296
assimilis (Quedius) 293
aterrima (Atheta) 261
atomaria (Oligota) 239
atramentaria (Atheta) 242
atricolor (Atheta) 241
bella (Bolitochara) 239
benickiella (Atheta) 241
bilineata (Aleochara) 263
bipustulata (Aleochara) 263
brachyptera (Oxypoda) 263
brunnea (Atheta) 240
brunneus (Mycetoporus) 237
brunneus (Tachyporus) =nitidulus
canaliculata (Drusilla) 293, 294
canescens (Atheta) 242
capillaricornis (Habrocerus) 239
carbonaria (Gynpeta) 240
carbonarius (Philonthus) 293
cauta (Atheta) 242
cerealis (Chrysomela) 144
chrysomelinus (Tachyporus) 238
complicans (Encephalus) 239
consimilis (?) (Enicmus) 293
coriaria (Atheta) 241
crassicornis (Atheta) 241
curtula (Aleochara) 263
decipiens (Amischa) 240
distinguendus (Crytophagus) 293
diversa (Aleochara) 263, 293
divisa (Atheta) 241
elongatula (Atheta) 240
exigua (Atheta) 261
fasciatus (Trichius) 144-5
ferruginea (Oxypoda) 262
flavicornis (Oligota) 239
fulgidus (Quedius)=assimilis
fungi (Atheta) 261
germana (Atheta) =arenicola
gracilenta (Aleuonota) 262
gregaria (Atheta) 240
haemorrhoa (Oxypoda) 262
halophila (Atheta) 240
hirtus (Emus) 145-6
humeralis (Tachinus) 238
hygrobia (Atheta) 240
hypnorum (Atheta) 242
hypnorum (Tachyporus) 238
immaculatus (Conosomus) 238
indubia (Atheta) 241
induta (Oxypoda) 262
inflata (Oligota) 239
inoptata (Atheta)=crassicornis
inquinula (Atheta) 241
intricata (Aleochara) 263
lanuginosa (Aleochara) 263
lata (Aleochara) 263
laticollis (Tachinus) 238
limbatus (Zyras) 262
linearis (Atheta) 240
littoreus (Conosomus) 237
lividipennis (Oxypoda) 262
longicornis (Atheta) 261
longicornis (Cypha=Hypocytus) 239
longulus (Mycetoporus) 237
luridipennis (Atheta) 240
malleus (Atheta) =hygrobia
marginellus (Tachinus) 238
melanocephalus (Sunius = Medon pars) 293
melolontha (Melolontha) 102, 203
mesomelinus (Quedius) 293
misella (Oxypoda) =ferruginea
moesta (Aleochara) =diversa
morion (Tinotus) 263
muscorum (Atheta) 261
nidicola (Microglotta) 293, 294
nigra (Atheta) 261, ? (as zosterae) 293
nigricornis (Atheta) 241, 293
nigrina (Oxypoda) 242
nigripes (Atheta) 242
nitidulus (Tachyporus) 238
obscura (Cordalia) 239
obscurus (Callicerus) 240
occulta (Atheta) 240
opaca (Oxypoda) 262
palustris (Atheta) 293
paradoxa (Bohemiellina) 239
parallelopipedus (Abax) 292
parva (Oligota) 239
parvula (Atheta) =cauta
pectinicornis (Schizotus) 145
pectita (Oxypoda) 262
perexigua (Atheta) 241
pertyi (Atheta) 242
phellandrii (Prasocuris) 91
pulla (Microgiotta) 263
pusillima (Oligota) 239
pusillus (Tachyporus) 238
pygmaea (Atheta) 261
rivularis (Autalia) 239
rufipes (Tachinus) 238, 293
saginatus (Cryptophagus) 293, 294
scapularis (Tachinus) 238
setigera (Atheta) 242
siliphoides (Leucoparyphus) 238
solutus (Tachyporus) 238
sordida (Atheta) 261
sordidula (Atheta) 242
sparsa (Aleochara) 263
splendens (Aleuonota) =gracilenta
splendens (Mycetoporus) 237
splendidus (Mycetoporus) 237
stercorarius (Staphylinus) 246
subsinuata (Atheta) 262
subterraneus (Tachinus) 238
sulcata (Falagria) 239
sulcifrons (Atheta) 240
suturalis (Crataraea) 293, 294
tenuicornis (Philonthus) =carbonarius
terricola (Pristonychus) 292
testaceus (Conosomus) 237
tomlini (Atheta) =halophila
triangulum (Atheta) 242

PAGE
trinotata (Atheta) 242
trinotatus (Lordithon=Bolitobius) ... 237
tristis (Aleochara) 263
umbrata (Oxypoda) 262
umbrosa (Amarochara) 262
validiuscula (Atheta) =benickiella
vicina (Atheta) =longiuscula
vulgaris (Melolontha) (Melanotus *in error*) =melolontha
xanthopus (Atheta) 242
zosterae (Atheta), *see* nigra

HEMIPTERA

adustus (Idiocerus) =stigmaticalis
albicans (Idiocerus) 56
aurulentus (Idiocerus) =cupreus
cognatus (Idiocerus)=distiguendus
confusus (Idiocerus) 55, 57
cupreus (Idiocerus) 56
decimusquartus (Idiocerus) 56
distignuendus (Idiocerus) 55
fulgidus (Idiocerus) 56, 57
h-album (Idiocerus) =vitreus
laminatus (Idiocerus) 56, 57
lituratus (Idiocerus) 55
populi (Idiocerus) 56, 57
scurra (Idiocerus) =decimusquartus
stigmaticalis (Idiocerus) 55
vitreus (Idiocerus) 56
vittifrons (Idiocerus) 57

HYMENOPTERA

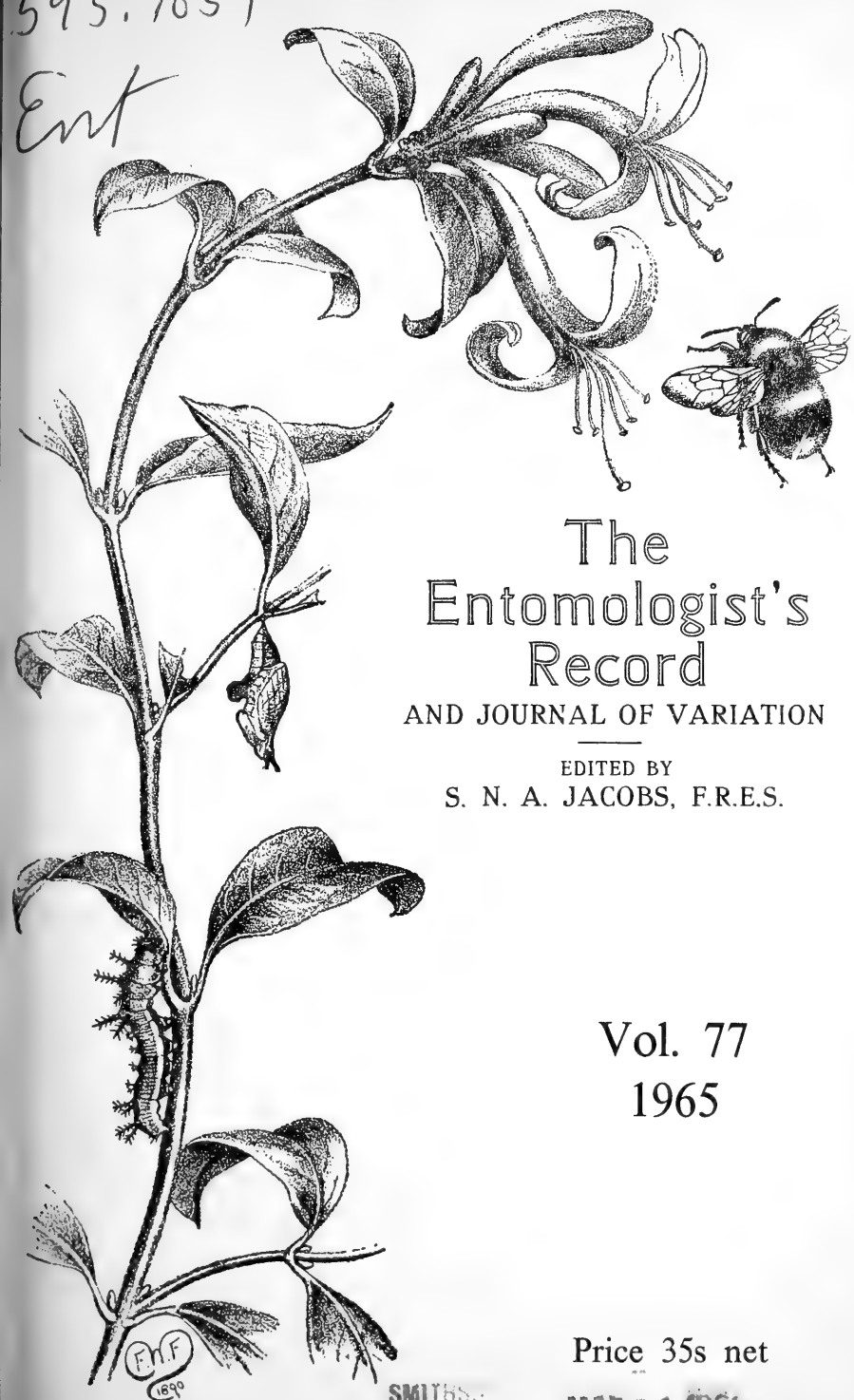
acervorum (Leptothorax) 139
alienus (Lasius) 140
brunneus (Lasius) 140, 287
caespitum (Tetramorium) 139, 287, 288
coarctata (Ponera) 58
cunicularia (Formica) 108, 141, 289
erraticum (Tapinoma) 140, 288
exsecta (Formica) 108, 140, 287
fuliginosus (Lasius) 59, 140, 287
fusca (Formica) 108
graminicola (Myrmecina) 58, 139
interruptus (Leptothorax) 139
lemani (Formica) 108
lobicornis (Myrmica) 139
lugubris (Formica) 108
mixtus (Lasius) 140
niger (Lasius) 58
nigricans (Formica) 141
nylanderi (Leptothorax) 58, 139
omnivorus (Psychophagus) 155-9
pharaonis (Monomorium) 141
rabaudi (Lasius) 59, 140
rubra (Myrmica) 59
rufa (Formica) 108, 140, 288
rubra (Formica) 108, 140, 288
sabuleti (Myrmica) 59, 139
sanguinea (Formica) 59, 107-14, 140, 287
scabrinodis (Myrmica) 139
schencki (Myrmica) 59, 139, 287
simillimum (Tetramorium) 141
sulcinodis (Myrmica) 139
testaceus (Strongylognathus) 139
transkaucasica (Formica) 58
tuberum (Leptothorax) 59
umbratus (Lasius) 140, 287
Xylocopa sp. 281

ORTHOPTERA

brunneus (Chorthippus) 138
domesticus (Acheta) 137
dorsalis (Conocephalus) ..... 136, 138, f. burri, 137
griseoaptera (Pholidoptera) 136
grossum (Stethophyma) 137-8
parallelus (Chorthippus) 138
punctatissima (Leptophyes) 137
subulata (Tetrix) 137
viridissima (Tettigonia) 136
viridulus (Omocestus) 138

TRICHOPTERA

brevipennis (Anabolia) 289-92
dubia (Ironoquia) 289-92
(Larvae, etc. :—)
basalis (Lasiocephala) 195, 198
Brachycentrinae 194, 196, 197
ciliaris (Notidobia) 195, 196
Crunoecia 197
decipiens (Limnephilus) 292
fimbriatum (Lepidostoma) 197
Goera 195
Goerinae 194, 196, 197
hirtum (Lepidostoma) 197, 198
irrorata (Crunoecia) 195, 198
Lasiocephala 194, 197
Lepidostoma 197
Lepidostomatinae 194, 196, 197
Limnephilidae 194, 195, 291
nigriceps (Limnephilus) 292
nigricornis (Silo) 197
Notidobia 194
pallipes (Silo) 197
personatum (Sericostoma) 195, 196
pilosa (Goera) 197
Sericostoma 194
Sericostomatidae 194-8
Sericostomatinae 194, 196
Silo 195, 197
subnubilus (Brachycenturs) 195, 197



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CONTENTS

Abraxas grossulariata. Flowering currants defoliated and abortive attempt at a second brood by. *B. K. West*, 49.
Acherontia atropos in Inverness-shire. *Commander G. W. Harper*, 190
Aethiopsestis austrina nebulosa Watson. Notes on the life-history of. *J. S. Taylor*, 281.
Aglais urticae L. at light. *R. C. Revels*, 25.
Agriphila latistria Haw. in Somerset. *J. F. Burton*, 241.
Agrotis obscura. Rev. Guy A. Ford, 239.
Allt Rhydd-y-Groes Nature Reserve, 51.
Androconical scales. Notes on affinities and distribution of various Pierid species derived from a study of the. *B. C. S. Warren*, 121.
Ant records and observations for 1965. *K. E. J. Barrett*, 248.
Apatele alni. Foodplant of. *H. Symes*, 163.
Apomea zollikoferi Frey in Sussex. *J. M. Chalmers-Hunt*, 26.
Apatura iris L. in Wilthire 1964. *I. R. P. Heslop*, 26.
Apatura iris L. in Hampshire. *R. C. Revels*. 241.
Apatura iris L. Parasitized ova of. *Major Gen. C. G. Lipscomb*, 260.
Apatura iris L. Observations of. *Col. C. F. Cowan*, 113.
Apeira syringella L. A bred gynandrous specimen. *M. J. Leech*, 241.
Aporophila nigra Haw. in Surrey. *D. A. Trembath*, 15.
Ascot. Some mercury vapour visitors at. *D. S. Johnson*, 67.
Atomelia caliginosa Haw. (The clouded buff). *T. D. Fearnhough*, 138.
Austrian Alps, July-August 1964. Butterflies in the. *The Baron de Worms*, 55.
Austrian Tyrol. Collecting butterflies in the. *G. Staughton-Harris*, 103.

Bath whites in the desert. *N. Manders*, 193.
Biston betularia L. and its melanic forms in Great Britain. A twelve years survey of the frequencies of. *H. B. D. Kettlewell*, 195.
Bog at the back of beyond. The. *An Old Moth-Hunter*, 33.
Brecon. Diptera in the. *R. M. Payne*, 20.
Burnets and Foresters in Sicily, a correction. *R. F. Bretherton*, 294.
Butterflies at light. *Air Marshal Sir R. Saundby*, 49.
Butterflies at light. *R. J. Swindells*. 87.
Butterflies at light. *R. Hayward*, 138.
Butterfly. A late. *H. Symes*, 21.
Butterfly records. *M. J. Hammerson*, 227.

Callophrys rubi L. A variety of. *E. E. Johnson*, 163.
Canna collecting notes 1964. Isle of. *J. L. Campbell*, 63.
Carinthia 27th July-8th August. *Major Gen. Sir G. Johnson*, 53.
(Cassidinae). Notes on some South African tortoise beetles. *J. S. Taylor*, 187.
Celastrina argiolus. Thoughts on. *H. Symes*, 219.
Celerio livornica in Hampshire. *D. S. Jones*, 191.
Celerio livornica in Malta. *A. Valletta*, 240.
Celerio livornica in Bristol district. *D. G. Gibb*, 192.
Church property. *An Old Moth-Hunter*, 142.
Cicada. The New Forest. *P. B. M. Allan*, 295.
Cirrhia gilvago Esp. at Woking. The Baron de Worms, 286.
Coleman and W. H. Allchin, W. S. *D. E. Allen*, 47.
Coleman and W. H. Allchin, W. S. *Dr. R. C. Ainley*, 104.
Colias croceus Fourch. and *Pyrameis cardui* L. in Eire. *The Baron de Worms*, 293.
Colias Hyale L. and *C. croceus* Fourch. in Kent. *M. H.* Edmonds, 12.
Cornwall, 1964. *Dr. F. H. N. Smith*, 105.
Corsica, May and June 1964. *J. A. C. Greenwood and D. Greenwood*. 133.
Cosmopteryx lienigella Zell. in Hampshire. *E. A. Sadler*, 19.
Cossus conundrum. The. *Dr. H. B. D. Kettlewell*, 140.
Cossus cossus. Hibernation and pupation habits of. *Dr. H. B. D. Kettlewell*, 1.
Cossus cossus. *Brigadier H. W. Warry*, 90.
Cossus cossus. *Commander G. W. Harper*, 103.
Cossus cossus. More about. *H. C. Huggins*, 176.
Cossus cossus. The larva of. *H. Symes*, 110.

Crambus furcatellus Zett. in the Lake District. *The Baron de Worms*, 240.
Cranleigh district 1964. Butterflies in the. *Major A. E. Collier*, 64.
Criorhina ranunculi Panzer (Dipt.). A note on. *P. B. M. Allan*, 161.

Danaus plexippus L. in Britain. Release of marked. *J. F. Burton*, 222.
Dartmoor. Midwinter collecting on. *G. Haggett*, 24.
Depressaria rotundella Dgl. in Isle of Man. *M. J. Taylor*, 23.
Diptera in the Windsor Forest. A few notable. *A. A. Allen*, 105.
Dorset. Some notes from. *Brig. H. Warry*, 48.
Dragonfly behaviour. *J. S. Taylor*, 25.
Dragonfly behaviour. *Col. C. F. Cowan*, 112.

Early emergences. *R. C. Dyson*, 25.
Easter Island. Orthopteroid insects of. *D. K. McE. Kevan*, 283.
East Norfolk. Lepidoptera migrants in. *L. C. Bruce*, 48.
Empididae (Diptera) in Brecon and Kirkcudbright. *R. M. Payne*, 109.
Enargia paleacea Esp. in Surrey. *D. A. Trembath*, 23.
Entomological notes 1964. *S. Wakely*, 91.
Eupithecia plumbeolata Haw. *P. Cue*, 294.

Fiat Justitia. *An Old Moth-Hunter*, 182.
Freezing and storing Lepidoptera. On. *R. S. Wilkinson*, 261.
Fritillary in a garden. *K. W. Grimwood*, 240.

Gavarnie 1965. Butterflies at. *Major Gen. Sir G. Johnson*, 269.
Glass-bottomed box. A nineteenth century. *Prof. G. E. Hutchinson*, 264.
Goat moth. Pupation site of the. *G. Norman*, 292.
Gonodontis bidentata L. Early emergence of. *D. A. Odd*, 84.
Gonodontis bidentata L. Parthenogensis in. *C. Moseley*, 191.
Gothic moth. A note on the. *P. B. M. Allan*, 290.
Greece. Some butterflies in. *Maj. Gen. Sir G. Johnson*, 229.

Hadena. Some comments on selected species of. *R. E. Scott*, 37.
Heliothis armigera Hübn. Rearing. *J. A. C. Greenwood*, 190.
Heliothis armigera Hübn. *D. G. Sevastopulo*, 262.
Herse convolvuli in Bedfordshire. *R. C. Revels*, 238.
Herse convolvuli in the New Forest. *L. W. Siggs*, 262.
Hornet. The good-tempered. *P. B. M. Allan*, 263.
Hydrillula palustris Hübn in Woodwalton Fen. *The Baron de Worms*, 240.
Hylecoetus dermestoides in Leicestershire. *C. J. Leech*, 235.

Industrial melanism. Some comments on. *A. J. Showler*, 70.
Insect conservation. An appeal, 141.
Inverness-shire in 1964. *Commander G. W. Harper*, 100.
Inverness-shire, Newtonmore district. The Macrolepidoptera of. *Commander G. W. Harper*, 83.
Ireland, 1965. Lepidoptera in. *T. N. D. Peet*, 293.
Ireland in 1964, a postscript. *H. C. Huggins*, 13.
Irish legend. Another. *G. Haggett*, 26.

Lachnocnema bibulus Fab. Lep., Lycaenidae. *C. G. C. Dickson*, 112.
Lancaster area, 1964. Migrant in the. *C. J. Goodall*, 17.
Lepidoptera harvest. *T. W. Harman*, 29.
Lepidoptera of two suburban localities. A comparison of the. *A. A. Allen*, 68.
Leptidea sinapis. The behaviour of. *Col. C. F. Cowan*, 192.
Leptomorphus walkeri Curt. A note on. *L. Parmenter*, 287.
Light trap. A genuinely portable mercury vapour. *J. Heath*, 236.
Lindisfarne National Nature Reserve. 52.
Lithocolletis acerifoliella Zell. ssp. *joannisi* Le Marchand, and a note on its occurrence in Britain. *J. W. Chalmers-Hunt*, 247.
Lithophane leautieri Boisd. ssp. *sabinae* H.-G. The recapture in 1965 of. *E. P. Wiltshire*, 267.
Lysandra bellargus Rott. A melanic. *Major Gen. C. G. Lipscomb*, 191.
Lycaenidae. Melanism in the. *A. E. Stafford*, 262.

Malaise trap. The. *D. O. Chanter*, 234.
Mercury Vapour traps. A new predator at. *T. N. D. Peet*, 261.
Microlepidoptera. Notes on the. *H C. Huggins*, 14.
Morocco. Spring collecting in. *The Baron de Worms*, 177.

Mottled umber. Dispersal of the. *P. B. M. Allan*, 263.
Myrmecophilous beetles in Ireland, Scotland and Wales. *C. A. Collingwood*, 45.

Nemapogon granella L. feeding on *Polyporus betulinus*. *M. J. Taylor*, 23.
Nephopteryx similella Zinck. and *E. rhododactyla* Schiff. in Middlesex. *B. Goater*, 83.
New Forest. Mercury vapour light records. More. *L. W. Siggs*, 42.
New Forest. Migrants in the. *L. W. Siggs*, 190.

Orthoptera in 1964. Notes on. *J. F. Burton*, 71.
Orthopteroid insects from the island of Santa Maria, Azores. Some. *K. McE. Kevan*, 39.
Outer Hebrides. Early arrival of migrants in the. *J. L. Campbell*, 162.
Oviposition. A curious site for. *S. N. A. Jacobs*, 292.

Painted ladies at night. *Russell James*, 234.
Pararge egeria L. in inner London. *D. Burrows*, 241.
Parascotia fuliginaria. A second brood of. *D. A. Odd*, 83.
Pins. Entomological. *L. Parmenter*, 238.
Phlyctaenia cilialis Hübn. in Hampshire. *E. A. Sadler*, 17.
Plusia ni Hübn. in South Devon. *C. S. H. Blathwayt*, 24.
Plusia ni Hübn. in Co. Kerry. *The Baron de Worms*, 289.
Polymorphism. *L. W. Siggs*, 98.
Princethorpe Wood, Warwickshire. A visit to. *M. J. Leech*, 235.
Procus versicolor Borkh. in Kent. *H. C. Huggins*, 186.

Rusland Moss National Nature Reserve, 52.

Saturniid at Woking. An exotic. *The Baron de Worms*, 294.
Satyrid butterflies. Evasive behaviour of two South African. *J. S. Taylor*, 239.
Scotch argus in England. *A. J. Showler*, 44.
Scottish records. Some random. *Austin Richardson*, 16.
Sesia apiformis (hornet moth). Long emergence of. *C. W. Price*, 221.
Sexual behaviour of Lepidoptera. The. *G. W. Harper*, 240.
Shades. In the land of. *An Old Moth-Hunter*, 95.
Shapwick Heath National Nature Reserve, 28.
Sicily. Sampling the butterflies of. *R. F. Bretherton*, 168.
Sorhaugenia janiszewskae Riedl. in Kent. *J. M. Chalmers-Hunt*, 262.
Spaelotis ravida Schiff. and *Ennomos autumnaria* Wernb. *H. E. Chipperfield*, 293.
Spaelotis ravida Hübn. indoors. *Air Marshall Sir R. Saundby*, 291.
Species names within a genus. The transference of. *F. Balfour-Browne*, 19.
Sphinx ligustri L. A two-year cycle in. *Dr. R. G. Ainley*, 111.
Staphylinus stercorarius Oliv. A rejoinder. *A. A. Allen*, 111.
Stauropus fagi L. Femininism in. *H. Symes*, 48.
Sugaring. A further note concerning the history of. *R. S. Wilkinson*, 223.
Sugaring. A note or two about. *P. B. M. Allan*, 161.
Sugaring. The origin of. *D. E. Allen*, 117.
Suspended animation in a moth. *Col. C. F. Cowan*, 113.
Swallowtails in Devon. *An Old Moth-Hunter*, 129.
Swallowtails in Devon. *A. H. Dobson*, 139.
Switzerland. A brief visit to. *The Baron de Worms*, 233.
(Syrphidae) parasitic? Are hoverflies. L. Parmenter, 227.

Tachypeza nubila Mg. L. Parmenter, 94.
Thecla betulae and *Strymonidia w-album*. Notes on two hairstreaks. Col. C. F. Cowan, 99.
Thetford Heath National Nature Reserve, 51.
Trichoptera in northern England. The flight period of. *A. Brindle*, 148.

Vanessa atalanta L. at light. *D. W. H. ffennell*, 54.

Westleton, Suffolk. A holiday in. *L. Parmenter*, 78.
Where have all the butterflies gone. *H. Symes*, 271.
Will-o-the-Wisp. *P. B. M. Allan*, 252, 273.
Wollett collection of lepidoptera. Sale of the. *The Baron de Worms*, 288.

Xylocampa areola Esp. correction, 36.

Zygaena Fab. from South-West France and Spain. Notes on species of the genus. *W. G. Tremewan and W. H. B. Manley*, 3.

Zygaena filipendulae. On the occurrence of abdominal belts in. *W. G. Tremewan*, 88.

Zygaena (*Agrumenia*) *fraxini* Mene and a new subspecies from Transcaucasia. *Hugo Reiss*, 165.

Zygaena Fab. from South-East Spain. On two new subspecies of the genus. *Hugo Reiss*, 85.

OBITUARIES

Ernest Scott, 22.

Samuel Gordon Smith, 136.

CURRENT LITERATURE

Animals. Vol. 5, Pts. 18, 19, 20. 114.
Animals. Vol. 7, Pt. 3. 245.
Annotationes lepidopterologicae. Pt. 1. *Francis Hemming*, 84.

Butterflies and Moths. *A. Werner*, 244.
Butterflies and Moths. *W. R. Corti*, 164.
Butterflies. *G. Warnecke*, 243.

Comparative Entomology. *Fox and Fox*, 115.
Creatures of the Earth's Crust. *F. M. Engel*, 297.

Entomops. Vol. 1, Pt. 1. 245.
Experimental Entomology. *Cummins Smith, Miller and Fox*, 116.

Forest refreshed. *N. E. Hickin*, 163.
Freshwater Life of the British Isles. *J. Clegg*, 193.

Grasshoppers and Crickets. *D. R. Ragge*, 265.

Hawkmoths of Great Britain and Europe. *L. Hugh Newman*, 194.
Household Insect Pests. *N. E. Hickin*, 27.

Introducing the Insect. *F. A. Urquhart*, 264.

Men and Insects. *L. Hugh Newman*, 296.
Microlepidoptera Palaearctica. *S. Bleszynski*, 242.

Photoperiodism and seasonal Development of Insects. *A. S. Danilevski*, 113.
Pond Life. *W. Engelhardt*, 243.
Proceedings and Transactions of the South London Entomological and Natural History Society, 49.

Revised Catalogue of the Irish Macrolepidoptera. *E. S. A. Baynes*, 50.

University Reviews in Biology, 297.

AUTHORS

Ainley, Dr. R. G.: 104, 111.
Allan, P. B. M., M.B.E., M.A.: 161, 252, 263, 273, 290, 295.
Allen, A. A.: 68, 105, 111, 297.
Allen, D. E.: 47, 117.

Balfour-Browne, Frank: 19.
Barrett, K. E. J.: 248.
Blathwayt, C. S. H.: 24.
Bretherton, R. F.: 168, 294.
Brindle, A.: 148.
Bruce, C. G.: 49.
Burrows, D.: 241.
Burton, J. F.: 71, 222, 241.

Campbell, J. F.: 63, 162.
Chalmers-Hunt, J. M.: 23, 26, 247, 262.
Chanter, D. O.: 224.
Chipperfield, H. E.: 293.
Collier, Major A. E.: 64.
Collingwood, C. A.: 45.
Cowan, Lt. Col. C. A.: 99, 112, 192.
Crewdson, R. C. R.: 136.
Cue, Percy: 294.

Dickson, C. G. C.: 112.
Dobson, A. H.: 139.
Dyson, R. C.: 25.

Eagles, T. R.: 84, 113.
Edmonds, M. H.: 12.

Fearnhough, T. D.: 138.
ffennell, D. W. H.: 54.
Ford, Rev. Guy A.: 239.

Gibb, D. G.: 192.
Goater, B.: 83.
Goodall, C. J.: 17.
Greenwood, J. A. C.: 133, 190.
Grimwood, K. W.: 240.

Haggett, G.: 24, 26.
Hammerson, M. J.: 227.
Harman, T. W.: 29.
Harper, Comdr. G. W.: 83, 100, 103, 190, 240.
Hayward, R.: 138.
Heslop, I. R. P.: 26.
Heath, J.: 236.
Huggins, H. C.: 13, 14, 36, 176, 186.
Hutchinson, G. E.: 264.

Jacobs, S. N. A.: 27, 28, 49, 50, 115, 116, 163, 164, 193, 194, 243, 244, 245, 246, 264, 265, 292, 296, 297.
James, Russel: 234.
Johnson, D. S.: 67.
Johnson, E. E.: 163.
Johnson, Major Gen. Sir G.: 53, 229, 269.
Jones, D. S.: 191.

Kettlewell, Dr. H. B. D.: 1, 140, 195.
Kevan, K. McE.: 39, 283.
Leech, M. J.: 235, 241.
Lipscomb, Major Gen. C. G.: 191, 261.
Manley, Lt. Col. W. B. L.: 3.
Manders, Neville: 193.
Moseley, Chas.: 191.

Norman, George: 292.

Odd, D. A.: 83, 84.
Old Moth Hunter, An: 33, 95, 129, 142, 182.

Parmenter, L.: 78, 94, 227, 238, 287.
Payne, R. M.: 20, 109.
Peet, T. N. D., L.R.C.P.: 261, 293.
Pierce, C. W.: 221.

Reiss, Hugo: 85, 165.
Revels, R. C.: 25, 238, 241.
Richardson, Austin: 16.

Sadler, E. A.: 17, 19.
Saundby, Air Marshal Sir R.: 49, 291.
Scott, R. E.: 37.
Sevastopulo, D. G.: 262.
Showler, A. J.: 44, 70.
Siggs, L. W.: 41, 98, 140, 262.
Stafford, A. E.: 262.
Stoughton-Harris, G.: 103.
Swindells, R. J.: 87.
Symes, H.: 21, 48, 110, 163, 219, 271.

Taylor, J. S.: 25, 187, 239, 281.
Taylor, M. J.: 23.
Trembath, D. A.: 15, 23.
Tremewan, W. G.: 3, 88.

Valletta, Anthony: 260.

Wakely, S.: 91.
Warren, B. C. S.: 121.
Warry, Brigadier H.: 48, 90.
West, B. K.: 49.
Wilkinson, Ronald S.: 223, 261.
Wiltshire, E. P.: 267.
Worms, The Baron de: 55, 177, 233, 240, 286, 288, 293, 294.

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Hibernation and Pupation Habits of *Cossus cossus* L. (Lep. Cossidae)

By Dr. H. B. D. Kettlewell

In a recent number of the *Entomologist's Record,* Commander G. W. Harper[1] has referred to a statement I made in a small book, "Your Book of Butterflies and Moths", published by Faber & Faber in 1963[2]. Albeit with the object of encouraging observation and curiosity, I stated that *cossus* had been found pupating in mounds, mole hills to be precise. This I quoted as an example of a recent most unexpected and interesting field observation.

I stand corrected on two counts. Firstly, that the "mole" and its hill were quite wrongly involved in the life of *C. cossus.* It should have read "anthills", and this indeed makes the original observation of even greater interest. Secondly, and this explains in part my first error, the "recent" observation in the field was, in fact, read by me 16 years previously and had certainly not been referred to by me since. Thus do the ravages of time on memory assert themselves! I have, however, paid the penalty by having to spend countless hours searching the entomological literature for the reference which I was certain existed! I hope this has not been in vain and that Commander Harper can forthwith concentrate his researches on the pupae of *cossus* in the direction of anthills. I much regret this mistake, and future editions of this book will include the correction of "ant" for "mole".

On 22nd July, 1947, Lt. Col. F. C. Fraser[3] of Winton, Bournemouth, recorded the following observations which, because of their clarity, I quote verbatim:

"On July 6th when emerging from a plantation of *Salix viminalis* L., I almost trod upon a fine male specimen of *Cossus cossus* (L.) which was clinging to a grass-stem in deep vegetation and which had probably come from the badly infested *viminalis.* I thought it to be resting after flight but, upon examining it, I found to my surprise that its wings, although fully expanded, were quite limp. It had evidently emerged quite recently, and I cast about to find the empty pupal case. Close to the moth was a large mound, the nest of *Lasius* (=*Donisthorpea*) *flavus* (F.), and on glancing at this, to my growing surprise, I noticed a pupal case projecting from its summit amongst the short grass. Further examination of this showed it to be half extruded from a cocoon embedded in the soil of the mound. Whilst doing this, I discovered a second empty pupa about four inches from the first, also projecting half out of a cocoon. I decided to remove a section of the turf containing the empty pupae with a view to keeping it as an exhibit. I found the soil to be very friable, but by careful cutting with a knife successfully removed the sod. In doing this I came on a mass of ant eggs and a vicious swarm of *L. flavus.* I decided to take the sod home and embed it in plaster-of-paris, a method which I had found useful for preserving the burrows of *Hyemalis boreus* L. Later I informed Miss Haines of my find and asked her to look for more. On the following Sunday, July 13th, she told me that she had gone at once to the spot and found two more large females of *Cossus* newly emerged as well as a number of empty pupa cases. I revisited the spot

on the same date and found no less than nine empty pupae all in cocoons in the ant mounds, of which there were about a score in close proximity to the *viminalis* plantation. In addition there were numerous fragments on several others, probably broken up by rabbits, which had been burrowing in some of the mounds. Miss Haines informs me that this area was recently under water but that the mounds would have been probably islets in the surrounding flood; thus the summits of these would probably be the only dry areas in which the larvae could build their cocoons. The latter are made up of fine friable loam and an admixture of web: when removed from the mounds they resembled short cigars and, notwithstanding the material from which they had been made, were remarkably compact and tough. A number were removed as specimens for any museum which might care to possess them. The tough greasy skin of the larvae evidently protects them from the attacks of the ants whilst burrowing and spinning their cocoons, or maybe the little people do not like the goaty effluvium? Mr. Scarsdale Brown, to whom I related this strange pupation site, tells me that some years ago he came on a somewhat similar mass of cocoons and empty pupae projecting from among metal between sleepers on a railway line in the neighbourhood of some badly infested poplars".

There can be no doubt then that *Cossus* at times pupates in earth mounds, nor can there be any argument that at others it pupates in dead wood. Entomologists from Moses Harris[4] onwards have referred to finding their pupal shells extruding from trees.

From this point onward I must disagree with Commander Harper who appears to hold the view that pupal hooks and spines (cremaster or abdominal) are only of use in those species which make cocoons in wood. On the contrary, such appendages can provide an even more important survival mechanism in species which pupate in soil. Thus the pupae of *Hadena glauca* and *Anarta cordigera* are in vertical elongated cocoons in both species, with their bases on soil, and they are able to travel up and down them which, on occasions, must provide an escape from drowning[5], [6].

We have evidence, then, that two very different pupal sites are chosen by *cossus*—dead wood or anthills. Most of us have met full-grown larvae of this species travelling along roads in the late summer after vacating their tree trunks. We have also noted that their colour has changed from light to dark during this period, thereby making them less conspicuous. This colour change has, no doubt, been subject to intense natural selection. It is not likely, therefore, that these autumn wanderings are accidental; more likely is it that for some individuals at least it is the rule. I believe it most unlikely that larvae leave their hibernating quarters in the earth in the spring and then attempt to find a tree with rotten wood in which to pupate. What are the chances of success in finding such a site? Has anyone seen such a treck in the spring? The over-wintering larvae I have bred (in sawdust) certainly did not appear capable of such activity. I do not in fact believe it happens. What hypotheses then can we put forward to account for the indisputable facts provided. I would hazard a guess that a more likely explanation is that there is an inherited habit-difference: there are those which leave the tree and wander in the autumn and eventually pupate in mounds or raised ground; and there are those

which remain *in situ* throughout their larva-pupa life in trees. This, then, would be a habit morphism, equating the dangers of drowning versus the risks of predation by such birds as woodpeckers. It is during the frozen periods of the year that these birds have to rely largely on wood borers for food.

One final interesting thought arises. Could this particularly thick-skinned larva with repellent smell have been especially evolved for avoiding attacks of ants? If so, and this is most important, it must be understood that any creature that succeeds in this way gains enormous advantage from the protection afforded by the ants themselves (particularly a species such as *L. flavus*), as they will keep out the majority of predators from their nests. Fraser himself suggests this in his paper. I hope it can be corroborated by Commander Harper and that the moles meanwhile will not have been unduly disturbed!

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[5]Hedges, A. (1954). *Ent. Rec.*, **66** : 129.
[6]Haggett, G. M. Personal communication (24.10.64). After comparing the early stages he states: "I would regard the same characters appearing in *glauca* as additional evidence of its closeness to *anarta* rather than convergence because of environment". I have previously looked upon this as an excellent example of the convergence of habit in two widely separated species.

Notes on Species of the Genus *Zygaena* Fabricius (Lepidoptera : Zygaenidae) from South-west France and Spain, with descriptions of New Subspecies

By W. G. Tremewan and W. B. L. Manley

During the latter part of the summer of 1964 one of us (W.B.L.M.) and his wife visited Spain to collect Rhopalocera and *Zygaenidae*. Much of the time was given to following up problems, raised during previous expeditions, relating to the *Lysandra coridon* Poda complex of the former and to the *Zygaenidae*. Leaving England on 30th June and returning on 24th August, most of the intervening time was spent in the Spanish Pyrenees and the provinces of Burgos, Santander and Leon. Nearly 500 *Zygaena* were brought back and are the subject of the following notes.

Z. sarpedon rianoica Tremewan

Z. sarpedon rianoica Tremewan, 1961, *Ent. Rec.*, **73**: 1.

2 ♂♂ and 2 ♀♀ were captured 10.vii.1964 at the type locality, Riano, Leon, 3400 ft.

Z. sarpedon ssp.

A worn male and female of *sarpedon* Hübner were captured 24.vii.1964 at Jaca, Huesca, 2700 ft.

Z. sarpedon ssp.

2 ♂♂ and 1 ♀, in worn condition, were taken 6.vii.1964 at Oña, Burgos, 2000 ft. As recorded previously (Tremewan, 1963b: 251), specimens from Oña are rather translucent compared with those of ssp. *rianoica* Tremewan. Although it was formerly considered that the Oña and Villasur specimens might be referable to ssp. *rianoica* (Tremewan, *loc. cit.*), it is highly probable that the populations from these localities represent a new subspecies. Further material in fresh condition is required to confirm this opinion.

Z. sarpedon ssp.

A short series (6 ♂♂, 1 ♀) of *sarpedon* Hübner, in slightly worn condition, was taken 2.vii.1964 at Puerto de Oncala, Soria, 4200 ft. The specimens differ from those from Oña, in having rather denser scaling and a much wider hindwing border.

Z. contaminei contaminei Boisduval

Z. contaminei Boisduval, 1834, Icones historique des Lépidoptères nouveaux ou peu connus, **2**: 48, pl. 53, figs. 4, 5.

A series of 28 ♂♂ and 6 ♀♀, in fresh condition, was captured 23.vii.1964 at Balneario de Panticosa, Huesca, 5500 ft. The specimens are referable to the nominate subspecies of *contaminei* Boisduval, described from the neighbourhood of Barèges, Hautes-Pyrénées. A large female has a trace of a red abdominal belt and is referable to ab. *cingulata* Fernández.

Z. purpuralis magnalpina Verity

Z. purpuralis magnalpina Verity, 1922, *Ent. Rec.*, **34**: 33.

Z. purpuralis hirsuta Holik, 1941, *Mitt. münch. ent. Ges.*, **31**: 755.

A worn male and two worn females of *purpuralis* Brünnich were captured 23.vii.1964 at Balneario de Panticosa, Huesca, 5500 ft. The specimens are referable to ssp. *magnalpina* Verity from Gèdre, Hautes-Pyrénées, 1000 m.

Z. fausta fernan Agenjo

Z. fausta fernan Agenjo, 1948, *Eos, Madr.*, **24**: 394.

A male and female of *fausta* Linné were taken 30.vii.1964 at Oña, Burgos, 2000 ft.; 2 ♂♂ and 1 ♀ were captured 6-18.viii.1964 at Sotopalacios, Burgos, 2800 ft.; a series of 11 ♂♂ and 8 ♀♀, 30.vii.1964 at Busto, Burgos, 3900 ft. and 24 ♂♂ and 7 ♀♀, 7-15.viii.1964 at Paramo de la Masa, Burgos, 3300-3500 ft. These specimens are referable to ssp. *fernan* Agenjo, described from Mte. Santiuste, Pampliega, Burgos, 894 m.

The species was also captured, 29.vii.1964, at Ullivari de Gamboa, Alava, 2200 ft. (20 ♂♂, 6 ♀♀), and at Abejar, Soria, 3300 ft., 21.vii.1964 (1 ♂, 1 ♀). The specimens from these localities are also referable to ssp. *fernan*.

The above series exhibit considerable variation. Most specimens have rather broad, yellowish rings around the forewing spots; in only a small minority are these rings reduced and then are not completely absent.

Z. fausta fassnidgei ssp. nov.

♂ 22-24 mm. Ground colour of forewings black with greenish tinge, forewing spots and hindwings varying from orange-vermilion to vermilion,

pale yellow rings around forewing spots reduced and very narrow, hindwing border narrow.

♀ 23-27 mm. Coloration similar to that in the male, hindwing border reduced and present only at the apex.

Holotype ♂, "Jaca, Spain. 2700 ft.: 16.8.1958 W. & M. Manley"; allotype ♀ with similar data but dated "15.8.1958".

Paratypes: 4 ♂♂, 13 ♀♀, Jaca, Huesca, 2700 ft., 4-26.vii.1964, W. & M. Manley; 5 ♂♂, 4 ♀♀, Jaca, Huesca, 1.ix.1931, W. Fassnidge, ex coll. A. E. Burras; 2 ♂♂ with similar data but dated "6.8.1933" and "22.8.1933", ex coll. A. E. Burras; 3 ♂♂, Jaca, Huesca, 2700 ft., 15-16.viii.1958, W. & M. Manley; 5 ♂♂, La Pena, Huesca, 2400 ft., 14-16.viii.1958, W. & M. Manley.

Ten specimens, 4 ♂♂ and 3 ♀♀ from Jaca and 2 ♂♂ and 1 ♀ from the Sierra de la Pena, Huesca, 3600 ft., are worn and are not designated as paratypes.

This distinct subspecies differs from the other known Spanish races of *fausta*, in the larger forewing spots, which are confluent with each other, and the reduction of the light yellow rings which are, in many specimens, so reduced as to be almost absent. It is nearest to ssp. *preciosa* Reiss from Albarracin, Teruel, in which the bright vermilion spots and hindwings are similar, but may be separated by the reduced rings around the forewing spots. In ssp. *preciosa* these rings are broad and well represented. A further character of the Huesca specimens is the vermilion coloured hairs that are present on the thorax in many specimens. These characters separate ssp. *fassnidgei* ssp. nov. from the nominate subspecies of *fausta* from the coastal region near Nice, southern France.

Z. hilaris leonica Tremewan

Z. hilaris leonica Tremewan, 1961, *Ent. Rec.*, **73**: 3.

A single female, in fresh condition, was captured 10.vii.1964 at the type locality, Riano, Leon, 3400 ft.

Z. occitanica burgosensis Tremewan

Z. occitanica burgosensis Tremewan, 1963, *Ent. Rec.*, **75**: 251.

This subspecies was described from Oña, Burgos, 2000 ft. A short series of 1 ♂ and 4 ♀♀ was captured at this locality, 30.vii.1964.

Z. occitanica burgosensis Tremewan f. **lutea** f. nov.

Three specimens of *occitanica* de Villers, which were bred in 1963 from cocoons collected near Sotopalacios, Burgos, 2800 ft., were separated from ssp. *burgosensis* Tremewan, as they differed greatly in wing pattern and coloration (Tremewan, 1963b: 252). As it was thought that the Sotopalacios populations might be distinct from those from Oña, a special effort was made in 1964 to collect further material from this locality. Consequently, a series of 23 ♂♂ and 24 ♀♀ was taken 5-18.viii.1964 while 21 ♂♂ and 27 ♀♀ were bred, 27.vii-31.viii.1964, from cocoons collected in the area. This additional material has revealed that the populations from Sotopalacios should be referred to ssp. *burgosensis* from Oña but that, in the former locality, the species is dimorphic. All specimens that were bred in 1964 are identical in coloration with the three specimens bred in 1963. Two males and five females that were captured in the wild are also referable to this form. The remaining specimens that were

captured have creamy white rings around the forewing spots, as in the specimens from Oña. Only six males of the creamy white form (of a total of 18 captured in the wild) have spot 6 joined to spots 4 and 5 by creamy white scaling along the veins, a character which, in the Oña specimens, is found only in the females. It should be pointed out that this dimorphism has not yet been found in the Oña populations. We see no justification for separating the Sotopalacios specimens as a subspecies distinct from ssp. *burgosensis* from Oña. We do consider, however, that the form with deep cream[1] or light yellow ochre rings around the forewing spots to be worthy of a name and propose naming it f. **lutea** f. nov. As stated above, this form may be distinguished from the nominate form of ssp. *burgosensis* by the light yellow ochre coloration of spot 6 and of the rings around spots 1-5. In addition, spot 6 is, in the males, frequently attached to spots 4 and 5 by light yellow ochre scaling along the veins (20 out of a total of 23 specimens), a character which, as has already been noted, is always present in the females of both forms and of both populations.

Holotype ♂, "Bred pupa, Sotopalacios, Burgos, 2800 ft.: 13.8.1964 W. & M. Manley"; allotype ♀ with similar data but dated "4.8.1964".

Paratypes: 20 ♂♂, 26 ♀♀, Sotopalacios, Burgos, 2800 ft., ex pupa, 27.vii-31.viii.1964; 2 ♂♂, 5 ♀♀, same locality, 3-16.viii.1964; 2 ♂♂, 1 ♀, same locality, ex pupa, 6-27.viii.1963.

Holotype, allotype and paratypes in W. & M. Manley collection.

Z. occitanica burgosensis Tremewan ab. **elisae** ab. nov.

One of the above mentioned specimens is a remarkable and striking aberration. The forewing spots are enlarged while the light yellow ochre rings are suffused to cover most of the ground colour of the forewings. The dark ground colour remains as a narrow black band extending from the apex and around the termen to halfway along the inner margin where it is broken by a suffusion of yellow ochre scaling. The basal quarter of the inner margin is of the normal ground colour, as is also a "spot" at the base near the costa. The ground colour also remains as a black "spot" between spots 2 and 5 and as a series of small, black, subterminal "spots". The hindwings are normal. We name this remarkable aberration ab. **elisae** ab. nov.

Holotype ♀, "Bred, larva Sotopalacios, Burgos. 2800 ft.: 6.8.1964 W. & M. Manley", in W. & M. Manley collection.

We have pleasure in naming this unique aberration after Mrs. Manley who found a single larva while searching for pupae. This larva pupated immediately in a pill-box and produced this aberration in spite of being subjected to the same conditions as the pupae from which some fifty specimens of f. *lutea* f. nov. emerged.

Z. occitanica huescacola ssp. nov.

♂ 24-28 mm. Ground colour of forewings blue-black, tinged with green, forewing spots and hindwings crimson tinged with scarlet. Rings around spots 1-5 and spot 6 varying from white to off-white. Spot 6

[1]The form from Sotopalacios was originally described as having distinct cream rings (Tremewan, 1963b : 252). These rings are better described, however, as being light, yellow ochre in colour.

varying in size and often reduced.

♀ 26-30 mm. Coloration similar to that in the male, forewing spots larger, spot 6 generally separate from spot 5, in two females attached to spot 5 by whitish scaling along the veins.

Holotype ♂, "Sierra de la Pena, Huesca. 3600 ft.: 25.7.1964 W. & M. Manley"; allotype ♀ with similar data but dated "26.7.1964".

Paratypes: 15 ♂♂, 6 ♀♀, Sierra de la Pena, Huesca, 3600 ft., 22-26.vii.1964; 2 ♂♂, 4 ♀♀, Jaca, Huesca, 2700 ft., 22-24.vii.1964; 1 ♂, 1 ♀, La Pena, Huesca, 2400 ft., 22.vii.1964; 1 ♂, La Pena, Huesca, 2400 ft., ex pupa, 28.vii.1964; 3 ♀♀, Jaca, Huesca, 2700 ft., 13.viii.1958; 2 ♂♂, 2 ♀♀, La Pena, Huesca, 2400 ft., 12-15.viii.1958, all leg. W. & M. Manley.

Holotype, allotype and paratypes in W. & M. Manley collection.

This new subspecies may be separated from ssp. *arragonica* Holik & Sheljuzhko (=*iberica* Staudinger) from the neighbourhood of Barcelona, Catalonia, by the warmer coloration of the forewing spots and hindwings. It is nearest to ssp. *disiuncta* Spuler from the Pyrénées-Orientales, but this subspecies differs in the coloration of the forewing spots and hindwings which are scarlet tinged with crimson. The size of the forewing spots, especially spot 6, of the Huesca specimens varies considerably, such variation not having been noted in ssp. *disiuncta*. These characters also separate ssp. *huescacola* ssp. nov. from the nominate subspecies from Aveyron, France.

Further specimens, nine males and one female from the Sierra de la Pena and four males and one female from Jaca, are in worn condition and are not designated as paratypes.

Z. loti soriacola ssp. nov.

♂ 27-32 mm. Ground colour of forewings blue-black, forewing spots and hindwings bright scarlet tinged with crimson. Black hindwing border present at apex or almost absent. Forewing spots very large; spot 1 extended along the costa as far as spot 3 from which it is just separated by the dark vein. Spots 1 and 2 confluent near base, spot 2 broadly confluent with spot 4. Apical spot (5+6) large, separate from remaining spots except in two specimens in which the apical spot is narrowly connected with spot 3.

♀ 29-32 mm. Blue-black ground colour of forewings dusted with yellowish scaling. Forewing spots and hindwings a warmer red, varying from scarlet in some specimens to scarlet tinged with vermilion. Hindwing border absent. Forewing spots large, confluence not so extreme as that in the males, spots 2 and 4 connected by a broad or narrow band of scaling; in one specimen these spots are separate.

Holotype ♂, "Abejar, Soria. 3300 ft.: 3 July 1964. W. & M. Manley"; allotype ♀ with similar data but dated "17 July 1964".

Paratypes: 25 ♂♂, 8 ♀♀, Abejar, Soria, 3300 ft., 3-18.vii.1964, W. & M. Manley.

Holotype, allotype and paratypes in W. & M. Manley collection.

Seventeen further specimens, 13 ♂♂ and 4 ♀♀, are in worn condition and are not designated as paratypes.

This new and distinct subspecies differs from ssp. *arragonensis* Staudinger from Albarracin, Teruel in its larger size, brighter red coloration of the forewing spots and hindwings and the confluence of the fore-

wing spots. In coloration it is similar to ssp. *avilensis* Koch, described from the Sierra de Gredos, Avila, but is easily separated by its larger size and the confluent spots. These characters also separate the new subspecies from the nominate subspecies from the neighbourhood of Vienna, Austria.

A male and two females of *loti* Denis & Schiffermüller were taken 2.vi.1964 at Puerto de Oncala, Soria, 4,200 ft. Only one specimen, a female, is in perfect condition, the remaining female and a male are worn. The forewing spots of these specimens are smaller than those in ssp. *soriacola* ssp. nov., being well separated in one of the females; in the other female and the male the confluence is not so extreme. It is highly probable, however, that these specimens from Puerto de Oncala are referable to the new subspecies from Abejar.

Z. loti ssp.

A fresh male and female of *loti* Denis & Schiffermüller were captured 14.vii.1964 at Sotopalacios, Burgos, 2800 ft., and a worn male was taken 30.vii.1964 at Busto, Burgos, 3900 ft. These specimens are not referable to ssp. *soriacola* ssp. nov. The coloration is similar but the forewing spots of the Sotopalacios specimens, although large, are not confluent except that spot 1 is extended along the costa and is attached to spot 3. In the male, spot 3 is joined to spot 4. The specimen from Busto is slightly more confluent as spot 2 is connected to spot 4 by a narrow bar.

Z. loti pardoi Agenjo

Z. achilleae pardoi Agenjo, 1953, *Graellsia*, **11**: 2.

Four ♂♂ of *loti* Denis & Schiffermüller were taken at Riano, Leon, 9-10.vii.1964. These specimens are provisionally placed under ssp. *pardoi* Agenjo (Tremewan, 1961a: 3; 1963a: 5; 1963b: 252).

Z. rhadamanthus rasura Agenjo

Z. rhadamanthus rasura Agenjo, 1948, *Eos, Madr.*, **24**: 392.

Three very worn females of *rhadamanthus* Esper were captured 14.vii.1964 at Sotopalacios, Burgos, 2800 ft. The specimens are characterised by the very large forewing spots and a red abdominal belt is present in each. We place these specimens under ssp. *rasura* Agenjo, described from Villasur de Herreros, Burgos, 1040 m.

Z. rhadamanthus ssp.

A worn series of 6♂♂ and 8 ♀♀ was taken 2.vii.1964 at Puerto de Oncala, Soria, 4200 ft. The specimens differ from those from Sotopalacios in having much smaller forewing spots. Except in two specimens, spot 6 is detached from spot 5. A red abdominal belt is present in all specimens and only in one is it reduced. From the available material, they cannot be referred to ssp. *manleyi* Tremewan, described from La Pena, Huesca, 2400 ft. In this subspecies, spot 6 is attached to spot 5 and the presence or absence of an abdominal belt occurs in equal numbers.

Z. ephialtes roussiloni Koch

Z. ephialtes roussiloni Koch, 1940, *Z. wien. Ent Ver.*, **25**: 135.

A series of 11 ♂♂ and 14 ♀♀ of five-spotted, red, ephialtoid *ephialtes*

Linné was taken 14-26.vii.1964 at Jaca, Huesca, 2700 ft. Although many of the specimens are not in fresh condition, red scaling is noticeable in spots 3-5, in addition to the basal spots 1 and 2, a character of ssp. *roussiloni* Koch from Vernet-les-Bains, Pyrénées-Orientales. Apart from their slightly smaller size, the specimens do not differ and are referable to this subspecies.

Z. hippocrepidis marujae ssp. nov.

♂ 28-31 mm. Ground colour of forewings blue-black with a slight greenish tinge, forewing spots and hindwings bright vermilion, hindwing border narrow. Spot 6 attached to spot 5 in the majority of specimens.

♀ 28-34 mm. Coloration similar to that in the male, ground colour of forewings greenish black. Forewing spots larger, vermilion coloration brighter, tinged with orange.

Holotype ♂, "Jaca, Spain. 2700 ft.: 24.7.1964. W. & M. Manley"; allotype ♀ with the same data.

Paratypes: 12 ♂♂, 21 ♀♀, Jaca, Huesca, 2700 ft., 14-26.vii.1964; 1 ♂, La Pena, Huesca, 2400 ft., 30.v.1960; 2 ♂♂, same locality, 2-3.vi.1962; 2 ♀♀, same locality, ex pupa, 17 and 20.vi.1962, all leg. W. & M. Manley.

Holotype, allotype and paratypes in W. & M. Manley collection.

Sixteen further specimens from Jaca, 4 ♂♂ and 12 ♀♀, are in worn condition and are not designated as paratypes.

This new subspecies was previously referred (Tremewan, 1961a: 6), on examination of a single specimen, to ssp. *asturiensis* Reiss (*Z. hippocrepidis rupicola* Rocci=) but later (Tremewan, 1963a: 7), when further material was available (2 ♂♂, 3 ♀♀), the populations from Huesca were considered distinct from ssp. *rupicola* and were placed near ssp. *centripyrenaea* Burgeff from the Hautes-Pyrénées. The additional material taken in 1964 shows that it is a new subspecies and differs from ssp. *centripyrenaea* by the brighter coloration of the forewing spots and hindwings. The forewing spots are larger and are more inclined to be confluent, e.g., spot 6 is frequently attached to spot 5. In this respect it is similar to ssp. *philippsi* Romei from Cuenca, Castile, but may be separated by its larger size, broader forewings and larger forewing spots. Three males of the new subspecies have traces of a red abdominal belt. The characters just mentioned also separate the new subspecies from the nominate subspecies from central and southern Germany (Jena, Thüringen).

Z. hippocrepidis ssp.

A very worn male of *hippocrepidis* Hübner was captured 6.vii.1964 at Oña, Burgos, 2000 ft. The forewing spots are small and well separated and a trace of a red abdominal belt is present on the abdomen. The species has already been recorded from Oña (Tremewan, 1963b: 253).

Z. hippocrepidis occidentalis Oberthür

Z. hippocrepidis occidentalis Oberthür, 1907, *Ann. Soc. ent. Fr.*, **76**: 41.

A very worn male was taken at Angoulême, Charente, 250 ft., 1.vii.1964.

Z. filipendulae kricheldorffiana Reiss

Z. filipendulae kricheldorffiana Reiss, 1936, *Ent. Rdsch.*, **54**: 75, pl. 2, figs.

Z. filipendulae microseeboldi Verity, 1946, *Redia*, **31**: 67.

4 ♂♂ and 1 ♀, in perfect condition, were taken 8-10.vii.1964 at Riano, Leon, 3400 ft.

Z. filipendulae agutangula Marten f. **sagitta** Marten
Z. filipendulae hybr. *sagitta* Marten, 1956, *Ent. Z.*, **66**: 58.

7 ♂♂ and 8 ♀♀ of this form, described from Penches, Burgos, 700 m., were captured 6-30.vii.1964, at Oña, Burgos, 2000 ft. Six males and seven females are five-spotted and one female has spots 3 and 4 confluent. The remaining male has spot 6 attached to spot 5, while the six-spotted female has the spots confluent in pairs. Such variation has been recorded previously (Tremewan, 1963b: 253).

Z. filipendulae aleonada Marten
Z. filipendulae aleonada Marten, 1956, *Ent. Z.*, **66**: 46.

3 ♂♂ and 1 ♀ of *filipendulae* Linné were taken 2.vii.1964 at Puerto de Oncala, Soria, 4200 ft., and 1 ♂ and 2 ♀♀, 3.vii.1964, at Abejar, Soria, 3300 ft. These specimens are five-spotted and are referable to ssp. *aleonada* Marten, described from Villar del Ala, Soria, 1200 m.

Z. filipendulae seeboldi Oberthür
Z. filipendulae seeboldi Oberthür, 1910, Études de Lépidoptérologie comparée, **4**: 543.

A rather small, six-spotted female, with spot 6 reduced and attached to spot 5, was taken 14.viii.1964 at Novales, Santander, 400 ft. The specimen is referable to ssp. *seeboldi* Oberthür, which was described from Bilbao, Viscaya.

Z. filipendulae altapyrenaica Le Charles
Z. filipendulae altapyrenaica Le Charles, 1949, *Rev. franç. Lépid.*, **12**: 179.

A series of 9 ♂♂ and 3 ♀♀ was taken 23.vii.1964 at Balneario de Panticosa, Huesca, 5500 ft. Only one male has a trace of spot 6, the remainder being five-spotted. A further five-spotted male was taken 27.vii.1964 in the same locality at a higher elevation of 6000-6750 ft.

From this small series, it is suggested that the populations of Balneario de Panticosa are predominately five-spotted; because of this, the specimens are provisionally placed under ssp. *altapyrenaica* Le Charles. This subspecies is predomiantly six-spotted and was described from Cauterets (Port d'Espagne) and Gavarnie, Hautes-Pyrénées, 900-1500 m. It should be pointed out that Balneario de Panticosa is situated on the southern slopes of the Pyrenees and is therefore on the opposite side of the mountain range to Gavarnie and Cauterets. It has been shown that in many other species of *Zygaena*, subspecies occur in Huesca that differ from those from the Hautes-Pyrénées.

Z. filipendulae pulcherrima Verity
Z. filipendulae pulcherrima Verity, 1921, *Ent. Rec.*, **33**: 90.

A male and a female were captured 1.vii.1964 at Vieux Mareuil, Dordogne, 350 ft., and a further male and female, the latter in worn condition, on the same date, at Angoulême, Charente, 250 ft. These specimens, which have the forewing spots confluent in pairs, are referable

to ssp. *pulcherrima* Verity, described from Dompierre-sur-Mer, Charente-Inférieure.

Z. trifolii pajini Tremewan

Z. trifolii pajini Tremewan, 1963, *Ent. Rec.*, **75**: 8, pl. 1, figs. 18, 19.

A single female was captured 10.vii.1964 at the type locality, Riano, Leon, 3400 ft. A new locality was discovered for the subspecies when a further female, in fresh condition, was taken 11.vii.1964 at Puerto de Tarna, Oviedo, 4750 ft.

Z. trifolii laincalvo Agenjo

Z. trifolii laincalvo Agenjo, 1948, *Eos, Madr.*, **24**: 397.

A female taken 6.vii.1964 at Oña, Burgos, 2000 ft., is referable to ssp. *laincalvo* Agenjo, described from Estépar, Burgos, 810 m.

Z. trifolii ssp.

An interesting series of *trifolii* Esper (9 ♂♂, 5 ♀♀) was captured 3-5.vii.1964 at Abejar, Soria, 3300 ft. These specimens may be referable to ssp. *laincalvo* Agenjo but unfortunately only two specimens of the latter are available for comparison. A striking characteristic of the Abejar specimens is the large size (for Spanish specimens) of the females and the rather broad borders of the hindwings.

Z. lonicerae intermixta Verity

Z. lonicerae intermixta Verity, 1925, *Ent. Rec.*, **37**: 76, 117, pl. 8, figs. 50, 53.

This subspecies was described from Orihuela near Albarracin, Teruel, 1700 m. A male and a female, captured 3.vii.1964 at Abejar, Soria, 3300 ft., are provisionally placed under this subspecies.

Z. lonicerae leonensis Tremewan

Z. lonicerae leonensis Tremewan, 1961, *Ent. Rec.*, **73**: 8.

2 ♂♂ and 3 ♀♀ were taken 10-12.vii.1964 at the type locality, Riano, Leon, 3400 ft.

Z. lonicerae ssp.

3 ♂♂ and 5 ♀♀ of *lonicerae* Scheven were captured 23.vii.1964 at Balneario de Panticosa, Huesca, 5500 ft. These specimens are possibly referable to the subspecies from Gavarnie, Hautes-Pyrénées. The populations from the latter locality are undescribed and have previously been placed under ssp. *major* Frey, described from St. Nicolas, Visptal, Switzerland (Tremewan, 1961: 200).

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Colias hyale L. and *Colias croceus* Fourc. in Kent

By M. H. Edmonds

During the last seven years I have annually searched S.E. Kent during the latter part of August for *C. hyale* L. Although I visited scores of lucerne and clover fields I never found it until this year.

I was therefore gratified on 20th August this summer when I took two males in fresh condition near Margate. Although I visited the area several times during the ensuing fortnight no further specimens were seen.

I consider that these two specimens were locally bred and may have been the first emergences from an adjacent lucerne field which had been mown, thus destroying the remaining pupae. This obviously raises a further problem regarding the appearance of *C. hyale* in this country. Not only is a fine hot summer desirable but also the breeding lucerne fields must escape the early attention of the combine harvester.

In this case I retreated from one lucerne field to another before the onslaught of the contractor and his combine. In at least three of these fields *C. croceus* Fourc. was emerging in fresh numbers whilst I watched the machine digesting not only the lucerne but presumably the remaining unhatched pupae. By the end of August hardly a field of lucerne stood uncut. This of course speaks well of efficient farming, making the best of a good spell of hot sunny weather.

It has been my experience that in the wild there are considerably more males than females, but from two breeding experiments this has not followed.

On the 1st September 1958 I took a fresh female at Folkestone.

Started laying 5th September until 14th September.

Well over 100 laid but many infertile.

Commenced hatching 15th September and fed slowly. During October thermostatically controlled heater added to breeding chamber at 65°-75°F. Feeding then improved and about 100 larvae were observed. During late stages 2 boxes of clover per day were stripped off.

First pupa noted 17th October. All pupated during next 14 days, except one larva which appeared to be trying to hibernate.

First imago emerged 3rd November, and continuously up to 20th November. The following resulted:—

		Approx. percentage
Males	41	40%
Females	21	20%
Female *helice*	21	20%
Unhatched pupae	7	
Faulty	4	
Total	94	

The ab. *helice* in this group were all of the lemon-yellow form.

On the 5th September 1959 I found *C. croceus* profusely in a clover field near Deal. Several females were taken including only one ab. *helice* form *pallida*. Normal females laid and from these under similar breeding conditions to the 1958 experiment. The following resulted:—

		Approx. percentage
Males	13	42%
Females	11	35%
Female *helice*	7	23%
Total	31	

First imago emerged 30th October, and continuously up to 11th November. The ab. *helice* in this group were all of the *pallida* form.

I was most interested to note in the October *Record* that two gentlemen had reported *C. hyale* from Essex this year. If any readers have any observations or recordings of this butterfly during the last few years I should be interested to hear from them.

"Gaveston", 938 Warwick Road, Solihull, Warks.

Ireland in 1964, a Postscript

By H. C. Huggins, F.R.E.S.

In my article on my last Irish trip (*antea* 223-227) I mentioned that I had some insects which must await further examination before identification could be certain.

I have now gone over some of these myself and taken a much greater number to the B.M., where Mr. D. S. Fletcher and Mr. J. D. Bradley very kindly assisted me with their expert knowledge.

The eggs laid by my large grey female *Eurois occulta* L. proved, as I had feared, infertile. I have been unlucky with eggs this year, about 60 laid by a female *Palpita unionalis* Hübn., taken in my garden here were also infertile, as were a number laid by a female of the Co. Dublin *Eumichtis lichenea* Hübn. sent me by Mr. Baynes. As I sent half of this batch to Mr. G. Haggett, their failure to hatch cannot have been due to any error of treatment on my part.

A male *Luperina testacea* Schiff., also taken at Ballynalacken, is the darkest I have ever seen. I take a few deep iron-grey specimens nearly every year, but in these the usual markings can be seen, the Burren one may be fairly called black and is almost unicolorous. Unfortunately it was the only *testacea* I took in the Burren, so I can give no idea of the proportion of this aberration there, but it is very much darker than those Messrs. Haggett and Wightman took in Kerry a fortnight later.

Mr. Fletcher patiently worked through the 24 Burren Hydraecias I set. As I had expected, the larger number were *lucens* Frey., there were 14 of this species to 10 *crinanensis* Burrows. With one exception all the *lucens* were substantially larger and more robust than the *crinanensis*, of which only one equalled the thirteen big *lucens* in size, though one *lucens* was the smallest insect of all. I think the proportion of *lucens* was even higher, as on the four hot nights when they were mostly taken, a good many more of these large insects knocked themselves about so much that I released them.

It is curious that I have never taken *lucens* on the peat in west Cork and Kerry, where it should be common; all mine thence have been *crinanensis*. In spite of Donovan's statement that *oculea* L. (*nictitans* Borkh.) is common in Ireland I have never yet taken one there.

My *Eupitheciae* have also proved interesting. Two *E. vulgata* Haw. from Dingle are much more varied than our southern English ones, though not nearly so extreme as ss. *scotica* Cockayne, or ss. *clarensis* Huggins. All my eight *castigata* Hübn. were of the black and white race of which I took two in 1963. Mr. Fletcher and I have been unable to find a similar form in the B.M. collection, but before writing further on the subject I hope to work out the local distribution.

Perhaps the most interesting "pug" of all was an almost unicolorous dark grey *virgaureata* Doubl., the only markings being the usual dot and costal ones. I have never seen such a dark specimen before, but Mr. Fletcher kindly dissected it, so there is no doubt as to its identity. It was taken on 10th August, so virgaureata is evidently partially double brooded in the Burren.

I bred a nice short series of *Thera juniperata* L. from the Burren larvae. Many of mine died before I could get them any foodplant here on my return, but Mr. Baynes with his usual kindness sent me some further pupae. The Burren ones seem to be slightly smaller than the southern English, though substantially larger than the Scottish. They are also more varied than my Surrey ones, some having quite a brownish tinge which seems to me rather strange, as Burren insects generally are usually of a purer grey than those in the south. There is also a tendency for the band to be broken.

My *Tortrix paleana* Hübn. were all of that species. I did not think they could be *unitana* Hübn. as they were too yellow, but I got Mr. Bradley to have a look at them as *unitana* was first differentiated in these isles from Burren specimens, and he confirmed my diagnosis.

Notes on the Microlepidoptera

By H. C. Huggins, F.R.E.S.

Euzophera ceratoniae Zell.

I have, during my residence here, taken 3 *ceratoniae* in the open air. There are in the district no large dried fruit warehouses and only comparatively small grocers, moreover not one of these is in the district where I live, and the grocers' shops are only small ones which do not carry a big stock.

My first specimen, a very large female, was taken on 8th July, 1933, sitting on the outside of a closed window in front of my then flat in the London Road, under a big arc light. Luckily there was a stone balcony outside which I could reach from another room, or I should probably have lost it, as these open-air *ceratoniae* are rather skittish. 1933 was a good migrant year here with lots of *Colias croceus* Fourcroy and *Vanessa cardui* L.; I did not work light in those days.

On 9th August, 1958, I took a large male in my mercury vapour trap, in good condition except for a chip on the right forewing. When I first saw it it was perfect, but I missed it, and when I later caught it, it was damaged. There were a good many migratory insects about; the following night I took a specimen of *Phycita semirubella* Scop., not an Essex insect.

On the night of 9/10th September, 1964, I again took a large male in the mercury vapour trap. Again there were numerous migrants about, *Palpita unionalis* Hübn. on 28th August, 5th September and 12th September, and *Rhodometra sacraria* L. on 14th September, whilst on 4th September Mr. D. More took two *Heterographis oblitella* Zell. at Hockley, and on 25th September Mr. D. Down saw *P. unionalis* at Rochford.

Although ceratoniae is often considered as solely a warehouse insect (B. A. Bower in one year took a large number in his City warehouse, and more recently Mr. Jacobs obtained a good many in the City) I see that L. T. Ford (*Guide to Smaller British Lepidoptera*: 15) states that the larva can only live on green dates. He does not, unfortunately, give his authority for this, and also states one was taken in a ripe orange by Mr. S. Wakely, but should this be correct, the warehouse specimens must be stowaways from the date-packing station, as *Laspeyresia funebrana* Treits. and *L. pomonella* L. are in fruit baskets; I found numbers of each and two *L. prunivorana* Rag. in 1922 in an Army hut where these baskets were stored when empty.

All my three open-air *ceratoniae* are very large specimens and it has occurred to me as at least possible that they are migrants from the Mediterranean.

I think that Mr. Ford's statement resulted from my suggestion that this species was a field pest rather than a warehouse one, and was brought in with the dates when packed. My experience is that larvae are reluctant to enter a new fruit, preferring to spend their life in the one date. The association of this insect with the locust bean, from which it derives its name, has not been mentioned by Mr. Huggins, and cargoes of these beans are delivered to the cattle-cake mills along the Thames. It is possible that his specimens have left a ship in the river, by way of the hold ventilators, or else are from one of the mills, which are not so very far from Westcliff-on-Sea.—Ed.

Tortrix unitana Hübn.

I have now been through all my *T. paleana* Hübn. and find that there are no *T. unitana* Hübn. amongst them. My Kentish and Burren ones are decidedly yellowish cream, but I thought possibly some whitish specimens with grey speckles from Yorkshire might prove to be the rarer moth, but Mr. Bradley has proved by dissection that they are only *paleana*. *Paleana* is a most variable insect, and I have a couple of bright yellow ones from Witherslack.

I wish to thank Mr. R. W. J. Uffen, M.Sc., F.R.E.S., and Mr. R. L. E. Ford, F.R.E.S., for giving me information about the present whereabouts of the late J. W. Corder's micros.

Aporophila nigra Haw. in Surrey.—Readers may be interested to hear of the occurrence of *A. nigra* in my mercury vapour light trap at Reigate: a female on 15.x.1962, a male on 19.x.1962, and a female on 21.x.1964. All were in good condition.—D. A. Trembath, Quarry Hill West, Gatton Road, Reigate, Surrey. 18.xi.1964.

Some Random Scottish Records

By Austin Richardson, M.A., F.R.E.S.

Drymonia ruficornis Hufn. at Loch Maree. Two specimens, 22.iv.1964. Furthest north record?

Eurois occulta L. in Skye, Unst, and various mainland localities. During the period 6th-15th August, 1960, I took three specimens of the grey form at Glenbrittle. It is interesting to note that Dr. J. Campbell took his first specimen in Canna, and that Mr. P. Wormell also took a specimen in Rhum, during the same period. We saw no more, 5-13.viii.1961. I can see no difference at all between these and five specimens taken at Hermaness and Petester in Unst, 4-18.viii.1950, or indeed from a very long series taken at and bred from Forres in 1947-48. This year I bred four of the black form from wild larvae taken at Glenshiel. In 1948 I recorded (*Entomologist*, **82**: 79) three greys among twenty blacks from Dalwhinnie.

Hydraecia petasitis Dbld. at Ardlui, Dunbartonshire. On 16.viii.1960 I took a specimen at light.

Arenostola pygmina Haw. in Unst. A series, mostly of the bright red form, 4-10.viii.1950. Apparently a new record at that time.

Orthosia gracilis Fab. at Loch Maree. With a distinct recollection of having been told some time ago that the *O. gracilis* at Loch Maree were brown, I this year spent the nights 19, 21, 22.iv hoping to test this. Owing to the unusually late season all I took, in spite of hard work, was one salmon specimen. I have one brown, taken among over a hundred salmon, at Struan, Perthshire, 22.iv.1948.

Xylocampa areola Esp. in W. Ross. I took specimens of the grey form at Shieldaig, Loch Maree and Inverewe (furthest north record?) during April 1964.

Alsophila aescularia Schiff. at Rannoch. One specimen taken 4-10.iv. 1960. A local collector told me that he had never seen it there previously.

Acasis viretata Hb. at Loch Maree. One specimen, 22.iv.1964. Furthest north record?

Carsia sororiata Hübn. in Unst. A single worn specimen, by day, at Vallarfield, 17.viii.1950. An interesting specimen because it appears to lack the pink clouding of ssp. *anglica* Prout. A careful search by day and by night failed to produce any more. There is one previous record for the species, but the whereabouts of the specimen is unknown.

Lygris populata L. ab. *musauaria* Frey. in Unst. A series taken 4-18.viii.1950, included three nearly black specimens. A new record for Unst at the time. These were taken at night off the heather, it being found almost impossible to flush most of the Geometrids by day.

Oporina filigrammaria H.S. in Eigg. I took three specimens, 22.viii.1933. This species was not included in Heslop Harrison's list for the island.

Eupithecia abbreviata Steph. at Loch Maree. One 22.iv.1964. Furthest north record?

Zygaena lonicerae jocelynae Trem. in Skye. I took a number of this species, then new for Scotland, in Skye, 8, 10, 11.viii.1961. Unknown to me, Mr. R. F. Bretherton had bred specimens from cocoons taken a month earlier in the same locality. My series contains several confluents.

Z. purpuralis caledonensis Reiss in Skye. I took thirteen specimens of this species, at that time unrecorded for Skye, 8, 10, 11.viii.1961, a very abnormal season. I wonder how many times it has been taken in August.

Though these records have not been previously published as such, in most cases the specimens have been shown at the South London annual exhibition.

Migrants in Lancaster Area, 1964

By C. J. Goodall

Migrant species of Macrolepidoptera have not been noted in any great numbers in this area in 1964, but the following records may be of interest.

Vanessa atalanta L. Fairly common in late summer.

V. cardui L. A few noted, mainly in gardens and parks, but not common.

Acherontia atropos L. A female of this species was given to me by Mr. H. Kinloch, a well-known local nature photographer. It was found on a window-sill at a hostelry in Skerton, Lancashire, on 27th August by a Mr. C. Anderson, and passed on to Mr. Kinloch, who obtained some magnificent photographs of it at rest and in flight.

Herse convolvuli L. A female was found in my garden m.v. trap on 26th August. It was in good condition.

Eurois occulta L. About a dozen specimens of this species were found in the garden m.v. trap of Mr. H. Robinson, of Warton, near Carnforth, about eight miles north of Lancaster, between 13th and 16th August. They were all of the pale form, and a north-east airstream prevailed at the time.

Agrotis ipsilon Hufn. First occurred on 27th May in the garden m.v. trap, and present in fair numbers for about a month following this. Appeared again on 4th September, and was common for several weeks.

Peridroma porphyrea Schiff. First recorded in garden m.v. trap on 5th October (one, worn). Small numbers appeared for the next fortnight.

Plusia gamma L. The first specimen appeared in the garden m.v. trap on 29th May. Since that date the species has been present in varying numbers on most nights when the trap has been operated, the largest catches being in late September and early October.

2 Derwent Avenue, Morecambe, Lancs. 11.xi.1964.

Phlyctaenia cilialis Hübn. in Hampshire.—A total of seven specimens of this moth have been taken by myself and a friend, while regularly running our mercury vapour light traps alongside a reed bed near Gosport during 1964. Two arrived on the evening of 13th June and three on 28th June, on which date they were beginning to look the worse for wear. No more were seen for seven weeks, then one appeared on the evening of 14th August, and another on 16th August. Both these later specimens were in good condition and suggest, perhaps, a second brood.—E. A. Sadler, St Christopher, West Tisted, Alresford, Hants. 12.xi.1964.

SOUTH-WEST ENGLAND RECORDS REQUIRED

Over the years records of Lepidoptera and other orders have been compiled by various people in Cornwall, Devon, Dorset and Somerset and these have been handed down to the present recorders. These records stem from resident collectors and visitors to the area who are in touch with the individual recorders. At the present time the area is not over-endowed with entomologists and enthusiasm for each order expands and dwindles by chance.

From time to time County Lists have been published, but, in the case of Lepidoptera only one, Somerset (A. H. Turner, 1955), draws considerable records from mercury vapour light traps. Other lists now require re-adjustment of originally held views on the distribution and scarcity or otherwise of particular species. The Somerset list also includes the micro-lepidoptera which have received little attention in the other counties.

A very valuable function of the county list has come to the fore in recent years. With the designation of Sites of Special Scientific Interest a preliminary list of the species occurring in the particular locality is available. Where areas are threatened by development, County Trusts for Nature Conservation can defend the area much better if equipped with factual information to support objections to the development of an interesting locality. This is a vital role in which all who are interested in entomology can help.

During the coming winter months it would be appreciated if anyone who can supply lists of species, with localities and other data, would get in touch with the particular recorder concerned, whose names and addresses are below.

CORNWALL

LEPIDOPTERA	Dr. F. H. N. Smith, Turnstones, Perranporth, near Torquay.
Other Orders	Through Dr. F. H. N. Smith (address above).

DEVON

COLEOPTERA	Rev. T. B. Kitchen, Skirlaw, Roundham Gardens, Paignton.
DIPTERA	G. M. Spooner, Five Oaks, Crapstone, Yelverton.
HYMENOPTERA	
Aculeata	G. M. Spooner (address above).
Symphyta	L. H. Woollatt, 123 Abbey Road, Torquay.
HEMIPTERA	H. G. M. Morgan, Staplake Mount, Starcross, Exeter.
LEPIDOPTERA	
Macro	A. H. Dobson, 60 Polsloe Road, Exeter.
Micro	Alan Kennard, Barton Head, Tedburn St. Mary, Exeter.
ORTHOPTERA	C. Gomm, Plymouth City Museum, Plymouth.
Other Orders	Through Miss M. A. Turner, Belford House, Kennford, Exeter.

DORSET

LEPIDOPTERA	R. I. Lorimer, 8 Southway, Totteridge, London, N.20.

Other Orders	Through R. F. Dalton, 9 Rochester Road, Dorchester.

SOMERSET

COLEOPTERA	W. A. Wilson, 16 Ballfield Road, Minehead.
LEPIDOPTERA	Dr. H. M. Chappel, The Old Rectory, Selworthy, Minehead.
Other Orders	J. Cowley, Holywell House, Erdington, Bridgwater.

The Transference of Species Names within a Genus

By Frank Balfour-Browne

In a recently published paper on the captures of coleoptera in England, the author includes the name "*Noterus capricornis* Herbst (*sparsus* Marsham)" for one of the water beetles. It was not until 1954 that Brinck found specimens of Degeer's *N. clavicornis* in the Degeer collection in Stockholm and by this discovery, the species which we had known as *capricornis* Herbst proved to be *clavicornis* Deg. Our two species differ considerably in size and it happens that what we now know to be the real *clavicornis* had been named *sparsus* by Marsham one hundred years later.

Many authors describing their captures give their list of names without stating whose nomenclature they are using but in this case the author does state that, so far as the water beetles are concerned he is relying upon my list dated 1940. Therefore, anyone knowing this history can correctly interpret the record. But how many coleopterists know about the changes that have taken place since? In 1954* I suggested that the Royal Entomological Society might take steps to prevent the transference of species names from one species to another and I mentioned a somewhat similar case in the Hydrophilids in the genus *Laccobius*. Nothing has been done and I therefore put forward the suggestion that when confusion has arisen with regard to the names of species within a genus, the species with reversed names should be given entirely new names, nomina conservanda.

In the present case I suggest that our two species of *Noterus* should be known as:—

Noterus major (nomen conservandum)= *N. clavicornis* Deg. (*sparsus* Marsh.)

Noterus minor n.c.= *N. capricornis* Herbst

*Problems in Nomenclature. *Ent. mon. Mag.*, 1954, **90**: 41, 2.

5.xii.64.

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Cosmopteryx Lienigella Zell. in Hampshire.—A single specimen of this attractive "micro" was found resting on a reed leaf (*Arundo phragmites*) in the glare of a mercury vapour light on the edge of a reed bed near Gosport, on the evening of 21st June 1964. The fens of the east coast would appear to be the home of this species, though possibly other collectors may have met with it in Hampshire; I would be interested to hear of such records.—E. A. Sadler, St Christopher, West Tisted, Alresford, Hants. 12.xi.1964.

Diptera in Brecon

By R. M. Payne

In May and June 1964 I made two short trips to Brecon, and had several good days in the pursuit of flies on the Brecon Beacons, the nearest real mountain area to London.

The greater part of two days, one on each trip, were spent working up the Nant Bwrefwr, a rocky stream with frequent waterfalls coming down from the horseshoe ridge of the Beacons. On 22nd May the powdery-blue crane-fly *Tipula subnodicornis* Zett. was extremely abundant on the moorland here, at heights of 1500 ft. to 2300 ft. Males were as usual much more in evidence than females, though I secured several pairs. On mossy rocks by a small waterfall at about 2000 ft. I found three other large crane-flies, *T. rufina* Mg. (a ubiquitous species), *T. alpium* Bergroth and *T. cheethami* Edwards. With them was a single female of the large dusky-winged Pediciine *Amalopis occulta* (Mg.).

It was interesting to compare the Tipulid fauna round this same waterfall a month later. On 30th June the Golden Saxifrage (*Chrysosplenium*) and mauve Butterwort were both in flower on the wet rocks above the stream. Of the Tipulids seen in May, only *T. cheethami* was now in evidence: several males were resting on the rocks with wings superimposed over abdomen. Another large fly which was very noticeable was *Rhagio scolopacea* (L.); again it was the males only, isolated specimens here and there on the vertical rocks and on the hanging sheets of *Chrysosplenium*, all facing downwards. The books suggest that this fly occurs mainly in woods, but the Nant Bwrefwr locality was on open moorland, probably a mile from any sizeable trees.

On a slightly overhanging vertical wet rock were a pair of the white-footed crane-fly *Dolichopeza albipes* (Stroem) in cop. They were fully extended in a vertical straight line, joined by the abdominal appendages, the male facing down with wings horizontally spread, the female facing up with wings folded over abdomen. Another female was resting a few inches away, also facing upwards but with wings outspread.

Other Tipulids taken by this waterfall on 30th June were *Dicranomyia aquosa* Verrall, *D. didyma* Mg. and *Tricyphona claripennis* Verrall. *Phylidorea squalens* (Zett.) was taken on the wing near-by.

On the damp rocks of Craig Cerrig Gleisiad on 22nd May I took *Tipula variipennis* Mg. (at 1600 ft.), *T. alpium*, *Erioptera lutea* Mg. and *Dicranomyia chorea* (Mg.).

On 24th May we went up the Dyffryn Crawnon valley, and in a narrow wooded ravine at 700 ft. I came across a huge Mountain Ash trunk that had fallen across a stream. On the underside of this fallen trunk was an assemblage of crane-flies, of which *Limonia nubeculosa* Mg. was much the most numerous and could at once be distinguished by its mottled femora. The white tarsi of the big *Dolichopeza albipes* were strikingly conspicuous in the gloomy light. *Cheilotrichia cinerascens* (Mg.) and *Dicranomyia mitis* (Mg.) were also present.

On 30th June I turned into a small marshy wood by the roadside near Libanus, and here, in addition to *Tipula unca* Wiedemann and *Ptychoptera albimana* (Fab.), I took the silvery Dolichopodid *Argyra argyria* (Mg.) on nettles, and also *Dolichopus ungulatus* (L.), *Chrysopilus cristatus* (F.) and

Syrphus cinctellus (Zett.). In another "lowland" habitat, the meadows by the Afon Tarell just out of Brecon, on 23rd May, I took *Dicranomyia mitis, Molophilus griseus* (Mg.), *Ptychoptera albimana, Bibio marci* (L.), *Dilophus febrilus* (L.) and *Dolichopus simplex* Mg.

As might have been expected, two days spent on the Carboniferous Limestone in the extreme south of the county proved particularly fruitful. On 23rd May I went to Ystradfellte, where at Porth yr Ogof the Afon Mellte goes underground. Here I saw large numbers of a striking Tipulid that was new to me, *Dactylolabis transversa* (Mg.), a species with milky-white wings flecked with dark markings. The specimens that I took had wing-lengths of from 9½ to 12 mm., compared with the range 8-10 mm. given by Mr. Coe in the Royal Ent. Soc. *Handbook*. Other Tipulids at Porth yr Ogof included *Tipula hortulana* Mg., *Limonia nubeculosa, Dicranomyia chorea, D. mitis, Rhipidia maculata* (Mg.), *Dicranota pavida* (Hal.), *Ormosia hederae* (Curtis) and *Trimicra pilipes* (F.), a very large Eriopterine with dark wings. Amongst flies of other groups I have so far identified the Psilid *Chyliza annulipes* Macq. and the local Syrphid *Brachyopa bicolor* (Fln.), of which I took a single male from an isolated Larch trunk in the wood above the river. At first I thought this was a large Muscid, and not till I examined it at home did I notice the *vena spuria* which revealed it as a hover-fly.

A month later, on 1st July, I was on the high Llangattock cliffs, a bold limestone escarpment near Crickhowell. These rocks were much drier than those by the river at Ystradfellte, and so the dipterous fauna was less varied, but *Dactylolabis transversa* was again plentiful: the wing-length of specimens taken here varied from 9 to 12½ mm. *Limonia nubeculosa, Austrolimnophila ochracea* (Mg.) and *Ormosia nodulosa* (Macq.) were also taken on the vertical rock-faces.

During my second trip to Brecon I kept a look-out for Tabanids, hoping to see some of the larger species, but was disappointed to take only *Haematopota pluvialis* L. (females of which were abundant at the lower levels) and a few male *H. crassicornis* Wahlberg. I saw no females of *crassicornis*, and as female horse-flies are generally much more noticeable than males I thought this rather odd, but on referring to Mr. Oldroyd's account of the species in "British Blood-sucking Flies" (1939) I was interested to see that he remarks there on the occasional prevalence of males in *crassicornis*. I wonder if other dipterists have noticed this?

I should like to acknowledge the help which Mr. L. Parmenter has been giving me with the naming of Dolichopodidae and other difficult groups of flies.

8 Hill Top, Loughton, Essex.

A Late Butterfly.—At 12.15 p.m. on 21st November (a very warm, sunny day) I saw a red admiral (*Vanessa atalanta* L.) on the wing at the bottom of my garden. It flew up to the house and settled on a window frame. After spending a few minutes there spreading its wings to the sun, it paid a visit first to a marigold, then to an iberis and finally to a yellow chrysanthemum, before flying off and disappearing near the place where I first saw it.—H. Symes, 52 Lowther Road, Bournemouth, Hants. 24.xi.1964.

Obituary

ERNEST SCOTT, D.S.O., O.B.E., D.M.

It is with deep regret that we must record the passing of Doctor Scott, of Westwell, near Ashford, Kent. He died quite suddenly on 10th July, 1964, at the age of 77, but had been in delicate health for several years.

Born at Hoddesdon, Herts., on 17th January, 1887, he was educated at St John's College, Oxford, and after graduating and entering the medical profession, served as House Surgeon and House Physician at St. George's Hospital, where he won the Brackenbury Prize, and later received honorary mention the Sir Charles Hastings Prize. About 1920, he went to live at Ashford, in which district he practised for more than 30 years, and in 1961 received the O.B.E. for his survey on pernicious anaemia. Besides an important medical career, Scott had a distinguished war record. He was awarded the D.S.O. for gallantry during the 1914-18 war, was twice wounded, and in World War II saw service in Norway, N. Africa, Greece and Italy.

Although a lover of all nature, it was plants and Lepidoptera that claimed most of his attention. He was above all a field naturalist, and in the above groups, proved remarkably keen and energetic. Entomologically, he was probably best known for his work on the Lepidoptera of the Ashford District, for which he issued three lists, and in which he made a number of signal discoveries.. Notable amongst these was that of the attractive Tortrix on larch, *Ptycholomoides aeriferana* H.-S., at Westwell in 1951, and at that time a new record for the British Isles. In 1959 he discovered the local plume *Buckleria paludum* Zell., in numbers at Hothfield, and a new record for Kent; he was also one of the few people fortunate enough to take the mysterious *Jaspidea deceptoria* Scop., a specimen of which obligingly appeared on his kitchen window one night in 1953. In 1960, he found the curious little Lamproniid, *Teichobia filicivora* Meyr., locally plentiful in the town of Ashford on the fructifications of *Dryopteris filix-mas*; a new county record of a species described from Ireland as new to science in 1937, and since noted from but few localities.

Besides his special interest in the Lepidoptera of Ashford, Scott was an active collector of European butterflies, of which he formed a large and fairly comprehensive collection, mostly of his own taking. Indeed, it has been said that his greatest love were the Rhopalocera; unfortunately, however, he appears to have published little on the subject of his many and varied exploits in search of them abroad, only two such accounts having been traced (in *Entomologist*, **59**: 309-312, **60**: 91: 93).

Mention must be made of his great interest in wild plants, the search for which he pursued systematically, and of which he contributed much of real value. His major scientific botanical contribution was in working out the detailed distribution of many species of plants in the Ashford area. He also made a number of important finds in Kent, among them *Stellaria palustris* Retz., *Carex elongata* L., *Euphorbia platyphyllos* L., *Filago apiculata* G.E.Sm., and *Potamogeton alpinus* Balb.

At "Suomi", his house at Westwell, he and Mrs. Scott invariably entertained most liberally naturalist friends who visited them, and the writer recalls many a happy occasion there and on expeditions with him in the neighbourhood in search of local species. Quite often these would end in a memorable night with light and sheet on the lawn of his lovely garden, a veritable entomologist's paradise high up on the chalk downs.

Scott was a founder member of the Kent Field Club, President of the Entomological Section of the Folkestone Natural History Society, and a member of the "South London". At the latter he was a familiar figure at the Annual Exhibitions, and frequently led field meetings in his area for the Society. In the Proceedings for 1957 (plt. 3) and 1959 (plt. 4), are photographs of him at two such meetings, including one a close-up study.

A man of great charm, boundless enthusiasm, and one who was ever ready to help others. He leaves a widow to whom we extend our deepest sympathy.

J. M. C.-H.

Notes and Observations

ENARGIA PALEACEA ESP. IN SURREY.—I read with interest reports of *E. paleacea* occurring in Southern England: Hampshire (antea 216), Suffolk (244/5), Surrey (antea 266) and Wiltshire (antea 268). I should like to report a further specimen; a slightly torn male of the pale form, which came to my mercury vapour light trap on the night of 15.viii.1964.

It is interesting to note that these specimens have all occurred within five days of each other (13th to 18th August), and have been geographically widely spaced. Does this mean that *E. paleacea* is an occasional immigrant from the continent?—D. A. TREMBATH, Quarry Hill West, Gatton Road, Reigate, Surrey. 18.xi.1964.

DEPRESSARIA ROTUNDELLA DGL. (LEP. OECOPHORIDAE) IN THE ISLE OF MAN.—While collecting in the Perwick Bay district, near Port St Mary, at the end of July this year, I found large numbers of larvae in rolled leaves, and a few in the flowers, of Daucus carota.

About fifty larvae were taken and placed in a polythene bag together with some 'kleenex' tissues to absorb any excess moisture.

A month later the moths started to emerge and eventually I had 46 specimens of *D. rotundella* Dgl. and two of *D. applana* F., no parasites were bred.

The larvae which were feeding on the flower heads were separated but they too produced *D. rotundella*.—M. J. TAYLOR, 8 Patch Lane, Bramhall, Cheshire. 6.xi.64.

NEMAPOGON GRANELLA L. (LEP. TINEIDAE) FEEDING ON POLYPORUS BETULINUS.—During the late autumn of 1963 I collected some *Polyporus betulinus* (Birch Bracket Fungus) from Isles Wood, Woodford, Cheshire, intending to cut them up for staging microlepidoptera.

The following spring I found specimens of *Nemapogon granella* L. in the room where I was keeping the fungus and in due course several dozen moths emerged from the two fungi. As moths are still appearing sporadically I assume that they are breeding in the remaining material.

I returned to Isles Wood in the spring and found that almost every fungus examined whether large or small, wet or dry, contained the pale pink larvae. The larvae so infested some fungi that they appeared to be living gregariously at the base of the gills of the fungus. The larger larvae subsequently make seperate mines into the solid body of the fungus.

Pupation takes place near the surface of the fungus. One fungus measuring about six inches in diameter finally had 33 extruded pupa cases in its surface.

This species is normally considered to be a pest which feeds on stored grain so its ability to exist under natural conditions is important when one is faced with the problem of controlling it. No parasites were bred from the material.—M. J. Taylor, 8 Patch Lane, Bramhall, Cheshire. 6.xi.1964.

Nemapogon granella L.—I have had an experience similar to that of Mr. Taylor with this species, but at the time I thought that the infestation of my Polyporus was due to escape from a culture which I was breeding on wheat. The Polyporus specimens were markedly smaller than those fed on wheat. In 1945 I met with a sample of ergot of rye from Portugal heavily infested by *N. granella* L., and the family gives one the impression of being naturally mycophagous, the grain infestations appearing as the unusual ones, although this species has been known from grain by Linnaeus as his name indicates.—Ed.

Mid-Winter Collecting on Dartmoor.—Midwinter might not seem to be the most congenial time of the year to search for larvae on Dartmoor, but as I was working there during the period 7-10th December, I tried my hand at searching after dark.

The first night blew a furious gale, the second torrential rain, but the third was fine and warm after rain all day. The moorland grass and herbage were soaked and the roads ran water.

I found *Ortholitha umbrifera* to be extremely plentiful and I collected 150 large ones in an hour and a half and saw a good many smaller. They were feeding on the outer part of Gorse pads, and I have, over the years, developed a technique with this larva, for the strong Gorse spines prevent it being picked and most attempts to box it in the normal way result in it dropping into the dense bush or its being flicked away; so I use a small chip-box which, with one hand, I carefully manoeuvre beneath the larva, holding a torch in the other, and let the larva slowly curl and drop into the box. It is not a species that can easily be beaten because it retires by day into the thickest parts of the bush near the ground, and also my experience is that it prefers low Gorse pads rather than taller bushes.

Common noctuid larvae on the move were *Lycophotia varia*, *Triphaena pronuba*, *Apamea crenata* and *Phlogophora meticulosa;* most numerous of all, however, was *Stilbia anomala* which was sitting about on Gorse and grass stems. all in the beautiful deep green penultimate skin, and I wonder if they had come up from the rain-soaked vegetation to dry off.—G. Haggett, 1 Torton Hill, Arundel, Sussex. 14.xii.1964.

Plusia ni Hübn. in South Devon.—I would like to report having taken a specimen of *Plusia ni* Hübn. at Budleigh Salterton on 4th October at light.—C. S. H. Blathwayt, 27 South Road, Weston-super-Mare. 19.xi.1964.

Early Emergences.—When collecting forms of *Erannis defoliaria* Clerc. on 6th December 1964, a *Phigalia pedaria* Fab. came to the paraffin vapour pressure lamp. Although I have seen this species flying in January, this is the first time I have observed it before the new year. I shall be interested to hear whether other readers have noticed *pedaria* on such an early date.

I would also record the emergence of a *Hydriomena ruberata* Frey. bred from ova from Aviemore, on 11th December, six months before normal emergence time. R. C. Dyson, 112 Hollingbury Park Avenue, Brighton, Sussex. 12.xii.1964.

Dragonfly Behaviour.—The behaviour of certain birds which take advantage of the movements of cattle and other animals, including man, through herbage to feed upon the insects disturbed by them is well known. Three classic examples in South Africa are the Cattle Egret, *Bubulcus ibis*, the Cape Wagtail, *Motacilla capensis* and the European Swallow, *Hirundo rustica*. Recently what can only be described as similar behaviour on the part of dragonflies, and of one species in particular, was observed in the St Lucia Reserve, Zululand. This behaviour is probably quite common but appears to have escaped notice as no reference can be found to it in any available literature consulted (viz. Imms.: Miall: Cambridge Natural History).

The species in which this behaviour was most marked is *Brachythemis leucosticta* (Burm.) (Libellulidae), a dark green to black medium-sized dragonfly (wing expansion c. 53 mm.) with a large dark patch or spot on each wing. It is of common occurrence on and near the lake shores, and is often met with on the roads and veld paths in the Reserve. On a number of occasions while walking along one of these paths I was joined by an individual of this dragonfly which would then closely accompany me, flying alongside, low down and hovering round, often pausing in mid-air as if watching every movement on my part, and now and then apparently darting after some insect disturbed by my feet. Such behaviour would be maintained for some distance and then the dragonfly would dash away ahead, only to reappear (or possibly another individual?) and resume operations some moments later. This behaviour was observed repeatedly and on more than one occasion. It was also noted, but to a much lesser extent, in at least one other species.

Such behaviour, which seems almost intelligent, on the part of a somewhat lowly classified insect, is perhaps worth recording.—J. S. Taylor, Wilderness, C.P. 16.xi.1964.

Aglais urticae L. at Light.—In reference to Mr. I. R. P. Heslop's observation of *A. urticae* (small tortoiseshell) coming to his electric light in his room (*antea* p. 246), I should like to add that a specimen of this species paid a visit to my mercury vapour moth trap on 19th September 1964, at 10.5 p.m. I am inclined to think that it came from a shed nearby, and as far as I know, it had not been disturbed, so I would agree with Mr. Heslop that light has an attraction for *urticae* in certain circumstances. —R. C. Revels, Top Field Farm, Dunton Lane, Biggleswade, Beds. 25.xi.1964.

ANOTHER IRISH LEGEND.—I reproduce an item published in the "Cork Examiner" on 1.xi.1964 that must be added to the already rich volume of Irish Lepidopterological Folklore. What intrigues me most is that *Calamia tridens* has acquired a further popular name, perhaps named after one of our most illustrious collecting characters, and I wonder whether Heslop will add it to his check list. I am indebted to Mr H. C. Huggins who sent me the cutting, and who, better than he, can appreciate an entomological curiosity from Ireland? The article reads:—

"Mystery of Bright Lights Solved. The mystery of the bright lights seen during the past week on the Burren Hills near Ballyvaughan, Co. Clare, has been solved.

Many farmers were afraid to go out of doors after nightfall because they believed that the lights had some ghostly connection. But in fact they were nothing more than Tilley lamps and mercury vapour lights being used by a party of English lepidopterists to attract rare moths and butterflies.

The party has been successful in capturing a number of the Baron Green moths, which are not to be found elsewhere in this country or in Britain".—G. HAGGETT, 1 Torton Hill, Arundel, Sussex. 25.xi.1964.

APAMEA ZOLLIKOFERI FREYER (SCARCE ARCHES) IN SUSSEX: A HITHERTO UNPUBLISHED RECORD.—Mr. A. L. Goodson (Br. Mus. (Nat. Hist.), Tring) recently showed me a ♂ *A. zollikoferi* which had lately been donated to the Rothschild-Cockayne-Kettlewell collection. It is of the plain form, which I judge to be typical, is in good condition, and was taken by Major F. Reeves at sugar, at Rye, Sussex, on 15th September 1934. So far as I am aware, there is no previously published record of this specimen, which now brings the total number of *zollikoferi* known to have occurred in G.B. to 14, and is an additional species to the Sussex list.—J. M. CHALMERS-HUNT, St, Teresa, Hardcourts Close, West Wickham, Kent.

APATURA IRIS L. IN WILTSHIRE IN 1964, INCLUDING AB. IOLE SCHIFF.—The Baron de Worms in his monograph of the Macrolepidoptera of this county remarked on the absence of records of lepidoptera from "from the north and north east of Wiltshire, where apparently no resident or visiting collectors have ever penetrated". I hasten to state that it is entirely by chance that since the summer of 1963, I have found myself stationed in this *terra incognita*—this "net shadow", so to speak.

I have found the general abundance of lepidoptera in this singularly lovely and unspoiled countryside above the average of elsewhere; and there are a number of specific localities and stretches of terrain offering the most inviting prospects. In particular I have been most interested this year, which has been a very good one for the species, to see the purple emperor not only in grounds which I have long known in the south of the county, but also in central Wilts. and in North Wilts. (exemplified by the relics of the ancient forest of Braden); in the latter in particular it having been unknown hitherto. I saw, personally, a total of 49 specimens of the purple emperor on the wing, in the county as a whole, in 1964.

But one of these observations I must describe in detail: this was of a male example of full ab. *iole* Schiff. which I, and my family saw in

south Wilts. on 30th July. This specimen, in full display and apparently quite fresh, we noticed the instant I stopped the car at 11.45 a.m., B.S.T., in a certain wood, on our arrival from Burnham-on-Sea on a day trip. It was high up, but we proceeded hastily to assemble the high net with maximum extension. Before this operation could be quite completed, the insect had made its way off. I offered up the net to the place where the butterfly had been at rest, but, although with my height I can reach 40 feet from the ground, the actual sprig—strain as I might—was just out of its range. Twenty minutes after it had flown off, the *iole* was back again—settling on the identical sprig. Here we could do no more than admire it fervently until it sailed off again a couple of minutes later. We saw no more of it, although we were on the ground for several further hours.

Some of the circumstances recall those of the incident recorded in *Entomologist's Record*, **69**: 97.—I. R. P. Heslop, Bentham House School, Purton, Wilts. 27.xi.1964.

Current Literature

Household Insect Pests. Norman E. Hickin. 172 pp.+4 coloured plates. Hutchinson (The Rentokil Library). 30/-.

In his treatment of this subject, Dr. Hickin has managed to serve both the entomologist and the non-entomological householder with an insect problem. The book is divided into three parts, in the first of which the insect is defined and its anatomy discussed; in the second part, insects of an order, or a group of orders, are discussed in each chapter (mites and ticks and woodlice and centipedes forming the subject of the last chapters in this part with an explanation of their difference from true insects). Each species is noted by its vernacular name with scientific name appended, and the text on each is divided into three parts: Appearance, Life cycle, and Economic importance. Each head is treated sufficiently fully in reasonably simple language which should be intelligible to any reader, without giving the impression that the author is talking down to him. The third part deals with notes on the control of each species described in part two, and commences with a description of the various control methods available to the householder, and good advice to him as to their application, putting special stress on the necessity for reading the instructions before applying the remedy, and carrying them out in that application. A full index follows with ample cross references to current names and recent synonyms.

This book is certainly interesting to anyone concerned with disinfestation problems and is well written throughout; the only quarrel I could raise being the use of the word extermination instead of control. The book is well printed on good paper and is bound in strong cloth boards, and is illustrated with photographs and good line drawings of the insects treated, the photographs being accompanied by an indication of the scale of enlargement. The coloured plates are not of the highest quality, but they serve well for general identification of the species figured, which include the silver fish, house cricket, German cockroach, bed bug, four moth species, and eight beetle species.—S.N.A.J.

Notes and Views of the Purple Emperor. By I. R. P. Heslop, G. E. Hyde and R. E. Stockley. Pp. xiii + 248 + 22 pl., of which six are in colour. Southern Publishing Co., Ltd. 1964.

This book consists of a collection of the authors' papers, previously published separately, under one cover with the addition of plates and some footnotes written after the papers were published. Thirty-three papers are concerned, of which nine were privately circulated, eight appeared in the *Entomologist*, eight in the *Ent. Record*, seven in the *Ent. Gazette*, and one in the *S.P.N.R. Handbook*.

Chapter 2 is an anthology in which the author has collected many quotations from the days of Edmund Spenser and William Shakespeare onwards, which do or might refer to the insect under discussion, and gives much for the ruminative mind to chew over. The other chapters range over almost every aspect of a study of *iris*, including much on the subject of its preservation by the establishment of nature reserves. Much of the matter is in very minute detail excepting, regrettably, mention of precise localities, and here one meets the silence of fifty or more years ago.

The authors' new varieties are, of course, among the papers reprinted, and these are, to some extent assisted by illustrative plates which did not accompany the original printing. The final part of the text consists of an appendix giving footnotes to the papers, in which the author's afterthoughts and new observations are set down, together with bibliographic references to works cited.

The illustrations include a map showing the distribution in Britain of *iris* in the period 1945-1950, and illustrations, both black and white and colour, show all the stages from the egg through the various larval instars to pupa and imago. There are also both black and white and coloured illustrations of set specimens showing varieties and aberrations from life and from drawings: Mr. Hyde is responsible for most of these, and is to be congratulated on his results. There are also photographs illustrative of habitat, one of Mr. and Mrs. Gulliver, of New Forest fame, and one of the authors.

This book is one which will have more appeal to the enthusiastic amateur than to the professional entomologist, but it contains plenty to occupy the reader during possible idle moments, when he has time to recall expeditions of the summer days in search of *Apatura iris* L.

S. N. A. J.

SHAPWICK HEATH NATIONAL NATURE RESERVE (EXTENSION), SOMERSET.

The extension to the reserve comprises about fifteen field enclosures totalling sixty-two acres on land adjoining the existing Reserve. These have been added under a Nature Reserve Agreement with the Western United Investment Company and their tenant farmers and will result in a more clearly defined boundary. Some of the enclosures are wet peat meadows grazed by farm stock and contain several plants typical of old-established grassland. Others consist of scrub woodland in which Willow, Birch and Ash predominate.

Access to the Reserve is by permit only. Applications should be addressed to the Regional Officer (South-West), Furzebrook Research Station, Wareham, Dorset.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

HIBERNATION AND PUPATION HABITS OF *COSSUS COSSUS* L. (LEP. COSSIDAE). Dr. H. B. D. KETTLEWELL 1

NOTES ON SPECIES OF THE GENUS *ZYGAENA* FABRICIUS (LEPIDOPTERA: ZYGAENIDAE) FROM SOUTH-WEST FRANCE AND SPAIN, WITH DESCRIPTIONS OF NEW SUBSPECIES. W. B. L. MANLEY 3

COLIAS HYALE L. AND *COLIAS CROCEUS* FOURC. IN KENT. M. H. EDMONDS 12

IRELAND IN 1964, A POSTSCRIPT. H. C. HUGGINS, F.R.E.S. 13

NOTES ON THE MICROLEPIDOPTERA. H. C. HUGGINS, F.R.E.S. 14

SOME RANDOM SCOTTISH RECORDS. AUSTIN RICHARDSON, M.A., F.R.E.S. 16

MIGRANTS IN LANCASTER AREA, 1964. C. J. GOODALL 17

THE TRANSFERENCE OF SPECIES NAMES WITHIN A GENUS. FRANK BALFOUR-BROWNE 19

DIPTERA IN BRECON. R. M. PAYNE 20

OBITUARY 22

NOTES AND OBSERVATIONS 23

CURRENT LITERATURE 27

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (215)

TO OUR CONTRIBUTORS

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Lepidoptera Harvest 1964

By T. W. Harman

Once again the "close season" gives one a chance to reflect on the past year and sift through the diary to produce a summary of the year's activities. It again has been a good year for me with a total of 452 species of macrolepidoptera identified, as compared with 421 in 1963 when areas visited were almost the same. The total number of species taken in my garden has now reached 390 in June 1961. I hope to describe some of the more interesting expeditions and species in the ensuing paragraphs.

The year opened quietly with the highlight being my first invitation to the Verrall Supper, a most entertaining and instructive evening as well as an excellent meal. The season began to move rapidly on 13th March when my wife saw a brimstone butterfly, but this was soon checked by snow on 15th which lasted until 20th March. Before the end of March the first *Stauropus fagi* L. emerged, the result of ova laid in 1963. Some *Cucullia verbasci* L. from 1963 larvae also began emerging at this time. They did not seem to favour going over two winters as did a great many *C. lychnitis* Ramb. bred the previous year.

Two specimens of *Nothopteryx polycommata* Hübn. came to light on 7th and 8th of April, only the second time I have seen this species here although there is plenty of privet close by. Mr. T. J. G. Homer and I made the first field trip to Pamber Forest on 9th April where we recorded 20 species, large numbers of *Apocheima hispidaria* Fab. being the most noteworthy. *Gypsitea leucographa* Hübn. was seen on sallow at Turville Heath on 10th April and, in the same locality, I caught my first *Colostygia multistrigaria* Haw. in the lights of my brother's Land Rover, a very handy vehicle for cross-country work. On 12th, the first of 11 specimens of *Eupithecia insigniata* Hübn. hatched from ova laid by a female which came to light in the garden last year. They always seemed to emerge in the morning even though indoors. The big difficulty with this insect appears to be in getting the females to lay. Of two I kept this year, one did not lay at all, and the other laid a few infertile eggs. We again went to Pamber on 17th to try for *Orthosia miniosa* Fabr. and managed to get some, including several females which laid later. We had expected to see this species commonly on sallow, but this was not the case, nearly all coming to light. Mr. B. R. Baker came over on the 18th on a quest for *Odontosia carmelita* Esp. We set up a light near birches about a mile from here on a very wet evening which finally forced us to pack up without seeing *carmelita*. On the way back we tried a long shot, a soaked male sallow bush. This very surprisingly yielded four male *G. leucographa*. Further searching in another area produced three more specimens from a female tree, one of these being a badly wanted female. April ended with a female *O. carmelita* on the 28th. She laid eggs and the larvae did well for a time but then suddenly started dying like flies until only about eight from the original 114 ova remained. The same day Mr. Homer and I collected black poplar catkins from under some huge trees growing about half a mile from here. We hoped to obtain larvae of *Cirrhia ocellaris* Borkh. Mr. Homer successfully bred five specimens, and the larvae I collected were sent, when quite well grown, to Mr. S. Coxey at Bolton, where they even managed to survive in this northerly latitude!

Mr. Homer and I went back to our *carmelita* spot on 1st May and had the good fortune to see 14 specimens, the bulk coming in between 9.30 and 10 p.m. We were joined here on 9th by Mr. R. Fairclough for his annual *insigniata* hunt. The village was illuminated by five mercury vapour lights, one of which was plugged in to the public house and another provided by a generator run on the vicar's back lawn; entomology knows no barriers! Whether the illuminations were overdone or it was just too windy, we could not tell, but *insigniata* failed to appear yet again. When Mr. Fairclough does get a specimen, it will have quite a petrol bill to answer for! Two males came to light here on the 17th, so it seems that in this locality it never flies until well into May, the dates for the last three years being 15th, 16th and 17th. The 12th May turned out to be rather exceptional and was a good example of the rapid effect on insects of sudden changes in temperature. During the day the temperature rose to 78°F. and was still 60°F. at 11 p.m. Seventeen new species for the year were recorded out of a total of 50 for that night. Among them was one male *Nycterosea obstipata* Fabr., a welcome sight so far inland and early in the year. This was not the only good night in May as I noted several when high temperatures and thundery conditions brought totals of species well into the sixties. Two specimens of *Perizoma albulata* Schiff. on the 25th were new to me and with them was the first Medmenham record of *Eustrotia uncula* Clerck, although this species breeds fairly closely in some Thames water meadows. The 28th brought in the first specimen here of *Apatele alni* L., always a nice moth to have around. I accompanied Messrs. Baker and Homer to Pamber on 30th May where we had a bumper night with such species as *Hapalotis venustula* Hübn., *Cepphis advenaria* Hübn., *Eumichtis adusta* Esp., *A. alni*, *Tethea* or Fabr., *Hadena contigua* Vill., and *Anagoga pulveraria* L. As usual, on such nights, it is difficult to get Mr. Baker to move, it is either worth a try fifty yards down the track at 2 a.m., or the next five minutes may produce something! This enthusiasm produces good moths but very tired collectors. On this occasion we managed to get home by 4 a.m. to be greeted by *Selenia lunaria* Schiff. and *Lophopteryx cucullina* Schiff.

June had a slow start, but there was one female insigniata on 2nd. On 10th a female *Odontaeus armiger* Sp. beetle came to light with another on 25th. This is supposed to be a July insect, but I nearly always get at least one in June. The 12th was an extraordinary day and one worth describing. After a very hot day of continuous sunshine, cloud came up in the evening and we then had the most violent thunderstorm I remember. Flashes of sheet lightning lasting seconds at a time were accompanied by at least two hours of torrential rain. The thermometer stood at 63·5°F. at midnight and through the storm moths flocked to the light, 90 species in all in great numbers. A polythene sheet is stretched over my m.v. lights and this protects insects which have settled from becoming damaged or drowned. The 27th was another red-letter night with two specimens of *Trisateles emortualis* Schiff., one to each of my two lights. One was rather worn, but was saved in the forlorn hope of obtaining eggs, the other was fit for the collection. Needless to say, the live specimen did not lay so was released. This means that at least three localities are known for this insect and it must be quite widespread although rather retiring in its habits.

Another field trip to Pamber on 16th July produced such species as

Parascotia fuliginaria L., *Catocalpe undulata* L., *Hyloicus pinastri* L., *Pseudoips bicolorana* Feussl., *Parastichtis suspecta* Hübn. with a fresh male *Thecla quercus* L. also coming to the sheet. By climbing oak trees near the sheet and shaking individual branches we obtained another later in the month. The trip of local collectors mentioned earlier were in Pamber Forest again on the 18th. Just as we were thinking of packing up at 2.15 a.m., two male specimens of *Lithosia quadra* L. came to Mr. Baker's sheet within two minutes. Back at my own sheet a few minutes later found a lovely *Catocala promissa* Esp. sitting on an egg tray with shimmering wings. This prompted us to stay until 3 a.m., but there were no more *quadra*. This time Mr. Baker could not be made to budge so we left him to wait for dawn and the low flying *Apatura iris* L., he saw one too!

Our summer holiday was again spent at Southwold. Mr Baker with his family stayed two doors away with Mr. Homer entrenched in the "Dutch Barn" restaurant. This enabled us to run four m.v. lights there every night and we made a number of trips to Walberswick Marshes. Species recorded over the two weeks numbered nearly 200. Among the more interesting at Southwold were *Arenostola brevilinea* Fenn., *L. cucullina*, *Pyrrhia umbra* Hufn., *Hadena compta* Fabr., *Nonagria dissoluta* Treits., *Plusia festucae* L., *Cosmia affinis* Haw., *Apamea oblonga* Haw., *Heliophobus albicolon* Hübn., *Amathes stigmatica* Hübn., *N. neurica* Hübn., *Perizoma bifaciata* Haw., *Sarrothripus revayana* Scop. and *N. typhae* Thunbg. At Walberswick we tended to get more species per night and on 6th August recorded 104 at three lights. Species of note there were *N. neurica* Hübn., very commonly on most visits, *N. dissoluta* Treits. in many forms and sizes, *Simyra venosa* Borkh., a fair number in one place in the marsh, *A. brevilinea*, a fair number, *Tholomiges turfosalis* Wocke, only one, *Heliothis viriplaca* Hufn., one specimen, *Spaelotis ravida* Hübn. one specimen and *Chilodes maritima* Tausch. commonly with two specimens of ab. *wismariensis* Schmidt amongst them. We all went to Barton Broad on 1st August and were joined there by Messrs. H. Chipperfield and C. Pierce for the night's collecting. Mr. Chipperfield seems to rapidly becoming the moth-hunter's guide to East Anglia! It was a poor night with a gusty breeze, but we found some shelter behind alder trees and were lucky enough to see a number of *Celena haworthii* Curt. and a few *Pelosia muscerda* Hufn. Mr. Baker again stayed out all night and managed to find larvae of *Papilio machon* L. just at dawn and to catch sight of a harrier flying over the reed beds. Before leaving East Anglia I should mention finding larvae of *Heliothis peltigera* Schiff. on a few plants of *Senecio viscosus* growing on the shingle beach at Benacre Broad near Southwold. This can only be reached on foot, but it is well worth the effort, especially if one is at all interested in ornithology. It is a paradise of water and reeds surrounded by woods, and well away from the madding crowds and their impedimenta.

The return to Medmenham was made rather reluctantly, but I was glad to see *P. bifaciata* here on the 12th. While at Southwold we had discussed the likelihood of seeing more *C. promissa* and *L. quadra* at Pamber in August. With these in mind we made a trip there on the 15th. We both got *promissa* but nothing more was seen of *quadra*, much to my disgust. After a quiet period at home I decided on a visit to one of my favourite areas, Dungeness. So far, I have never been there without at least one

good night. The 27th August was the day chosen for the trip and it turned out to be a pretty good one with *Nonagria sparganii* Esp., *H. peltigera* and *Semiothisa alternaria* Hübn, as new species. The larvae of *peltigera* were extremely common on *S. viscosus*, with up to three specimens on a plant. They were still to be had in September. *Colias croceus* Fourc. was common at this time too and I netted a male and female *helice* with one sweep after a hectic chase. From Dungeness I moved to Worth, near Sandwich, where I stayed with my mother-in-law until 3rd September. The weather during this spell was terrible, with sunny days and clear cold nights. However, I went to Rye to meet Messrs. Homer and Tweedie with a view to taking *Gortyna hucherardi* Mab. Mr. Tweedie knew the area well and although we were early for this species and the weather was rather unsuitable, his excellent guidance led to four specimens between us. On the 3rd September I decided to have another try for *hucherardi* and arrived at about 4.30 p.m. to have a real look round and see if any pupae of *N. sparganii* could be found. In a small ditch I found plenty of empty cases in *Typha* stems, but did get five which had not hatched. These all came out successfully. Just at dusk a torrential thunderstorm sent me scurrying for shelter, but, determined not to be outdone, I dashed out at intervals to look for *hucherardi* among the soaked herbage. By 9.30 p.m. I had three specimens, so packed up and went back to Worth. The storm had not penetrated very far east, but it had become cloudy and made things fair for moths. The light at Worth had attracted three male *Ennomos autumnaria* Wernb., a new species and a very welcome one to fill a long, empty gap in the cabinet. There was also one *S. alternaria* Hübn. This made a one day extension to my proposed stay well worth while.

Early September really began to show the change in seasons with a change in species. *Schrankia taenialis* Hübn. came in on the 5th and the first of the sallows on the 6th. It was Pamber again on the 7th where we found *Amathes glareosa* Esp., *A. castanea* Esp., *Asphalia diluta* Schiff. and *Trichiura crataegi* L. fairly commonly, but, by the 11th, on a further visit, they had become decidedly worn. Much of September was poor by night, but the first *Cirrhia ocellaris* Borkh. seen at light here came in on the 23rd. For some time I had wanted to try Dungeness for *Aporophila australis* Boisd. so decided on a weekend trip from 25th to 27th September. On the way down, the weather looked bad for moths, but a rare thing happened; it became more cloudy as I got near Dungeness and things improved as the evening wore on. *A. australis* was common and among a number of other species was one *N. obstipata*. Mr. R. E. Scott allowed me to help myself from his trap, so I had a complete series of *australis* on the first night. By the next evening it was a different story with clear sky and heavy dew. However, a few *australis* came in plus the best catch of the trip, a specimen of *Leucania unipuncta* Haw., the fourth for Kent in 85 years. Mr. Scott promptly got the fifth for Kent within a few days!

October was a poor month on the whole, the only moths worth recording locally being two specimens, male and female, of *Chesias legatella* Schiff. on the 20th to m.v. light at Henley. Mr. Homer and myself again went to Swanage from the 23rd to 27th inclusive. We could hardly hope to do better there than in 1963, and with some shocking weather on most nights this proved to be so. *Dasypolia templi* Thunb. was much less common, migrants much fewer, and numbers of common species down on

the previous year. Still, we did see two dozen *Lithophane leautieri* Boisd., one *Macroglossum stellatarum* L. and a specimen of *Chloroclysta siterata* Hufn., this being taken on ivy. Probably the best moth of the trip was a single *Lithophane ornitopus* Hufn. which came to light in a small wood near Arne. This seems to be a difficult species to find in any numbers. We explored Lyme Regis and the area to the west on the 25th, a lovely autumn day. The undercliffs to the west must be one of the finest pieces of natural coastline in Britain as well as being one of the few. We spent an hour scrambling from the beach to the footpath at the top of the cliffs. It was like being on another planet, with, one minute, jungle scrub covered with lichen, and the next, open areas of clay uncovered by landslips of different ages on which were small ponds and, in some places, forests of horsetails several feet high. From enquiries made, the area, a Nature Conservancy Reserve, is almost unexplored entomologically. I hope to remedy this in 1965 as we have booked a bungalow at the western end of Lyme Regis and will attempt to make inroads into the lepidoptera of the region. Near the beach that day we saw a male *C. croceus* flying in the sunshine, surely a late date.

This almost brought the year to a close except for *Ptilophora plumigera* Esp. This appeared on 6th November. This makes its first appearances in the garden over the past four years fall within three days. Thirteen specimens were seen here this year, all males, and on the 17th, Mr. Homer and I saw 11 males in a locality about five miles away. By the 22nd they seemed to be over. From experience here it would appear to have a very short, regular season.

In conclusion lepidopterists may be pleased to hear that on the farm where we live, some of the calves are now being named with latin names of moths. So far Blanda and Dominula have emerged, a welcome change from the usual Buttercup and Daisy. This might be a way of finding unusual childrens' names, who knows.

3 Lodge Farm Cottages, Medmenham, Nr. Marlow, Bucks.

The Bog at the Back of Beyond

By An Old Moth-Hunter

We had a good lunch at the Forsyth Arms, so good in fact that as I sprawled in an easy chair after coffee I was glad that a younger man was to be at the wheel that afternoon. My companion had been content with a mere half-pint of lager beer; for it is his rule (and should be everybody else's) to be abstemious to the verge of teetotalism when in charge of a car, especially if the car be a high-powered one and the distance not inconsiderable.

"Have you got that map?" said he, anxious to be back on the road.

I pulled out the map and, unfolding it, spread it across my knees. "The best thing we can do", said I, "is to make due north for the coast, then 'run our easting down' as the sailors say, along the coast road. About sixty miles I make it".

He took the map from me and scrutinised it. "But why go all that way round?" he asked. "There's a road here right across the hills, going

almost straight in our direction—if a mountain road can ever go straight for more than fifty yards. It won't be more than forty-five this way".

"It's not motorable", said I. "Most of it is marked by a dotted line. I expect it's been washed away in several places, near the tops of the hills. And just look at it"—I leant across him—"It goes miles and miles from anywhere. Right over the back of beyond. If anything happened to the car when we got well up into these hills we'd have to walk miles and miles before we came to even a village. I know these tracks across the hills. Most of them ought not to be marked on the map at all. You might do it in a jeep, but not in a car sixteen feet long".

"Let's ask somebody. The landlord ought to know what state it's in". He got up and went in search of the landlord. Presently he came back and reported that the road over the hills was doubtful through the first six miles of it were all right, being used almost daily by the inhabitants of outlying farms.

"And after the first six miles?" I asked.

"He's never been more than six miles along it, so he doesn't know. I vote we try it. We can always turn back".

I thought of a recent incident when he had been obliged to drive the car backwards for nearly a mile until a farm gate made it possible to turn. However, there are always farm gates .... "Very well", said I. "Let's have a go".

We climbed out of the village by a road which only an optimist would have called 'serpentine'; for it consisted chiefly of hairpin bends. These happened whenever the road narrowed to about nine feet, and there was invariably a minor precipice at the most acute part of the bend.

When we came out on to a plateau which extended for a couple of miles my companion stopped the car and we just sat and stared. I am sure we could see for thirty miles in every direction. Doubtless there were farms tucked away in valleys over which we gazed; but of these we saw nothing —nothing but ridge after ridge of russet-purple hills and peaks which met the clouds at every horizon. The cool air was as exhilarating as vintage champagne: one could not drink enough of it. "I must look at that Lychnis", said I, indicating a wide pink patch of ragged robin a few paces from the car. "Might find eggs of *conspersa*" But it wasn't the Lychnis nor the chance of *conspersa* that impelled me to get out of the car: I just wanted to walk about in that marvellous air at the wonderful spot.

We found no *conspersa;* so presently, glutted with mountain air and scenery, we got back into the car and drove on, now along the top of a ridge and across gently undulating plateaux, now up a hill, now down one. but climbing all the time and every few miles stopping to look down upon little farmhouses and green meadows and coloured specks that were cattle, all nestling in the valleys far below the road along which we drove.

After we had been going for about three-quarters of an hour, while scrutinising the map I noticed something thereon that caught my attention. "Pull up for a moment", said I to the driver. The map showed, ahead of us and a mile to the right of our road, a pale-coloured patch about an inch long and nearly an inch wide, such a patch as is used on ordnance maps to denote low-lying ground—swamps and fens. No track, not even a dotted line indicating a footpath, crossed this patch anywhere, and it was

contained by 2,500 feet hills on all sides except at one end, where it was bounded by a ridge that came down nearly to the 2,000 feet contour.

"A bog of sorts", said my companion. "Looks rather an interestting place. Must be about a mile long and nearly a mile wide. Shall we go and have a look at it? There's a track of some sort going off the road we are on: we might pull in there and walk down and inspect".

I agreed and when presently I estimated that we were near the spot where the track branched off we slowed down to walking pace.

Even so we had passed the track before we saw it. "That must be it", said I, pointing backwards to a narrow cleft in the ridge that bounded our road. We backed, then drove the car on to the grass in the cleft, and walked through the rift to prospect.

In a few minutes we were on the other side of the ridge and stopping simultaneously had our second thrill that day. We found ourselves looking down into a great oval punchbowl, the floor of which was a patchwork of greens and browns. Neither of us spoke; for the silence was unbroken even by the hum of an insect and the scene we gazed upon was truly impressive. At last "Gosh!" said my companion, and we started to clamber down among the bracken and bilberry and boulders till at length we came to the edge of the 'floor'.

It was more of a fen than a bog, for it was a watery place; no wonder there was neither track nor footpath across it. The brown patches were reeds and the green was a lush growth of marsh and fen flora. There were one or two shallow pools at the edge we had now reached, and I noticed *Alisma*, figwort, silverweed, a patch of water-mint, the amphibious persicary, and many other common marsh plants. I wondered what moths would come to light and sugar in such a spot . . . .

My companion explored botanically while I wandered on, gazing over this strange place we had come to all unexpectedly and noting reed birds—buntings with black heads, a snipe, and once a *Larus ridibundus* whose mocking laugh echoed eerily from the sides of the great bowl. It was indeed a desolate spot, the kind of place where any rare plant or insect or bird might occur. My eyes lighted upon a tall dock plant with huge leaves—*hydrolapathum* without a doubt . . . .

I stopped suddenly in my walk. It was Thomas Edwards, an accomplished zoologist, curator of a museum and Associate of the Linnean Society, who told Edward Newman that he had seen, and chased, a large copper butterfly in this part of the country and had come close enough to it to see that it was a male. "It settled several times in full view", he wrote. "I repeatedly fell in pools concealed by the tall reeds and grasses, and at last was so completely tired that I gave up the chase". . . . And *hydrolapathum*, the foodplant of the coppers, here! . . . . I sat down on a boulder and gazed across the bog. Could Edwards have come to this lonely place, and could it have been here that he saw and chased—?

At that moment my companion came up.

"I've just seen a fritillary", said he.

"Oh! Was it *aurinia*?" (Although he is a botanist he knows most of the butterflies).

"May have been; it flew rather like *aurinia*. But it seemed to be a brighter colour; quite a brilliant beast. It was going fast, over there", he extended an arm, "and when the sun caught its wings it looked quite red. Expect it was a new var", he laughed.

I said nothing at all, because all of a sudden I felt—rather as I should have done had my companion remarked "there's a plesiosaurus wallowing about over there". Also I had remembered that *aurinia* is not on the wing in July.

"Anyhow you won't catch it", he went on. "You couldn't even force a canoe through this, and if you jumped overboard from one you'd probably go in up to your neck. Quite a sanctuary for birds and insects, isn't it. Rather a discovery. I wonder if anybody's ever explored it".

I got off the boulder "Show me just where you saw this fritillary", I said. "Then I'll sit and smoke and perhaps I'll catch sight of it too while you're exploring along this side. Don't go too far".

We walked back to where he had seen the butterfly, and I sat and stared over the bog, glancing every now and then at my companion as he jumped across hummocks and stooped over pools; for it was a dangerous place and a false step might have landed him in difficulties.

But the butterfly did not appear again, and after an hour we toiled up the ridge and so back to the car and resumed our journey.

When we had gone a mile or two we came to a cross-roads and there we saw a shepherd lighting a stump of pipe. We stopped and I got out of the car, ostensibly to ask him the way but really to make enquiry about the bog. Being a shepherd he was a contemplative man, therefore polite. He had English, and he spoke it slowly and correctly.

"We call it 'Bhuig na Bhodaich' ", he said in answer to my enquiry.

I racked memory and translated "the bog of the bogle".

He thanked me with his eyes and nodded.

"It's a strange place", said I. "Who is, or was, the Bhodaich?"

"I do not know", he said. "It was called that very long ago".

"Before you were born?"

He nodded gravely; then: "They say it was there before the hills".

I thanked him and got back into the car. "It was there before the hills", I repeated as we drove off. Then all at once I turned to my companion. "Do you know", said I, "I believe he was right. It was there before the hills were thrust up from the earth's crust. It's been there for millions of years".

And now, sometimes, when I lie in bed waiting for sleep to come, I see with my mind's eye that strange silent bog hidden far away in the hills at the back of beyond, the bog that cannot be glimpsed from any road, the bog that was there before the hills; and I hear the murmuring conversation of the reeds as they discuss the two strangers, and the taunting laugh of the pretty little gull, and the *'scape, 'scape* of the snipe, which is bird-language for "Catch me if you can!"

But most of all I think of a butterfly that was "going fast over there, and when the sun caught its wings it looked quite red . . . ."

CORRECTION

It is to be regretted that in Mr. H. C. Huggins's description of a new aberration of *Xylocampa areola* Esp. (*Ent. Rec.*, **76**: 286) the name was incorrectly spelt. The line should have read:

Xylocampa areola Esp. ab nigro-brunnea ab. nov.

ED.

Some Comments on Selected Species of the Genus *Hadena* Schrank at Dungeness, Kent, 1962-64

By R. E. Scott

Since the spring of 1962 I have operated an 80 watt Robinson m.v. light trap on a south-east facing slope of a grass bank at Dungeness, Kent (grid reference: 085172). Electrical supply was obtained from the Dungeness Bird Observatory building. The trap was switched on each evening at dusk except when weather conditions were exceptionally adverse (e.g. severe gales, heavy rain) and examined as soon as possible the following morning. The specimens trapped were checked, counted and released—a small number were taken as cabinet specimens, but insufficient to affect the contents of this paper. The present paper is concerned with the six commonest species of the *Hadena* group at Dungeness, *w-latinum* Hufn., *nana* Hufn., *lepida* Esp., *conspersa* Schiff. (=*confusa* Hufn.), *albimacula* Borkh., and *serena* Schiff. (=*bicolorata* Hufn.). In addition to these, the following were also trapped, but in insufficient numbers to warrant any comparison of the different years:—*trifolii* Hufn., *cucubali* Schiff. (=*rivularis* Fabr.), *bicruris* Hufn., *suasa* Schiff. and *thalassina* Hufn.

The basic results of the three years trappings are presented in the two tables, but the following points of interest and summary may be useful:

1. 1964 was a more prolonged season, with the period of emergence extending over a greater number of days in all species.
2. Apart from *conspersa*, the first and last dates in 1962 and 1963 are remarkably similar.
3. The specimen of *albimacula* trapped on 4th September, 1964, was freshly emerged and obvious evidence of a partial second brood at Dungeness in some years.
4. Maximum nights were confined to 1962 (4) and 1963 (2), no peak numbers occurring in 1964.
5. *W-latinum* and *serena* were the only species where the relative abundance and numerical strength followed similar patterns over the three years.
6. In order of abundance in my m.v. trap at Dungeness, the six species are (most numerous first): *lepida*, *nana*, *conspersa*, *albimacula*, *w-latinum* and *serena*.

The following comments summarise the position of each species:

a. *w-latinum*: most numerous in 1962; 1963 and 1964 similar, although numerically slightly more numerous in 1964.
b. *nana*: comparitively most abundant in 1963, although more specimens actually taken in 1964; markedly less numerous in 1962.
c. *lepida*: less numerous in 1963; 1962 and 1964 similar.
d. *conspersa*: less numerous in 1962; 1963 and 1964 similar, although numerically more numerous in 1964.
e. *albimacula*: most numerous in 1962, although 1964 was numerically similar; less numerous in 1963.
f. *serena*: most numerous in 1962; 1963 and 1964 similar, although numerically slightly more numerous in 1964.

Dungeness Bird Observatory, Romney Marsh, Kent. 2.i.1965.

TABLE I

Periods of emergence, maximum nights and average numbers of selected members of the genus *Hadena* trapped at Dungeness, Kent.

Species	*Year*	*First Night Recorded*	*Maximum Night (Date)*	*No. of Light/nights*	*Average no. of Moths per night*	*Last Night Recorded*
w-latinum	1962	30th May	72 (June 12)	38	9	8th July
	1963	31st May	20 (June 14)	28	3	3rd July
	1964	18th May	23 (May 30)	47	3	7th July
nana	1962	29th May	75 (July 13)	79	16	20th August
	1963	26th May	160 (July 5)	64	22	15th August
	1964	21st May	135 (June 29)	88	20	28th August
lepida	1962	16th May	151 (July 2)	100	26	30th August
	1963	20th May	110 (August 3)	78	20	1st September
	1964	7th May	98 (June 11)	104	28	4th September
conspersa	1962	9th June	44 (June 28)	76	8	30th August
	1963	31st May	107 (July 3)	54	15	7th August
	1964	21st May	95 (July 3)	72	17	10th August
albimacula	1962	10th June	57 (July 2)	35	10	17th July
	1963	10th June	29 (July 3)	31	5	22nd July
	1964	27th May	37 (June 11)	41	8	13th July
serena	1962	16th June	20 (July 13)	40	2	29th July
	1963	22nd June	5 (July 16)	29	1	26th July
	1964	28th May	8 (June 30)	41	1	20th July

Notes: 1. No. of Light/nights indicates the number of nights on which the light was operational between the first and last capture.
2. A specimen of *albimacula* was trapped on 4th September 1964.

TABLE II

Total Numbers and Percentages of selected members of the genus *Hadena* trapped at Dungeness, Kent, 1962-64.

Species	*1962* (*% of year's total*)	*1963* (*% of year's total*)	*1964* (*% of year's total*)
w-latinum	352 (6·5%)	80 (2·0%)	136 (2·0%)
nana	1279 (24·5%)	1435 (35·5%)	1772 (27·5%)
lepida	2614 (50·0%)	1550 (38·5%)	2960 (45·5%)
conspersa	580 (11·5%)	781 (19·5%)	1215 (19·0%)
albimacula	345 (6·5%)	166 (4·0%)	344 (5·5%)
serena	64 (1·0%)	26 (0·5%)	41 (0·5%)

Note: The percentage gives an idea of the abundance of the species in relation to all species in a particular year.

Some Orthopteroid Insects from the Island of Santa Maria, Azores

By D. KEITH McE. KEVAN

(Dept. of Entomology, McGill University, Macdonald College, P. Que., Canada)

In general the insect fauna of the Azores is poor and a very high proportion of the species are introduced. There are, however, a few endemic species and others restricted to the Atlantic, or Macaronesian, Isles generally. The orthopteroids of the Azores have been described, listed, or discussed, wholly, or in part, by Drouet (1861), Bolívar (1892, 1894, 1898, 1905, 1915), Chopard (1932, 1942, 1946), Uvarov (1948) and Princis (1963). There are, however, very few records (and none this century) from Santa Maria, the most easterly island of the archipelago. In earlier times the island was seldom visited (Chopard, 1946), but it gained importance during the Second World War, particularly as an air base, and is now used as a stop-over by certain transatlantic airlines. Until recently, however, for military reasons, it was a restricted area. It is not surprising that its fauna has been little studied.

On a recent visit to Santa Maria (11-13.vi.1964), a number of insects were collected by the writer, mostly in the rather drier, flat, north-eastern part of the island between Vila do Porto and Aeroporto (the latter, as its name suggests, is the village in the vicinity of the airport). The season was rather early and conditions for collecting not particularly favourable, but, in view of the paucity of published information regarding the orthopteroids of the island, the following list of species, taken in the area referred to, may be of interest. Species marked with an asterisk (*) have not previously been reported from Santa Maria.

Only *Loboptera decipiens* (Germar), determined by Dr. E. Princis of Lund, and *Platycleis sabulosa* Azam have not hitherto been reported from the Azores.

DICTYOPTERA

BLATTOIDEA. BLATTIDAE: **Periplaneta americana* (Linnaeus)—A cosmopolitan domiciliary species; observed in a cannery, Vila do Porto.

EPILAMPROIDEA. BLATTELLIDAE: **Blattella germanica* (Linnaeus)—Another cosmopolitan domiciliary species; observed in a shop, Vila do Porto.

**Loboptera decipiens* (Germar)—A widespread Mediterranean littoral species; in the Macaronesian Islands, so far only recorded from Madeira (Princis, 1963); under stones, etc.; very common in all instars including copulating adults and females carrying oothecae.

ORTHOPTERA

GRYLLOIDEA. GRYLLIDAE: *Gryllus bimaculatus* Degeer—A very widely distributed species in the warmer parts of the Old World; under large stones, etc.; not uncommon as adults and last instar nymphs. **Tartarogryllus* [formerly *Acheta* or *Gryllus*] *burdigalensis* (Latreille)—A widespread Mediterranean species; under stones; very common as adults and late-instar nymphs.

TETTIGONIOIDEA. TETTIGONIIDAE: *Decticus albifrons* (Fabricius)—A widely distributed species in the Mediterranean region and western Asia; among long grass; rather common, but as young nymphs only (distinguishable from *Platycleis* nymphs by having a complete medio-dorsal carina on the pronotum, longer hind femora and usually four, instead of three, externo-dorsal spines on the front tibiae; the ovipositor also is straight and not curved). *Platycleis* (*P.*) *falx* (Fabricius) [formerly called *P. laticauda* Brunner von Wattenwyl]—A widespread Mediterranean species; among long grass and low herbage; very common as nymphs of most ages, rare as adults. **Platycleis* (*P.*) *sabulosa* Azam—A western Mediterranean species known also from the Canary Islands and not hitherto recorded from the Azores; grassy sandy locality near Vila do Porto, 12.vi.1964, two nymphs only (unfortunately no adult was observed, but this seems the only possible species the specimens could represent; the female nymph is clearly distinguishable from the last species on account of its much longer, more slender, and less strongly curved ovipositor). PHANEROPTERIDAE: **Phaneroptera nana nana* Fieber [formerly called *Ph. quadripunctata* Brunner von Wattenwyl]—The more northerly subspecies of a very widely distributed African and western Palaearctic species; abundant on bushes, shrubs and low vegetation; only as nymphs of all instars (the subspecies is assumed to be the same as that known from other islands in the Azores (Ragge, 1956)).

ACRIDOIDEA. ACRIDIDAE: **Oedipoda canariensis* Krauss—An endemic Macaronesian species; fairly common in dry grassy situations; as young nymphs only (determination beyond genus assumed, but *canariensis* is probably the only species found in the Azores—see below). *Locusta migratoria* Linnaeus, subsp. aff. *gallica* Remaudière —A small-sized, probably local and non-migratory "race" allied to the western Mediterranean "subspecies" of the very widely distributed Old World Migratory locust; in areas of rather long grass; reasonably common as nymphs, adults not common.

DERMAPTERA

LABIDUROIDEA. LABIDURIDAE: **Euborellia* [formerly *Anisolabis*] *annulipes* (Lucas)—A widely distributed cosmopolitan species; under stones; not uncommon but mostly immature.

Other species of orthopteroids previously reported from Santa María are, by inference, the European Field cricket, *Gryllus campestris* Linnaeus, and the Desert locust, *Schistocerca gregaria* (Forskål). The former was said by Drouet (1861) to be common throughout the archipelago (he mentioned no specific island), but Chopard (1932) suggests, presumably correctly, that this is an error for *G. bimaculatus* (also recorded by Drouet for the greater part of the archipelago, although only Florès and Corvo are mentioned by name). The record of *S. gregaria* is inferred from the fact that Drouet (*op. cit.*) cited the "Gafanhoto" as being very common on Santa María. He had been told that the species had come from the coast of Africa, and that it sometimes covered the sea. He used the name "*Oedipoda migratoria*", but, as explained by Bolívar (1894), this was probably due to the confusion that existed in the literature. Bolívar (*op. cit.*) mentions that *S. gregaria* has been taken from time to time on one or other of the islands of the Azores. He includes the species in his later list (Bolívar, 1915). Chopard (1932) expresses the contrary view that Drouet's reference was in fact to the local population of *Locusta migratoria*, but this would be questionable if Drouet's information that the insects were immigrants from Africa is to be accepted. There is good evidence that, from time to time, *S. gregaria* has reached the Azores from Morocco (Waloff, 1946; 1960), and Santa María *is* the most easterly island.

The following species have been recorded from other islands in the Azores, but not yet from Santa María.

DICTYOPTERA

POLYPHAGOIDEA. EUTHYRRHAPHIDAE: *Zetha vestita* (Brullé) [formerly as *Z. chavesi* (Bolívar) and *Z. freyi* Chopard] (Macaronesian endemic).

BLABEROIDEA. PYCNOSCELIDAE: *Pycnoscelus surinamensis* (Linnaeus) (cosmopolitan). OXYHALOIDAE: *Leucophaea maderae* (Fabricius) (cosmopolitan).

BLATTOIDAE. BLATTIDAE: *Blatta orientalis* Linnaeus (cosmopolitan).

EPILAMPROIDEA. BLATTELLIDAE: *Loboptera fortunata* Krauss (Macaronesian endemic—for synonymy, see Princis, 1963). ECTOBIIDAE: *Ariblatta chavesi* (Bolívar) (Macaronesian endemic).

PHASMATODEA

PHYLLIOIDEA. PSEUDOPHASMIDAE (BACILLINAE): *Clonopsis gallica occidentalis* (Bolívar) (endemic form of a Mediterranean species).

ORTHOPTERA

GRYLLOIDEA. GRYLLIDAE: *Acheta domesticus* (Linnaeus) (cosmopolitan); *Nemobius sylvestris* (Bosc) (European and N. African).

TETTIGONIOIDEA. MECONEMATIDAE: *Cyrtaspis variopicta* Costa (Mediterranean). CONOCEPHALIDAE: *Conocephalus chavesi* (Bolívar) (endemic).

[ACRIDOIDEA. ACRIDIDAE: *Oedipoda caerulescens* (Linnaeus) (W. Palaearctic) and *Oe. fuscocincta* Lucas (Mediterranean)—Chopard (1932) was unable to confirm the presence of the latter species; both have presumably been confused with *Oe. canariensis* Krauss, which is very similar in appearance.]

DERMAPTERA

LABIDUROIDEA. LABIDURIDAE: *Anisolabis maritima* (Bonelli) (cosmopolitan); *Labidura riparia* (Pallas) (cosmopolitan). LABIIDAE: *Labia minor* (Linnaeus) (cosmopolitan).

FORFICULOIDEA. FORFICULIDAE: *Forficula* (*F.*) *auricularia* Linnaeus (cosmopolitan).

The material reported is deposited in the Lyman Entomological Museum, Macdonald College, Province of Quebec.

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More New Forest Mercury Vapour Light Records

By L. W. SIGGS

It is pleasing to be able to report another good year with my mercury vapour trap at Minstead (*Ent. Rec.*, 76: 25). Another 16 species arrived for the first time:—

Acherontia atropos L.
Herse convolvuli L.
Trichiura crataegi L.
Utetheisa pulchella L.
Graphiphora augur Fabr.
Eurois occulta L.
Apamea sublustris Esp.
Nonagria dissoluta Treits.
Lithophane socia Rott.
Cosymbia annulata Schultz
Hydrelia flammeolaria Hufn.
Pelurgia comitata L.
Eupithecia laricata Freyer
E. dodoneata Guen.
Ennomos quercinaria Hufn.

The total number of species recorded during 1964 was 352 (5 less than the peak year of 1963).

It was a good year for migrants, which included *A. atropos*, *H. convolvuli* (2), *U. pulchella*, *Lithosia quadra* L. (11), *Laphygma exigua* L., *Rhodometra sacraria* L. (5), and *Nycterosea obstipata* L. (5). The *E. occulta* was probably also an immigrant. There were 1172 *Agrotis ipsilon* Rott. (previous maximum 119) and 91 *Peridroma porphyrea* Schiff. (previous maximum 13). On the other hand *Plusia gamma* L. were fewer than usual, 672 compared with the usual 800-1000.

The following table shows the total and average catch per night for each month.

1964

	No. of nights	Total catch	Average
March	10	428	43
April	24	3098	129
May	28	2054	74
June	30	4245	141
July	28	6092	217
August	31	6748	218
September	30	3800	127
October	25	1637	65
November	25	590	24
Total	231	28,692	124

Overall, these figures are much the same as for 1963, but there was a considerable variation in most individual months.

An appreciable reduction in certain "abundant" species was noted in 1963. Some have continued to fall:—

Agrotis exclamationis L. ..... to 1216
Diarsia rubi View. ..... to 251
Apamea monoglypha Hufn. ..... to 271

The others have made various degrees of recovery:—

Lycophotia varia Vill. ..... to 775
Ochropleura plecta L. ..... to 1697
Amathes xanthographa Schiff. ..... to 281
Noctua pronuba L. ..... to 2672
Phlogophora meticulosa L. ..... to 292
Leucania pallens L. ..... to 372
Apamea secalis L. ..... to 653

There would seem to be no apparent reason for such fluctuations. Others could be quoted, but perhaps the most curious was the increase of *Orthosia cruda* Schiff. from 368 to 705, *O. incerta* Hübn. from 323 to 469 and *O. gothica* L. from 694 to 867, while *O. stabilis* View. decreased from 1576 to 1154. The number of species showing an appreciable increase was nearly twice that of species showing an appreciable decrease.

There were a few late emergences, e.g., *Ceramica pisi* L. on 9.ix (normally finishes in July), *Plusia chrysitis* L. on 14.ix (normally finishes in October), *Caradrina clavipalpis* Scop. on 25, and 26.ix (normally finishes in October), *Thera variata* Schiff. on 10.xii (normally finishes in November), and most remarkable of all, *O. stabilis* on 26.xi (but this is perhaps "early" rather than "late").

Sungate, Football Green, Minstead, Lyndhurst, Hants.

Scotch Argus (*Erebia aethiops*, Esp.) in England

By A. J. Showler, Ph.D.

Although in the past the Scotch Argus, *Erebia aethiops* Esp., was more generally distributed than it is at present, being found as far south as Grassington, Yorkshire, Ford[1] states that the insect now occurs only at Arnside Knott in Westmorland, a favourite locality for many years, and that it may possibly still exist "in some remote places".

In November 1954 I commenced my National Service at Catterick Camp, Yorkshire, and during the following winter several times visited the late J. P. Robson at Barnard Castle. I learned much about the insects of the area from him and by looking through his collection, and in addition he very kindly gave me a number of specimens, including some very fine varieties of *Abraxas grossulariata* L. and *Oporinia dilutata* Schiff., all bred by him; he also gave me a few *Erebia aethiops*, and these had been taken at Smardale, Westmorland, in 1950. I commented that this seemed to be an unknown locality, and was told, to the best of my memory, that it had always occurred there and that he and his friends always went there for specimens. The railway (now closed) at this time connected Barnard Castle directly with Smardale.

I decided to visit the locality for myself to see *aethiops* on the wing, but by the next summer I was stationed in Surrey, and the one after that found me in Jordan. Little success followed my return home, either, for Smardale is not an easy place to get to, and I never found myself free at the right time and in the right area until 1964, when en route for Scotland with my wife and daughter we arranged to stay with friends nearby for a few days. I was to have only one whole day there and resolved to use this to visit Smardale at last.

On the morning of 10th August I set off with the friend with whom we were staying, arriving in sunshine, but with the sky clouding over. However, the day was warm and I hoped that this would encourage the butterflies to fly even if the sun were to disappear. My friend and I selected a route along the dale, running parallel to the old disused railway, through dense woodland. Emerging from this we looked up towards the railway to see an apparently black butterfly fluttering over the flowers. Climbing the slope left no doubt, more insects were seen, and all were *E aethiops*, mostly fresh, in fact there were few other butterflies on the wing. Continuing for another half-mile, more *aethiops* were observed, but as we sat down for lunch the sun disappeared, a little rain started falling and all disappeared.

We continued later and then returned along the other side of the dale; by then the weather had improved and become warm again so that despite the lack of sun the species had reappeared. The general impression was of a well-established colony spread over an area of at least ¼ sq. mile. No specimens were taken, but those given to me by Mr. Robson (who died several years ago) were compared with my own from Arnside and the figures of specimens from Grassington[1]. The Smardale specimens are quite typical and do not resemble the sub-species formerly found in N.W. Yorkshire.

It seems surprising that such a colony should remain almost unknown

for so many years—are there more like it in England or indeed, could *E. ligea* L. be found in similar circumstances?

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Myrmecophilous Beetles in Ireland, Scotland and Wales

By C. A. Collingwood

A few interesting records have accumulated since I last wrote on beetles associated with ants. In particular, opportunities have been taken of collecting beetles in wood ants' nests of the species *Formica aquilonia* Yarrow, *F. lugubris* Zett. in Ireland and Scotland, while in Wales nests of *F. rufa* L. as well as *F. lugubris* were examined.

WOOD ANTS' NESTS

Ireland

In a previous note (Collingwood, 1959) reference was made to Bouskell's record in 1908 of the beetles *Clytra quadripunctata* L., *Quedius brevis* Erichs. and *Monotoma angusticollis* in nests of *F. lugubris* at Caragh Lake in S. Kerry. This ant appears to have totally disappeared from Kerry having last been seen by Mr. E. F. Bullock in 1933 near the Upper Lake, Killarney. I have also watched it become extinct in a wood in the Glen of Aherlow, Tipperary. Mr. A. W. Stelfox told me of its discovery there at the top of Ballinacourty wood in 1945. I found a single small nest in a follow-up visit in 1957. In 1962 this had disappeared but two others, each with very few workers, were found nearby. In June 1964 all trace of these had gone. The ant was found again at Lower Town near Woodford, Galway; two single isolated nests were seen in June 1964 in approximately the same position as in 1957 and appeared to be in a flourishing condition. The larger of the two was examined and the beetles *Oxypoda formiceticola* Märk., *Thiasophila angulata* Er. and *Monotoma conicicollis* Aub. were taken; all are new county records and the latter is a first record of this widely distributed species for Ireland.

The *F. aquilonia* site near Churchill in Armagh was again visited in 1964. In addition to *Q. brevis, T. angulata* and *O. formiceticola* previously reported (Collingwood, 1959) *Monotoma conicicollis* as well as the more southern *M. angusticollis* were taken and also *Atheta talpa* Heer, *Notothecta flavipes* Gr. and *Acrotrichis montandoni* All. which three species are recorded here for Ireland for the first time. As wood ants in Ireland are extremely local—these two sites are the only ones known to me where the ants still exist—it would be highly desirable to keep them under some sort of regular surveillance and protection. The Woodford site is in a forestry area and appears to be in no present danger but that at Churchill could easily be destroyed by clear felling of the belt of woodland where the ants still flourish.

Scotland

F. aquilonia nests in the Drumrunie valley W. Ross, and a colony of *F. lugubris* in the Shin valley south of Lairg in Sutherland were examined

for myrmecophiles in 1960 since they represent the most northern localities for wood ants in Britain. *Atheta talpa, N. flavipes, N. anceps* Er. and *Oxypoda haemorrhoa* Mann. were all taken at the Shin site and are probably new county records. Beetles were very scarce at Drumrunie where only single examples each of *T. angulata, M. conicicollis* and the common nonmyrmecophilous *Gyrohypnus melanocephalus* Gr. were taken after much search.

F. aquilonia nests at Ellary, Argyllshire, were visited in 1956 and again in October 1964. The inquiline ant, *Formicoxenus nitidulus* seen there in 1956 was found again abundantly in some of the nests. Beetles taken included *N. anceps, N. flavipes, T. angulata, O. formiceticola, A. talpa* and *Ptilium myrmecophilum* All. which are all probably new records for the county. *Dinarda märkeli* Kies. was abundant in and on the surface of a nest of *F. lugubris* in Glenborrodale, Argyll, in June 1959. Donisthorpe (1927) found this beetle scarce in the Scottish Highlands where I have only taken it previously near Ballater in Aberdeenshire also with *F. lugubris.*

WALES

There are few records of myrmecophilous beetles in Wales. Butler took *O. haemorrhoa, T. angulata, N. flavipes* and *A. talpa* with *F. lugubris* near Llanberis, Caernarvonshire in 1911, and I can add the following records for counties in N. Wales. *C. quadripunctata, Q. brevis, Heterothops dissimilis* Gr., *Dendrophilus pygmaeus* L. were taken together with *T. angulata* in nests of *F. rufa* near Macchynelleth, Montgomeryshire. *D. märkeli, N. anceps, Q. brevis* and *O. formiceticola* occurred with *F. lugubris* near Rhayader, Radnorshire. All are probably new county records and *D. märkeli, H. dissimilis* and *N. anceps* are also new records for Wales.

BEETLES WITH OTHER ANT SPECIES

The ant *Lasius fuliginosus* Latr. is host to a number of local beetles. Unfortunately I have failed to locate this species during successive visits to Ireland although Stelfox and others have noted it in several places up to at least fifteen years ago. In 1957 I discovered among my collection of the abundant *Drusilla canaliculata* F. an example of the local *Zyras limbata* Pk. This was taken on a sandy wayside border near Malin Head, Donegal, in the vicinity of scattered corpses of the ant *Myrmica scabrinodis* Nyl. on which it had probably been preying. This beetle has occurred with several species of ants in Britain as far north as the Isle of Man and S. Scotland. The only other Irish record is that of Power who took it in Waterford in 1878.

Z. funesta Gr., a new record for Wales, was taken in runways of *L. fuliginosus* near Wern Gron, Merionethshire, in June 1962, together with *N. flavipes* which is more commonly found with wood ants. *Amischa analis* Er. is common in nests of *Lasius* and *Myrmica* and several were found with *Myrmica ruba* L. near Clifden in W. Galway. *Cetonia aurata* L. is not a myrmecophilous beetle although sometimes the larva is found in ants nests. Adults were abundant at Cong, E. Mayo, in June 1962, a new county record.

At Dale, where I had the pleasure of staying in October 1963 through the courtesy of Mr John Barrett, Warden of the Dale Fort Field Centre, I took a specimen of the local *Lomechusa paradoxus* Gr. This beetle has

been taken sparingly in S. England from Folkestone to Lands End but has not hitherto been recorded for Wales. Its summer host is the ant *Formica cunicularia* Latr. which is abundant at Dale and, according to Donisthorpe (1927), its winter host is a *Myrmica* sp I took it in a nest of *M. scabrinodis* Nyl. on the cliffs of Westdale Bay on the Dale peninsula; just as with *L. emarginatus* a much more widely distributed species, it much resembles its host *Myrmica* in superficial appearance, deportment and colouring.

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W. S. Coleman and W. H. Allchin

By D. E. Allen

Dr. R. G. Ainley (Vol. 76, pp. 254-6) will find a fairly full account of Coleman in no less a work than the *Dictionary of National Biography* (Second Supplement, 1912, Vol. 1, p. 382). This reveals that William Stephen Coleman (1829-1904) was born at Horsham, Sussex, and was the son of a physician. A keen naturalist from youth, he achieved a considerable success at a relatively early age with *Our Woodlands, Heaths and Hedges* (1859) and *British Butterflies* (1860), both of which ran into several editions and seem to have launched him on his lengthy career as a book-illustrator and artist. Among subsequent assignments were the illustrations to T. Moore's *British Ferns* (1861), to *Common Moths* (1870) by that best-selling Victorian author the Rev. J. G. Wood, and to *Cassell's Natural History*. He also designed the heading of the *Field* newspaper.

It is not clear whether he was any relation of the other Victorian naturalist of the same name, the Rev. William Higgins Coleman (1816-63), co-author of *Flora Hertfordiensis* (1849).

His friend Dr. Allchin is much more obscure. It so happens that I have myself been trying to track down details of him for some years in connection with the botany of the Isle of Man. For once that invaluable work, Britten and Boulger's *Biographical Index of British and Irish Botanists* (always well worth a try by entomologists, as so many of the earlier naturalists were all-rounders), can tell one next to nothing. However, I have succeeded in piecing together the following few details from various different sources:

> William Henry Allchin (1828?-1891) graduated as a Bachelor of Medicine in London in 1844 and from 1852 onwards was in practice as a physician in Bayswater, where he resided in Pembridge Villas. His main natural history interest was ferns, of which he owned one of the finest collections of varieties in Britain, contributing many records (notably from the Isle of Man) to Moore's famous volumes on British ferns around 1860. According to F. W. Stansfield ("Pioneers of the Fern Cult", *British Fern Gazette*, 1909, 1, 43), he devised a classification of fern varieties which was probably never published. About 1880 he retired and went to live at Bridport in Dorset. It is not known what became of his collections on his death.

There may well be obituaries of him in medical works, but I have not troubled to search these.

Notes and Observations

FEMININISM IN STAUROPUS FAGI L.—Mr. M. J. Leech's note on the ratio between the sexes in the case of a number of *Apeira syringaria* L. that he bred last summer (*Ent. Rec.*, **76**: 297) prompts me to report a similar disparity in the case of *Stauropus fagi* L.

In August 1963 Mr. D. R. M. Long sent me a dozen very small lobster larvae, the offspring of a normal light grey female that he took at Bromley. From these I bred four moths, all females, and all very dark grey, almost black. When I mentioned this to Mr. Long, he told me that all the moths that he had bred of this stock, about two dozen if I remember rightly, were also females and also very dark grey.—H. SYMES, 52 Lowther Road, Bournemouth, Hants. 5.i.1965.

SOME NOTES FROM DORSET FOR 1964.—Immigrant records here have been *Colias croceus* Fourc. seen in fair numbers along the coast between Weymouth and Lulworth, but not many were seen inland. I only saw two in Upwey. One *Herse convolvuli* L. came to my mercury vapour light on 27th August, and I took a very worn female *Heliothis peltigera* Schiff. on the Chesil Beach on 25th June, which laid some eggs but these were apparently infertile. She must have been a very late arrival.

Unusual broods noted include *Axylia putris* L. on 13th September, *Plusia festucae* L. on 26th August, *Phytometra viridaria* Clerck on 21st July, *Hypena proboscidalis* L. on 13th September and *Hepialus lupulina* L. on 3rd September.

Lithophane socia Hufn., as in 1963 appeared at a very late date on 21st May and 5th June. It may have changed its habits and it will be interesting to see whether it does the same in 1965.

Of the hibernators, on 23rd October I counted 14 *Scoliopteryx libatrix* L., three more than in 1959, and one *Triphosa dubitata* L. hibernating in my cellar.—Brigadier H. WARRY, Eastbrook House, Upwey, Weymouth, Dorset. 13.i.1965.

LEPIDOPTERA MIGRANTS IN EAST NORFOLK.—Having taken a portable mercury vapour light equipment to a marsh near Barton Broad in search of *Nonagria sparganii* Esp., which, although omitted as a suitable locality from the 1961 South's Moths, are fairly common in the area, I was surprised to see a male *Enargia paleacea* Esp. come to the light, but I have since noted that Mr. C. J. Cadbury saw one on the east Norfolk marshes in August 1963 when searching for *Pelosia obtusa* H.-S.

My recording is for 22.viii.1964, which approximates to the recording dates for this species in Suffolk and Surrey, 14-15.viii.1964, so I suppose mine was a migrant.

A definite migrant, *Cosymbia puppillaria* Hübn. was in my light trap on the night of 26.ix.1964: the trap was near the River Bure in the Wroxham area. The insect was a female, but no ova were obtained. I believe that this is the furthest north record for this species. Using the trap

in the same spot, I have taken *Leucania albipuncta* Schiff. and *Plusia interrogationis* L.—C. G. Bruce, 16 Harland Road, Lee, London, S.E.12. 15.i.1965.

Butterflies at Light.—Mr. Revels's note about *Aglais urticae* L. coming to electric light in his room at 10.5 p.m. on 19th September 1964 (antea, p. 25) prompts me to record that a very fresh specimen of *Vanessa atalanta* L. came to my light trap here well after dark on the night of 18th October 1964. The moon was nearly full and the temperature 46°F.—Sir Robert Saundby, K.C.B., Oxleas, Burghclere, Nr. Newbury, Berks. 18.i.1965.

Abraxas grossulariata L. Flowering Currants Defoliated and Abortive Attempt at Second Brood.—On several days in May 1963 larvae of this moth were observed wandering across the soil and along a wall away from their flourishing colony in a clump of *Euonymus japonicus* Thunb. at Bexleyheath, Kent. Young flowering currant bushes (*Ribes sanguineum* Pursh) planted in their vicinity the previous Autumn were invaded and several completely defoliated. It must be unusual for this shrub to be attacked so severely, and especially by *A. grossulariata* larvae.

Eggs were laid subsequently on over a dozen of the flowering currant bushes, and on two favourably situated plants the larvae continued feeding in the Autumn to produce some thirty pupae, all but three of those seen being attached to a leaf or petiole, between 2nd and 18th November. I collected 18 and these were kept out of doors, though in a sheltered situation; all had died by 21st January. However, I believe this is the customary fate of such precocious larvae.

After hibernation, caterpillars were feeding on the flowering currants in Spring 1964. Noticing some defoliation in September I anticipated finding another brood of maturing *grossulariata* larvae, but in fact found many large *Melanchra persicariae* L. and a few *Diataraxia oleracea* L. and *Biston betularia* L. caterpillars; those of *grossulariata* were present but remained small.—B. K. West, 29 Cold Blow Crescent, Bexley.

Current Literature

Proceedings and Transactions of the South London Entomological and Natural History Society, 1963, Part I (October 1964), xv + 111 + 5 plates (one in colour), 18/-, from the Secretary.

The 1963 volume follows the general line of previous volumes with accounts of both indoor and outdoor meetings, including a full account of the Annual Exhibition, with two plates of notable varieties, and another illustrating the ova of the bug *Chrysolina cerealis* L. exhibited there, and also an account of the Society's exhibit at the National Nature Week Wild Life Exhibition organized by "The Observer".

The president's address read at the Annual General Meeting gives an interesting account of his collecting butterflies in Ceylon.

There follow accounts of the 25 field meetings organized by the Society with notes on special captures and observations, and a comprehensive paper by Mr. G. M. Haggett, illustrated by a fine coloured plate, showing 27 specimens, entitled "Researches into colour variation of the moth *Leucania vitellina* Hübner (Lep., Noctuidae)".

There are editorial notes on nomenclature changes, including 5 Coleoptera, 1 Hemiptera, and 1 Diptera, and finally a full index.

Part II, 1963 (December 1964), 140 pp. + 8 half-tone plates, 20/-, is devoted to a highly interesting account of the Natural History of the garden of Buckingham Palace, resulting from the survey by a team of 26 specialists during the period 1961-1963.

After an introduction by Mr. D. McClintock, in which acknowledgments to a long list of helpers who have given assistance by verifying determinations, and in other ways, there follow chapters on the layout of the garden, history divided into pre-1820 and post-1820, a note on the soil, wild and naturalized vascular plants with an account and a long list of species. This is followed by a chapter on the cultivated plants, again with a list of species, and a similar chapter on Bryophytes and Fungi. The Mammals are covered by a short note by Dr. G. Corbet. The birds are dealt with by Mr. Robert Spencer and Mr. Stanley Cramp, with tables of species breeding in the garden 1961-63, and of species breeding in the garden and in the inner Royal Parks. Amphibians and fishes are covered by Mr. Maxwell Knight.

Notes on the Land Invertibrates other than insects are co-ordinated by Dr. W. S. Bristowe with notes and lists of species recorded. Of the true insects, the Lepidoptera are written up by Mr. J. D. Bradley and Mr. R. M. Mere, with a very full account of occurrences and remarks on absentees, together with a long list of species: 302 species, plus a further 41 in the addendum. These species include *Erias biplaga* Walk., a cotton pest, and the Gelechiid *Monochroa hornigi* Staud. as additions to the British list, there being single specimens of each, though the latter may be a resident in *Polygonum* species. The list of species gives emergence periods, or in the case of single specimens or species represented only by a few examples, the date of capture; short notes on their likely associations in the gardens are added.

Insects other than Lepidoptera are co-ordinated by Prof. O. W. Richards, a long catalogue of Coleoptera being the work of Mr. A. E. Gardner and Mr. F. D. Buck. Drs. J. H. Evans, B. M. Gilchrist and J. Green give a very full account of the lake and its contents. The final chapter by Dr. McClintock deals with the Palace garden as a habitat. There is a full index, and a relevant bibliography follows each chapter.

S. N. A. J.

A revised Catalogue of Irish Macro-lepidoptera by E. S. A. Baynes, O.B.E., F.R.E.S. E. W. Classey Ltd., 25/- (35/- interleaved), iii + 110 pp.

This catalogue is designed to bring up to date the catalogue of Lt. Col. Donovan, published in 1936, and the nomenclature of butterflies follows the Royal Entomological Society's report of 23.ii.1934, while the moths follow the revised edition of "South". The species are listed both by scientific and vernacular names, and a short account of each is given. This is followed by a list of 71 species named in the Donovan catalogue, the occurrence of which in Ireland lacks sufficient corroberation to justify their retention. The species are indexed by scientific and vernacular names separately.

The format is octavo in strong paper-covered boards, and the book is well printed on excellent paper. My only grumble is that Mr. Baynes

did not join forces with Dr. Beirne and include the whole of the Irish lepidoptera bringing both Macro- and Micro- lists up to date under one cover as in the Birchall and Kane lists. It is, however, a most useful list and should commend itself to all who contemplate a collecting visit to Ireland.

S. N. A. J.

Current Notes

ALLT RHYD-Y-GROES NATIONAL NATURE RESERVE EXTENSION, CARMARTHENSHIRE.

In 1959 the Nature Conservancy declared forty-six acres at Allt Rhyd-y-groes in the valley of the Afon Doethie, a tributary of the River Towy, about nine miles north of Llandovery. Through the co-operation of Economic Forestry Group 107 acres have now been purchased on the west bank of the Afon Pysgotwr which joins the Afon Doethie on the eastern boundary of the Reserve. The extension, which was declared on 29th September, 1964, includes the oak-wood at Allt Pen-y-rhiw-iar, about 1000 feet above sea-level, and the upper reaches of the valley where there are rocky outcrops and fan-shaped screes.

Cascading mountain streams in the woodland provide damp conditions in which ferns and mosses flourish. Interesting flowering plants in this area and in the adjoining damp meadows include Wood Avens, Water Avens, Orpine, Globe Flower and Greater Butterfly Orchid. Further upstream at Cribyn Du Parsley Fern grows on the lower parts of the scree and various club mosses occur where the rocky outcrops merge with open moorland.

Pied Flycatcher and Wheatear are among the many birds breeding on the Reserve.

The natural regeneration of native trees will be encouraged on the Reserve, though some seedlings may have to be planted if regeneration fails.

Access to the Reserve away from the rights of way will be by permit only. Applications should be addressed to: The Regional Officer (South Wales), The Nature Conservancy, Buarth Mawr, Aberystwyth, Cardiganshire.

THETFORD HEATH NATIONAL NATURE RESERVE (EXTENSION), NORFOLK.

This Breckland Reserve is owned by the Norfolk Naturalists' Trust with whom the Nature Conservancy concluded a Nature Reserve Agreement in 1958. In 1960 the Air Ministry requested the release of a small area within the Reserve and agreement was reached to exchange an equal amount. In addition the Air Ministry agreed to sell a further eighteen acres to the Norfolk Naturalists' Trust.

As a result of these arrangements the size of the Reserve is now increased to 243 acres.

Access to the Reserve is by permit only. Applications should be addressed to the Regional Officer (East Anglia), The Nature Conservancy, Government Offices, Bishopgate, Norwich, Norfolk.

RUSLAND MOSS NATIONAL NATURE RESERVE (EXTENSION), LANCASHIRE.

In 1958 the Conservancy declared thirty acres of this Reserve which is in Rusland Valley between Coniston Water and Windermere, about four miles north of Roudsea Wood National Nature Reserve. It is one of the few remaining "mosses" in North Lonsdale which has not been damaged beyond repair as a result of enclosure and cultivation.

Twenty-eight acres have now been added by purchase, lease and Nature Reserve Agreement, bringing the total Reserve up to fifty-eight acres.

Access to the Reserve is by permit only. Applications should be addressed to The Regional Officer (North), The Nature Conservancy, Merlewood Research Station, Grange-over-Sands, Lancashire.

LINDISFARNE NATIONAL NATURE RESERVE, NORTHUMBERLAND.

The ancient name Lindisfarne has been officially revived by the Nature Conservancy in their declaration of the first part of a new Reserve on the Northumberland coast. It includes the sand-dunes on Holy Island together with the sand and mud-flats lying between high and low tide north of a line from Longbridge End on the mainland to Snook Point. A separate area in Budle Bay, north of Bamburgh, covers Chesterhill Slakes and Budle Point. This has been leased partly from Cheswick Estates and partly from the Crown Estate Commissioners. The owners of the whole intervening coastline and of a further coastal strip near Cheswick Black Rocks have agreed in principle to include these areas in the Reserve, but for technical reasons they cannot be declared for some time.

The Holy Island area is well known for its many species of wildfowl and wading birds. Wigeon predominate (up to 10,000 have been estimated in some winters) and Mallard are also numerous. Herds of Mute Swans and Whooper Swans are recorded regularly and Bewick's Swans are seen occasionally. Small flocks of Grey-lag, Pink-footed and Brent Geese also occur, the last-named being mainly of the light-bellied or Atlantic race for which Lindisfarne is the only regular wintering area in Great Britain.

The interesting plants in the area are mainly those on which the wildfowl feed. Eel-grass (*Zostera*) forms an important component and although it is decreasing in several other areas it is still plentiful on the Reserve. The sand-dunes on the Snook have a typical flora showing colonisation and succession from open shore to dune grassland.

The Reserve will provide the main national refuge for migrating and wintering ducks, geese and waders in North-east England; it will also help to meet the needs of ornithological research. A warden, Mr. H. Dollman, has taken up his duties on the Reserve and a panel of local wildfowlers and naturalists has been set up under the chairmanship of Mr. Frank Stabler, a leading wildfowler, to advise the Nature Conservancy on management and conservation of the wildfowl. A local committee under the chairmanship of Professor J. H. Burnett will advise on other management aspects of the Reserve.

Access to the Reserve is unrestricted, but permission is required to undertake research and collect specimens. Applications should be addressed to the Regional Officer (North), The Nature Conservancy, Merlewood Research Station, Grange-over-Sands, Lancashire.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

LEPIDOPTERA HARVEST, 1964. T. W. HARMAN 29

THE BOG AT THE BACK OF BEYOND. An OLD MOTH-HUNTER 33

SOME COMMENTS ON SELECTED SPECIES OF THE GENUS *HADENA* SCHRANK AT DUNGENESS, KENT, 1962-64. R. E. SCOTT 37

SOME ORTHOPTEROID INSECTS FROM THE ISLAND OF SANTA MARIA, AZORES. D. KEITH McE. KEVAN 39

MORE NEW FOREST MERCURY VAPOUR LIGHT RECORDS. L. W. SIGGS 42

SCOTCH ARGUS (*EREBIA AETHIOPS*, Esp.) IN ENGLAND. A. J. SHOWLER, Ph.D. 44

MYMECOPHILOUS BEETLES IN IRELAND, SCOTLAND AND WALES. C. A. COLLINGWOOD 45

W. S. COLEMAN AND W. H. ALLCHIN. D. E. ALLEN 47

NOTES AND OBSERVATIONS 48

CURRENT LITERATURE 49

CURRENT NOTES 51

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (219)

TO OUR CONTRIBUTORS

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Carinthia, 27th July - 8th August

By Major General Sir George Johnson, K.C.V.O., C.B., C.B.E., D.S.O.

With the object of collecting some of the late summer butterflies of the eastern limestone Alps, I visited Carinthia from 27th July until 8th August. Flying out to Klagenfurt, I there picked up a self-drive car and motored the twenty odd miles to Villach, which I made my base.

On 28th July I explored the lower slopes of the Villacher Alpe near the village of Bleiberg some two miles west of Villach. Butterflies were in good numbers, but with the exception of *Erebia ligea* L. and *Heodes virgaureae* L. there were few that could not have been caught in England. In the afternoon I motored up a mountain road to Gerlitzen on the Ossiacher See to about 5,000 feet, seeing amongst commoner species many *Melitia athalia* Rott. with a few *Heodes alciphron* Rott. and *Pyrgus alveus* Hübn.

On 29th July, a rather dull morning, I motored 40 miles north-west to Mallnitz where I joined Baron de Worms for a short trip up the See bachtel valley to about 4,000 feet. Sun was rather evanescent but we found some butterflies. The Erebias were represented by *E. aethiops* Esp. and *E. melampus* Fuessl. with an occasional worn *E. ligea* and *E. alberganus* Prun. Many fresh *Argynnis niobe* L. were on the thistles and one *Clossiana titania* Hübn. was taken.

The next day I first visited a patch of marshy ground near Warmbad Villach, which had a good growth of sanguisorba. The two marsh blues, *Maculinea nasithous* Bergstr. and *M. teleius* Bergstr. were flying in small numbers, the latter being the commoner. A fine fresh specimen of *Nymphalis antiopa* L. was disturbed from a bush and, for once, easily netted. Later I went on to explore the Rosenbach valley which runs up into the northen slopes of the Karawanken, here the frontier range between Austria and Yugoslavia. A narrow but motorable road follows the railway through the village of Rosenbach until the railway disappears into a tunnel leading through the range to Yugoslavia. From near the tunnel entrance a rough, and in places washed-out, path leads up the mountain stream which drains the valley. This valley proved one of my best collecting grounds. A few hundred yards after leaving "road head" the path crosses the bottom of a limestone scree, where I found *Erebia stirius* God., one of my main objectives. On this and subsequent visits a good series was obtained from this scree and a better one half a mile further on. *Neptis rivularis* Scop. (*lucilla* Schiff.) was not uncommon but very worn, flitting about bushes along the stream, while *Apatura iris* L., though worn, was common. Other butterflies included a few *Minois dryas* Scop. near the village, *Everes argiades* Pall., *Araschnia levana* L., *Limenitis camilla* L. and *L. anonyma* Lewis (*rivularis* Scop.), with many females of *Melitaea didyma* Esp. sitting on thistles.

On 31st July I motored about 100 miles to the Gross Glockner where at about 6,000 feet I spent a profitable hour or so on flowery slopes above the Glocknerhaus Hotel. Here were flying quite commonly *Erebia manto* Esp., *E. melampus*, *E. Pronoë* Esp., *E. cassioides* R. u. Hochenw., *Boloria pales* Schiff. and *Polyommatus eros* Ochs. One *E. nivalis*, an eastern member of the *tyndarus* group, was taken and a few *Colias phiconome* Esp., *Coenonympha satyrion* Esp. (worn) and *Albulina orbitulus* Prun. were noted. The heavy holiday traffic on the well engineered, but not very wide, road made the journey back to Villach a tiring one.

1st-3rd August were spent exploring the country round Klagenfurt in hopes of finding a locality for *Colias myrmidone* Esp. In this I was unsuccessful, but a disused stone quarry at the little village of Karnburg just north of Klagenfurt provided a number of *M. dryas, E. argiades* and several fresh *Scolitantides orion* Pall.

On 4th August I again visited the Rosenbach valley, and found females of *E. stirius* just beginning to come out.

The next day I motored towards the Italian frontier turning north at Arnoldstein on to a country road running through woods to the River Gail. In a wet clearing *M. dryas* was abundant and further on near the river, another clearing produced a number of *Hyponephele lycaon* Rott. sitting on thistle heads. The females were in good condition, but most of the males were worn. *Argynnis paphia* L. was also common on the thistles, with many var. *valesina* Esp.

On 7th August I motored into Italy at Tarvisio and turned north on to a mountain road up the Val di Ugovizza. This road shortly above Ugovizza crosses a limestone scree where *E. stirius* was again common. Further up from 3,500 to 4,500 feet *E. pronoë* was abundant, but only one female was obtained.

On my return to Villach I found Baron de Worms and Mr. Bretherton both established at my hotel and was able to give them an account of my doings to date. I was due to leave for London on the afternoon of the next day (8th August) but Mr. Bretherton gave me further information as to the locality for *C. myrmidone* at Klagenfurt. The morning of 8th August was hot, and I accordingly set off with my suit case to have a last try for *myrmidone* en route for the airport.

I duly found the place, which turned out to be a clearing in the pine woods of about two acres on a south-facing slope just north of Klagenfurt. Here amongst long grass and brambles grew a number of plants of a broom (*cytisus*) which is the larval foodplant of *myrmidone*. I have not determined the exact species, but the broom has a habit not unlike our rather local dyer's greenweed, with small brilliant yellow flowers, with a delicious scent. The butterflies were not numerous, but in about an hour I collected six specimens in good condition including one female var. *alba* and I saw perhaps as many more. After this the day began to cloud over, very thundery conditions developing, and *myrmidone* disappeared. It was by then anyhow time for me to leave for the airport.

So ended a very pleasant ten days, during which I recorded 75 species of butterflies.

21.xii.1964.

VANESSA ATALANTA AT LIGHT.—Further to the recent correspondence on *Aglais urticae* L. coming to light, three specimens of *V. atalanta* came to my mercury vapour light trap near Padstow, Cornwall, just before dawn on 12th September 1964. They were presumably part of a migration, since no others were taken during the week I spent there although the insect was common by day. It was a period of heavy migratory activity; that night and the two either side of it produced single specimens each of *Acherontia atropos* L., *Herse convolvuli* L., *Leucania loreyi* L. and *Rhodometra sacraria* L. whilst on the 14th I was kept busy counting 562 *Plusia gamma* L.—DENZIL W. H. FFENNELL, Martyr Worthy Place, nr. Winchester, Hants. 20.i.1965.

Butterflies in the Austrian Alps: July-August 1964

By C. G. M. de Worms, M.A., Ph.D., F.R.E.S.

Though the alpine ranges in Austria have been fairly thoroughly searched for lepidoptera, they do not seem to have received as much mention in the general literature as those of the Swiss regions. Although they may not be as rich in butterflies, some areas in the Austrian mountain chains harbour some choice species, especially among the Erebias, which do not occur at the western end. Among these is *Erebia claudina* Bkh. (=*arete* Fabr). which has so far not been found outside the present limits of Austria. In 1933 A. E. Welsh and F. B. Welsh, on a visit to Carinthia, discovered a new locality for it in mid-July in the mountains near Mallnitz (*Ent. Rec.*, **46**: 69 *et seq.*). This small town in the Tauern range seemed a very attractive venue for the summer of 1964, especially as it had been visited in July 1937 by that eminent authority on the Erebias, Mr. B. C. S. Warren, who kindly gave me some very valuable information about the local lepidoptera.

I set out on July 23 via Ostend, where I boarded the Tauern Express, which reached Munich early on the 24th, and thence on to Salzburg. From there the line ascends to the Tauern tunnel just south of Bad Gastein. It is six and a half miles long, and only a couple of miles from its southern end lies Mallnitz at 4000 ft. Since there is no road over the high pass, there is a continual shuttle service of specially equipped trains, taking hundreds of cars a day either way through the tunnel, and in consequence, a wide motor way has been constructed up to Mallnitz from the south. I arrived at my destination at lunch time on the 24th in glorious weather, but I was soon able to appreciate the effects of the very early season in this part of Europe. When I carried out a short survey that afternoon in the Jamnig Valley, radiating to the north-west, it was evident that most of the butterflies at even this altitude were very much past their best, and quite a lot of species already completely over, since there seemed to be a general dearth all round. A few worn *Erebia ligea* L. and *Argynnis niobe* L. were still in evidence together with *Gonepteryx rhamni* L. and *Mellicta athalia* L. Even the whites were scarce. The following morning I set out on foot, in again ideal weather, along the wooded path running over the entrance to the tunnel, covering the two and a half mile stretch to the Alpenrose Hotel. *Erebia aethiops* Esp. was just appearing. After a quick meal at the restaurant, I began the ascent of the steep slope leading to the Hochalmblick hut at 6,000 feet. I followed the route Mr. Warren had indicated, but was soon much dismayed to find that the rugged path through the pineclad slopes was in process of being cut away by bull-dozers to make way for a big ski-lift with the result that one of the small glades half way up where *E. claudina* used to be prevalent, no longer existed. However, a few of the commoner species of this genus were flying, including *Erebia melampus* Fuessl. in great plenty, apparently just out, and interspersed with a few *E. epiphron* Knoch of the form *aetherius* Esp. An occasional *E. ceto* Hübn. appeared, already very worn. What was most striking was the absence of Lycaenids, especially of the *Plebeius* group, which virtually does not occur in this region. Nearer the hut, where there was a good growth of *Vaccinium uliginosum* I found a newly emerged female of *Vacciniina optilete* Knoch. The only other blue on

the wing was *Cyaniris semiargus* Rott. Unfortunately, when I reached the altitude of the hut, which houses a good restaurant, a high wind had arisen. Little was moving, and there was no sign of *E. claudina* in that vicinity though several *Erebia cassioides* Esp. and *Boloria pales* Schiff. were flying. By the time I made the descent, few insects were to be seen and it was almost dark when I got back to my hotel in Mallnitz after repeating the two and a half mile walk from the Alpenrose hotel. The 25th again dawned bright and warm and was even a better day than the previous one. During the morning I confined my search to the lower levels among the bracken-covered slopes along the path towards the tunnel, but only in one restricted area did I find anything on the wing. In this spot *Argynnis niobe* L. was very numerous with some *A. aglaia* L. and the two coppers *Lycaena hippothoë* Hübn. and *L. virgaureae* L., while a few females of *Maculinea arion* L. put in an appearance about the middle of the day as is their wont. Early in the afternoon I took the sesselbahn which runs up the steep slope to the west of the railway station, to a height of 6,000 ft. where there is a stretch of open ground steadily rising, called the Hauseralmbick. It is covered with a carpet of *Vaccinium*, mostly *V. uliginosum*. One of the first butterflies I saw was *Colias palaeno* L., but there was a general shortage of insects in spite of the sunshine. However, by venturing further upwards I found a sheltered valley where I was pleased to see *Albulina orbitulus* Prun. (=*pheretes* Hübn) flying in plenty up and down the grassy slopes and for the most part both sexes were in very good order. Here too the high level fritillaries were mainly *Boloria napaea* Hübn. Several worn *Erebia euryale* Esp., of the form *ocellaris* Stgr. were also among larches in this locality.

27th July was yet another glorious day when I set out at an early hour by motor coach for the Gross Glockner. We descended to Obervellach and then followed the route along one of the valleys until we reached the small town of Heiligenblut where we halted before making the steep ascent to the Glockner, which is reached by a very tortuous route on which one climbs nearly 4,000 feet in five miles. Most cars have to wait at the Glocknerhaus Hotel before they can make the final steep hairpins to the Franzjosefhöhe so as to let the large streams of traffic descend in relays. The view from the summit of the road is magnificent with the huge glacier at the foot of the Glocknerspitz which rises to over 12,000 ft. There was as usual a multitude of humanity and numbers of vehicles just below the spacious restaurants and car parks, but on searching around I soon found a rather deserted steep path just below the buildings where there were some flowery slopes alive with butterflies. I have seldom seen so many *B. napaea* which were skimming very fast over the herbage accompanied by many *Erebia manto* Esp., mostly just freshly out. There were also a few *E. epiphron* and *E. pharte* Hübn. together with a lot of *Coenonympha satyrion* Esp. An occasional *Colias phicomene* Esp. flitted past while the blues were represented mainly by *C. semiargus* and *Polyommatus eros* Ochs. This rather restricted area kept me busy until the time for our descent at 2 p.m., when the temperature was at 75° F. at this altitude of just over 8,000 ft.

28th July was a very dull and somewhat overcast day when little collecting was possible and the only addition to the list was *Issoria lathonia* L. on the outskirts of Mallnitz where I was joined on the 29th by

Major General Sir George Johnson and his wife, who had motored the forty miles up from Villach where they were obtaining a good harvest of lepidoptera.

We three motored up the valley past the Alpenrose restaurant till we found some rough ground covered with alder bushes. Here *A. niobe* was plentiful and I was fortunate enough to secure a male with heavy black blotches on the forewings. *E. melampus* was swarming, with a few *E. ligea*, but we saw only one *Parnassius apollo* L. I did not venture forth on the 30th until the afternoon owing to cloudy conditions and once more went to the high ground by the sesselbahn, obtaining some more *A. orbitulus* and another fresh female *V. optilete*. That evening I met Mr. R. F. Bretherton off the train which he had taken direct from Klagenfurt, having flown there from London.

The following morning, 31st July, we set out at 8.30 by car to the Alpenrose in ideally warm and calm conditions and once more made the steep ascent to the Hochalmblick by 11.30 a.m. There was plenty to keep us busy on the way up. *E. melampus* was in numbers at about the 5000 ft. mark with a few *E. euryale* and *E. cassioides*. In a small clearing among fir trees at this level we took the first *Erebia pronoë* Esp. When we had reached the hut we investigated a rough piece of ground in the vicinity that had been indicated by Mr. Warren as a former locality for one of the colonies of *E. claudina* and one of the first insects Russell Bretherton netted in this area was a female of this species, already somewhat worn. We concentrated on the very thick tufts of grass growing down a very precipitous slope and in the next hour managed to obtain six females and five males of this *Erebia* which had evidently been out for several weeks already. *Lycaena dorilis* Hufn. in its very black mountain form was quite numerous. Just as we were about to make the descent in the afternoon we saw an *Apatura ilia* L. sail past at this level of 6000 ft.

August opened with some rather unpropitious weather. We spent the first day of the month on the heights above the sesselbahn where *A. orbitulus* was again plentiful, but it was a day for Geometers with *Itame fulvaria* Vill. in swarms among the Vaccinium and *Larentia caesiata* Schiff to be flushed off the rocks in droves. The 2nd was again very dull when we penetrated the lower slopes of the Jamnig valley late in the day under very rainy conditions with little to show for our effort. However, the weather once more improved on 3rd August when, after missing the early 'bus to the Glockner, we decided to try some of the lower levels towards Villach which in the end well repaid us. We took the train to Spittal and a 'bus on to Seeboden at the western end of the Millstättersee. We soon found a secluded wooded path and road on the south side of the lake and one of the first butterflies to greet us was *Neptis lucilla* F. which just eluded us. Along the road and in the clearings was flitting *Araschnia levana* L. in its summer form *prorsa* L., but on catching them few were in perfect condition. *Argynnis paphia* L. was everywhere, with a sprinkling of *A. cydippe* L. The Nymphalines were well to the fore with a single *Nymphalis antiopa* L. which escaped from Bretherton's net. A good many *Polygonia c-album* L. were flitting about the low bushes of the wooded slopes to the lake. I caught sight of a female *Apatura iris* L. gliding high up among some alders and we missed

a *Nymphalis polychloros* L. There were also many *Mellicta athalia*, mostly rather worn, but among them were two fresh specimens of a smaller and darker insect which we have tentatively identified as *M. britomartis* Assmann. Among the Satyrids, *Melanargia galatea* L. was abundant as also was *Maniola jurtina* L., while *Aphantopus hyperanthus* L. and *Pararge egeria* L. were only sporadic. *Erebia aethiops* was about in plenty in all the glades, and a few *Leptidia sinapis* L. We returned to Mallnitz by the same route and spent the 4th on a longer trek up the Jamnig valley under much better weather than the previous occasion, but the absence of butterflies at the lower levels was most noticeable. We spent some time in a small valley at about 5,000 ft. just below the Jamnighütte which was lined with alders and apparently a locality for *Erebia eriphyle* Freyer, but although several of this genus were on the wing in this spot, none eventually turned out to be this species. The only surprise was a solitary *E. oeme* Hübn., a very late date for this insect. Further up beyond the hut the country opened out into a large valley which had been heavily grazed, but on some hilly ground with low vegetation we found *E. manto* in plenty and very variable with an occasional *E. pronoë*. A certain number of *B. pales* were skimming over the herbage with *C. phicomene*, while *P. eros* was in numbers on the drier places. We also saw one *P. apollo* there.

5th August was another glorious day when we set out soon after 8 a.m., by the motor coach for the Gross Glockner following the same route as before. Once more the Franzjosefhöhe was a seething mass of people, so we tried to dodge the multitude and venture further west towards the higher glaciers along a path above the main one in search of *Erebia nivalis* Lorkovic and DeLesse. But no sooner had we found the route leading to the Helmanhütte than we saw an ominous notice announcing the whole area to be a sanctuary for all forms of life, including insects, so that, since our nets were being eyed with suspicion by one of the uniformed wardens, we decided we had better beat a retreat back towards the restaurant where we had to content ourselves by covering the ground I had collected on during the previous week. Most of the same species were present as before with the addition of *A. orbitulus*. *E. manto* was now abundant in both sexes. We spent our last day, the 6th, at Mallnitz, on the high ground above the sesselbahn. When we had reached the top of this chairlift at the Hausleralm (6,000 ft.) I found the area just below it alive with butterflies, the commonest of which was *E. pronoë* flying with several *E. euryole* and *E. cassioides*. We then climbed by a very steep and tortuous path another 1,500 ft. to the summit ridge, but saw little on the wing on the luscious slopes facing north. However, as soon as we reached the south side the grass slopes were a mass of butterflies. *B. napaea* was in prodigious numbers with a wonderful variety of females of every gradation of colour from pale brown to almost black. Many Erebias were flying, including *E. manto*, *E. epiphron*, and quite a number of *E. pharte* in both sexes. Another feature was the profusion of the high level *Plusia howenwarthi* Howenwarth which were settling everywhere on the flowers in the bright sunshine. We indeed reaped a rich harvest to end our stay in this delightful spot. Early on 7th August we set out by train southwards down the winding line to Villach. The station lights at Mallnitz had attracted a large number of moths, mostly *Cleora repandata* L. and a few *Eurois occulta* L. After settling in

at the very spacious Park Hotel at Villach, we ventured by train to Arnoldstein, where we had our first sample of the chief lowland species at the foot of the Karawanken range. *Hipparchia dryas* L. was very plentiful and we saw our first *Papilio machaon* L. in fields near the station. That evening we joined forces with the Johnsons who were due to leave next day, and were able to tell us the best collecting localities in this attractive region, the lakeland in Austria. The next morning we set out by train for Klagenfurt, skirting the 20-mile long Worthersee, the largest lake in Austria. Under very warm conditions we made our way to the airfield to pick up a car which had been booked for us. The road to it yielded several interesting insects, in particular a very large form of *Plebejus*, probably referable to *P. idas acreon* Fabr. and also a rather worn female of *Maculinea teleius* Bgstr. (=*euphemus* Hübn.) We then motored a short distance from the airfield to the slopes of the Maria Saaller Berg, but the weather soon broke up and we were caught by a violent thunderstorm, having to shelter in a pinewood on the edge of some very rich ground which harboured the special broom (*Cytisus*) which is the foodplant of *Colias myrmidone* Esp., of which we saw, but failed to catch, one female. So we had to be content with some bright *M. jurtina* and a few *Argynnis dia* L.

The 9th was the only wet day of our sojourn when no collecting was possible and we resorted to a survey of the old parts of Villach. However, the elements relented on the 10th when we motored past the marshy area round the Faakersee, a small lake five miles from Villach. We then penetrated the lower slopes of the Karawanken up to the small village of Rosenbach where the railway enters the big tunnel into Yugoslavia. We followed a very winding path on foot up the valley indicated by Gen. Johnson. We soon came upon some very steep screes on which were flying Erebias in quantity. Nearly all these turned out to be *Erebia stirius* Godart (=*nerine* Freyer) of which the males were getting over, though the females were just appearing with their superb dove-grey undersides. They were extremely difficult to catch and it was virtually necessary to perch oneself high up on the screes and have a shot at each insect as it dashed past. However, by dint of a good deal of effort, we managed to get some good specimens. Another feature was several *Nymphalis antiopa* L. sailing up and down the ravine. *Lysandra coridon* Poda was just appearing. This secluded area was our venue again on 11th August when we obtained further *E. stirius*. On the way up, Bretherton was lucky enough to net a huge female *A. iris* as it skimmed down from a high sallow. Many more species were on the wing on this occasion including some worn *Limenitis camilla* L., also a number of whites, all of which seemed to be *Pieris bryoniae neobryoniae* Shzko. Some of these were very large, approaching *P. brassicae* in size. Lots of *A. paphia*, a good many *A. levana* and a few *Melitaea didyma* Ochs., past their best, were on the wing. After lunch we motored the 35 miles along the Rosental, south of the Worthersee to Klagenfurt to those slopes by the airfield which this time were much more productive. A field of what appeared to be wild michaelmas daisies was teeming with insects. *H. dryas* was in quantity with further *P. machaon* and we saw one *P. podalirius* L. The rough ground covered with birch bushes harboured some second brood *Clossiana selene* Schiff. and a few *Coenonympha iphis* Schiff. with a heavily spotted underside. The large *P. idas* also inhabited this terrain

together with *Aricia agestis* Schiff. Russell Bretherton took a somewhat worn *Philotes vicrama* Moore and the white form of *C. myrmidone*, just out.

Our final day, the 12th, was spent once more in the vicinity of Arnoldstein under very warm conditions when we penetrated the woodland bordering a canal which runs into the River Drau. In the clearings among the firs, *H. dryas* was abundant as was also *M. galatea*. Nearby the canal, as told us by Gen. Johnson, we found both sexes of *Maniola lycaon* Rott. on thistles. The form *valesina* of *A. paphia* was almost more numerous than the normal females in this region. In the afternoon we made our way up the very steep Wurzen Pass and at one or two points on this bad and twisty road we thought our Volkswagen would not make the gradient since many larger cars could not do so. However, we managed to reach a grassy open space near the summit where *L. virgaureae* was flying. We then went on to within a mile of the Yugoslav frontier and in walking among the low scrub a male *A. iris* was fluttering round some alder bushes, but was scared off by other visitors. *A. cydippe* was flying everywhere. On our way back to Villach we stopped to survey a large marsh on the edge of the Faakersee where we noticed *Gentiana pneumonanthe*. A little later Russell Bretherton flushed and netted a still fair male *Maculinea alcon* Schiff. The next morning he revisited this spot under a hot sun, but saw no more of this species. As he had a couple of hours to spare before boarding the 'plane for London, he went again to the Maria Saaler slopes where he caught one more *C. myrmidone* as well as some *Colias australis* Vty. which were careering over the cultivated fields. He also secured *Lysandra bellargus* Rott. and the only *L. argester* Bergstr. seen on the expedition.

I left by the Tauern express that afternoon, travelling by way of Salzburg and Munich and reaching London the following evening.

We recorded 89 species of butterflies in all, including 13 *Erebia*. Thurner in his survey of the butterflies of Carinthia (1948) enumerates 163 to which several newly separated ones may be added. These include *C. australis* Vrty., *B. napaea* Hon., *B. sifanica* Gr-Gr., *Mellicta britomartis* Assmann and *E. stirius* Godart.

In the following summary of species (G)=Gross Glockner, (K)=Klagenfurt, (M)=Mallnitz, (R)=Rosenbach, (S)=Seeboden, (V)=Villach area and (W)=The Wurzen Pass.

Papilio machaon L. few seen (V) and (K).
P. podalirius L. only one, worn (K).
Parnassius apollo L. only three observed (M).
Pieris brassicae L.
P. rapae L. } a few seen (M).
P. napi L.
P. bryoniae neobryoniae Shelzacko fairly numerous (V) and (R).
Colias croceus Fourc. only a few noted (M).
C. hyale L. one (V).
C. australis Vrty. several (K).
C. phicomene Esp. not common (G) and (M).
C. palaeno L. only one seen (M).
C. myrmidone Esp. just appearing early August, few seen (K).
Gonepteryx rhamni L. few noted (M).

Leptidea sinapis L. occasional (S) and (V).
Erebia melampus Fuessl. ssp. *melampus* Fab. abundant (M).
E. epiphron Knoch ssp. *aetherius* Esp. numerous (G) and (M).
E. pharte Hübn. ssp. *pharte* Hübn. few of both sexes (G) and (M).
E. oeme Hübn. only one taken (M).
E. claudina Borkh. few of both sexes, worn (M).
E. alberganus de Pr. (*ceto* Hübn.) few seen, rather worn (M).
E. manto Esp. very plentiful and variable (G) and (M).
E. euryale ocellaris Stdgr. uncommon and getting over (M).
E. aethiops Esp. very numerous and fresh (M) and (R.)
E ligea L. past their best and scarce (M).
E. pronoë Esp. ssp. *tarcenta* Frhst. becoming numerous at high levels (M).
E. stirius Godart only noted in the Karawanken (R).
E. cassioides R. and H. not common, just emerging (G) and (M).
Hipparchia dryas Scop. abundant (K) and (V).
Maniola jurtina L. abundant (S), (K) and (V).
M. lycaon Kuhn. few of both sexes (V).
Coenonympha arcania L. few, worn (V).
C. satyrion Esp. fairly common (G) and (M).
C. pamphilus L. a few (S) and (M).
C. iphis Schiff. only one (K).
Aphantopus hyperanthus L. numerous (S).
Pararge maera L. a few (M).
P. egeria L. few seen (S).
Melanargia galatea L. numerous (S), (K) and (V).
Apatura iris L. seen singly at (M), (S), (R) and (W).
A. ilia L. one at 6000 ft. (M).
Limenitis camilla L. few, worn (R).
Neptis lucilla Fab. one seen (S).
Araschnia levana prorsa L. fairly common (S) and (R).
Nymphalis antiopa L. one (S) few (R).
N. polychloros L. one seen (R).
Pyrameis atalanta L.
Vanessa io L.
Aglais urticae L.
} singly (M).
Polygonia c-album L. few (S).
Argynnis paphia L. plentiful (S) and (R).
A. cydippe L. few fresh (S) and (W).
A. niobe L. plentiful including one melanic male (M).
A. aglaia L. numerous (M) and (W).
Issoria lathonia L. one taken (M).
Clossiana euphrosyne L. a few worn (M).
C. selene Schiff. a few second brood (K).
Brenthis dia L. a few (K).
B. titania Esp. (=*amathusia* Esp.) few worn (M).
Boloria pales L. uncommon (G) and (M).
B. napaea Hübn. abundant (G) and (M).
Mellicta athalia Rott. numerous (M) and (S).
M. britomartis Assmann: a few possibly this species (S).
Melitaea didyma L. several worn (K).
Maculinea arion L. a few fresh (M).
M. alcon Schiff. one fresh male (V).

M. teleius Bgstr. (=*euphemus* Hübn.) one worn female (K).
Vacciniina optilete Knoch two fresh females and worn males (M).
Albulina orbitulus de Prun. (=*pheretes* Hübn.) few (G), locally plentiful (M).
Polyommatus icarus Rott. scarce (M) and (V).
P. eros Ochs. fairly common (G) and (M).
Lysandra coridon Poda becoming plentiful (R).
L. bellargus Rott. few (K) and (V).
L. argester Bgstr. (=*hylas* Schiff.) only one (K).
Aricia agestis Schiff. only one noted (K).
Plebeius argus L. one taken (V).
P. idas Hübn. a very large form fairly common (K).
Philotes vicrama Moore, two, worn, (K) and (V).
Cyaniris semiargus Rott. numerous (G) and (M).
Celastrina argiolus L. one seen (M).
Heodes phlaeas L. few seen (K).
H. dorilis Hufn. numbers at high levels (M).
H. virgaureae L. scarce (M) and (W).
H. hippothoë L. uncommon (M) and (W).
Thymelicus sylvestris Pod. a few (S).
T. lineola Ochs. numerous (S).
Ochlodes venata Br. and G. (=*sylvanus* Esp.) numerous (S) and (K).
Hesperia comma L. a fair number (M).
Pyrgus serratulae Rambur several (M).

During our stay at Mallnitz we made almost nightly walks to see what moths the shop windows had attracted and obtained quite an interesting harvest. Among the species noted were *Plusia ain* L., *P. interrogationis* L., *Lygris populata* L., *Itame fulvaria* Vill., and *Larentia caesiata* Schiff. Other geometers observed in the field included *Perizoma blandiata* Schiff., *P. minorata* Treits., a large form of *Plemyria bicolorata* Hufn. and *Coenotephria verberata* Scop. on the mountains.

Three Oaks, Woking. 16.i.1965.

SOME RECORDS OF MIGRANT LEPIDOPTERA IN KENT DURING 1964.—*Colias croceus* Fourc. Singles at Boxley on 9th September, Aylesford on 20th September and Folkestone Warren on 1st October.

Vanessa atalanta L. First seen in my garden at Aylesford on 3rd June and very common there from mid-August until the end of September. One at Folkestone Warren on the 1st October.

Vanessa cardui L. Singles at Aylesford on 20th August and at Folkestone Warren on the 1st October.

Acherontia atropos L. A male caught at light in Maidstone on 20th September and a fresh female found in a potato field at Burham on 9th October.

Herse convolvuli L. A Mrs. Price of Grove Green near Maidstone caught one that had come to a lighted window on 6th September.

Macroglossum stellatum L. One in my garden at Aylesford on 20th September and again on 23rd September. One in Maidstone on 21st September.

Plusia gamma L. was noted on many occasions but was particularly abundant during the week-end 19th-20th September when one or two could be disturbed from practically every bush or plant in the Aylesford area.—ERIC G. PHILP, Department of Natural History, The Museum, Maidstone, Kent. 15.ii.1965.

Isle of Canna Collecting Notes, 1964

By J. L. Campbell

This was a rainy stormy summer, after a very fine April when there were some unusually large catches in the m.v. trap; but there were some spells of very fine weather, during which fairly good catches were made, and the total for the season, 4,775, was well above the average. On 14th August two worn grey specimens of *E. occulta* were taken in the trap; I had only once had this species on Canna before, in 1960, when a dead specimen was found in a building on 17th August and brought to me. On 11th September a specimen of *H. convolvuli*, in fairly good condition, was found in the trap. This species has turned up in the district every four or five years since 1945: the last previously taken was on 12th September, 1960.

On 30th September a small catch of 29 moths in the trap included specimens of *C. lutosa* and *L. unipuncta*, the latter worn. *C. lutosa* had only occurred twice before, on 25th September, 1960, and 9th October, 1962. The capture of a specimen of *L. unipuncta* was a great surprise: has this moth ever been caught so far north in Britain before? and how often in Scotland? On 6th October another worn specimen was taken in the trap, in a catch of 28 moths. The identity of the species was kindly confirmed by Mr. D. S. Fletcher.

There has been a considerable deterioration in our weather during the past four years or so, or else we are going through a cycle of bad summers. A regular feature of the climate now seems to be gales, often very severe, in mid-May, at the midsummer equinox and in mid-August, as well as the usual ones at the autumn equinox. I find the following notes in my entomological diary for 1962, for instance: 14th May, 'spring latest on record'; 15th May, 'shattering SW gale, 90 miles an hour'; 31st May, 'end of coldest May and latest spring I can remember. No *urticae* or *io* seen at all'; 22nd June, 'summers 1961 and 1962 two of the worst experienced on Canna'; 30th June, 'coldest and stormiest June I can remember'; 8th July, 1962, 'first day that could be called real summer'. This 'summer' of 1962 ended with a very severe S.E. gale, when a German coaster, the *Widder*, was stranded in Coroghon Bay here and the crew was taken off by breeches buoy; the ship was refloated by Mallaig lifeboat the next morning. (Coroghon Bay can be seen on the Canna local stamp.)

The mid-May gale has become an annual event: I find diary notes of this on 6th May, 1961; 15th May, 1962; 13th May, 1963; and 13th May, 1964. These May storms are very deleterious to the foliage of trees, especially trees in the young plantations made in 1949-50 and 1956-58 and also to lepidoptera. The Puss Moth particularly has suffered in them.

The summers of 1963 and 1964 were little better than those of 1961 and 1962. In 1964, July was washed out so completely that I cannot remember having encountered even a single clegg, an unprecedented situation. It is possibly a consequence of this deterioration in the weather that *V. urticae* and *V. io* have disappeared from the island. The disappearance of *V. urticae* from the sheltered parts of the island, where nettles are common enough (and where last year a number of *atalanta* larvae were easily found), is particularly striking. In 1963 only four specimens were seen, of which two entered my house for hibernation and two were seen in remote parts of the island. In 1964 only one specimen was seen, on 3rd

October, and it was migrating in the company of two specimens of *cardui*. *Cardui* itself has become a most infrequent visitor. Indeed the days when one could see numbers of *atalanta*, *urticae*, and *cardui*, with an occasional *io*, flying around the buddleia, veronica and michaelmas daisies in the late summer, now completely belong to the past; I have not seen these butterflies together in numbers since a day in August 1955. *Atalanta* alone of these species has appeared fairly regularly. *C. croceus* has not been seen here since 1947; will such a summer ever be repeated?

The m.v. trap has now been worked here every summer since 1951 inclusive, and has added 47 species to the Canna list published in the *Scottish Naturalist*, second number of 1954. Over 35,000 moths have now been caught in the trap, but it must be said that over a seventh of these were large yellow underwings (*T. pronuba*). Occasionally there are large runs of other species, as on 18th July, 1964, when out of 305 moths in the trap, 153 were *Agrotis strigula*. But of course the interesting species are those that have only turned up once or twice during these 15 years. I shall have more to say about them eventually.

Butterflies in the Cranleigh District, 1964

by Major A. E. Collier

A mild and pleasant spring followed by a perfect summer had little immediate effect on the local butterfly population, but may very well produce improved results in 1965 and later years.

In the meantime there are usually enough insects about to provide plenty of interest and occupation for anyone who is not afflicted with a setting board obsession. The Pieridae were more in evidence this year, with the unlamented exception of *P. brassicae* L. which remained rather scarce. *P. napi* L. and *P. rapae* L. were both more plentiful than for some years, and *Euchloe cardamines* L., favoured by the absence of any cold spell in May, had an uninterrupted period of emergence during which its egg-laying activity augurs well for next year.

Leptidea sinapis L. also showed up in good numbers, and on 23rd May in quite a small wood I was able in a short walk to count 26 specimens, the best on a first viewing for many seasons. *Gonepteryx rhamni* L. appeared to have recovered from their comparative scarcity in 1963. Nothing seems to worry the Hesperiidae, but the abundance of one species or another varies from year to year. This time *Syrichtus malvae* L. came out on top, particularly in newly-cleared woodlands carpeted with wild strawberry which, for the second year in sucecssion, remained untouched by frost. A high percentage of the *malvae* examined showed a tendency towards *ab taras*. *Erynnis tages* L., *Ochlodes venata* B. & G. and *Thymelicus sylvestris* L. were all well up to normal in their usual habitats.

After its poor performance in the late summer of last year *Pararge aegeria* L. appeared to have recovered its status, and the richly coloured specimens of the second brood were particularly noticeable from 8th June onwards. The spring fritillaries, *Clossiana euphrosyne* L. and *Argynnis selene* Schiff. were again not over-plentiful. For several years these two species have been evenly and widely, but thinly, distributed over large areas of reafforested land where everything appears to be in their

favour and their growth potential would seem to depend now on a series of good springs and summers.

Euphydryas aurinia Rott. was not seen locally this year, nor did I meet with *Mesoacidalia charlotta* Haw. and *Fabriciana cydippe* L., while *A. paphia* L. seems very nearly to have reached the point of no return. *Polygonia c-album* L. was rarely seen in the spring and summer, but what specimens there were must have had a very successful season judging by the numbers seen on the scabious flowers in a local field in September. These greatly exceeded those seen in 1957 when the Nymphalidae were generally more plentiful in this part of Surrey than they are to-day.

Aglais urticae L. and *Vanessa atalanta* L. improved a little on recent years but did not approach the numbers seen in counties further south and west. *Nymphalis io* L. and *V. cardui L.* were only occasionally encountered.

After such a remarkable summer I had expected to see great numbers of *Lycaena phlaeas* L. in September and October, but this expectation was not realised. Occasional specimens had been met with in May and June, but the rather heavy rainfall in these two months may not have suited the young larvae, which I have always found to be very susceptible to overdamp conditions. It is possible that the insect was as usual more plentiful in the heather localities where the foodplant is much less affected by wet weather.

Limenitis camilla L. is still to be seen occasionally, but it is only just holding its own except in one recently cleared area where only the oak trees have been removed, leaving a jungle of birch and thorn trees festooned with honeysuckle, and interspersed with bramble.

Apatura iris L. was not seen this year in the immediate locality, and a fairly exhaustive search in late August disclosed one larva only, which may survive, but the imago will have to work hard to find a mate.

The Satyridae were as usual the mainstay in this part of Surrey and it was a pleasure to see *Coenonympha pamphilus* L. in good heart from 23rd May onwards after its virtual disappearance in the late summer of 1963. Inexplicably, however, it failed to increase its numbers, and became exceedingly rare on the downs in September. This was particularly noticeable after the numbers met with in Dorset and Wiltshire.

Pararge megera L. was rarely seen, either on downland or in the local fields, but *Maniola jurtina* L. and *M. tithonus* L. both flourished exceedingly, the former in all suitable areas, the latter rather more locally and particularly in two most favourable localities. The best of these consists of a rectangular field of about ten acres, bordered by oak forest on one long side, and by narrow belts of mixed woodlands on the others. Until quite recently, *iris* and *camilla* were not uncommon in and around the forest, and *iris* larvae could be found on the sallows in the borders.

The field has been completely neglected for many years and is now almost covered with hundreds of clumps of fleabane, separated by various grasses, among which flourish thistles, knapweed, self-heal and birdsfoot trefoil. Examination of the great numbers of *tithonus* becomes a simple matter owing to their passionate addiction to the fleabane on which they feed, and among which they retire for the night or for shelter from wind and rain. The field is also inhabited by a very strong and variable colony of *Aphantopus hyperantus* L., which occupies the western half,

leaving the eastern half to innumerable *jurtina*, widely variable in colour and spotting.

My old *lanceolata* field was treated very roughly this year by a few bullocks, which left very little vegetation intact and may have had disastrous effects on the butterflies.

As a matter of interest I found *caeca* and *arete* forms of *hyperantus* more common than ever before in my experiece of Surrey, while *lanceolata* turned up in several unexpected places. The Hairstreaks were not much in evidence. *Callophrys rubi* L. occurred very locally in woodlands in May, *Strymon W. album* Knock was not seen at all, and *Quercusia quercus* L. still fails to build up its numbers to any noticeable extent.

Most of the blackthorn thickets, which in earlier years were the habitats of *Thecla betulae* L. have now been destroyed, but I was delighted to find a new and flourishing colony in a situation which may preserve it from destruction by the local farmer.

Lycaenopsis argiolus L. has not appeared for some years, but it is a great pleasure to find that *Plebejus argus* L. is slowly increasing in numbers in places where fresh young heather is growing again over the burnt out areas.

Polyommatus icarus L. has not been plentiful either in woodland or on the downs, but *Lysandra coridon* L. showed up well from mid July, and females were still busy depositing eggs in the second half of September.

The spring brood of *L. bellargus* Rott. was nearly a complete failure, as it appears to have been in most parts of England. The autumn brood was reasonably satisfactory and at least held some hope for the future.

I had an interesting experience with the unpredictable *bellargus* in 1963. On 8th June I was on my way home from Dorset, and passed near a down which had carried a very flourishing colony of *bellargus* up to eleven years ago, when part of the down was built on, and the remainder turned over to agriculture. From the car a narrow strip of the down appeared to be a mass of yellow flowers, which invited a closer look. After a quick lunch in the car and a difficult scramble over several barbed wire fences and through a cornfield, I arrived at the strip and found it full of *Hippocrepis comosa* in bloom, and swarming with countless *bellargus* of both sexes and in prime condition. With little time to spare, I walked up and down the acre strip several times, filling my net every yard or two, but saw nothing better than *obsoleta* types, interesting enough to warrant a return in September.

On 7th September I returned and found one bewildered and lonely male *bellargus*, no herbage left on the hillside, and a small herd of malevolent-looking goats.

The same emptiness, and goats, prevailed in June and September of 1964.

I wonder for how many years thousands of *bellargus* flew on this piece of down unobserved and unrecorded, and whether we shall ever see them there again.

In my review (*antea* p. 28) I regret to say that my wording indicates that the drawings of *iris* were by Mr. Hyde. They are, in fact, the work of Mr. A. D. A. Russwurm, to whom I am obliged for having pointed out my error.—Ed.

Some Mercury Vapour Visitors at Ascot

By D. S. Johnson, M.A.

My trap sits almost on the Berkshire-Surrey border at Sunninghill, a fairly wooded area just south of Ascot, now being subjected to substantial building operations. The garden, however, lies on the edge of the village, and has a variety of trees and shrubs.

Very little activity was possible this year in March, owing to the wintry weather in the middle of the month, and my absence from the area at Easter.

Operations got under way early in April. *Biston strataria* Hufn. (oak beauty) was reasonably plentiful up to 23rd (peak on 7th and 8th), while *Orthosia gothica* L. (Hebrew character) (66 on 12th May), *O. stabilis* Schiff. (common quaker) (135 on 16th April), *O. incerta* Hufn. (clouded drab) (50 on 7th April) and *O. cruda* Schiff. (small quaker) 29 on 15th April) were all very common. Specimens of *O. populeti* Fab. (lead-coloured drab) and *O. advena* Schiff. (northern drab), were also recorded. *Dasycampa rubiginea* Schiff (dotted chestnut) arrived on three occasions only (6th and 16th April, 3rd May—single specimens), while *Achlya flavicornis* L. (yellow horned) was much scarcer than usual. *Panolis flammea* Schiff. (pine beauty) was a fairly regular visitor in twos and threes between 7th April and 27th May. *Odontosia carmelita* Esp. (scarce prominent) was recorded on two occasions (28th April and 3rd May), as well as *Selenia tetralunaria* Hufn. (purple thorn) (16th April and 17th May). *Chaonia ruficornis* Hufn. (lunar marbled brown) seemed to be in smaller numbers than previously between 27th April and 12th May; *Polyploca ridens* Fab. (frosted green) scored 11 between 27th April and 15th May. The best nightly total for April was 223 on 16th, with the average standing at 88.

May saw the beginning of *Pheosia gnoma* Fab. (lesser swallow prominent) which continued in fairly large numbers throughout the month, with sporadic arrivals in June, and then a build-up to the second brood at the end of July and through August, when the insect was common. *P. tremula* Clerck (swallow prominent) was somewhat scarce, *Notodonta ziczac* L. (pebble prominent) regular in ones and twos throughout May, *Lophopteryx capucina* L. (coxcomb prominent) very irregular, while of *Notodonta trepida* Esp. (great prominent) a total of 30 was recorded between 10th May and 3rd June. Three *Clostera curtula* L. (chocolate-tip) and two *Harpyia furcula* Clerck (sallow kitten) appeared. *Biston betularia* L. (peppered moth) was noted in large numbers beginning on 17th May, with the melanic ab. *carbonaria* much more prominent than the regular form; very dark forms of *Gonodontis bidentata* Clerck (scalloped hazel) were also in evidence. Upwards of 40 specimens of *Plagodis dolabraria* L. (scorched wing) were obtained, some particularly finely marked. The first appearance of *Plusia gamma* L. (silver Y) was on 22nd May, and that of *Agrotis ipsilon* Hufn. (dark sword grass) on 30th May.

In June, *Selenia lunaria* Schiff. (lunar thorn) was captured on 9th, and *Hapalotis venustula* Hübn. (rosy marbled) on 27th. Seventeen examples of *Stauropus fagi* L. (lobster moth) were recorded between 12th June and 20th July. *Noctua pronuba* L. (large yellow underwing) and *Lycophotia varia* de Vill. (true lover's knot) appeared about mid-month and reached

large numbers—121 of the latter on 17th July, and of the former, 174 on 27th August and 167 on 4th September.

The more interesting records for July included *Zenobia subtusa* Schiff. (olive moth), *Euphyia cuculata* Hufn. (royal mantle), *Polychrisia moneta* Fab. (golden plusia), *Lithosia griseola* Hübn. (dingy footman) ab. *flava* Haw., and *Chloroclystis coronata* Hübn. (V pug). But the highlights of the month were the arrival of *Lithosia quadra* L. (four spotted footman), a fine male on 16th and a damaged male on 18th, and *Parascotia fuliginaria* L. (waved black) on 6th and 18th, both in fine condition, while, of all things, a worn specimen of the last named turned up on 10th September!

The year was remarkable in that not a single *Mimas tiliae* L. (lime hawk), or *Deilephila porcellus* L. (small elephant hawk) was recorded—very unusual for this area. Of the other hawks, *Laothoe populi* L. (poplar hawk) was first noticed on 15th May and was common, *Deilephila elpenor* L. (elephant hawk) on 29th May, *Smerinthus ocellata* L. (eyed hawk) on 30th May, while eight *Hyloicus pinastri* L. (pine hawk) were recorded between 3rd June and 20th July. For the first time in my experience here, *Herse convolvuli* L. (convolvulus hawk), very worn and battered, paid a visit on 3rd September.

Unfortunately, a severe eye infection brought the season to an untimely end on 10th September, but I count myself lucky that up to then it had been full of interest.

A Comparison of the Conifer-feeding Lepidoptera of Two Suburban Localities

By A. A. Allen

It occurred to me that it might be of some little interest to tabulate for comparison the results of a few years' work with the mercury-vapour lamp in two well-separated parts of the London suburbs, as far as they relate to the conifer-feeding Lepidoptera; since these results present certain unexpected features. The localities in question—Carshalton Beeches, near Croydon, Surrey, about 11 miles nearly due south of Central London; and Blackheath, Kent (county of London), about seven miles E.S.E. of it—different as they are in many respects, are alike in that the only coniferous trees in both areas are more or less isolated and scattered specimens in gardens (see below), and neither in individuals nor in range of genera and species at all abundant. To this admittedly there is one exception, namely the Cupressaceae (cypresses and their allies), prevalent in both districts; on the other hand these conifers—like the yew, also common—are not among the recognized foodplants of any of the moths listed with the one exception of *Dichomeris marginella* (referred to below). Nothing like the extensive pine-woods or fir plantations of some of the districts further out of London are near at hand.

It might be expected, therefore, that the corresponding lists of Lepidoptera (in fact, of course, all moths and mainly 'micros') would be not only meagre but also very similar for the two places, with a majority common to both. This, however, is not the case. Firstly, the number of species—combining the two lists—is considerably higher (22) than would have been thought likely in the circumstances just described. Secondly,

a curiously small proportion of them—three only, or just under a seventh of the total—are shared between the two localities; this is the most interesting feature of the list. A few further species, not yet found, probably occur in both places. It does not appear that the more suburban of the two localities is any less rich in conifer-feeders than the other, in fact rather the reverse (14 as against 11 species). No importance, however, is to be attached to the slightly higher number for Blackheath, which is probably deceptive and due to the cause mentioned below.

The Carshalton results are the work of my friend Mr. Dudley Collins —or rather, a tiny fraction of it. He ran the lamp intensively in 1955 and the few following seasons, recording as far as possible everything that turned up. He emphasises, however, that at least in the first year some of the obscurer micros must certainly have been passed over—the number of moths attracted being very large. As regards my own efforts here, commencing in 1959, I have endeavoured to overlook nothing, but a few species nevertheless have most likely gone unnoticed; particularly as the light at Blackheath has been run on the whole less continuously than at Carshalton, only the nights that seemed favourable being chosen (many more in 1959 than any year since). Both lists cover a similar period of years, but in each case the great majority of species had already appeared in the first year.

It must be stressed that the lists for the two localities are not strictly on a par since the collecting was done during successive periods, instead of simultaneously; but even so I think they may be considered roughly comparable. Each period began with an excellent season; the next was very fair to good; thereafter, in both cases, there was a marked falling-off. To introduce more analytical detail into the table, beyond a general indication of frequency, would not, I think, serve any useful purpose. The high proportion of 'singletons', the shortage of Olethreutinae in the Carshalton list and the lack of Tortricinae and Phycitinae in that for Blackheath, will be noted. One difference in procedure was that the lamp was run at the latter place from a second-floor room, and at the former from a first-floor one; this may have an effect in certain groups (thus the Pterophorids seem to keep low, and the Hepialids perhaps even more so) but little in those here concerned.

I was hesitant whether or not to include *Blastobasis lignea* Wals. as a conifer-feeder. The larvae are recorded from yew and spruce and I have beaten the moth from the former at Box Hill and (often) in my garden. Mr. S. Wakely, however, inclines to the view that the larvae are polyphagous, feeding mostly on decaying leaves and the like; he once found them eating the inner rind of fallen Spanish chestnuts. The species is common in both areas in question.

The relative poverty of conifers therein has already been mentioned. Larch seems wholly absent, and so, therefore, are the associated species —except for the single *P. aeriferana* at Carshalton, probably a wanderer. (This species has not otherwise, I believe, occurred so close to London.) We have noticed no juniper in either area, so that the source of *D. marginella* is perhaps dwarf ornamental forms of *Juniperus* likely to be in some gardens, rockeries, etc. In any case its occurrence at Blackheath (1961 only) is far more unexpected than at Carshalton, not far from the wild juniper of the North Downs. The Scots pines and Norway spruces are few and small (here, frequently stunted and sickly); while the other

exotic conifers* met with—chiefly cedars and certain pines—in all probability (like the "flowers that bloom in the spring") have nothing to do with the case, unless the adventive *R. piceaella* is attached to such a species. This was only the second British record—cf. Allen, 1961, *Ent. Rec.*, **73**: 40.

I am, as usual, grateful to Mr. Wakely for his help in naming or confirming some of the micros, among very many others; and particularly to Mr. Collins for his generosity in pressing me not only to accept all his best micro captures but also to borrow his lamp for the more thorough investigation of the Blackheath fauna (so well justified by results).

*Besides the cypresses, mentioned above.

Frequency indications used in the table:—

1; 2; r.=rare; n.c.=not common; f.c.=fairly common; c.=common (more or less).

Species	Blackheath	Carshalton
Hyloicus pinastri L.		1
Ellopia fasciaria L.		1
Semiothisa liturata Clk.	2	
Thera obeliscata Hübn.	c.	c.
Bupalus piniaria L.		1
Dioryctria abietella F.		1
Euzophera terebrella Zinck.		1
Eulia formosana Fröl.		2
Ptycholomoides aeriferana H.-S.		1
Rhyacionia buoliana Schiff.	1	
R. pinicolana Doubl.	1	
R. pinivorana Zell.	2	
Clavigesta purdeyi Durr.	n.c.	
Zeiraphera diniana Guen.	f.c.	
Z. ratzeburgiana Sax.	1	1
Epinotia tedella Clk.	1	
Olethreutes decrepitana H.-S.	n.c.	
Exoteleia dodecella L.	n.c.	
Dichomeris marginella F.	r.	r.
Recurvaria piceaella Kearf.	1	
Cedestis farinatella Dup.		2
C. gysseleniella Dup.	r.	
Separate totals of species	14	11
Combined total of species	22	
Number common to both places	3	

Industrial Melanism—Some Comments

By A. J. Showler, Ph.D.

In a recent article, Johnson[1] stresses the importance of keeping records of the occurrence of melanics amongst moth populations. This is undoubtedly so, and it is to be hoped that others follow his example, but before they do so one error should be pointed out. The author himself says "we need records of actual numbers", but Ford[2] states the consequences when quoting an example (in 1900) where the recorders were "so badly briefed, or their results so ill-recorded that the frequencies of the melanic forms are merely given in percentages, without the numbers

upon which these were calculated, save in two instances. As a result, the information contained in the report is largely useless".

This should serve as a warning; without actual figures results cannot be interpreted, since it cannot otherwise be discovered later whether the percentages calculated are statistically significant, and the possible error cannot be assessed. After all, one black moth from a total of one means little, but 990 from a total of 1000 can fairly safely be taken to represent 99%.

Thus in the paper in question, the author's "average percentage" is a value which may not be justifiably quoted, unless all the samples are very large. A value based on total captures over the four years will, of course, be different numerically, since different numbers will be taken each year, so that it would seem better to simply express the changing percentages over the years by means of a graph.

The author must be corrected when he states that polymorphism "simply means variation of some kind". Ford[3] stresses that the variation must be discontinuous, defining genetic polymorphism as "the occurrence together in the same locality of two or more discontinuous forms of a species in such proportions that the rarest of them cannot be maintained merely by recurrent mutation". Thus even the melanic form of a white moth would not be a polymorph if various intermediates of deepening shades of grey occurred, unless the melanic and each distinct intermediate grey form were governed by a different set of genes.

By definition, then, a large number of the "vars." collected in the past like stamps by many, are not polymorphs, and I would venture to suggest that they would all be better left un-named until some insight into the reason for the variation could be established. This could be either environmental or genetic; if the latter then it should be shown whether the character is dominant or recessive, and whether one or more genes are responsible for the variation. This would be particularly useful where variation is continuous, since then one name could be given to a whole range of variations between two extremes governed by one gene or gene complex, rather than giving the many intermediates a series of pointless names.

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Notes on British Orthoptera in 1964, with some New Vice-county Records

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Introduction

The fine warm summer, at least in the south, of 1964 was ideal for Orthoptera, though some species tended to have a rather short season in consequence. On the other hand, several species, especially the Acridids, made a late appearance presumably due to the rather cold weather during the first three weeks of April. For instance, at Pill, the

north Somerset village where I live, I did not notice the first adults of *Chorthippus brunneus* (Thunb.), the common field grasshopper, and *Ch. parallelus* (Zett.), the meadow grasshopper, until 5th July; and the first very small nymphs of *Pholidoptera griseoaptera* (Degeer), the dark bush-cricket, until 30th May, compared with 12th May in 1963 and 13th May in 1962 (same instar nymphs).

My own field observations made during 1964 are given below. Dr. D. R. Ragge has asked me to publish some new vice-county records of British Orthoptera which he has collected together and I am grateful to him for the opportunity to do so; they are included in the final part of this paper.

North Somerset (vice-county 6)

Gordano Valley

In my garden at Pill in the broad, eastern entrance to the valley I found a very small nymph of *Leptophyes punctatissima* (Bosc) (the speckled bush-cricket on 26th May, two on 13th June, two on 14th June and one on 5th July; they were found on wild raspberry (*Rubus idacus* L.), stinging nettle (*Urtica dioica* L.) and dwarf Michaelmas daisies (*Aster* sp.). This species feeds readily on the last-named plant in captivity. One of the above nymphs, which I kept in captivity, underwent its final moult when I happened to be there to watch it; it partially ate its discarded cuticle and then fed voraciously on wild raspberry leaves. As mentioned above, I found the first nymphs of *Pholidoptera griseoaptera* at Pill on 30th May; the first adults were heard stridulating on 1st August and the last on 6th November. On 20th September my next-door neighbour handed me a female *Meconema thalassinum* (Degeer), the oak bush-cricket, which came to light in his house the previous night.

On 5th July my wife and I searched much of the apparently suitable damp pastureland between Easton-in-Gordano and the Severn Estuary for *Chorthippus albomarginatus* (Degeer), the lesser marsh grasshopper, but without success. The only species encountered were *Ch. brunneus* and *Ch. parallelus*, both of which were common, although few were adult.

On our way back from a collecting trip to the Somerset peat moors on 21st August, Dr. D. R. Ragge and I drove over Weston Down, which overlooks the Severn Estuary near Portishead. Here, in the fading evening light, we heard several *Tettigonia viridissima* L., the great green bush-cricket, and many *P. griseoaptera* stridulating from the hedgerows on both sides of the coast road.

The next afternoon, 22nd August, a hot, sunny one, Dr. and Mrs. Ragge and I explored the Gordano ridge around Cadbury Camp and Tickenham Hill. We first investigated a small rough field between Westpark Wood and the lower slopes of Cadbury Camp which sported a most attractive limestone flora with marjoram (*Origanum vulgare* L.), wild carrot (*Daucus carota* L.) and wild thyme (*Thymus drucei* Ronniger) dominant. We fully expected to find *Stenobothrus lineatus* (Panz.), the stripe-winged grasshopper, and *Gomphocerippus rufus* (L.), the rufous grasshopper, but it proved to be a disappointing place for Acridids; only *Ch. parallelus* was abundant, although small scattered colonies of *Ch. brunneus* were also present. The Tettigoniid, *P. griseoaptera* was abundant in the rough field borders, along the edge of Westpark Wood and in the neighbouring hedgerows overgrown with wild clematis (*Clematis*

vitalba L.) and brambles. One *T. viridissima* was heard stridulating from the edge of Westpark Wood; on Cadbury Camp it was numerous in the bramble clumps around the old Celtic camp. We captured one male which was stridulating from the middle of a bed of stinging nettles in the middle of the camp. Again we were disappointed with the Saltatoria present: *P. griseoaptera* and *Ch. parallelus* were both very common, while *Ch. brunneus* occurred in small scattered colonies in the barer places. Along Tickenham Hill ridge *T. viridissima, P. griseoaptera, Ch. parallelus* and *Ch. brunneus* were all common and stridulating in the hot sunshine.

In the late afternoon we descended into the valley and visited Walton Moor. It was rather late in the day for grasshoppers, with the sun setting fast, but we found *Ch. parallelus* in plenty and Ragge captured one form *bifasciata* (Herbst.) of *Tetrix subulata* (L.), the slender groundhopper.

At Leigh Woods, above the Avon Gorge, which lie on the same carboniferous limestone system as the Gordano ridge proper, Michael Kendall and I searched unsuccessfully on 25th August for *Omocestus rufipes* (Zett.), the woodland grasshopper. I had thought it possible that the attractive, grassy glades and clearings of these woods might be suitable for this rare species; however, the only Acridids encountered were the ubiquitous *Ch. brunneus* and *Ch. parallelus*, both of which were to be found in rather small isolated colonies. Tettigoniid, *P. griseoaptera*, was widespread and common in the open parts of the woods.

The Northern Mendips

On 23rd August, *en route* for the main range of the Mendips, Dr. and Mrs. Ragge, my wife and myself, stopped for an hour or so just before lunch in a delightful little combe in the carboniferous limestone near Broadfield Farm, nearly two miles north-east of Wrington and not far from the upper part of Goblin Combe. Here, on a low, south-facing hill where the rock is exposed and the turf is rather short and springy, we found a thriving colony of *Myrmeleotettix maculatus* (Thunb.), the mottled grasshopper; the majority were green forms, but a small number of slate, black and brown forms were also represented. *Ch. brunneus* was plentiful on the driest, rockiest parts of the hill, and *Ch. parallelus* fairly common in the grassier areas. A male *Omocestus viridulus* (L.), the common green grasshopper, was heard stridulating from a patch of bracken on the north-east slope of the hill, while *P. griseoaptera* was numerous in the hedgerows and bramble clumps.

In September Michael Kendall brought me a female *M. maculatus* which he had captured on the limestone scree at the upper end of Goblin Combe on the 20th; he saw several others there.

The Mendip Hills

Dr. Ragge and I, together with our wives, spent the afternoon of 23rd August exploring the Mendips. It was mainly sunny and very warm, though cloudy at times. During one bright period we examined a steep slope of Burrington Combe. *O. viridulus* was the commonest Acridid; *Ch. parallelus* was fairly common on the lower slopes and *Ch. brunneus* on the higher slopes. On the rockier slopes *M. maculatus* was also to be found in small numbers. *P. griseoaptera* occurred in plenty in the tangled vegetation bordering the road which winds up through the combe.

Moving on to the tops of the Mendips we found a mixture of acid and calcareous soils at Velvet Bottom, near Charterhouse, with a consequently curious mixture of calcicolous and calcifugous vegetation: wild thyme (*Thymus drucei* Ronniger), felwort (*Gentianella campestris* (L.)), devil's-bit scabious (*Succisa pratensis* Moench), centaury (*Centaurium erythraea* Rafn) and ling (*Calluna vulgaris* (L.)). Small colonies of *M. maculatus* were encountered wherever the grass grew very short and thyme occurred; elsewhere *O. viridulus, Ch. brunneus* and *Ch. parallelus* were all common. Around Priddy Pool we searched the boggy ground, where cotton grass (*Eriophorum angustifolium* Honck.) grew, for *Metrioptera brachyptera* (L.), the bog bush-cricket, but without success. It was, however, overcast and already rather late, so the possibility of its occurrence in these bogs cannot be ruled out; they looked suitable for it. The only Saltatorian seen on the boggy ground was *Ch. parallelus,* which was frequent, and I collected one very dark, brownish male.

Athough by now it was rapidly becoming dark we paid a brief visit to the southern slopes of Crook Peak. Here *M. maculatus* was common; grey forms which matched the bare limestone rock being dominant. *Ch. brunneus* and *Ch. parallelus* were also common, although the latter was largely confined to the lower slopes where the grass was more luxuriant. *T. viridissima* was numerous and males could be heard stridulating from almost every clump of brambles; earlier, we had heard many more on the slopes above Westbury and Ebbor.

The Polden Hills

On 21st August, Dr. and Mrs. Ragge, my wife and I arrived at Walton Hill, near Street, during the late afternoon in search of *Gomphocerippus rufus* (L.), the rufous grasshopper. J. Cowley (1951, 1952) mentions its discovery in this locality on 5th September, 1948, but, as far as I know, it has not been recorded here since then, although Cowley has also reported it from the Poldens near Bawdrip and Cossington, 7-8 miles further west, in 1950, and from Socombe Hill, near Edington, about 6 miles further west, as late as 19th August 1953 (Cowley, *in litt.*). Ragge and I soon succeeded in finding *rufus* in good numbers on a south-facing slope where there was a well-developed Liassic limestone flora; *Ch. brunneus* and *Ch. parallelus* were also present and very common.

The Somerset Moors

On 4th July Michael Kendall and I stopped at Meare Heath at 10 a.m. *en route* for the Isle of Purbeck. The sun was just breaking through the clouds and it soon became very warm and sunny. I collected several small nymphs of *Conocephalus dorsalis* (Latr.), the short-winged conehead, by sweeping through the rank, bog vegetation, where it was common, with my water net. After a good deal of intensive hunting through the boggiest areas I eventually managed to catch a last-instar female of *Stethophyma grossum* (L.), the large marsh grasshopper. I also collected a single adult male *Tetrix subulata* and saw a black variety of *Tetrix undulata* (Sowerb.), the common ground-hopper. Nymphs of *Ch. parallelus*, mainly very small ones, were abundant.

My next visit to Meare Heath was on 21st August, a beautifully hot and sunny day, in company with Dr. and Mrs. Ragge and my wife. Before

lunch we made a stop at Hythe Moor, between Cheddar and Wedmore, where we looked unsuccessfully for *Ch. albomarginatus*. After lunch at the George Inn at Wedmore, where we saw a red admiral butterfly (*Vanessa atalanta* L.) flying around and settling on some empty beer-barrels, we made another halt by an attractive-looking meadow at Oxen-pill, very near the prehistoric lake village at Meare. Here we found *Ch. albomarginatus* in abundance on the damp, peaty ground. *Ch. parallelus* was also very common, especially in the drier parts. We found both *T. undulata* and *T. subulata* in good numbers, particularly where the peaty soil was exposed as bare patches, such as on the banks of the boundary ditches. The form *bifasciata* of *subulata* was just as common as the typical form; we also obtained several beautiful brown specimens marked with a mottled white band or patch on the pronotum. Two nymphs of *C. dorsalis* were also seen among the rushes in a drainage ditch.

Arriving at Meare Heath, which we reached about mid-afternoon, we located several small scattered colonies of *S. grossum* in the boggy areas, especially where the tussock sedge (*Carex paniculata* L.) grew. Most were adult, but we also found several last-instar nymphs. There had been some destruction of the habitat since I visited Meare in July: one of the best fields had been almost completely cleared ready for peat cutting, but *grossum* still survived in the remaining clumps of tussock sedge. One of the other sites for this species and *C. dorsalis* is slowly being spoilt by a growing rubbish tip; it is to be hoped that the new Somerset Trust for Nature Conservation can do something to save it. *C. dorsalis* was plentiful in all suitable places, but like *grossum* it was less common than in 1963. *Ch. parallelus* was abundant and *Ch. brunneus* locally frequent on the drier ground; and one *O. viridulus* male was heard stridulating. The ground-hoppers, *T. subulata* and *T. undulata* were both common, especially on dry, peat turfs. Once again, form *bifasciata* was as numerous as the typical form of *subulata*. The Tettigoniid, *P. griseoaptera*, was locally abundant.

In the lank, marshy vegetation around Ashcott Station three or four *T. viridissima* were stridulating, plus many *P. griseoaptera*.

DORSET (vice-county 9)

Isle of Purbeck

Michael Kendall, my wife and myself arrived at the *Decticus verrucivorus* (L.) (wart-biter) locality, a heath not far from Corfe Castle, shortly after 3 p.m. on 4th July. I was searching in the sunshine for *verrucivorus* and for nymphs of *M. brachyptera*, when we were joined by Dr. Ragge and his wife who were holidaying in the area. While Ragge and I were talking, his wife wandered off to the damper part of the heath carrying a large glass tube; shortly afterwards she returned with a fine female *verrucivorus* nymph in one of its later instars—a rather unexpected capture! This specimen was later exhibited alive at the 12th International Congress of Entomology in London. *M. brachyptera* nymphs were very common on the boggy parts of the heath and varied greatly in size, although some of them were already in their last instar. *M. maculatus* was common in the drier areas and fully adult.

After taking our leave of Dr. Ragge and his wife, we drove from Corfe Castle to Chapman's Pool, near Kingston, but it was nearly 6 p.m. when we arrived and rather overcast, so we contented ourselves by investigating the steep slopes above the cove. Apart from numerous nymphs of *Ch. parallelus*, the only Saltatoria we found was a female nymph of *T. viridissima* and a fourth-instar nymph of *P. griseoaptera*. We left soon after 7 p.m.

South Hampshire (vice-county 11)

The New Forest

From 18th to 21st July inclusive, Michael Kendall, G. F. Wade and I stayed in the New Forest where we made wildlife sound recordings for the B.B.C. Sound Archives; this trip gave me the opportunity to collect Orthoptera. In the late afternoon of the day of our arrival we visited a boggy valley between Backley Inclosure and Bratley Wood. Here I found *M. brachyptera* and *Ch. parallelus* in abundance and noted a few *O. viridulus* and *Ch. brunneus*.

The next day, a very hot one with frequent sunny periods, I found time to visit Ibsley Common before lunch and noted *M. maculatus* in great numbers and a fair number of *Ch. brunneus*, but nothing else. In the afternoon we drove to Aldridgehill Inclosure, near Brockenhurst, where I had a most profitable time. On both sides of the main ride I encountered Saltatoria in abundance and extremely active in the hot sunshine. The most exciting species was *Omocestus rufipes* (Zett.), which was common, and I collected a short series. *O. viridulus* was also common in the same situation, although more perhaps where the grass was lusher and greener: *rufipes* seemed to prefer the drier parts. *Ch. parallelus*, *Ch. brunneus* and *P. griseoaptera* were also common and I saw a few *T. undulata*. *Nemobius sylvestris* (Bosc), the wood-cricket, was extremely common in the leaf-litter and drier parts of the inclosure, and their stridulation could be heard on all sides. While collecting, I was twice assailed by the large and ferocious horse-fly, *Tabanus sudeticus* Zeller.

Between 6 and 7 p.m. we visited the edge of Denny Wood, overlooking Denny Bog, and found *O. rufipes* and *N. sylvestris* in great plenty amongst the leaf-litter and dry-looking grass beneath the well-spaced beech trees (*Fagus sylvatica* L.). *Ch. parallelus* and *Ch. brunneus* were also common here.

I spent the afternoon of 20th July on Ibsley Common. The weather was again very hot and sunny, and I was surprised to hear a few male wood-crickets, *N. sylvestris*, stridulating from an area of gorse and scrub birch amongst the ling—more than a mile from the nearest woods. The commonest Acridid was, of course, *M. maculatus* and I collected a short series. *O. viridulus* was frequent in the bracken and *Ch. brunneus* along the grassy paths, together with, in the lusher areas, *Ch. parallelus*. The ground-hopper, *T. undulata*, was plentiful on the dry heath. Once again I was bothered by the unwelcome attentions of *Tabanus sudeticus*, as well as clouds of Muscids.

West Gloucestershire (vice-county 34)

County of Bristol

Michael Kendall and I took a lunch-time stroll in hot sunshine along the cliff-tops of the Avon Gorge at Clifton Down on 4th August; *Ch. brunneus* and *P. griseoaptera*, both of which were numerous, were the only Saltatoria met with.

On 26th August, one of my colleagues, Mrs. Jean Alvey, gave me a male *Meconema thalassinum* which entered a lighted room at her home at Stoke Bishop the previous night. Another of my colleagues found a dead male *Periplaneta americana* (L.), the American cockroach, in a desk drawer at Broadcasting House, Bristol, on 8th October.

Isle of Man (vice-county 71)

From 11th to 15th August inclusive I visited the Isle of Man to make sound recordings of birds and the recently discovered (1962) Acridid, *Stenobothrus stigmaticus* (Rambur). I have published elsewhere a full account of the Orthoptera seen on this trip (Burton, 1964); for a full account of the discovery of *stigmaticus* see Ragge (1963).

NEW VICE-COUNTY RECORDS OF BRITISH ORTHOPTERA
(Supplied by Dr. D. R. Ragge)

Specimens marked with an asterisk are in the City of Leicester Museum, and the information was kindly provided by Mr. I. M. Evans, Keeper of Biology.

**Ectobius lapponicus* (L.). LEICESTERSHIRE: Newton Linford, Bradgate Park, v.1936, 1 ♂ (*P. A. H. Muschamp*) (v.c. 55).

Tachycines asynamorus Adelung. KENT: Canterbury, nurseries of G. Mount & Sons, 9.xi.1963 (v.c. 15). Identified from a Kodachrome transparency taken by Mr. E. C. M. Haes.

**Meconema thalassinum* (Degeer). LEICESTERSHIRE: Swithland Wood, at light, 21.x.1962, 1♂, 1 ♀ (*M. J. Leech*); Loughborough, Outwoods, birch scrub, 31.viii.1963, 1 ♂ (*I. M. Evans*); Leicester, in house, 26.x.1963, 1 ♀ (*M. Thorpe*) (v.c. 55).

Conocephalus discolor (Thunberg). SUSSEX: Peacehaven, 20.ix.1964, 4 ♂♂, 4 ♀♀ (*D. R. Ragge & L. R. Boreham*) (v.c. 14). Dr. Ragge writes "this colony was found by Mr. Ronald McHugh, to whom I am indebted for drawing my attention to it. Although Kevan (1961) includes v.c. 14 in the recorded distribution of this species, he tells me that he cannot trace a published record for East Sussex. It seems, therefore, that Mr. McHugh's discovery constitutes a new vice-county record".

Chorthippus brunneus (Thunberg). GALWAY: Errisbeg, 100-900 ft., 19.viii.1964, 3 ♂♂, 8 ♀♀ (*I. Lansbury*) (Irish v.c. 16).

Tetrix subulata (L.). CORNWALL: Penhale Sands, Holywell, 19.iv.1963, 1 ♂, 8 ♀♀ (*R. A. Farrow*) (v.c. 1). BRISTOL: Coombe Dingle, 27.v.1950, 1 ♂ (*J. Cowley*) (v.c. 34).

Acknowledgments

I am grateful to Dr. D. R. Ragge for checking the typescript of this paper and to Mrs. Jean Alvey for typing it.

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A Holiday in Westleton, Suffolk

By L. Parmenter

The interesting account given by Messrs. J. M. Chalmers-Hunt and S. Wakely of their visit to Suffolk in 1964 (*Ent. Rec.*, **76**: 271-5) reminded me of a visit paid to part of their area in 1952. My interest was mainly directed to the bird life and diptera of the area.

Arriving by mid-day on 24th May for a stay at Westleton, I started off at 2.30 p.m. to walk over the heath to the coast at Dunwich and back. Stone curlews, woodlarks and corn buntings distracted my attention from the flies. *Rhamphomyia tarsata* Mg. were particularly abundant, in swarms, mostly males, dancing in the air with long black legs dangling and coupling with the females as they rose from below the dancers. Among the Syrphidae, *Tropidia scita* Harris and *Helophilus frutetorum* Collin were taken. *Micropeza corrigiolata* L. females were found at rest on the leaves of a clump of delphinium in the cottage garden and were seen daily on the same clump for over a week. *Tachydromia extricata* Collin was among the flies taken on hedgerow herbage. At Dunwich, *Beris chalybeata* Forst. males were hovering in a lane, *Empis nigritarsis* Mg. was seen and females of *Drosophila vibrissina* Duda were about a fungus in Greyfriars wood. *Minettia longipennis* F., *M. inusta* Mg., *Tricholauxania praeusta* Fln. and *Lyciella platycephala* Lw. represented the Sapromyzidae in the wood.

On the leaf of a lilac bush a female *Platypeza atra* Mg. was found next day as she ran jerkily somewhat like a phorid but not so actively, with wings reddish from reflected light. Males of *Chrysotoxum cautum* Harris in their striking yellow and black, looked wasp-like as they worked up and down the garden hedge, alighting from time to time, head upwards, on the sun-lit leaves. On some of these leaves were several *Coenosia tricolor* Zett. A female *Oedalea holmgreni* Zett. hovered under a fruit tree. I walked over Westleton Common to Minsmere, noting red-backed shrike and shelduck on the heathland and captured a male *Conops vesicularis* L. on a leaf of a birch and from around the haunts of small hymenoptera in the sand, the Calliphorid, *Metopia leucocephala* Rossi. A pair of the Asilid *Dioctria baumhaueri* Mg. were seen with the male in display flight, moving from side to side causing the pleural stripes of silvery pubescence to flash in the sunshine. A *Pachymeria femorata* F. female was sucking nectar from a buttercup. Approaching Hangman's wood I found *Tabanus bisignatus* Jaen. females alighting on my trousers. In the wood itself the attack came from *Chrysops caecutiens* L. as I collected amongst

others—*Helomyza affinis* Mg., *H. pallida* Fln., *H. fusicornis* Zett., *Megaselia tumida* Wood, *Macrocera stigmoides* Edw., *Diadocidia ferruginea* Mg., *Agathomyia antennata* Zett., *Trichina clavipes* Mg., *Tachydromia longicornis* Mg., *Leptopeza flavipes* Mg., *Fannia aerea* Mg. and *F. armata* Mg.

In the marshland about Minsmere, where bitterns and marsh harriers were seen flying over, *Pipunculus campestris* Latr., *Dolichopus nubilus* Mg., *Bibio leucopterus* Mg., *Asteia amoena* Mg., *Anthomyza gracilis* Fln., *Oscinella nitidissima* Mg., *Chlorops planifrons* Lw. and *Cryptonevra flavitarsis* Mg. were taken and *Helophilus versicolor* F., *Tetanocera robusta* Lw., *Dichanota pavida* Hal. and *Cordylura umbrosa* Lw. were found on leaves of reed-mace. The cigar-shaped galls of *Lipara lucens* Mg. on *Phragmites* were gathered and visitors to the flowers of *Ranunculus repens* L. included *Helophilus lineatus* F., *H. pendulus* L., *Pyrophaena granditarsa* Forst. and *Tropidia scita* Harr.

Before walking to Walberswick on 26th May I searched the cottage garden, finding *Tropidia scita* Harr. taking pollen at the flower of alkanet, *Pentaglottis sempervirens* (L.) Tausch. and from the elm hedge I gathered *Earomyia nigra* Mg., *Palloptera quinquemaculata* Mcq., and among the species of *Tachydromia—annuata* Fln., *longicornis* Mg., *minuta* Mg., *pallidiventris* Mg. At the coast a passage of terns was seen and during the morning two sandwich, 22 common and 61 little terns passed northwards. Oyster catchers, turnstones and a grey plover were among the waders seen and there were two kittiwakes among the various gulls. At the marsh at Walberswick good views were had of bearded tits, gadwall, teal, widgeon, garganey, shoveller, water rail and a cream-headed marsh harrier. I met Miss C. M. Ackland on a bird-photography trip, who reported having seen earlier that day an osprey and a white-winged black tern. We discussed the blue-headed wagtails and nightjars I had seen on my way to the marsh. I then tramped back to Westleton, visiting the sand-dunes on my way, and found *Alloneura litoralis* Beck., *Dysmachus trigonus* Mg., *Helina proturbans* Zett., *Dexiopsis lacteipennis* Zett., *Delia albula* Fln., *Coenosia pygmaea* Zett., *Chamaemyia flavipalpis* Hal., *Tephrochlamys rufiventris* Mg. var. *canescens* Mg., *Leucopis griseola* Fln., *Androvandiella halterata* Mg., *Campsicnemus armatus* Zett., *Chlorops hypostigma* Mg., *Oscinella frit* L. and *Siphonella oscinina* Fln., among the clumps of dune grasses.

Miss Ackland reported a spoonbill at Walberswick on 27th May, but I spent a quiet afternoon at Minsmere following a morning of pinning, listening to nightingales and woodlarks and watching the courtship display of the little terns. Hangman's wood provided a few additions to the holiday list, *Neurigona quadrifasciata* F., *Xanthochlorus ornatus* Hal., *Bicellaria nigra* Mg. and *Monoclona rufilatera* Walk.

Dunwich was visited again on 28th, and flies visiting the umbels of a clump of Alexanders, *Smyrnium olustrum* L. were noted or taken. The most numerous was *Dilophus febrilis* L., *Bibio marci* L. and *Dilophus femoratus* Mg. and in the Syrphidae, *Helophilus pendulus* L., *Tropidia scita* Harr., *Syritta pipiens* L., *Eristalis arbustorum* L., *Syrphus ribesii* L., *Cheilosia variabilis* Panz., *C. impressa* Lw., *Orthoneura nobilis* Fln., *Melanostoma scalare* F.; in Empididae—*Empis tessellata* F., *Rhamphomyia tarsata* Mg.; in Muscidae—*Musca autumnalis* Deg., *Fannia armata* Mg., *Hebecnema affinis* Mall., *Lasiops semicinereus* Wied. Other visitors included *Pegohylemyia fugax* Mg., *Hylemyia variabilis* Stein, *Hydrophoria*

conica Wied., *Calliphora erythrocephala* Mg., *Scatophaga stercoraria* L., *S. maculipes* Zett., *Lucilia caesar* L., *Sarcophaga carnaria* L., *Phyto melanocephala* Mg., *Sepsis cynipsea* L. and *Themira leachii* Mg. In Greyfriars wood *Agromyza reptans* Fln. was taken on nettles, its larval foodplant, and amongst others in the wood were *Epiphragma ocellaris* L., *Calobata cibaria* L., *Bibio nigriventris* Hal., *Neurigona quadrifasciata* F., *Empis nigritarsis* Mg., *Oedalea holmgreni* Zett., *Tachydromia annulipes* Mg., *Dolichocephala guttata* Hal., *Clusiodes gentilis* Collin, *Drosophila phalerata* Mg., and *Sicodus arrogans* L.

The next three days were mostly spent on the heathland about Westleton where at dusk nightjars hunted for Swift moths and grasshopper warblers and nightjars reeled and churred. One morning as I watched a pair of courting bitterns, two stone curlews visited the mud edging the pool in front of the observation hide at Minsmere. *Rhagio scolopacea* L. males had been seen frequently during the week, sitting head downwards, on the tree trunks, but on 29th I found a female caught by the sundew, *Drosera rotundifolia* L. On some lime trees in Hangman's wood I found *Rhamphomyia filiata* Zett., *Lyciella pallidiventris* Fln., *Bibio johannis* L. and *Helophilus frutetorum* F. The wood also provided the common *Limonia nubeculosa* Mg., *Phylidorea ferruginea* Mg., *Gonomyia tenella* Mg., *Bolitophila cinerea* Mg., *Ula sylvatica* Mg., *Chrysotus neglectus* Wied., *Gymnopternus aerosus* Fln., *G. cupreus* Fln., *Culicoides chiopterus* Mg., *Anatopynia punctata* F., *Agromyza phragmitidis* Her., *Liriomyza flaveola* Fln., *Phytobia carbonaria* Zett., *Helomyza laevifrons* Lw., *H. fuscicornis* Zett., *H. notata* Mg. var. *hilaris* Zett., *Cheilosia nigripes* Mg., *Bicellaris simplicipes* Zett., *B. nigra* Mg., *Hydrophoria ruralis* Mg., *Pegomyza virginea* Mg., *Pegomyia univittata* v. Ros., *Hebecnema nigricolor* Fall., *Mydaea urbana* Mg. and *Chirosia albitarsis* Zett.

In another small wood nearby were *Pegomyia fulgens* Mg., *Helomyza bicolor* Zett., *Dicranota pavida* Hal., *Diastata vagans* Lw., *Rhamphomyia tibiella* Zett., *Fannia similis* Stein, *Actia crassicornis* Mg., *Tachydromia annulata* Fln., *Nephrotoma submaculosa* Edw., *Coenosia pulicaria* Zett., *Trichina clavipes* Mg., *Tachydromia annulata* Fln. Both *Aedes caspius* Pallas and *A. detritus* Hal. were on the wing outside the wood. In the cottage garden at Westleton were several *Rhacodineura pallipes* Fln., the parasite of earwigs, also *Lonchaea vaginalis* Fln. and *Pipizella varipes* Mg. On the windows walked *Scenopinus fenestralis* L. and *Drosophila funebris* F.

On 1st June I met Mr. J. E. Collin and with Messrs C. N. Colyer, C. O. Hammond and E. C. M. d'A. Fonscea, spent the day under his guidance at Butley Thicks and visited the Chillesford decoy wood. Amongst the ancient large hollies and oaks of the Thicks, which I also visited on 4th June, were many interesting diptera. In the sunshine on the floor of dead leaves rested males of the Asilid, *Lasiopogon cinctus* F. and the Syrphid, *Brachypalpus bimaculatus* Mcq. was disturbed from the foot of the large oaks. Flies were being captured by the Empid, *Pachymeria femorata* F. as it hunted those diptera that hovered under the canopy of the oaks. Among other Empididae in the wood were *Tachydromia nigritarsis* Fln., *T. annulata* Fln., *T. ciliaris* Fln., *T. minuta* Mg., *Empis prodomus* Lw., *E. aestiva* Lw., *Dolichocephala irrorata* Fln. and *Heleodromia immaculata* Hal. Mr. Colyer encouraged the capture of Phoridae and identified those I secured as *Phora aterrima* F., *Megaselia pleuralis* Wood, *M. projecta*

Beck., *M. variana* Schmitz and *M. pulicaria* Fln. As is usual in woodland *Austrolimnophila ochracea* Mg. and *Limonia nubeculosa* Mg. were numerous and other Tipulidae taken were *Dicranomyia dumetorum* Mg., *D. serva* Walk., *Molophilus griseus* Mg., *Epiphragma ocellaris* L. and *Limonia tripunctata* F. On the bracken were three species of *Chirosia* that have larvae that mine this fern, namely, *crassiseta* Stein, *albitarsis* Zett. and *parvicornis* Zett. Rotting tree trunks on the ground provided *Clusia flava* Mg., *Clusoides albimana* Mg. and Mr. Collin's *gentilis*. On living tree boles were *Xylota nemorum* F., *Medeterus saxatilus* Collin and the lovely *Eustalomyia histrio* Zett. Circling under the trees were males of *Fannia armata* Mg., *F. coracina* Lw. and *F. sociella* Zett., whilst from the vegetation were swept *Macrocera stigma* Curt., *Tetragoneura sylvatica* Curt., *Callimyia speciosa* Mg., *Agathomyia antennata* Zett., *Diadocidia ferruginosa* Mg., *Phaonia palpata* Stein, *Helina lasiophthalma* Macq., *Scarophaga haemorrhoa* Mg., *Paroxyna loewiana* Hend., *Chrysotus neglectus* Wied., *Gymnopternus metallicus* Stan. and *Neoleria inscripta* Mg. to select a few from the varied fauna of this ancient wood.

At Chillesford other species found were—*Melanagromyza pulicaria* Mg., *Limonia nigropunctata* Schum., *Empis stercorea* L., *Sciomyza albocostata* Fln., *S. dubia* Fln., *Dorylomorpha confusus* Verr. (det. R. L. Coe), *Megopthalma pallida* F., *Sympycnus desoutteri* Par., *Dolichopus claviger* Stan. and the widespread *D. ungulatus* L.

On the 2nd June I found a few more species about Westleton—*Diploneura pilosella* Schmitz, *Liriomyza orbonella* Hend., *Cerodonta denticornis* Panz., *Tetanocera silvatica* Mg., *Tachydromia pictitarsis* Beck., *T. agilis* Mg., *T. extricata* Collin, *Rhamphomyia barbata* Macq., *Empis caudatula* Lw., *Tricimba cincta* Mg., *Dolichopus pennatus* Mg., *Erioptera griseipennis* Mg., *Tephritis bardanae* Schrk., *Paragus tibialis* Fln., *Alophora pusilla* Mg. and *Schoenomyza litorella* Fln.

Next day the sand dunes at Minsmere were searched and on the blown sand were dotted the silvery males of *Thereva annulata* F., and here and there waiting for prey the Asilid, *Dysmachus trigonus* Mg. close to the clumps of grass. On the turf *Oedoparea buccata* Fln. were quite numerous. Elsewhere among the dunes were *Trypetoptera punctulata* Scop., *Helina protuberans* Zett., *Dexiopsis lacustris* Karl, *Oscinella posticata* Collin, *Chlorops pumilionis* Bjerk., *Meromyza pratorum* Mg., *Swammerdamella brevicornis* End., *Philygria flavipes* Fln., *Scatella stagnalis* Fln., *Microchrysa flavicornis* Mg., *Medeterus saxatilis* Collin, *Enicta annulipes* Mg., *Alloneura littoralis* Fln., *Medeterus petrophiloides* Par. and *Urophora quadrifasciata* Mg.

A long tramp to Southwold, Buss Creek and back on 5th June gave me the rare sight of a Kentish plover chased by ringed plovers. Greenshank, wood sandpiper and sanderlings were among the other waders seen. The saltings were swept for flies and I was pleased to take *Oscinella vastata* Curt. and *Syntormon pallipes* F., including the variety *pseudospicatus* Strobl. At Southwold *Fucellia maritima* Hal. males were found waving their wings on the shore amongst the seaweed jetsam. My last two days added little to my diptera list—*Goniglossum wiedemmanni* Mg. on white bryony, a solitary *Tipula cava* Ried. and a *Ferdinandea cuprea* Scop. on a tree trunk. But hornets were noted for the first time as I walked through the wood at Minsmere to join the Warden and visit the bird hides to watch once again the families of bearded tits, water

rails, bitterns, marsh harriers, gadwall and other ducks before leaving for London.

Other species recorded during the period but not mentioned above:—

ANISOPODIDAE: *Anisopus punctatus* F.

PTYCHOPTERIDAE: *Ptychoptera albimana* F.

CULICIDAE: *Aedes annulipes* Mg.

STRATIOMYIDAE: *Beris clavipes* L., *Microchrysa polita* L., *Nemotelus nigrinus* Fln.

THEREVIDAE: *Thereva nobilitata* F., *T. pebia* L.

EMPIDIDAE: *Hilara cingulata* Dahl., *H. lundbecki* Frey., *H. maura* F., *Ocydromia glabricula* Fln., *Tachypeza nubila* Mg.

DOLICHOPODIDAE: *Argyra argyria* Mg., *A. leucocephala* Mg., *Campsicnemus curvipes* F., *Chrysotus cupreus* Mcq., *Dolichopus plumipes* Scop., *D. simplex* Mg., *Sciopus platypterus* F., *S. wiedemanni* Fln.

SYRPHIDAE: *Baccha obscuripennis* Mg., *Eristalis pertinax* Scop., *E. tenax* L., *Eumerus tuberculatus* Rond., *Leucozona lucorum* L., *Melanostoma mellinum* L., *Myiatropa florea* L., *Platycheirus albimanus* F., *P. peltatus* Mg., *Neoascia dispar* Mg., *Rhingia campestris* Mg., *Syrphus albostriatus* Fln., *S. eligans* Harr., *S. venustus* Mg., *Volucella bombylans* L. form *bombylans* L., *V. pellucens* L., *Xylota segnis* L.

PIOPHILIDAE: *Piophila vulgaris* Fln.

DRYOMYZIDAE: *Dryomyza flaveola* F.

TRYPETIDAE: *Philophylla heraclei* L.

SAPROMYZIDAE: *Calliopium aeneum* Fln., *Lyciella rorida* Fln., *L. subfasciata* Zett., *Minettia plumicornis* Fln., *M. rivosa* Mg., *Sapromyza hyalinata* Mg.

PSILIDAE: *Psila rosae* F.

SEPSIDAE: *Sepsis fulgens* Hgg.

SCIOMYZIDAE: *Elgiva sundewalli* Fries.

CHAMAEMYIIDAE: *Chamaemyia aridella* Fln., *C. herbarum* R.D., *C. juncorum* Fln.

HELOMYZIDAE: *Helomyza variegata* Lw.

OPOMYZIDAE: *Opomyza germinationis* L.

EPHYDRIDAE: *Hydropota griseola* Fln., *Parydra coarctata* Fln.

DROSOPHILIDAE: *Parascaptomyza disticha* Duda, *Scaptomyza apicalis* Hardy, *S. graminum* Fln.

AGROMYZIDAE: *Agromyza anthracina* Mg. (larvae), *A. rufipes* Mg. (larvae), *Liriomyza strigata* Mg., *Napomyza glechomae* Kalt. (larvae), *Phytagromyza lonicerae* R.D. (larvae), *Phytobia carbonaria* Zett., *Phytomyza atricornis* Mg. (pupae), *P. anthriscii* Hend. (larvae), *P. chaerophylli* Kalt., *P. ranunculi* Schrank (larvae) and var. *praecox* Mg., *P. primulae* R.D. (larvae).

CHLOROPIDAE: *Meromyza saltatrix* L.

CORDILURIDAE: *Norellia spinimanum* Fln., *Scatophaga anale* Mg.

TACHINIDAE: *Phorocera assimilis* Fln., *Siphona geniculata* Deg., *Smidtia conspersa* Mg., *Tachina fera* L., *Winthemia quadripustulata* F.

CALLIPHORIDAE: *Lucilia richardsi* Collin, *Melinda anthracina* Mg., *Morinia nana* Mg., *Sarcophaga incisilobata* Pand.

MUSCIDAE: *Azelia zetterstedti* Rond., *Helina impuncta* Fln., *Hydrotaea dentipes* F., *H. irritans* Fln., *Mesebrina meridiana* L., *Morellia hortorum* Fln., *Phaonia scutellaris* Fln., *Polietes lardaria* F.

ANTHOMYIIDAE: *Anthomyia procellaris* Rond., *Delia cilicrura* Rond., *D. intersecta* Mg., *Hylemyia strenua* R.D., *H. variata* Fln., *Lasiomma meadei* Kow., *Nupedia dissecta* Mg., *Pegomyia bicolor* Wied., *P. genupuncta* Stein (larvae), *P. nigritarsis* Zett.

Total 331.

The Macrolepidoptera of Inverness-shire: Newtonmore District

By Commander G. W. HARPER, R.N. (Retd.), F.R.E.S.

(See *Ent. Rec.*, **66**: 58, 90, 124; **67**: 39; **68**: 91; **69**: 52; **71**: 115; **72**: 14; **73**: 60, 61; **74**: 59. 60)

SUPPLEMENT No. 8

GEOMETRIDAE

Larentiinae

Acasis viretata Hb. A very fresh male specimen of this quite unexpected species entered my m.v. light trap on 17th May 1963, at Newtonmore. At the time I recorded this capture as a furthest North record for this species, but I understand that about the same date specimens were taken in Sutherland and elsewhere in North Scotland. I suspect that the foodplant in these localities may be the flowers of Rowan, *Pyrus aucuparia*, but as *A. viretata* is in most years rare in the North, I have not yet been able to confirm this.

This supplement further increases the total number of Badenoch Macrolepidoptera at the present date, January 1965, to 370 species.

Neadaich, Newtonmore, Inverness-shire. 28.i.1965.

Notes and Observations

SECOND BROOD OF PARASCOTIA FULIGINARIA.—During a visit to Effingham Common in May 1964, a number of larvae of *Parascotia fuliginaria* (waved black) were obtained. These were sleeved out on bracket fungus (*Polystichus versicolor*) and they pupated by June 4th. Emergence started at the end of June and pairings were obtained; ova were deposited on July 2nd and a second brood of larvae were reared. These emerged between 18th and 30th September.

About ten larvae of the second brood which were late in hatching have hibernated; they appear to be healthy and should survive the winter.

I do not see any reference to a second brood having been recorded in any one year, and it could be that the warm summer of 1964 may have had some influence on this occurrence.—D. A. ODD, Dingley Dell, Washington, Sussex. 12.ii.1965.

NEPHOPTERYX SIMILELLA ZINCK AND EUENAEMIDOPHORUS RHODODACTYLA SCHIFF. IN MIDDLESEX.—Single specimens of these moths appeared at mercury vapour light at Scratch Wood, Middlesex, on 28th June and 17th July respectively. According to Beirne, B. P., *British Pyralid and Plume Moths* (1952) there is no record of *N. similella* for Middlesex, and *E. rhododactyla* was believed to be extinct in the county.—B. GOATER, 22 Reddings Avenue, Bushey, Herts. 31.i.1965.

EARLY EMERGENCES OF GONODONTIS BIDENTATA L.—Whilst on holiday at Aviemore in June 1964, I obtained a female *Gonodontis bidentata* L. (scalloped hazel) at mercury vapour light. Ova were obtained and about ten days later these hatched. The larvae fed well and by 25th August they had all pupated. A specimen emerged on 17th January 1965, and two more appeared on 1st and 4th February, the room temperature on each occasion being between 40° and 45° F. It appears that these are very early dates for this species to emerge.—D. A. ODD, Dingley Dell, Washington, Sussex. 12.ii.1965.

Current Literature

Annotationes Lepidopterologicae; Part I. By Francis Hemming. Hepburn & Sons Ltd., London, 25th November, 1960. 10″×7″, 36 pp., price 25/-.

The purpose of this book is to achieve, as far as possible, stability in the nomenclature of butterflies as a preliminary to the publication of two books on which the author was working. He took the view that matters of nomenclature should be dealt with in papers published before the appearance of the books and thus should not encumber them or distract the readers.

The first section is devoted to the selection of a type species for a genus. It treats of this from the general and theoretical aspect and then proceeds to put the principles enunciated into practice by choosing type species for seven genera of Lycaenidae.

The second section is concerned with a group of African Nymphalidae at present without a valid name. After giving reasons for rejecting the generic name *Euryphene* at present widely used he adopts the name Bebearia. He says how this is to be spelt and how pronounced and lays down that it is to be treated as a feminine noun of the first declension. This last injunction may seem quixotic, but not so to anyone who had seen specific names in obvious disagreement with generic names. Finally he chooses a type species (*Bebearia iturina*) for the new genus.

Next in Section III he tackles a suprageneric group of the Nymphalidae and sets up four new tribes.

In Section IV he straightens out a confusion arising from the fact that the male and the female of a single species had originally been regarded as two separate species.

In Section V he puts forward an entirely new name, both generic and specific, for *Papilio phegea* and calls it *Elymniopsis lise*. He lays down that the word "lise" is a noun in the nominative singular in apposition to the generic name *Elymniopsis*.

Finally in Section VI he corrects a muddle started by Karsch when setting up the genus "Oboronia" of the Lycaenidae and he selects as a type of the genus *Oboronia staudingeri*.

All this is important to the specialist and, incidentally, may be controversial. It may not be important to the ordinary reader, but he should, however, be interested in this insight into the mysteries of nomenclature. He may as a general rule take such matters for granted but for all that he should be aware of the nature of the problems involved.—T.R.E.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

CARINTHIA, 27TH JULY-8TH AUGUST. Major-General Sir GEORGE JOHNSON, K.C.V.O., C.B., C.B.E., D.S.O. 53

BUTTERFLIES IN THE AUSTRIAN ALPS: JULY-AUGUST 1964. C. G. M. DE WORMS, M.A., Ph.D., F.R.E.S. 55

ISLE OF CANNA COLLECTING NOTES, 1964. J. L. CAMPBELL 63

BUTTERFLIES IN THE CRANLEIGH DISTRICT, 1964. Major A. E. COLLIER 64

SOME MERCURY VAPOUR VISITORS AT ASCOT. D. S. JOHNSON, M.A. 67

A COMPARISON OF THE CONIFER-FEEDING LEPIDOPTERA OF TWO SUBURBAN LOCALITIES. A. A. ALLEN 68

INDUSTRIAL MELANISM—SOME COMMENTS. A. J. SHOWLER, Ph.D. ... 70

NOTES ON BRITISH ORTHOPTERA IN 1964, WITH SOME NEW VICE-COUNTY RECORDS. J. F. BURTON, F.R.E.S., F.Z.S. 71

A HOLIDAY IN WESTLETON, SUFFOLK. L. PARMENTER 78

THE MACROLEPIDOPTERA OF INVERNESS-SHIRE: NEWTONMORE DISTRICT. Commander G. W. HARPER, R.N. (Retd.), F.R.E.S. 83

NOTES AND OBSERVATIONS 83

CURRENT LITERATURE 84

TO OUR CONTRIBUTORS

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THE ENTOMOLOGIST'S RECORD

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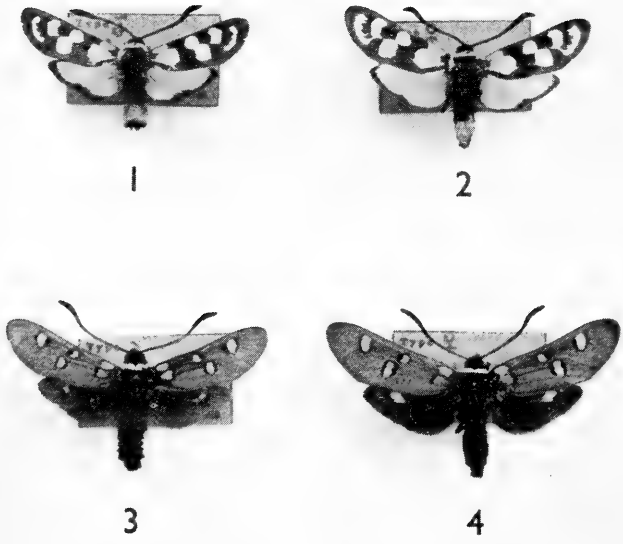

Fig. 1. *Zygaena occitanica valenciaca* ssp. nov., Holotype ♂ (wingspan 27 mm.).
Fig. 2. *Z. occitanica valenciaca* ssp. nov., Allotype ♀ (wingspan 29 mm.).
Fig. 3. *Z. lavandulae oropesica* ssp. nov., Holotype ♂ (wingspan 30 mm.).
Fig. 4. *Z. lavandulae oropesica* ssp. nov., Allotype ♀ (wingspan 35 mm.).

On Two New Subspecies of the Genus *Zygaena* Fabricius (Lep., Zygaenidae) from South-East Spain

By Hugo Reiss, Stuttgart

During a collecting trip to Spain in 1963, my son, his wife and I found, in considerable numbers, two new subspecies of *Zygaena* Fabricius, one at Torres (Valencia) and another at Oropesa (Castellon), that are clearly distinct from the lowland races of the east coast of Spain and which also differ from the nominate subspecies of southern France and those of the mountainous regions of Spain. I am most grateful to my son, Dr. Günther Reiss, for the original photographs of the specimens illustrated in the plate.

Zygaena (Agrumenia) occitanica valenciaca ssp. nov.

I have before me 39 ♂♂ and 14 ♀♀ labelled: Torres, Sagunto (Valencia), 250 m, 22.6.1963. The ground colour of the forewings is black with a light blue gloss. The five, carmine-red coloured, forewing spots are, in the males, less strongly surrounded with white than those in the females. Spots 3 and 4 are near to one another and, with a few exceptions, are confluent by the white rings. Spot 6 is present in all specimens and only rarely is it reduced. The carmine-red coloured hindwings have a narrow blue-black border extending from the apex to the tornus. The underside of the hindwings has a pattern similar to that of the upperside, but the coloration is duller. The carmine-red, abdominal belt is rarely reduced and, when this does occur, then only in the males. The wing shape, the position and size of the forewing spots and the width of the hindwing borders can be seen in the illustrations (figs. 1, 2). I name this subspecies: **valenciaca** ssp. nov.

Holotype ♂, labelled: Torres, Sagunto (Valencia), 250 m; allotype ♀ with the same data, in coll. H. Reiss (figs. 1, 2).

Paratypes with the same data in coll. H. Reiss, coll. G. Reiss and coll. W. Schäfer, Stuttgart.

31 ♂♂ and 45 ♀♀ from Oropesa (Castellon), 80 m, 2.6.1963, in collections H. Reiss, G. Reiss and W. Schäfer, are very similar in size and coloration and differ only a little in the variation. In 4 ♂♂ of this population, spot 6 is strongly reduced and in a further male is almost completely missing. In 10 ♂♂, the blue-black border of the hindwings is somewhat broader. The slight darkening of the carmine-red, abdominal belt is as frequent in the males as in ssp. *valenciaca* ssp. nov.; in 4 ♀♀ the abdominal belt is somewhat darkened.

1 ♂ and 2 ♀♀ from Gandesa-Calacejte (Teruel), 350 m, 25.6.1963, coll. G. Reiss, belong, as far as can be ascertained, next to ssp. *valenciaca* ssp. nov.

The new subspecies differs from ssp. *eulalia* Burgeff [1, 7] (type race from Sta Eulalia, Sierra Espuña (Murcia), ca. 400 m), according to 1 ♂, 1 ♀ topotypes, leg. Korb, in coll. H. Reiss and a series of topotypes in coll. H. Reiss and coll. G. Reiss, collected in 1962 and 1963, through the smaller size and lesser variation. In ssp. *valenciaca* ssp. nov., the form of the male with reduced white rings around the forewing spots does not occur, neither does the form of the female with enlarged and suffused rings. The

latter form is not rare in ssp. *eulalia* and I propose naming it ab. **albicans** ab. nov. The darkening of the carmine-red, abdominal belt occurs more frequently in ssp. *eulalia*.

The ssp. *eulalia* also occurs near Villajoyosa (Alicante), 10 m, according to a series collected in 1962 and 1963 (coll. H. Reiss and coll. G. Reiss). Also the localities El Altet (Alicante), 50 m (according to 7 ♂♂, 7 ♀♀, 7.6.1963, in coll. H. Reiss and coll. G. Reiss); Altea (Alicante), 50 m (according to 5 ♂♂, 6 ♀♀, 4-22.6.1963, in coll. G. Reiss) and near Calpe (Alicante), 50 m (according to 2 ♂♂, 3 ♀♀, 4.6.1963, in coll. G. Reiss), are within the range of ssp. *eulalia*, as far as can be ascertained from the available material.

The difference is great between ssp. *valenciaca* ssp. nov. and the populations of ssp. *arragonica* Holik & Sheljuzhko [4] (=*iberica* Staudinger [10] preoccupied) from the neighbourhood of Barcelona, leg. Faller, 1919 and other collectors, and a series collected in 1962 and 1963 in coll. H. Reiss and coll. G. Reiss. On average, ssp. *arragonica* is smaller and has narrower wings than those in *valenciaca*. The red coloration of the forewing spots and hindwings is also darker. In *arragonica*, specimens frequently occur which have the white rings around the forewing spots absent or spot 6 may be completely absent. In some specimens the dark hindwing border is broadened and spreads across the wing and in others the red scales of the abdominal belt are interspersed with black scales. With the exception of the latter, such forms have not been found in ssp. *valenciaca* ssp. nov.

Zygaena (Zygaena) lavandulae oropesica ssp. nov.

Of this new subspecies, I have before me 18 ♂♂ and 52 ♀♀, labelled: Oropesa (Castellon), 80 m, 2.6.1963. The size is distinctive. The ground colour of the forewings is blue-black with a distinct blue to blue-green gloss, the hindwings are blue-black with a blue gloss. The abdomen has a light blue-green gloss which is much stronger in the females. The red of the forewing spots and the cell spot of the hindwing is light and warm. The forewing spots 1 and 2 are always separated by the dark vein and are encircled with black. The black-encircled, medium-sized spots 3 and 4 are, in the majority of specimens, almost confluent, spot 4 being generally larger and longer than spot 3. The black-encircled spot 5 is always the largest forewing spot. On the underside, the forewing spots are enlarged and not circled with black. The hindwings have, in 1 ♂ and 6 ♀♀, red scaling extending from the base, otherwise, in the remainder they are blue-black with the usual red, cell spot; the underside always has the red coloration extending from the base and merging with the enlarged, red cell spot. On the underside of 1 ♂ and 1 ♀, the area between the base and the cell spot is more or less strongly suffused with light red, so that in extreme examples, a broad, blue-black hindwing border remains.

On the upperside of 1 ♂ and 1 ♀, spot 1 of the forewings is extended along the costa as far as spot 5. On the underside of this rare form, all spots are confluent by the red scaling in the spot area and the hindwings are scaled with light red from the base to the cell spot. I name this rare form ab. **rubricosta** ab. nov.

The wing shape, position and size of the forewing spots and the cell spot of the hindwings can be seen in the illustrations (figs. 3, 4). I name this distinct subspecies: **oropesica** ssp. nov.

Holotype ♂, labelled: Oropesa (Castellon), 80 m, 2.6.1963; allotype ♀ with the same data, in coll. H. Reiss (figs. 3, 4).

Paratypes with the same data in coll. H. Reiss, coll. G. Reiss and coll. W. Schäfer, Stuttgart.

3 ♂♂, 19 ♀♀, labelled Gandesa-Calacejte (Teruel), 350 m, 25.6.1963; 2 ♂♂, 1 ♀ from Calpe (Alicante), 50 m, 4.6.1963 and 1 ♂, 3 ♀♀ from Altea (Alicante), 50 m, 4 & 5.6.1963, all in coll. G. Reiss, are placed in ssp. *oropesica* ssp. nov.

The new subspecies differs greatly from the type series of ssp. *espunnensis* Reiss [6, 7], from the Sierra Espuña, Totana (Murcia) and a series of topotypes from Sierra Espuña, via Totana (Murcia), 300-400 m, 1962, 1963, in coll. H. Reiss and coll. G. Reiss. In comparison with the new subspecies, the light red hindwings with a broad, blue-black border on the upper and underside and the nearly always more or less joined forewing spots of *espunnensis*, are very striking. Series collected in 1962 and 1963 from the upper half of Alhama in the Sierra Espuña, in coll. H. Reiss and coll. G. Reiss compare well with the type series of ssp. *espunnensis*. The same applies to a series from Villajoyosa (Alicante), 10 m, in coll. H. Reiss and coll. G. Reiss, collected in 1962 and 1963. It should be noted that in ssp. *espunnensis* the ab. *rubricosta* G. Reiss [5] was described.

The type series of ssp. *barcelonica* Reiss [8] from the coastal region near Barcelona, in coll. H. Reiss and a series from the neighbourhood of Barcelona, collected in 1962 and 1963, in coll. H. Reiss and coll. G. Reiss, differ from ssp. *oropesica* ssp. nov. by the generally smaller and narrower wings and the smaller forewing spots and cell spot of the hindwings, the red of which is somewhat darker. In comparison with ssp. *oropesica* ssp. nov., spots 3 and 4 are always widely separated in ssp. *barcelonica*.

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[10]Staudinger, O. & Wocke, M., 1871. Catalog der Lepidopteren des europaeischen Faunengebiets, p. 50.

BUTTERFLIES AT LIGHT.—The recent records of butterflies coming to light after dark (antea, pp. 25 and 49) remind me of a similar observation which I made while on holiday in Taunton. At about 10.45 on the night of 25th August 1964, a specimen of *Vanessa cardui* L. (painted lady) came through the open front door into the hall which was lighted by electric light. The butterfly was in good condition.—R. J. SWINDELLS, 12 Hawthorn Road, Wallington, Surrey. 13.iii.1965.

On the Occurrence of Abdominal Belts in *Zygaena filipendulae* Linné, with Descriptions of Two New Aberrations (Lepidoptera: Zygaenidae)

By W. G. Tremewan

In what are considered to be the more recently evolved species of the genus *Zygaena* Fabricius, an abdominal belt, when present, occurs only in aberrant specimens. Holik (1937) wrote at great length on this subject and gave many records that were known up to that time.

In those species which have a coloured collar and abdominal belt, the latter is usually of the same colour as the former. For example, in normal specimens of *Z. fausta* Linné, a red, thoracic collar and abdominal belt are present but in the aberrant, yellow form of this species, in which the normal red coloration of the forewing spots and hindwings is replaced with yellow, the collar and abdominal belt are also yellow. The occurrence of an abdominal belt in *Z. lavandulae* Esper, which has a pure white collar, was unknown until Storace (1956: 140) recorded a specimen, which he named ab. *staliana* Storace, from Staglieno, Liguria, north Italy. It is of interest to note that the abdominal belt in this specimen is grey, a colour that one might expect to find in a species with a white, thoracic collar. An abdominal belt has not been recorded in *Z. lonicerae* Scheven and *Z. ramburii* Herrich-Schäffer.

Tutt (1908: 248) recorded the capture of *Z. trifolii* Esper on 27.vii.1908 on boggy ground at Stäfa, above Lake Zurich (Züricher See) and, according to this author, a few examples had a faint, red abdominal ring. These specimens were named ab. *ruficincta* Tutt. In the British Museum (Natural History) collection there are 9 ♂♂ and 2 ♀♀ of *trifolii* labelled: "Staefa, L. Zürich, 29. July 1905 ex coll. Tutt.". The data of these specimens do not agree entirely with that given by Tutt (*loc. cit.*). It is well known, however, that Tutt often did not label every specimen but just one of a series (sometimes merely a single data label was pinned below a series of specimens) and, when his collection of *Zygaena* was purchased by Rothschild in 1911/12, the latter had each specimen labelled with a printed label. Tutt's original data label is missing, although 1 ♂ bears a label in Tutt's handwriting: "ab. miniata-palustris Tutt types". As Tutt (*loc. cit.*) states that ". . . some of the *A. trifolii* had almost the facies of *A. palustris*, the lowland marsh species", I consider that there can be no doubt that these are the type specimens of ab. *ruficincta* Tutt although part of the data, i.e., the date of capture, is erroneous.

A close examination shows that there is no red, abdominal belt or ring present on the abdomen of any of these specimens. Three ♂♂ and 1 ♀ have a greenish black abdomen, the remaining 6 ♂♂ and 1 ♀ have the abdomen bluish black with a purple sheen in each segment. It is probable that this purplish sheen is what Tutt erroneously considered to be an abdominal belt. It is worth noting also, that on the second segment of 1 ♂, red scaling is present, having been transferred from near the basal part of the hind wing. It follows that the name *ruficincta* Tutt was unnecessary and, for convience, it has been placed in synonymy under the nominate subspecies, *Z. trifolii trifolii Esper* (Reiss & Tremewan, in manuscript).

Tutt (*loc. cit.*) also records ". . . whilst the six-spotted species, which so

much resembles *A. filipendulae*, and may be *A. stephensi* (*hippocrepidis*, Stphs.), must have the genitalia examined to make certain of the species". I have been unable to trace these specimens which were probably *Z. filipendulae* Linné or possibly *Z. transalpina* Esper. There is, however, a series of 3 ♂♂ and 6 ♀♀ of *Z. viciae* Denis & Schiffermüller with the same data as that of the *trifolii* and it is curious that Tutt did not mention these specimens. One of the females bears a label in Tutt's handwriting: "var. buglossi Dup. Zürich (Staefa) types Nat. Hist. Brit. Lep. 1.457".

There are no authentic records of abdominal belts in *Z. filipendulae* Linné although Linde (1894: 3) noted a specimen from Tzaritzin (Tzaritzyn), Southern Russia. This specimen was described as "abdomine rubro-cingulata" and named ab. *cingulata* Linde. Holik & Sheljuzhko (1958: 175) stated that this was certainly a misidentification. I have been unable to trace this specimen and in a systematic catalogue of the genus *Zygaena* (Reiss & Tremewan, in manuscript), the name *cingulata* Linde is provisionally placed in synonymy under *Z. ephialtes kiewensis* Reiss.

Lécaillon (1928: 344) records that, among fifteen examples of *filipendulae* captured at Aizy (Aisne), France on 23.vii.1927, two specimens had a red, dorsal band on the abdomen. On 26th July, a further fifty specimens were collected, six of which had red scaling on the same abdominal segment, but showing varying degrees of development. A further aberrant specimen, with a red abdominal belt, was found among thirteen captured on 27th July. On 11th August, the species was obviously getting over as a search produced only two specimens, both normal. Prof. A. Vandel states (*in. lit.*) that when Lécaillon retired from the Chair of Zoology at the University of Toulouse in 1929, he took his collections with him. The present location of these collections is unknown and it is thought that they are probably destroyed. Lécaillon's paper was based on work carried out from the Laboratoire de Biologie rurale d'Aizy. According to Dr. P. Viette (*in lit.*) this laboratory and the collections it contained were disposed of after Lécaillon's death in 1930. Until the identity of the Lécaillon specimens is confirmed, I doubt the authenticity of his records. If the extreme rarity of belted *filipendulae* is taken into consideration, it is suggested that Lécaillon had another species of *Zygaena* before him as, although it is not impossible, I consider it most unlikely that such a form would occur so frequently in *filipendulae*. It is possible, however, that the populations at Aizy were *hippocrepidis* Hübner or a mixture of this species and *filipendulae*. In *hippocrepidis*, aberrant specimens showing varying degrees of development of red, abdominal belts, are not uncommon in some populations.

While arranging the collection of *Zygaena* in the British Museum (Natural History), I discovered two specimens of *Z. filipendulae pulchrior* Verity from Hungary with abdominal belts. Mr. H. Reiss (Stuttgart) also found a further specimen in his collection from north Italy (ssp. *maior* Esper). In order to place these aberrant specimens on record, I propose describing and naming them below.

Z. filipendulae pulchrior Verity ab. **cingulata** ab. nov.

Reddish or purplish brown scaling is present on the dorsal and lateral surface of segment 6 and on the ventral surface of segments 5-7. Holotype ♂, "Bischofsbad Bihar C. 26.vi.1913"; "Rothschild Bequest B.M. 1939-1", in British Museum (Natural History).

Paratype, 1 ♂, "Csehtelek Bihar C. 11.vii.1910"; "Rothschild Bequest B.M. 1939-1", in British Museum (Natural History).

Z. filipendulae maior Esper ab. **semicingulata** ab. nov.

Bright, scarlet scaling is present on the dorsal surface of the abdominal segments 5-7; the remainder of the dorsal part of the abdomen is blue-black. The ventral surface is greenish black, without a trace of scarlet scaling.

Holotype ♀, "Castellnuova Süd Gardasee, leg. Dr. Weinmann 100 m. 24.6.1954, H. Reiss Stuttgart"; "24.6.54 Castellnuova am Süd Garda. 100 m. Höhe", in H. Reiss collection, Stuttgart.

I am greatly indebted to Dr. P. Viette, Muséum national d'Histoire naturelle, Paris, and Prof. A. Vandel, Université de Toulouse, for information on the location of the Lécaillon collections.

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Pupation of Cossus cossus L.—On 27.vi.53 I came across a female in the middle of a fair sized lawn. The pupa case was sticking up out of the lawn close by it. Two days later there was a male specimen within a foot or two of the previous one with the pupa case again sticking up out of the lawn. The obvious tree where the larvae must have fed was a good ten yards from the spot where the two moths were seen.

The lawn is low lying, and I have known it to be flooded.

On 4.ix.58 I came across a full grown larva wandering about the verandah of the house adjacent to the lawn already mentioned. The larva was at least 25 yards from the same tree and pupated on 7.ix.58.

Why then does *Cossus* choose places like the middle of the lawn and anthills besides trees in which to pupate?

My guess is that they choose a place that is not likely to be disturbed by man or predator. Besides the woodpecker, moles and mice might be their chief enemies. In the case of the anthill the woodpecker would be much too busy eating ants, and the other two would give an ant's nest a wide berth.

The gregarious habit of pupation may be a source of protection through the unpleasant smell produced by the insect.

Both moles and mice are sensitive to smell. Wild capers planted in a garden are said to keep away moles, and rags soaked in Jey's Fluid will certainly deter mice.—Brigadier H. E. Warry, Eastbrook House, Upwey, Weymouth, Dorset. 22.ii.1965.

Entomological Notes, 1964

By S. Wakely

The following notes have been written about species which I have met with recently and which seem worthy of mention either for their rarity or because of habits observed which may be of interest to others. The nomenclature used is that of Heslop's Check List, 1962. To maintain some sort of order the species are mentioned under the names of the counties in which they were observed.

Essex.—At a joint meeting of the South London Entomological and Natural History Society and the Essex Field Club at Stanford-le-Hope on 17th May, the strange whitish larvae of *Ochsenheimeria mediopectinella* Haw. were particularly common. They feed in stems of *Dactylis glomerata* and when full-fed can be swept from the grass. They have rather a pointed rear end and at first glance might be thought to be non lepidopterous. One moth from larvae which I kept emerged in June, a normal emergence time, but two others, much to my surprise, emerged in early October.

Kent.—At Westwell in June, a number of *Depressaria* larvae were found feeding in rolled leaves of *Pastinacea sativa* (wild parsnip). The first two moths to emerge in July were *Depressaria douglasella* Staint., but others that followed were the common *Agonopterix applana* F., a species with several different foodplants. The usual foodplant of *D. douglasella* is *Daucus carota* (wild carrot)—indeed this is the sole foodplant mentioned in all the entomological books consulted—but I have certainly bred *D. douglasella* previously from *P. sativa* as well as *D. carota*. On the 3rd August I received a telephone call from Mr. Chalmers-Hunt who said he had just taken a series of *Eucosma pupillana* Clerck at Dartford (cf. *Ent. Rec.*, **76**: 214). Following his instructions I was able to find the place about 7 p.m. the same evening and quickly found the foodplant (*Artemisia absinthium*) well established. Walking about round the plants I netted a couple of *Evergestis extimalis* Scop., giving yet another locality in Kent for this local moth. As dusk started I disturbed a light-coloured moth from a large clump of Wormwood and was pleased to see it was indeed *E. pupillana*. For the next hour I was kept busy boxing specimens from the net. When a moth was seen flying round the plant it was quickly netted and several more sweeps with the net were made to the plant itself and in this way several were often found in the net at the same time. This species is extremely difficult to disturb from the plant during the day. As I had never previously found this moth I was very pleased to take about twenty, mostly in good condition.

London (Camberwell).—The most interesting species taken in my moth trap at Camberwell was undoubtedly *Lozotaeniodes formosana* Frol. This beautiful moth seems to be turning up in the most unusual places and is obviously spreading its range rapidly in this country. My specimen appeared on 2nd August. Near my house is a garden in which are growing two trees of False Acacia (Robina) about ten or twelve feet high. During August these trees had a peculiar look which caused me to make a closer inspection, when it was discovered that all the side lobes of the leaves had been eaten leaving the long central ribs intact and still green. It was noticed that on the trunks were numerous green larvae barely half-an-inch long. These larvae appeared to be trying to reach the upper parts of the trees in their search for leaves on which to feed. Specimens were sent

to the British Museum where they were identified as *Pteronidea* (*Nematus*) *tibialis* E. Newman, a species of sawfly which feeds solely on Robina and which was introduced with the tree from America many years ago. Two larvae which I kept, spun up and produced imagines on 10th September. On looking at the trees again then, it was seen that the trees were once again in full leaf, but the mid-rib of the old leaves were still on the trees. Several of the sawflies were also seen at the base of the trunks resting on grass. A few weeks later the trees were swarming with the larvae again and quickly defoliated. It will be interesting to see if these trees can survive such drastic defoliation twice in a few weeks, as there is the dead trunk of a third tree in the garden. I would like to know if similar infestations have been noticed in other districts.

Surrey.—In April I visited Riddlesdown to look for the larvae of *Parectopa ononidis* Zell. on clover. This is a most difficult larva to find and appears to be always rare. However, I was successful in finding several tenanted mines in the clover leaves, but succeeded in breeding only one moth, which emerged on 25th May. Although Rest Harrow (*Ononis*) is given as a foodplant—as the name of the moth suggests—I have never heard of larvae being found on anything but clover. Larvae have been found previously by me from 12th to 24th April. On 28th March I was at Clandon and collected a small bag of hazel catkins, concentrating on those which were distorted. These catkins were wrapped in tissue paper and placed in plastic containers. On examining them later some of the catkins were spun to the paper. Fresh hazel buds were supplied weekly and the old material removed after careful examination for larvae. About the end of May I bred several *Epinotia tenerana* Schiff. On the same day as the first lot of catkins were collected I found some larvae of *Caryocolum tricolorellum* Haw. in spun terminal shoots of *Stellaria holostea*. This was in a lane near Clandon railway station. Although an occasional spinning made by the larva was conspicuous owing to the shoot being distorted at the tip, the majority were most difficult to see, but by searching well near a spinning, many more were brought to light. This species is easy to rear if fresh shoots are introduced among the older food once a week. Moths emerged in June. The containers were examined in the evening, as the moths hide among the old dry foodplant during the day and are very sluggish, but they are more active at night and appear if the container is shaken. The foodplant is best kept in tissue, but fresh food is essential while the larvae are still feeding. On the 12th April the South London Society had a field meeting at Ash Vale, and the local *Xenolechia aethiops* Westw. was disturbed from the heather on ground which showed signs of earlier devastation by fire. Owing to the cold weather and wind, only a few were taken, but it was nice to see such an elusive local species once more. This species seems to be found where the heather has been burnt, but one is always lucky if it can be found at all. From a rather unpromising-looking sallow gall a specimen of *Aegeria flaviventris* Staud. was bred on the 26th June. This Clearwing appears to be very much more rare nowadays than it was a few years ago. By the Byfleet Canal on 18th May numerous pupae of *Elachista poae* Staint. were found on the upper side of the leaves of *Glyceria maxima*. The species evidently got its specific name from the older name of the foodplant—*Poa aquatica*. The pupae were found under a slight web, usually one on a leaf. However, in one instance four were found on one leaf spaced about an inch

apart. This habit of pupating on the top of the leaf differs from L. T. Ford's observation that they pupate in "rubbish on the ground", and may not be the general habit. Visiting the spot again with a friend on the 18th August a few more pupae were found and one imago was boxed as it rested on a leaf. This is the first time on which I have come across this interesting insect, but I expect it is common if looked for at the right time on the *Glyceria*. At Ockham on the 18th May—and later—it was pleasing to find larvae of *Parascotia fuliginaria* L. comparatively common. Those found were all under pine logs and branches. At Bookham on the 22nd July *Isophrictis tanacetella* Schrank were fairly common flying among its foodplant which is *Achillea ptarmica* (Sneezewort) in this locality. On the 24th August 1963, at a field meeting of the South London Society at Pyrford, small larvae of *Hydriomena coerulata* F. were found in rolled leaves of alder by the canal. These rolled leaves were the earlier feeding places of *Epinotia immundana* F. R., and by examining these rolled leaves numerous small larvae of *H. coerulata* were discovered. The moths appeared in May 1964. An imago of *Tethea duplaris* L. emerged on the 19th June from a larva found on alder at the same Pyrford meeting. This latter species is more commonly found among birch. At a meeting of the South London Society at Mickleham on the 10th October a small bag of spindle (*Euonymus europaeus*) berries were collected. These were wrapped in tissue and placed in plastic containers. On examining these a few days later, signs of larvae could be seen by exudations from a few berries together with signs of silk spinnings. Three larvae of *Alispa angustella* Hübn. were eventually found and they spun up in some pieces of hollow dry stems provided for the purpose. This is an elusive larva to find, but by gathering plenty of berries in October and wrapping them up in tissue they can be located if present. As soon as a berry containing a larva is found it should be put into a smaller container with several berries and a piece of cork or dry hollow stem for it to spin up. As the berries soon deteriorate, fresh berries should be supplied at least once a week as long as the larvae are still feeding. Also the tissue must be changed as soon as it gets wet from humidity. At Newlands Corner the previous year (on 23rd November) two local species were taken, both worthy of mention. One was *Acleris hyemana* Haw., not quite the locality one would expect to find this heather-feeding species, although the foodplant is fairly common there in patches. The other was *A. cristana* Schiff., a variable species prized for its many beautiful forms.

Sussex.—On the 3rd May I visited Ditchling Common, accompanied by Mr. Chalmers-Hunt, to look for *Grapholita lathyrana* Hb. Mr. R. Fairclough told me that it was on the wing the previous week and as this is one of our most local and rare tortricids, we were both anxious to see if it was still out. Arriving there about mid-day we wandered about looking for its foodplant—*Genista tinctoria*. This plant is not easy to find in early May, as the leaves do not open out until later and the bare twigs are not easy to recognise among all the mixed vegetation. However, we had both been there previously and knew the plant was quite common. During a spell of sunshine we spotted a moth which proved to be the species we were after, and in a sheltered place we were able to net a number—mostly in fair condition. A few were also taken by sweeping. This species flies freely in the sunshine in mild weather, but is difficult to see owing to its small size. The only localities given by Meyrick are: "Sussex, Lancashire, very local". One wonders if it has

been seen in recent years in Lancashire. Local collectors there should look for it on a fine day during the last week in April, providing they choose a spot where the Dyer's Greenweed is well established. It is not a common plant and is local in most counties. I have been given to understand that there are old records for Hampshire. One of the difficulties encountered in searching for this moth is being able to get a sunny day at the right time of the year—last week in April and first week in May. It used to occur not many years ago at the northern end of Tilgate Forest, Sussex, but the Genista disappeared when the ground was used for pig farming. I have no doubt that it still occurs near Plaistow in Sussex, a place where the foodplant still grows, but on a visit last spring some of the best ground where the plant still existed was planted with conifers. I hope that Ditchling Common will remain unspoilt for many years to come as it is the best locality I know for many rare species of micros.

There are a few other species I should like to mention before ending these notes. In August I had an imported peach given to me which obviously had a larvae feeding in it. The fruit was wrapped in tissue and kept in a plastic container with a piece of nylon kept over the top by a rubber band. This was to avoid mould which would have quickly appeared had there been no ventilation. A few days later it was examined and no sign of the larva could be found in the fruit. By holding the paper up to the light I was able to detect a pupa spun up in the paper and the moth appeared on 8th September. It was, as I expected, *Grapholita molesta* Busck, a species I had bred several times previously and which has been recorded by several other entomologists in Britain from imported peaches. Soon after finding the first larva my neighbour gave me another peach containing a larva. This was given the same treatment as the first and another pupa was found spun up in the paper later. This produced a specimen of *Anarsia lineatella* Zell. on 30th September. As far as I am aware this is the second time this moth has been bred in Britain, the first one being recorded by Mr. R. Uffen (*Ent. Gaz.*, **10**: 57).

In October a friend sent me some ova of *Nycterosea obstipata* Fabr. This migrant has often been bred in this country, but I wonder if it has been previously noticed how the larva have a special liking for flowers. I was advised to feed them on crysanthemum and they were given a sprig of leaves together with a single variety of the flower from the garden. The larvae immediately fed on the flower petals and stamens and ignored the leaves. There were only four, but they fed up rapidly on this diet, being kept on the mantlepiece near a hot-water system. Another lot of ova were given me in December and it was noticed these larvae preferred the flowers of ragwort (*Senecio squalidus*) whenever they were offered.

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TACHYPEZA NUBILA MG. [DIPT., EMPIDIDAE] IN WINTER.—This species is well distributed in the British Isles from May to October. It is generally seen running or resting on the trunks of living deciduous trees but also occurs on large stones, fences, telegraph poles and fallen logs. I have, however, found a female in winter, on 9th December 1951, at Bookham Common, Surrey, when in the company of the late Lt. Col. C. E. Bensley on whose face the fly was running.—L. PARMENTER, 94 Fairlands Avenue, Thornton Heath, Surrey.

In the Land of Shades

By An Old Moth-Hunter

Persons: Pliny the Elder and Henry Tibbats Stainton.

Stainton is a somewhat spare man about 5 ft. 9 in. with sloping shoulders; cleanshaven; a pleasant, somewhat 'smug' face. He is dressed in a brown tweed square-cut pleated Norfolk jacket, with the belt buttoned in front, and knickerbockers. Stockings of brown worsted, and black boots. On his head is a tweed cap (known as a 'deerstalker') such as may be seen in many of John Leech's drawings of the 'sixties. He would pass unnoticed in a crowd.

Pliny is a large portly man, about 5 ft. 11 in. and weighing probably 16 stones. There is something stately about him, he is in fact a typical patrician. His head is large and round; his nose on the small side and very beaked, his mouth inclined to be sensuous. Obviously he is a personage and one accustomed to giving orders—and to being obeyed. He is dressed in a spotless tunica of fine cream wool, his toga being rich blue, and wears cothurni of dark red leather richly embroidered with gold thread; sandals the same.

Pliny sees Stainton advancing towards him, gives him the briefest of glances, and would have resumed his walk had not Stainton planted himself in front of the great man. They speak of course in Latin, of which the following is a careful translation.

S. I have come to make your acquaintance, Mr.—I mean Signior—or should I say Doctor?—Pliny. It gives me not a little satisfaction to know that we are both to be domiciled, for an indeterminate period, in this pleasant spot. I trust that no inconsiderable advantage will accrue, to me at all events, from our friendly intercourse upon natural phenomena. I have read your book with considerable, I may say great, interest and have obtained no little edification from it.

P. Which book?

S. Your *Natural History.*

P. Yes, that is a good book. A monument for future ages. The fruit of much diligent observation of Nature and well reasoned thought.

S. Indeed it is. A good book, carefully written and based upon close personal observation, is sufficient monument for any man. I hope that my work on the Tineina also—

P. Never heard of it. What's a Tineina?

S. I mean my *opus*—if I may venture to use the word—on that superfamily of the Lepidoptera which we call the Tineina.

P. What kind of animals are you referring to?

S. The—er—butterflies and moths.

P. Oh. You mean the Phalenae. Yes, I know all about them. Book Fourteen, Chapters eleven and twelve.

S. (*a little offendedly*): I must refresh my memory. I think I remember your description of *cossus*, though.

P. You like *cossus*?

S. I think it's a very interesting moth.

P. It's not a moth; it's a caterpillar.

S. (*smiling*): So great a naturalist as you is doubtless aware of the relationship of a moth to a caterpillar.

P. There's no relationship between them. A moth flies; a caterpillar crawls. One is of the air, the other of the earth . . . . why did you say you find *cossi* interesting? Do you mean you are interested in the different ways of cooking them?

S. I confess I have never regarded the Goat Moth larva in that light.

P. Don't you like *cossi*?

S. (*bowing*): You will forgive my lack of learning on that point; but I have not yet investigated the edible properties of a caterpillar.

P. Do you mean to say you have never eaten a *cossus*? And yet you have written a book upon natural history?

S The-er-cooking of animals does not seem to me to be related to the study of their *natural* history (*he smiles feebly at his own joke*).

P. Not related to their study! Then what do you think they are for? Why have the gods bestowed them upon mankind if not for food?

S. But surely there are many animals which even you do not consider fit food for Man.

P. Precious few of them. I believe that if properly cooked *any* animal is good to eat. What else are animals for?

S. Some of us are content to study their life histories.

P. Yes, and when you have done that what do you do with them?

S. Oh, we either liberate them or preserve them for further study.

P. Why not make your study complete at one examination, then accept the food which the gods have sent you? To spurn the gifts of the gods is a dangerous proceeding.

S. We don't spurn their gifts. In fact we accept them gratefully. Only we don't always eat them. Sometimes, as I remarked just now, we preserve them for further study.

P. How do you preserve them?

S. Well, we keep the larva of *cossus*, for instance, in spirits.

P. In spirits? Ah-h-h . . . Now I understand! You steep them *in flore vini* first of all! Delicious! . . . . They're very good when steeped in Falernian, too.

S. I - I don't quite mean that, Mr. - I mean Signior - Pliny. We - er - don't ever eat them, in my country.

P. Don't ever eat them! Then what a strange lot of people you must have in your country. Is it ignorance, or stupid prejudice, or what?

S. I suppose it *is* prejudice . . . . But you see, in England we have so many other foods that we do not require to eat the larva of the Goat Moth.

P. Don't require to! Of course nobody's *required* to eat a delicacy. But anybody who isn't altogether a fool relishes a delicacy. Doesn't he?

S. Er - yes; I suppose so . . . . It's a matter of - er - the definition of the word 'delicacy'.

P. A delicacy is a delicacy wherever it occurs. It has the same definition in every country of the world. It is a choice meat which has so exquisite a taste as to ravish the senses. Are your countrymen so low in the scale of humanity that they do not know a delicacy when they taste one?

S. It's a little difficult to explain, Mr. - er - Signior - Pliny. Every country has its own particular delicacies. In France, for instance, frogs are esteemed choice fare.

P. Their legs are. Very good indeed. They should be steeped in *vinum Rhenanum* for twenty-four hours, then lightly grilled . . . . Go on.

S. In - er - China, sea slugs—the bêche de mer—are partaken of with avidity.

P. Yes. I know the big sea slug. It should always be boiled—a most delicious jelly. We used to import them, candied . . . . Go on.

S. In - er - Syria, locusts are much used by the inhabitants as food.

P. One of the nicest breakfast dishes I know. They should be cooked quickly on a pan over a hot fire, spread with butter and honey, and eaten between slices of buttered toast. Exquisite . . . . Go on.

S. In - er - parts of meridional Africa scorpions are devoured by the Kaffres.

P. *Scorpio*? That's new to me. I never heard of anyone eating *scorpio*.

S. (*much relieved*): So you see, Mr. - I mean Signior - Pliny, there are delicacies in other countries of which even so great and distinguished a naturalist as you are unaware.

P. That is possible. I was not able to visit all the countries of the earth . . . . But how does all this affect *cossus*? Because certain nations are unacquainted with a certain delicacy, does that fact make the delicacy any the less delicious, and therefore the less acceptable to any person of intellect?

S. No - o - o, I don't suppose it does. But just as the Romans did not eat *scorpio*, so we English did not eat *cossus*.

P. I'm not sure that *scorpio* is a delicacy. Have you ever tried it?

S. No indeed.

P. Then how do you know it's a delicacy?

S. I merely remarked that the Kaffres esteem it.

P. Kaffres? Do you mean Ethiopians?

S. Er - yes; I suppose so. The negroid tribes of the austral territories in Africa.

P. Black men?

S. Yes.

P. (*contemptuously*): Black men will eat anything. How could they possibly know what a delicacy is? Do you place *scorpio* in the same class with *cossus*? *Scorpio* is not even an eruca. *Scorpio* is a pod wasp.

S. Er - if you will forgive me for mentioning it, I think *scorpio* is an Arachnid.

P. A what?

S. It belongs to the Arachnida, the Class which includes the spiders.

P. Spiders? What has *scorpio* to do with a spider? Do you think *scorpio* spins a web? Have you ever seen a *scorpio*?

S. Modern science places both *scorpio* and *aranea* in the same Class of the great phylum Arthropoda.

P. How amazingly ignorant of natural history your nation must be! And do you claim that *aranea* is a delicacy too? How do you cook them?

S. No, you misunderstand me, Mr. - I mean Signior - Pliny. I merely observed that *scorpio*, esteemed a delicacy by the Kaffres, is now classed with the Araneae.

P. And I observed that that is not so. There's not the slightest relationship between *scorpio* and *aranea*—as you would have known if you had read my book diligently.

S. (*bowing*): It would be unbecoming of me to contradict so eminent a naturalist as yourself.

P. Of course it would. And very foolish too. It is never wise to put oneself in the wrong. Do you think the noble Titus would have honoured me with his intimate friendship had I not known more about natural history than anybody else? . . . . Well, I see Buffon over there, and I must go and talk to him now. Perhaps his countrymen are better acquainted with delicacies than yours.

(*Dismisses Stainton with a nod, and moves away*).

Polymorphism

By L. W. Siggs

Mr. J. H. Johnson's records of polymorphism in N.E. Derbyshire (*Ent. Rec.*, **76**: 282) are full of interest and, as he suggests, similar records over a period from various localities would be valuable in bringing to light various trends.

The following are comparable percentages for *Biston betularia* L. from my m.v. trap at Minstead in the New Forest:—

	1960		1961		1962		1963		1964	
	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%
B. betularia										
typical	14	93·3	33	86·8	243	91·1	250	85·3	197	87·6
carbonaria	nil	nil	5	13·2	18	6·7	14	4·8	10	4·4
insularia	1	6·7	nil	nil	6	2·2	29	9·9	18	8·0

Before 7th July 1961, a less effective trap was used.

In this species there is a difficulty in that specimens occur in an almost continuous range from typical to *carbonaria*. So far as I know, there is no adequate definition of the intermediate form *insularia* and recorders may well have differing standards which would make comparisons useless. Ford (1955, p. 189) merely describes it as "black with a scattering of white dots".

Separate records for the two forms of *Sterrha aversata* L. have been kept for the past two years and are as follows:—

	1963		1964	
S. aversata				
	Nos.	%	Nos.	%
remutata	141	78·3	57	75·0
aversata	39	21·7	19	25·0

It is interesting to note that the proportion of the form *aversata* is higher in the New Forest than at Chesterfield. Indeed, it is higher than that suggested by Ford as being general (1955, p. 67), assuming that both forms are equally attracted to light.

I am encouraged by Mr. Johnson's example to extend my records in future years to cover polymorphism in other species.

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Notes on Two Hairstreaks (*Thecla betulae* and *Strymonidia w-album* var.)

By Lieut. Col. C. F. Cowan

Thecla betulae L.

(The Brown Hairstreak): Habits and Habitats in Wiltshire

The brown hairstreak has not apparently been recorded in North Wiltshire (vice-county 7) for over 84 years (Baron de Worms, 1962). I found it there in two places in 1964 between Wootton Basset and Minety, an area where blackthorn thickets are frequent but where one, even as I watched, was being cleared for road widening. I saw only females here, and only males near Tidworth in the well-known localities in South Wilts. and Hants.

Both sexes are secretive, selecting sheltered resting places below the contours of bushes rather than viewpoints on the tips of twigs like other species.

All females seen were flying along over the tops of trees and shrubs, and then resting either high or quite low in such secluded spots. The two males seen, however, both rested well inside bushes on main stems whose bark was damaged. The first was in company with a common wasp, on a broken privet stem. It suffered removal twice by forefinger and transfer to a sunlit leaf of sloe for photography, returning each time to the original stem. It then lost patience with me.

The second male was first seen flying at about 15 feet, some 50 yards away. I located it eventually on a tall ash stem which was apparently being ring-barked by three hornets. It was well out of reach and in gingerly bending the stem down I disturbed and lost it.

The species "settles with wings closed" (Newman, 1959). This is so, but both sexes in my brief experience will soon open them if undisturbed, to bask in sunshine.

This is the first time I have seen the species apart from one fleeting glimpse at Trieste in Italy.

Strymonidia w-album Knoch.

(The White Letter): A Rare Variety from Wiltshire.

Maj. Gen. C. G. Lipscomb reported the rare variety of this species with broad white shading outside the post-discal line from South Wilts. in 1956. His specimen was also figured by Baron de Worms in his comprehensive list of 1962.

It seems to have escaped notice that an identical specimen was taken in North Wilts. in 1929. The captor was Mr. F. M. Richardson, then a pupil at Marlborough College. I reported on it in 1931: "Well worth recording is a fine variety of *Thecla w-album* taken in 1929 in West Woods, where the species was plentiful. The wings are shaded on the underside with separate white lines extending outwards from the **W** mark to the outer margins. Barrett (quoted in part by South) describes the variety, adding that the example he had seen was probably unique. The record was omitted from the last issue of the *Report* as the variety was unnamed".

My last five words were at fault. A similar variety was named *albovirgata* Tutt (1907).

Barrett, writing in 1893, did not give a locality for his specimen. Nor did Newman (1870), who was quoted by Tutt. But Tutt referred to an

example taken near Ipswich in 1859. It seems likely that all referred to the same specimen. Barret's description agrees with Newman's and Tutt's figures in which the white shading is about half the width of that of the two Wiltshire specimens.

The variety is also known from France, having been recorded by Bellier as taken in the Forêt de Bondy, some 12 miles east of Paris, in 1857. Bellier's coloured figure is much nearer the Wiltshire examples.

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Inverness-shire in 1964

By Commander G. W. Harper, R.N. (Retd.), F.R.E.S.

The 1963-1964 winter was most unusually open and mild, with no snow and very little frost, and I was therefore astonished that *Phigalia pedaria* Fab. did not appear at the street lights until 26th January, accompanied by a few hibernators such as *Cornistra vaccinii* and *Eupsilia transversa* Hufn.

A short, ten-day wintry spell with a little snow and frost at last arrived in the middle of February, but by the last day of the month *Colostygia multistrigaria* Haw. began to emerge in beautiful sunny weather, which ended in the middle of March with another cold spell. Again we had hardly any snow in Badenoch, but a few miles to the south twenty-foot drifts blocked all road and rail traffic. Although the rest of March remained chilly, all the usual early Spring species of *Orthosia* and *Achlya flavicornis* L. were about in good numbers.

April began with even colder East winds and slight frosts, but *Archiearis parthenias* L. succeeded in emerging on the 1st. Most of the month I spent in the South, the early part being just as cold as it had been in Scotland. I found the sallows in Herefordshire and Worcestershire just approaching their best, and they obligingly produced quite a good number of *Gypsitea leucographa* Schf. in first-class condition. It was also a sheer joy to see the wild daffodils carpeting the local woods after an interval of many years; but the many necessary notices prohibiting visitors from picking them was an unpleasant reminder of the ill effects of the motor car. The last week of April I spent near Portsmouth, and the fairly warm night of the 25th enabled me to break a personal record; on this night my portable m.v. light in a mixed wood near Rowlands Castle produced no less than twenty-five male *Odontosia carmelita* Esp. on my sheet! Some nice *Polyploca ridens* Fab. and *Selenia tetralunaria* Hufn. also appeared.

Our return to Badenoch on 3rd May was greeted by very stormy, cold weather with snow on the tops on 11th! Only small numbers of the usual Spring species came to my garden m.v. light trap. Brief gleams of sunshine between the gales and storms revealed the first butterflies of the year on the 13th May, when good numbers of *Callophrys rubi* L. were seen flying over the Cowberry on the local moorlands, but *Pieris*

napi L. did not appear until Whitsun, the 17th, which was the first warm, sunny day. By the 24th a really settled warm sunny spell became established for ten days, almost a record in itself for the Highlands of Scotland I should think! Moreover, we had planned to spend it more than 120 miles to the West, in Skye, still in our enormous county of Inverness-shire, and the weather was just as good there. But I was distressed and horrified en route, to see the effect of that accursed modern invention of the motor car and tourist traffic on the once lovely, narrow, twisting, "road to the Isles". It is in course of being "improved" out of all recognition; rocks and trees are being blasted and hacked away to widen and straighten it throughout its whole length, and doubtless in twenty years time it will again be quite inadequate, and a motor-way will be substituted! No wonder our rates continue to rise inexorably!

My principal quarry in Skye were the Zygaenids, and especially that fine new Scottish species *Z. lonicerae jocelynae* Trem. recently discovered there by Mr. R. F. Bretherton. There were plenty of *Z. purpuralis* Brun. mostly spun up, and *Z. filipendulae* L. mostly parasitized heavily. I found several very localised colonies, but in spite of my efforts to emulate a mountain goat, I had less success with *jocelynae*, only one cocoon producing a superb form with spots 2, 3, & 4 all joined together, in July. *P. napi* were flying everywhere in the sunshine, and I have never before seen it in such large numbers; I also saw a single immigrant *V. atalanta* L. in the garden of Dunvegan Castle, but the most interesting record, I believe a most northerly one, was a small colony of *Chiasma clathrata* L. They were freshly emerged on 29th May, and are larger and of more ochreous "English" ground colour than specimens I have from Lanark in South Scotland, but I rather doubt if it is double-brooded in Skye.

Only one night, 29th May, was warm enough for m.v. light to be very effective, but working my portable lamp on a bridge crossing a small steep corrie on this night produced over thirty interesting species, including very fresh *Ecliptopera silaceata* Schf., many *Colostygia salicata* Hb., and *Dyscia fagaria* Thun.

On the 2nd June we returned to Newtonmore in stormy, wet weather with a bitterly cold East wind. The best of our northern summer was soon over! But in spite of fresh snowfall on all the higher tops on the 18th, m.v. trap catches of all the usual early summer moths were fairly good, and some of my southern friends at Aviemore reported fairly good sugaring; pupae of *Amathes alpicola* Zett. on the high ground were much scarcer than two years ago when a good recovery in numbers of this lovely moth seemed imminent. During this month I was very pleased with the successful emergence of the great majority of a new species to me, *Calophasia lunula* Hufn., collected as larvae at Dungeness last year. Two or three of them delayed their emergence until September. Another *V. atalanta* L. was in my garden on the 10th June, but this welcome visitor did not apparently find conditions to its liking and breed locally this year. A remarkable absentee this year was *Lasiocampa quercus* L. *callunae* Palmer; I have neither seen larvae nor imagines here for about two years, and suspect that the great increase in numbers of Black-headed Gulls recently may be responsible; there has certainly been a progressive decline in the local population in recent years.

July was yet another month of very mixed weather with many severe gales and heavy rainstorms, and even in the intervals high winds prevailed. First emergences continued to be a week or so later than normal; thus

Aricia agestis Schf. *artaxerxes* Fab. did not fly in any numbers until the first week in July, nor *Argynnis aglaia* L. until the middle of the month, when it became very abundant. I had a quite remarkable experiece with this lovely butterfly on the 25th, when I noticed a large cluster of them hovering near the ground as though assembling sexually; and so it proved, for in one stroke of the net I secured no less than five, two females with wings scarcely dry, and three males! All the usual Summer moths were in good numbers in their usual haunts and visiting my m.v. light trap; but my one expedition with portable m.v. to the high ground failed to attract more than a few *Plusia interrogationis* L., *Diarsia festiva* Schf., and *Eumichtis adusta* Esp., *A. alpicola* Zett. being disappointingly absent.

In August the weather continued very changeable, but consistenly windy and wet. On the 20th there was a sharp ground frost. A big immigration of the grey form of *Eurois occulta* L. occurred in the middle of the month and again later. It appears to have been unusually widespread, being recorded from the Western Isles, the South of England, and I believe, Ireland, as well as Inverness-shire. There was a very welcome recovery in the numbers of *Aglais urticae* L.; I saw more than twenty together on a short bank covered in Scabious, together with one worn *Vanessa cardui* L., the first I have seen myself in this district. A short note on our old friend (or enemy) *Noctua pronuba* L. may not be out of place here. The revised edition, 1961, of South's "The Moths of the British Isles", vol. 1 gives a misleading impression of the normal flight season of this universally abundant species. Here it never emerges before August, this year on the 9th. It reaches its peak in mid-September, and fades out in October, and this is probably normal for the northern latitudes of its range; this flexibility may well be one factor in the extraordinary success *pronuba* achieves everywhere in the survival stakes.

September opened with a few warm, sunny days, but storms and rain soon interrupted the sun's beneficent efforts again. A large batch of ova I obtained in August from an obliging grey immigrant *E. occulta* L. proved fertile, and the young larvae fed well on dock, but insisted on hibernating in November. As I gave most of them away I hope one of us will breed some through. It will be interesting to see whether they produce grey, black, or both forms.

Apart from the *E. occulta* L. already mentioned, imimgrants were again very scarce this year, even *Plusia gamma* L. records being in single figures for the whole year. *Two Nomophila noctuella* Schf. entered my m.v. trap on 11th September, and single *Agrotis ipsilon* Hufn. a few nights later. Only a single *V. atalanta* L., probably southbound, paused for a few hours nourishment on Knapweed flowers on the 12th. Of the usual Autumn moths in my m.v. trap, *Dasypolia templi* Thun. was commoner than usual, as many as six a night, including pairs in cop. being frequent. Other species were in about normal numbers except *Anchoscelis helvola* L. which failed to appear at all.

October began with a short, but pleasant spell of cloudless Indian Summer sunshine, soon accompanied with very sharp frosts which produced unusually fine Autumn colouring on the trees. But heavy snow on all low as well as high ground on the 23rd virtually brought the season to an end here. It was an average one, and not at all remarkable, except for poor Summer weather, especially when compared with reports from the South.

Neadaich, Newtonmore, Inverness-shire. 20.2.65.

Hibernation and Pupation Habits of *Cossus cossus* L. (Lep. Cossidae)

By Commander G. W. Harper, R.N. Retd., F.R.E.S.

"Curiouser and curiouser" as Alice once observed. Driven from the shelter of molehills, *C. cossus* now cohabits with ants. Seriously, however, I would like to thank Dr Kettlewell for unearthing the original note, and for re-publishing Col. Fraser's very interesting observation in *Ent. Rec.* 77: 1. The result of his heavy penance will be much appreciated by many Lepidopterists.

Dr. Kettlewell has, as was to be expected, produced some ingenious and stimulating theories to account for the evolution of a balanced habit dimorphism in the *cossus* larva, if I understand him aright. But I feel sure that he would be the first to admit that such dimorphisms can only be established by close statistical study spread over several years of observation of a colony of the species concerned, as he has himself done with such success with *Callimorpha dominula*, L. But in the case of *cossus*, we have as yet only a single observation to work on. Many more yet will be needed before we can conclude as he does, that *cossus* habitually pupates in earth mounds, or that it does not leave its hibernation cocoon in the Spring in order to search out a more suitable pupation site. Quite clearly in captivity *cossus* does so, and when given the choice of wood billets and earth, it prefers the former. After all, the great majority of species pupating in earth have not evolved pupal abdominal spines, and until we have much more evidence I shall adhere to my opinion that *cossus* prefers to use his in wood if he possibly can, and only adapts earth as an unpleasant necessity when driven to it by factors outside his control. In Col. Fraser's case, flooding may well have prevented them leaving the ant-heaps to go back to their over-populated trees! But I am now guessing as much as Dr. Kettlewell with his ant-repellent theory, but, I think, rather more plausibly!

Unfortunately since I settled in Inverness-shire thirteen years ago I have been unable to find any trace of *cossus* anywhere near me, for I would very much like to observe and record a colony. But I confidently anticipate further notes in future issues of the Record from more favourably located Lepidopterists.

Collecting Butterflies in the Austrian Tyrol in 1964

By G. Stoughton-Harris M.A.

For some time I had in mind to go to Austria for a summer holiday and in 1964 we did it.

My wife and I and a friend left London on Thursday, 11th June, and travelling by sleeper from Calais we reached Innsbruck about mid-day on Friday. After luncheon in the station restaurant we went on by train to Seefeld—a journey of about threequarters of an hour.

Seefeld in the Austrian Tyrol is about 3700 feet above sea level and the surrounding mountains rise to a height of some 7000 feet.

We found good collecting grounds on the lower grassy slopes and glades in the tree covered hillsides.

The following is a list of the species taken during the fortnight we spent in Seefield.

Aporia crataegi L. ..... Three fresh specimens taken in one place.
Pieris bryoniae Hübn. ..... Not common. Five taken.
Pieris brassicae L. ..... Not noticeably common.
Pieris rapae L. ..... Not noticeably common.
Leptidea sinapis L. ..... Common.
Anthocharis cardamines L. ..... Only a few seen.
Colias australis Vty. ..... Fairly common but some worn.
Pararge aegeria L. ..... Very few seen.
Pararge hiera F. ..... Two worn specimens taken.
Pararge maera L. ..... A short series of a dark form taken.
Coenonympha pamphilus L. ..... Not very common.
Coenonympha iphis Schiff. ..... Six taken—not common.
Coenonympha tullia Müll. ..... Two taken—no others consciously seen.
Erebia medusa Schiff. ..... Common but many worn.
Erebia ligea Esp. ..... Only one fresh one seen and taken.
Erebia euryale Esp. ..... Only one seen and taken.
Vanessa atalanta L. ..... Only one seen.
Hamearis lucina L. ..... Two worn specimens taken.
Melitaea athalia Rott. ..... Common.
Melitaea dictynna Esp. ..... Common.
Brenthis amathusia Esp. ..... Three fresh specimens taken.
Argynnis thore Hübn. ..... One seen and taken.
Argynnis selene Schiff. ..... Only two taken—both rather worn.
Lysandra coridon Poda. ..... One seen and taken.
Lysandra bellargus Rott. ..... A few seen and taken.
Lysandra hylas Esp. ..... Only one seen and taken.
Polyommatus icarus Rott. ..... Fairly common.
Maculinea arion Rott. ..... Fairly common.
Cyaniris semiargus Rott. ..... Common.
Aricia agestis Schiff. ..... One taken.
Plebejus argus L. ..... Fairly common.
Chysophanus hippothoe L. ..... A good series taken from one small hayfield.
Erynnis tages L. ..... A few seen and taken.
Ochlodes venata Br. and Grey. .... One taken.
Carterocephalus palaemon Pall. .... One worn specimen taken.

Walden Cottage, Horsell, Woking. February 1965.

W. S. Coleman and W. H. Allchin.—I wish to thank all readers of the "Record" who have been so kind as to send me information on W. S. Coleman, especially Messrs. P. B. M. Allan (Vol. 76, p. 297) and D. E. Allen (Vol. 77, p. 47), for pointing out the account in the *Dictionary of National Biography*. Prompted by Mr. Allen's article I have searched the Obituary columns of the *British Medical Journal* and *Lancet* for 1891 and 1892 for information concerning Coleman's friend Dr. Allchin, but could find no mention of him. Incidentally, Mr Allen gives Allchin's dates as "1828?-1891" graduating as Bachelor of Medicine in 1844. If the date of graduation is correct, it seems highly unlikely that the date of his birth would have been 1828, since this would mean that he became medically qualified at the age of sixteen.—Dr. R. G. Ainley, 46 Peveril Crescent, Chorlton-cum-Hardy, Manchester, 21.

Cornwall 1964

By Dr. F. H. N. Smith

The temperature fell to 24°F. one evening in early March, but in general it was a mild spring. The mercury vapour light brought some immigrants: 1 *Nycterosea obstipata* Fabr. on 20th May, 1 *Heliothis peltigera* Schiff (bordered straw) June 16th, *Leucania unipuncta* Haw. (American wainscot) September 17th, and another of this species was found obligingly sitting in the kitchen on August 6th. *Herse convulvuli* L. was first seen at tobacco flowers on August 20th, and subsequently seven more were noted, some at the lamp, and the last being on 19th September. On 3rd October, 4 *Rhodometra sacraria* L. (vestal) came to the light with one more on 4th October.

On 19th August, my eight-year-old son put me to shame by finding a larva of *Apatele alni* L. (alder) in its last instar: this was all the more interesting because it was feeding on hazel—a small scrubby bush, the result of clearance activities. We had no idea that hazel was an alternative food. It was very disappointing that the larva proved to have been parasitized, and it produced a number of small cocoons such as are seen on the larvae of *Pieris brassicae* L. (large white) indicating an *Apanteles* species.

On some local moorland on 8th June I had the good fortune to capture a freshly emerged var. *margo-striata* of *Argynnis selene* Schiff. (small pearl-bordered fritillary). It is identical with the specimen depicted in the large edition of Frohawk, and this also was from "N. Cornwall". Cornwall is not over-endowed with resident butterflies, but most of the species were about in average numbers, except perhaps *Polygonia c-album* L. (comma). I wonder whether this species is on the decline again? Has any evidence of this been noticed up in England? A few *Nymphalis cardui* L. (painted lady) were seen, and only one *Colias croceus* Fourc. (clouded yellow), a male on October 2nd. I have kept the strawberry until the end, and this was a specimen of *Danaus plexippus* L. (milkweed) reported on 26th September. This was seen by Mr. Pattenden of Penzance, who is primarily an ornithologist, but he had a prolonged view of the butterfly as it was crossing the road at Marazion marsh, "being caught in the slip-streams from cars". He last saw it flying in a cabbage field, whither who can tell? I can only say I am pretty certain it did not get as far as Perranporth!

Would it be possible to make a correction regarding my address? I think Mr. Kennard (*antea* p. 18) probably gave it as Perranporth, Nr. Newquay, but the printers have got it down as Nr. Torquay, which would put us in Devon! The correct address is Perranporth, Cornwall (i.e. not "near" anywhere).

A Few Notable Diptera from Windsor Forest

By A. A. Allen

The following brief notes deal with the more interesting or uncommon flies met with (for the most part) whilst working for beetles in this famous old hunting-ground. The paucity of species recorded, and especially of the families represented, calls for some excuse. My collecting of Diptera in the locality was practically limited, with few exceptions, to the one

season of 1940; and, in that, to odd week-ends from May to July; moreover few flies but Syrphids were then noted. Since again beginning in latter years to take notice of some sections of the Order, and casting my net now more widely, I have unfortunately from one cause or another been unable to manage more than a few visits—and those not at the best times of year in an entomologically far less favourable period. Hence the somewhat meagre list (to which I hope to add in future years).

Like Donisthorpe in his study of the Coleoptera of the area (1939) I make no general distinction between Windsor Forest and the Great Park, which adjoin and are essentially and faunistically of the same character; but, unlike him, I do not include under the former designation the sandy heath and pine-wood area around Ascot, which has a markedly different fauna and has for long been quite separate from Windsor Forest proper. None of the flies here listed are from this Bagshot Sand country. Though the Virginia Water portion of Windsor Great Park is in Surrey, again none of the species were taken there, so that all the records appertain to Berkshire.

STRATIOMYIDAE

Solva maculata Mg.—A female of this rare and extremely local insect, recorded hitherto, it would seem, only from the New Forest and Epping Forest, was bred from a puparium found in the wet rotten wood of an old beech stump in May 1940, emerging towards the end of the month*.

*Since this was written, a record has appeared of a specimen taken on a window at Silwood Park, near Ascot, 18.vii.57, and a larva in rotten wood at Virginia Water, Surrey (about a mile away), iii.33 (Southwood, 1964). Mine, however, appears to have been the first find in Berkshire.

THEREVIDAE

Psilocephala melaleuca Lw.—In terms of specimens in collections this handsome species must probably be classed among our rarest Diptera; the only ones I know are of a ♂ bred from a larva by Donisthorpe in May 1930—now in the British Museum collection—and a ♀ bred from a pupa by myself in June 1940, now in Mr. J. E. Collin's collection. (See Collin, 1948: 96). The puparium of the latter was found in wood-mould in a hollow beech trunk which yielded also larvae of *Pocota* (see below). I believe I once saw an adult settled for a moment on this same tree, in July, but could not secure it. Therevid larvae presumably of this species—only one having been reared—are, however, not very seldom met with in old rotten stumps or trunks of oak, beech, ash, etc, in the area; but owing to the uncertain nature of their food, perhaps, it seems difficult to bring them to maturity if not already full-grown. Small earthworms were not taken by a half-grown larva I tried to rear, but it is possible that its vigour had been impaired by some degree of previous starvation.

EMPIDIDAE

Heleodromia immaculata Hal.—One or two males swept in company with the next species (5.x.62), kindly determined by Mr. E. A. Fonseca. Apparently a new record for Berkshire, this not being among the counties listed by Collin (1961: 687), who notes it is 'by no means common', and whose latest date (8.ix) is practically a month earlier.

Rhamphomyia erythrophthalma Mg.—This autumnal species was not uncommon on 5th October, 1962, by sweeping the lowest foliage of oaks, and the bracken etc., beneath them, in one area of the Park; also in another

part at the end of September, 1964, in plenty on flowering ivy, but seeming very local. Possibly also a new county record to judge from Collin (p. 438), but I believe it can be found almost anywhere if looked for at the right time.

SYRPHIDAE

Chrysogaster chalybeata Mg.—On umbels at Highstanding Hill, at the side of the Winkfield road skirting the forest, where a narrow ditch ran, with a few *C. solstitialis* Fln., vii. 40 (and 41?). I have only one specimen, but others may have been present at the time.

.. *Cheilosia fraterna* Mg. and *C. bergenstammi* Beck.—Single specimens along the forest verge by the Ascot road just outside the park, visiting hogweed umbels, late June 1940. No doubt neither species is rare, but they are far from common compared with many others of the genus, and I have not seen either since.

Syrphus diaphanus Zett.—A female of this rare species at the same place as the Chrysogasters, at rest on an umbel of Heracleum or Angelica in dull weather, mid-July 1941.

Xanthandrus comtus Harr.—A male with wings badly damaged, also at these flowers, vii.40. Another species which is anything but common, though supposed to be generally distributed (which I doubt).

Brachyopa insensilis Coll.—Two examples netted about a sapping elm, 1.vi.63. In Berks., it is already on record from Bagley Wood, and perhaps elsewhere.

Brachypalpus bimaculatus Macq.—On tree trunks, scarce; only one caught, a ♀, which settled rather high up on a beech, late May 1940; another seen, but missed, on a beech trunk in a different part of the area, in July of that year. Its resemblance to a honey-bee is striking.

Myiolepta luteola Gmel.—At bramble blossoms, very local; singly in June 1939 and 40 in one spot at the edge of the forest, at Highstanding Hill—*Pipiza austriaca* Mg. accompanying it (also singly) on each occasion. Berkshire is not among the counties listed for *M. luteola* by Coe (1953:47).

Xylota lenta Mg.—Local and not common in openly wooded places, June; probably far more widespread in the area than yet found. I have seen this fine fly in Epping Forest also.

Xylota xanthocnema Coll.—Two males of this comparatively new species were taken alighting on one of the forest paths in sunshine, June 1940. Not, I believe, previously recorded at Windsor, but originally described from Berks. (Bagley Wood) and since found in about six other counties (Coe, p. 79).

Xylota nemorum F.—One example on an oak stump in fairly shady forest, end of June 1940. (Perhaps less uncommon than formerly, as I have met with it in some numbers about a very old rotten beech at Knole Park, Sevenoaks, Kent, besides singly at Ham Street in the same county—on a buttercup—and at Esher, Surrey, swept near the Black Pond.)

Xylota florum F.—Two specimens (one a very small ♀ more like *X. abiens*, but kindly confirmed as *florum* by Mr. Coe) taken on the same occasion as the last species, flying round and basking on old logs and stumps; I have not come across it elsewhere. Thus all the British species of the genus except *tarda* Mg. and *abiens* Mg. have been noted in the locality—*sylvarum* L. and *segnis* L. being common, especially the latter.

Eumerus ornatus Mg.—A male caught settling on the ground in open forest with much bracken, in strong sun, vi.40. Otherwise I have not come

across the species, and do not think it can be generally common.

Helophilus hybridus Lw.—I have noted this as having occurred about one of the ponds in the park, viii. 39; the specimen has not survived, but should have been correctly recognised.

Calliprobola speciosa Rossi.—This fine Syrphid, taken in very few localities, is well known from the area and has already been mentioned in these pages by Mr. L. Parmenter (1960). It was not very uncommon in late May and early June, 1940, on hawthorn bloom here and there in the park and forest, but caught specimens often had the wings frayed. Later in June and during July, when the hawthorn blossom was over, it could sometimes be seen hovering high up in sunlit forest glades and once or twice settled (for a brief moment) on old oak or beech trunks—in which, most likely, its early stages are passed.

Pocota personata Harr. (=*apiformis* Schk.).—Another handsome rarity already recorded from the Forest, but very seldom seen at large; its remarkably close resemblance to a bumble-bee may contribute something to this, but its secretive habits and generally elevated habitat probably have more to do with it. (See Hobby, 1940; Allen, 1964, *in press*). I bred a few flies late in March, 1940, from larvae found the previous June deep down in very rotten wet wood-mould in a hollow beech, as recorded in Dr. Hobby's paper on the species cited above; a year later the larvae in this tree were almost wholly replaced by those of the common *Myiatropa florea* L. in plenty. *P. personata* was first recorded from the area by Donisthorpe, who bred out a number, but the first imago encountered there seems to have been a female captured by me on a beech trunk, 1.vii.41. The flies bred the year before were of the yellow-banded form, whereas the others were tawny-banded.

Criorrhina ranunculi Panz.—Also a large and impressive bee-like species, uncommon but widespread, of which the sole example I have yet come across was a female caught in the act of 'prospecting' the various holes and cavities around the roots of a large old stump of beech on the date last mentioned under *Pocota*—a late one for both insects—doubtless with a view to oviposition. I have often seen its commoner congener *C. berberina* similarly engaged, so cannot entirely agree that these are habitual high fliers rarely coming within reach of an ordinary net except sometimes when attracted to flowering shrubs (see, for instance, Colyer & Hammond, 1961: 170). *C. ranunculi* should also be obtainable from hawthorn blossom in the area, on which *C. berberina* F. (both forms) and *C. floccosa* Mg. are not infrequent in some years. *C. asilica* Fln. I have not seen, but it probably occurs.

Volucella inflata F.—One, which eluded capture, settling on a small Cossus-infected oak, August 1939. I have met with it, also singly, in exactly similar conditions in two other places—and *only* thus (Allen, 1961). To me therefore it is easily our rarest species of the genus, though Mr. Parmenter assures me that it is not uncommon in certain districts, where its habits seem to agree with those of the other Volucellae.

DROSOPHILIDAE

Drosophila picta Staeg. (=*macularis* Villen).—A specimen of this small but neatly-marked fly was obtained by sweeping not far from a marshy pond in the park, 5.x.62, for the name of which I have to thank Mr. Fonseca.

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Empididae (Diptera) in Brecon and Kirkcudbright

By R. M. Payne

Since writing my notes on Diptera in Brecon (1965, *Ent. Rec.*, **77** : 20-21) I have identified a number of Empididae taken in the county in May and June 1964. In a few cases these appear to be extensions to the recorded range given in Mr. Collin's *British Flies VI. Empididae* (1961). But Brecon (BR) is such an under-worked county entomologically that it seems worth while listing all the species taken; and for the same reason I include a few records from Kirkcudbrightshire (KB) in the previous year.

Although Mr. Collin's book, with its wealth of clear illustrations, has made the indentification of at least the larger Empids (or Dance-flies) as they are called in America) fairly easy, the capture of only a single specimen sometimes makes it difficult to decide between two closely allied species, and again I must thank Mr. Parmenter for his assistance.

Tachypeza nubila Mg. KB. Colvend, running on the bole of a large Sycamore tree, 18.8.63.

Sicodus annulimanus Mg. KB. With *T. nubila*, but less numerous.

Tachydromia notata Mg. BR. A female taken in flight near the top of Pen y Fan, alt. 2,800′, 29.6.64.

Hybos femoratus Müller. BR. Libanus, in a damp wood, 30.6.64.

Rhamphomyia (*Megacyttarus*) *crassirostris* Fln. BR. Ystradfellte, flying over river at Porth yr Ogof, 23.5.64.

R. (*R.*) *stigmosa* Macq. BR. Brecon Beacons, several flying over stream (Nant Bwrefwr) at 1,800-2,000′, 22.5.64.

R. (*Holoclera*) *flava* Fln. KB. Duff's Loch, 27.8.63.
BR. Libanus, in a damp wood, 30.6.64.

Empis (*Xanthempis*) *punctata* Mg. BR. Llanfaes, flying over a meadow by the Afon Tarell, 23.5.64.

E. (*X.*) *stercorea* L. BR. With *E. punctata*.

E. (*Kritempis*) *livida* L. KB. Banks Hill, on Ragwort flowers, 21.8.63.

E. (*Anacrostichus*) *lucidus* Zett. BR. Craig Cerrig Gleisiad, a male flying over stream at 1,600′, 22.5.64.

E. (*A.*) *verralli* Collin. BR. Brecon Beacons, a male flying over stream (Nant Bwrefwr) at 2,000′, 22.5.64.

Trichopeza longicornis Mg. KB. Dalbeattie Forest, a male, 23.8.63.

The two species of the sub-genus *Anacrostichus* may perhaps be confined to high ground, at least in the southern half of Britain. Collin (*op. cit.*) gives Stakefell (Yorks.) and Black Mountains (Hereford) for *lucidus*, while Parmenter (1951, *Ent. mon. Mag.*, **87**: 41-4) mentions specimens taken on Cader Idris by C. H. Wallace Pugh. For *verralli*, Collin gives Yorkshire and Snowdon, and Parmenter records a pair taken by O. M. White on Kinderscout.

8 Hill Top, Loughton, Essex.

Notes and Observations

THE LARVA OF COSSUS COSSUS L.—With reference to Dr. Kettlewell's suggestion (*Ent. Rec.*, **77**: 2) that the larva of *C. cossus* may be divided into those which remain in their tree and pupate there, and those which leave their tree in early autumn and wander about until they find a suitable ant-hill or other mound in which to hibernate and eventually pupate, an experience of mine may be worth noting.

On 20th September 1922, I found a *cossus* larva on the top of a five-barred gate post at the entrance to a field at Llandovery, Carm. It was an old post and there were some cracks and fissures in it, down one of which the larva was beginning to make its way. After leaving its tree, it presumably had failed to find a suitable ant-hill or mound, and fallen back on the gate-post as a hibernation site. The field was low-lying and close to one of the local rivers and quite likely to be flooded. I removed the larva and put it in a biscuit tin with some rotten wood, where it formed a cocoon and hibernated; in the spring it reappeared and formed another cocoon where it pupated, a moth emerging in due course.

In those days I often used to stay with friends in Somerset and sometimes caused them amusement when we were driving along the country lanes and I sniffed the smell of a goat caterpillar as we were passing an infested tree, usually an ash.

I do not think the silver birch is one of the trees most commonly chosen by *cossus*, but about thirty years ago there was a row of pine trees alternating with birches at the side of a road skirting Queen's Park, Bournemouth. One September day I saw a small crowd round one of these birches, and found that they were fascinated by the sight of a number of Red Admirals fluttering round the tree and settling on the trunk, where they feasted on the sap exuded from *cossus* holes with which the tree was riddled. At the foot of the tree were several heaps of saw-dust, and on investigating these I found quite a number of small *cossus* larvae, up to an inch or so in length. The tree was dying, and several of the other birches in the row were infested with *cossus* larvae; they were all cleared away within a few months. About the same time a large silver birch in the grounds of a neighbouring laundry was also killed by *cossus* infestation. In recent years I have not seen (or smelt) any birch trees that have been attacked in this way.

It is well known that the Romans used to eat what they called *cossus* larvae, and indeed esteemed them as a delicacy, but it is not so certain that their tasty morsel was the same as our repulsive-smelling goat

caterpillar. However, the Romans' taste may well have been very different from ours. According to Pliny, these larvae were specially fattened for the table on flour and wine, and also, as I have read elsewhere, on corks from wine jars. (For a discussion of the subject, see C. A. Ealand, Insects and Man, pp. 205-6.) No wonder the Romans used to have a *vomitorium* at one end of their dining-rooms. Nero's is still in existence.—H. Symes, 52 Lowther Road, Bournemouth. 10.ii.1965.

Two Year Cycle in Sphinx ligustri, L.—On 20th July 1963, I took a female *Sphinx ligustri*, L. in the mercury vapour trap near St. Albans, Herts. The moth was released the following day, having done her duty by laying about 100 eggs. These hatched in the first week of August, and were reared on a mixture of lilac and privet. Burrowing for pupation began on 28th September. I had given away many of the larvae, and mortality was heavy among the remainder, so that I finally had only five viable pupae. These were kept at room temperature for the winter (about 15-20° C.).

On 8th April 1964, they were placed in a warm airing cupboard at 35° C. In five weeks four of the five had emerged (3 normal, 1 crippled). The fifth was kept in the warm cupboard for a further six weeks; by the end of June it had not emerged, and was returned to room temperature It has passed the present winter as a pupa, and is still very much alive.

It is well known that *ligustri* occasionally spends two winters as a pupa; the present example is recorded because "forcing" for eleven weeks at 35° C. at the appropriate season failed to induce emergence, illustrating the probability that in a small proportion of *ligustri*, as in some other species, the tendency to a two-year life-cycle is genetically-determined, and independent of temperature. It would be hazardous to speculate further on the basis of a single example, but since it might be of interest to analyse the results of pairing the above specimen (a male) with a female which has undergone a similar life-cycle, I should be pleased to hear from any reader of the *Record* who has a suitable pupa of *ligustri* he would donate for this purpose.—Dr. R. G. Ainley, 46 Peveril Crescent, Chorlton-cum-Hardy, Manchester, 21.

Staphylinus stercorarius Oliv. (Col.): A Rejoinder.—My friend Mr. Colin Johnson, having met with a specimen of this rove-beetle in cow-dung in Cornwall (*antea*: 246), is inclined to question a previous statement of mine that "it does not frequent dung"; pointing out that Fowler (1888) records it from dung and dungheaps (among other situations). Thus, at first sight, appearances are against me. I was, however, not unaware of Fowler's datum when writing—indeed it was that, contrasting with my experience of the species, which led me to make the remark. The only time I have come across *S. stercorarius* in some quantity—on a moor near Aviemore—there was no dung to be seen, and the beetle was under stones etc. I still think that its supposed connection with dung is almost wholly accidental, and that when so found it is merely utilizing the material as a temporary shelter. Similarly, when working dung, one quite often turns up odd specimens of such species as *Ocypus olens* Müll., or common Pterostichi and other Carabids, none of which would be regarded as 'stercoricoles' (i.e., characteristic of that habitat). The same applies, *mutatis mutandis*, to carrion or carcases—also given by Fowler for the present species, though he says truly that it is more often taken

at large. I should say that our only *Staphylinus* habitually associated with dung and carrion is *S. pubescens* Deg.

Many insect species have received somewhat or wholly misleading names through the chance occurrence of the type specimen(s) in an untypical environment; or simply through confusion of data. Such names may well have caused early authors to jump to wrong conclusions, and erroneous ideas as to habitat to be diffused and handed on from one work to another—remaining uncorrected in some cases for many years. The attribution of *S. stercorarius* to dung *may* be an instance of this, but in any event it is not nearly as much at fault as some others (e.g. where an insect's name gives a totally false notion of its foodplant). Misconceptions of the sort are not absent from Fowler's great work—it could hardly be otherwise, considering its relatively early date. At the same time, the possibility that a gradual change might have taken place in the habits of certain species is one that must be kept in mind.

To return to my remark quoted above: the verb 'frequent' surely in any case implies a *habitual* biotope, or occurrence *in some numbers;* so I 'stick to my guns' and maintain that it was a true enough statement as far as it went!—A. A. Allen, 63 Blackheath Park, S.E.3. 12.i.65.

A Note on Lachnocnema bibulus (Fab.) (Lepidoptera Lycaenidae).—The small Lycaenid butterfly referred to in the following note has an extensive distribution in tropical Africa, but it also extends down to the east coast of South Africa, as far south as the Port Elizabeth district and, in this locality, the larva was found by the late Gowan C. Clark to feed on a species of Homoptera.

From the first observation, made in Durban, a case of protective resemblance would seem likely; but, in the second one, it is not known to the writer whether the "scale" concerned would always be passed over by birds.

On the afternoon of 22.iv.57 a female of *L. bibulus* was noticed at rest on a young shoot of "flat crown" (*Albizzia fastigiata* Oliv. (*Leguminosae*)). It was rather windy at the time and the butterfly was resting partly concealed by the leaves with its legs spread out round a thin stem and the wings folded well back. The white "woolly" legs gave a solid effect and, with the wings, made the insect look very much like a bird dropping. Small ants of the species found with certain other Lycaenids in Durban were walking about on the stem and if these came into contact with the legs of the butterfly, the latter were twitched momentarily.

At Durban on 25.iv.57, a young plant of flat crown, several feet in height, had its slender stem covered with scale, and numerous small ants crawling over it. At least two females of *L. bibulus* were resting on the stem and it was immediately noticed how perfectly the white woolly legs of the butterflies simulated the scale. The covering of the legs may protect them from ants.

In South Africa, and especially the more tropical portions, one is quite often struck by the resemblance certain insects bear to other objects.—C. G. C. Dickson, "Blencathra", 2 Cambridge Avenue, St. Michael's Estate, Cape Town. 15.ii.65.

Dragonfly Behaviour.—With regard to Mr. J. S. Taylor's observation (*antea,* p. 25) on his being attended by dragonflies in Zululand. This behaviour was discussed and similarly explained in the Bombay Natural

History Society *Journal* in 1961-62. Mr. Harinarayan G. Acharya (*loc. cit.* 58 (3): 819)) reported the habit of Anisoptera near Ahmedabad pacing abeam the rear wheel of his bicycle. Mr. C. Brooke Worth (*id.* 59 (2): 676) recorded the foreshadowing of the front wheel of his cycle, and also of himself on foot, in Natal.—C. F. Cowan, The Cow Roast, Tring, Herts. 28.i.1965.

Suspended Amination in a Moth.—On 6th February 1964 at Devizes an Early Grey, *Xylocampa areola*, was noticed on the trunk of a Cherry Tree which I visited daily to check my max./min. thermometer. The site was exposed, on the southern slope of Roundway Hill, altitude 500 ft. The weather for the next month was frigid with biting south and west winds, and sleet alternating with fog or driving drizzle. Daily, and often at night, I visited this moth, which remained on the trunk for five weeks till 12th March. I once thought I had lost it, but found it had moved round the trunk, probably for better shelter. It moved about six times in all, within a span of nine inches between the south and west sides of the trunk.

The minimum night temperature rose above zero for the first time on 4th March, and remained then between 5° and 8°C, so I hope its disappearance was voluntary and not inside a sparrow.—C. F. Cowan, The Cow Roast, London Road, Tring, Herts. 4.iii.65.

Observations of Apatura iris.—I saw my first Purple Emperor about 3 p.m. on 28th July 1963, a brilliant day in the miserable summer. A female, about 15 feet up on the leaf of a Birch, in South Wilts woodland not very far from Whiteparish. No males seemed to be there, so I drove to another spot and at once saw six, at least four at any one time, careering round a couple of oaks. All appeared quite fresh. A couple more were seen on 11th August.

On 5th July 1964 I parked my car near the first spot again at about 10.45 a.m. and walked along the track. Two White Admirals were coming towards me side-by-side, face-high. They loomed larger—and were *iris*! On reaching the car, one peeled off and sailed up into the oaks, brandishing his white stripes; the other stayed for a closer inspection. For fully three minutes I watched him from less than a yard whilst he skated along the warm radiator grille, intrigued by the dead flies, the caked mud, the engine smell or the A.A. Badge. This was a perfectly fresh male, full ab. *iole*. I feel sure, though I cannot say why, that this pair were two males on their first exploratory flight. After recovering from this visitation, I found, only ten yards from my car and 18 inches from the ground, a fine mated pair of *Hyloicus pinastri*—my first.

I saw no more *iris* till 25th and 26th July in the second spot, where at least four had been caught, one flying round a car the week before. I also heard of one found dead inside a car parked there.—C. F. Cowan, The Cow Roast, London Road, Tring, Herts. 1.iii.1965.

Current Literature

Photoperiodism and Seasonal Development of Insects. A. S. Danilevskii. 304 pp., 8½″ × 5½″, 62 line illustrations, 42 tables. Oliver & Boyd, Edinburgh and London, 1965. Price, 70/-.

This book has been translated from the Russian by J. Johnston, M.A., and edited by N. Waloff, Ph.D. The original was published in 1961 at Leningrad, U.S.S.R., and this is the first English edition.

In the preface the author says that he is familiar with the Lepidoptera and he frequently refers to species of Butterflies and Moths well known to us all. Some Acarina also are dealt with. Thus the book has a wide appeal.

Chapter I treats of diapause, a condition of comparative rest. It discusses diapause in temperate latitudes and in the tropics and it explains how it may be induced by Winter conditions, by wet and dry seasons, by heat or by lack of suitable food. It tells how diapause regulates the life history and the range.

In Chapter II we come to grips with day-length and photoperiodism generally. The author tells us that about 90 species of insects and mites have been studied in his laboratory from this angle. The influence of light was found to be widespread and the experiments covered such aspects as gradual change in day-length, intensity of light and spectral composition. The way in which insects and mites receive the light stimulus, whether by their eyes or in some other way, was also investigated.

Subsequent chapters give details, with graphs and tables, of experiments showing that day-length and not food is the determining factor. When it becomes necessary to distinguish between the effects of day-length on the one hand and temperature on the other, the task of the experimenter is more difficult. It is found that a combination of the two is operative. Many other matters are dealt with.

The size of the Soviet Union helps when investigating the formation of local races by differing day-lengths, southern forms from Sukhumi can be compared and mated with northern forms from Leningrad. The study of the inheritance of photoperiodic reactions by hybridising local races can also be done without the necessity of leaving the Soviet Union.

One wonders sometimes whether the book has not suffered at the hands of the translators. Are they, or is the author responsible for spelling *callunae* with one "l" and for so treating the plant *Alliaria*? One is surprised also to see *Hylophila prasinana* spoken of as a Butterfly and to find our old friend *Lasiocampa quercus* described as the Oak Silkworm. But a really puzzling thing is the use of the generic appellation "*Acronycta*" for *rumicis* and allied species. We had for long called them "Apatele". Perhaps the older name is coming back. Let us hope so.

These, however, are small matters when dealing with a book so full of original matter, so well printed on such good paper and with very clear figures and tables.

It has an appendix listing the species investigated and giving particulars of the result and a reference to the experiment. Finally there are two bibliographies (one Russian and the other non-Russian) and two indices.

T. R. EAGLES

Animals, Vol. 5, Nos. 18, 19 and 20. This monthly magazine carries in these parts, a series of articles by Dr. H. B. D. Kettlewell on the subject of insect adaptations, the first dealing with Brazil, the second Africa and the third the British Isles.

The first paper gives a tabloid account of the many ways in which insects have developed to exhibit a defensive pattern, either in colour, shape, behaviour, or a combination of two or all of these.

Dr. Kettlewell's visit to Brazil was undertaken in order to follow the route taken by Charles Darwin one hundred years earlier, and to report on the insect life in the light of that great author's theories. His writing, of course, bears the hall-mark of one who knows what he is saying, and while being intensely interesting to the intelligent layman, will also spur the more scientifically inclined to make further studies of the matter.

The paper is copiously illustrated with excellent colour-photographs by the author.

The second paper is based on the author's four-year stay in Africa and deals with many interesting problems in mimicry and gregarious behaviour, where many widely different species share a pattern of coloration and associate together. The polymorphic mimicry of *Papilio dardanus*, which has been so closely studied by Professor Sheppard and Dr. C. A. Clarke of Liverpool, receives a considerable portion of attention, and other interesting insect phenomena, including a hitherto unknown female of a species which is found to be wingless, and to be devoured in the cocoon by the larvae hatching from the eggs she has produced, as is the case with many of our Psychid moths. There is also the mention of pupation within the larval skin after the manner of some diptera, apparently to assist in the conservation of body fluids in a desert area.

Illustrations are again from coloured photographs, and one in colour of the bug *Hancenia glauca* resting on a stem with the green forms at the top and the pink forms below, thus giving the impression of a flower spike.

The third part covers the subject of melanism in the British Isles, with reference to the continent and to North America, with which subject the author's name is so closely associated. Here again, the article is well illustrated by half-tone and coloured photographs.

Beside these articles, the magazine carries interesting accounts of animal life in all its many branches, mostly written to interest the intelligent layman, but also highly interesting to the more initiated reader.

S. N. A. J.

Comparative Entomology. Professor Richard M. Fox and Jean Walker Fox. xiv + 450 pp. Chapman & Hall Ltd., London. 76/-.

The authors of this book are attached to the Carnegie Museum of Pittsburg University. The book covers insects, myriapods and arachnids, and is designed to assist those who have the backing of at least one full course in general zoology; it devotes its whole text to material such as comparative morphology, physiology, embryology and evolution. There is no space given to keys for identification or details on collecting and preserving insects, which are readily available elsewhere.

The text is in thirteen chapters, commencing with a balance sheet of harmful and beneficial aspects of the insect world. Chapter 2 deals with the skeleton, which being an exo-skeleton, brings in the matter of muscles and skin structures. It also deals with the general plan of insects, myriapods and arachnids. Chapter 3 deals with appendages, divided between locomotion, antennae, mouth parts, genitalia and spinnerets. A chapter on wings follows covering development, mechanical aspects, coloration and flight.

Chapter 5 deals with maintenance, going into close anatomical detail of various organs, with specialisations in various orders, and finishing with the reproductive systems. Chapter 6 covers the nervous system and is followed by two chapters on embryology entitled Early Embryogenesis and

Postovarian Embryogenesis, and Chapters 10, 11, 12 and 13 deal respectively with Arthropoda in general, Arachnida, Myriapoda and Insecta.

The bibliography is preceded by a list of recommended topical references, and is followed by a bibliography of the text references. A complex index concludes the book.

The book is strongly bound in cloth boards and is very well printed on good paper. The illustrations are mainly line drawings which are very well executed, with a coloured photograph frontispiece. The book shows a very welcome link with humanity in that while its text is strictly scientific, the chapters are headed by an opposite and generally humourous quotation, which should have the effect of going far to preserve a sense of proportion in the mind of the student.

S. N. A. J.

Experimental Entomology. Kenneth W. Cummins, Ned A. Smith, Lee D. Miller and Richard M. Fox. xi + 176 pp. Chapman & Hall Ltd., London. 52/-.

This book is designed to offer a range of experiments with living insects, as an improved alternative to the customary dissection and observation of dead specimens usually offered to students, and the authors claim that this change has in fact stimulated a livlier interest among their classes. A range of experiments is offered for selection, based on *Comparative Entomology*, Fox and Fox, though the experiments may just as well be applied to a course based on any other standard text books.

The first chapter is on morphology and offers six subjects from the giant cockroach, *Blaberus giganteus*, to *Drosophila*, dealing with each in close detail. Chapter 2 on systematics gives a key to the classes and orders of terrestial arthropods and a specimen key to a family of Orthoptera, explaining how a key is made and the terms used. Illustrative of behavioural identification, there is a well illustrated key to the cases of caddis fly larvae. Chapter 3 on genetics sets out a sample experiment with *Drosophila*, salivary gland chromosomes in *Drosophila* and sex determination in *Hebrobracon*. The next chapter is on physiology and deals with such matters as sensory reception illustrated by sex attraction in Saturniid moths, taste in diptera, and chemical factors in determining the foodplant of lepidopterous larvae. The subject of temperature is discussed and an experimental apparatus is described. Insect blood offers an experiment to make a quantitive analysis of free amino acids in the hemolymph. An apparatus is described for respiration experiments. Neural physiology and hormone control of insect growth are discussed with relative experiments.

Chapter 5 on insect behaviour suggests experiments in case-making by caddis fly larvae, the courtship of *Drosophila*, stridulation by Orthoptera and web-building and orientation by spiders, while Chapter 6 lists experiments in ecology.

An appendix lists suggestions for species making suitable subjects for experiments as suggested, followed by hints on maintaining cultures of these insects. There follows a section on various media and materials and special equipment, and finally a note on keys. There follows a list of references cited and an index.

The book is well printed on good paper and is strongly bound in cloth boards.

S. N. A. J.

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THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

ON TWO NEW SUBSPECIES OF THE GENUS *ZYGAENA* FABRICIUS (LEP., ZYGAENIDAE) FROM SOUTH-EAST SPAIN. HUGO REISS ... 85

ON THE OCCURRENCE OF ABDOMINAL BELTS IN *ZYGAENA FILIPENDULAE* LINNÉ, WITH DESCRIPTIONS OF TWO NEW ABERRATIONS (LEPIDOPTERA: ZYGAENIDAE). W. G. TREMEWAN 88

ENTOMOLOGICAL NOTES, 1964. S. WAKELY 91

IN THE LAND OF SHADES. AN OLD MOTH-HUNTER 95

POLYMORPHISM. L. W. SIGGS 98

NOTES ON TWO HAIRSTREAKS (*THECLA BETULAE* AND *STRYMONIDIA W-ALBUM* VAR.), Lieut.-Col. C. F. COWAN 99

INVERNESS-SHIRE IN 1964. Commander C. W. HARPER, R.N. (Retd.), F.R.E.S. 100

HIBERNATION AND PUPATION HABITS OF *COSSUS COSSUS* L. (LEP. COSSIDAE). Commander G. W. HARPER, R.N. (Retd.), F.R.E.S. ... 103

COLLECTING BUTTERFLIES IN THE AUSTRIAN TYROL IN 1964. G. STOUGHTON-HARRIS, M.A. 103

CORNWALL, 1964. Dr. F. H. N. SMITH 105

A FEW NOTABLE DIPTERA FROM WINDSOR FOREST. A. A. ALLEN ... 105

EMPIDIDAE (DIPTERA) IN BRECON AND KIRKCUDBRIGHT. R. M. PAYNE. 109

NOTES AND OBSERVATIONS 110

CURRENT LITERATURE 113

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (227)

TO OUR CONTRIBUTORS

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The Origin of Sugaring

By D. E. Allen

The history of the discovery of 'sugar' has been entered into fairly fully by Allan (1937, 1943). Recently, in going through several natural history journals of the 1830s, I came across a number of additional references which fill in some of the gaps in the record and, in particular, cast important new light on the part played by P. J. Selby. This fresh material has been incorporated into the following survey of all the evidence on the subject that has so far accrued to date.

The earliest observation of the attraction of sweets for moths and the value of this as a means of capturing nocturnal species seems to have been in September, 1831. In that month three London collectors, Walton, Bowerbank and Hoyer, noticed moths guzzling the ripe berries of yew-trees near Mickleham, in Surrey. Returning with their lanterns on the next and subsequent evenings they took a rich haul 'in the very act of feasting on the saccharine juices of the fruit' (Walton, 1835). It does not appear to have occurred to them, however, to use the berries as a bait independently of the trees.

In much the same way Dale (1833) reported that he had observed (though apparently no more than observed) that 'the bottles filled with sugar and water which are frequently hung against walls to attract wasps, and so preserve the wall fruit, will attract moths also'. Some years later Stevens (1843) mentioned that a relative of his had accidentally caught a scarce moth in 1838 near Arundel 'in a bottle containing beer and sugar, that was placed against a wall to catch the wasps'; and perhaps for this reason Stevens, a Hammersmith collector, preached the virtue of mixing sugar with beer instead of water when the fashion for sugaring had caught on (Newman, 1844). Bartlett (1845) also began invariably using these same two ingredients after observing 'a year or two since' some dozen moths drowned in a bottle of sugar and beer hung in a tree to catch wasps.

Even before Dale's note, however, Edward Doubleday (1833), then aged twenty-one, in a now famous letter written in November, 1832, had secured for empty sugar hogsheads the credit for inspiring the first fermentation bait devised and used in entomology. The Doubleday brothers helped to run the family grocery business at Epping and in the course of their daily work had noticed that moths were attracted to hogsheads turned out of their warehouse. Taking the hint, they put out several that were just emptied in open places near gardens and fields, capturing by this means no fewer than 69 species, some of them distinctly uncommon. English (1882), a close friend, claimed to have noticed moths at the grocery hogsheads independently; according to him, the moths came to the bait only in small numbers, chiefly during the autumn and rainy seasons, in summer the bees in a single fine day cleaning the casks of every vestige of sugar.

It is not clear whether this discovery was made in 1832 or even earlier. Nor is it clear how long the Doubledays persisted with their undoubtedly cumbrous technique. We have it on the authority of English that Henry Doubleday never utilised sugar in any other way before 1840; and Edward (1840, pp. 214, 275) only mentions the use of light as his method of collecting Noctuae in his account of his nineteen-month collecting trip to

America. It is not certain, even, that more than one other collector bothered to act on their suggestion. Dale (1833), writing only a month or two later, advised that 'if sugar barrels are heated, they will attract moths much sooner than when cold; some gauze should be so placed as to prevent the moths injuring themselves, and a person should stand near with a net ready'—but these may have been suggestions and no more.

The one other collector whom the Doubledays certainly inspired was P. J. Selby, High Sheriff for Northumberland and one of the foremost ornithologists of the day. At that time birds were still Henry Doubleday's principal interest and it is quite likely that the two were correspondents. If so, it would have been natural for the new method to be recommended when Selby first came to take up entomology seriously in 1835. In a letter quoted by Duncan (1836, p. 105—not 1834, *Entomologia Edinensis*, as cited in error by Allan), Selby begins: 'In the course of my entomological pursuits—for that fascinating department of Zoology has for the last year engrossed a great part of my leisure—my attention was first directed to the mode I have since adopted for the capture of nocturnal lepidoptera, by the extraordinary success that I understood had attended the exposure of a sugar-cask, recently emptied, in a favourable situation'. As sugar-casks were not readily procurable in his part of the country, he cast around for a substitute; and an empty bee-hive (locally known as a skep) generously smeared on the outside with honey, quickly showed itself the perfect answer, as was immediately apparent from the first evening's experiment, which took place in the second half of August. Selby does not specify the actual year referred to in the passage quoted by Duncan, but from the wording considered in relation to the date of publication it seems likely to have been 1835. This is supported by the fact that the first part of his Fauna of Twizell (his Northumberland estate), which included the Lepidoptera, was laid before the Berwickshire Naturalists' Club in December, 1835 (Jardine, 1837, p. 103). Although four years elapsed before the Fauna of Twizell appeared in print (Selby, 1839), it seems fair to assume that the published account was substantially the same as that written in 1835. If this was indeed the case, 1835 is established as the *terminus ante quem* by the fact that the paper contains a description of the bee-hive method—as well as additional comments on its potential usefulness that are identical word for word with those used in the letter quoted by Duncan in 1836. A yet further reason for dating Selby's discovery to 1835 is that this was the first summer when at long last his ten-year series, *Illustrations of British Ornithology*, had been put firmly behind him: it may be that he took up entomology as a refreshing change after a temporary surfeit of birds.

The date of Selby's discovery has been gone into in some detail, because it can now be shown that he was the first person to consider (though not, it would seem, actually to instigate) the more practicable method of sugaring that has been used ever since. This is revealed by a letter in April, 1837, to the Rev. F. O. Morris, who had written for further details after reading the account in Duncan's book. Morris considered Selby's reply of sufficient general interest to send it for publication in Neville Wood's *Naturalist* (1837, **2**: 147), where until now apparently it has lain overlooked. Terming it 'a certain trap for all the nocturnal Lepidoptera', Selby recommended that the hive be placed 'on a forked stick at the most convenient height for taking the insects with the

clippers'. 'I set it', he continues, 'immediately after sunset, and visit every half hour till ten or eleven o'clock, during autumn and summer . . . . The Moths are generally so engaged in sucking the honey, as to allow themselves to be easily taken if quietly approached. A candle or lamp is used, but not left standing with the hive'. In 1836, he adds, he took in this way many rare species not expected in his district (a list of some of these was published in Selby, 1837). On a favourable night in July he had seen the whole outside of the hive covered with moths and taken eighteen to twenty different species on it at a time. 'Anointing the trunks of trees', he goes on, 'would no doubt have the same effect, but it would require a much greater consumption of honey, as wasps, bees, and other insects would devour every particle during the day. Inferior honey answers as well as the best, and I find it more attractive than sugar'.

Ten years later, however, he had changed his mind, perhaps swept along by the subsequent fashion; for we are told (Selby, 1848) that in that season at Twizell Noctuae 'resorted to the boles of the trees anointed with honey or syrup of sugar'. Even if he was not the first to adopt this simpler method, it is clear that he had at any rate evolved a 'sugar-beat', paying periodic visits with a lantern, and in view of this his claim to the title 'Father of Sugar' is surely a stronger one than allowed by Allan (1937).

In his other accounts Selby recorded that he generally selected a sheltered situation, near to wood, for his hive. He had apparently experimented with a variety of other objects but found the local type of bee-hive best, because its larger surface and circular shape made capturing the insects easier. He stressed the potential value of the method for studying the periods of duration of various species and the varying proportions of the sexes.

It is curious that Selby's suggestion of 1837 seems to have met with no reaction from the Doubledays, even supposing that they were aware of it. For the method of sugaring with a brush was invented, apparently quite independently, a few years later by James English, who almost immediately introduced it to Henry Doubleday (English, 1882). Noticing the attraction honey-dew on some plum leaves in his Epping garden had for moths, English hit on the idea of making a kind of artificial honey-dew by dissolving sugar in water and brushing it on leaves. This at once met with immense success.

English dated his discovery to 1843, but, as Christy (1888) later demonstrated, this is certainly incorrect. It would appear, rather, to have been in the summer of 1841. For Humphreys & Westwood (1843-45), in their preface dated October, 1841, had announced that 'Mr. Doubleday has recently tried the experiment of brushing a mixture of sugar and water upon the bark of trees where moths are likely to abound, and found the plan perfectly successful, having captured immense numbers this season in that way, many of them of the most rare and beautiful species'. Furthermore, in a letter to T. C. Heysham of Carlisle in August, 1841, Henry Doubleday had written: 'I go out every night that is at all tolerable. By taking some sugar and water and brushing it on the trunks of trees or sprinkling it on the bushes, you attract an immense number of moths, . . . and with a light you may select what you want'. There are no earlier mentions in the Heysham letters. In March of that very year Doubleday (1841) had relied on working sallows for capturing Noctuae; and he noted

(p. 155) that the season of 1840 had been peculiarly unfavourable for these species, many normally abundant not having been seen at all—a remark that might have been expected to include some allusion to sugar, had he been using it at that date. The wording of another remark (Doubleday, 1842)—'both sucking sugar which I had placed on the trunks of some trees to attract moths'—suggests that even as late as November, 1842, he was conscious that most collectors were still unaware of the method. In the following year (Doubleday, 1843) he used the word 'sugar' in the title of a note contributed to the *Zoologist* and it was this, according to English (1882), which first attracted widespread notice.

Some of the leading collectors had certainly copied Doubleday's method by the beginning of the season of 1842. J. W. Douglas, of London, and Robert Edleston, of Manchester, were two of these, though the latter claimed it was useless: 'possibly', remarked Douglas (1842), 'the sugar he uses is not strong enough; treacle I find does equally well'. (This is the earliest mention of treacle as such.) From letters from other correspondents Douglas concluded that the method was not generally understood by collectors outside London, and he accordingly contributed to the *Zoologist* (Douglas, 1844) a detailed account of it. Some people, he noted, boiled the sugar and water; and more than once he had seen one collector use sugar with rum and another sugar without rum, and the former had had twice as much success. A large number of collectors wrote into the *Zoologist* as a result (Newman, 1844), some warmly thanking Douglas for making such a useful method known, others still complaining of a total lack of success. It was finally left to Gregson (1844) to point out to those who remained sceptical that they were using the wrong kind of sugar: ordinary white household sugar was no good; they needed to use the very dark brown, strong-smelling sugar from the lower part of West Indies hogsheads. From that point on success seems to have been universal.

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Notes on the Affinities and Distribution of various Pierid Species, derived from a study of the Androconial Scales

By B. C. S. Warren, F.R.E.S.

Some collectors and students interested in my previous papers on the Pierid androconial scales have very kindly given me specimens from a number of less well-known localities. For this valuable material which forms the basis of the present paper I am especially indebted to Mr. S. R. Bowden, Herr G. Hesselbarth, Dr. L. G. Higgins, and Mr. G. H. Youden.

A noteworthy feature in Pierid androconial scales is the apparent extent of variation in formation in many types. At first sight this variation seems incompatible with the idea that these types are specific characteristics. But study has shown that when the haphazard variation in some scales is disregarded, a specific constancy in development of the others exists. One feature that has attracted notice is the seeming deviation in width of the scales in many cases. My attention was caught some time ago by two mounts, made from the same specimen, one of which displayed but a limited degree of this variation while in the other it was abnormally prevalent. This suggested that the mounting of the specimen might in some degree be responsible for the difference. Experiment soon proved that alteration of the mount changed the degree of this seeming variation in width. Any scale in a mount, in proximity to others, may be enabled to twist slightly, and the greater the twist the narrower the scale appears to be. It is not possible to detect by simple observation under the microscope whether a given scale has twisted or not. Many actually narrow scales exist. But when a number of what appear to be broader scales are present, together with a number of narrow ones, the latter can usually be shown to be twisted, by pressure on the cover glass exactly above one with the point of a needle. This will tend to flatten the scale, and in proportion as it does so will bring a greater area of its surface into view, thereby increasing the width of the body. A scale displayed at its full size cannot be changed by such pressure (only broken). There is no doubt that the broadest body-formation of any scale shows the true type of that species: anything less is merely inaccurately displayed. In examining a mount the variable formations of narrower bodies may simply be ignored. I noted this previously (Warren, 1963 B), on the strength of the fact that the narrow types showed no constancy of form, while the broadest displayed a considerable degree of uniformity. Where I have given photographs of scales of reduced size in previous papers, such scales are displayed at their full development.

P. bryoniae dubiosa. In the past (Warren, 1963 B) it was shown that the scales of spring specimens from Corte, Corsica, were of a typical 1st. generation *bryoniae* type: similar to the spring scales of other *bryoniae*

races, and that they could not be regarded as *P. napi* as was suggested, but must be the spring form of the Corsican summer race—*dubiosa*. The scales of the latter are close to those of typical *bryoniae*, especially in the presence of the primitive type scale which is characteristic of all races of the insect; though the normal racial scale of the summer *dubiosa* is recognizably different from that of the summer *bryoniae bryoniae*. Proof that these Corte specimens were unquestionably true 1st generation *dubiosa* has since been established. For this we are once more indebted to Mr. S. R. Bowden. He visited Corsica in late April 1964 and captured some of the spring generation specimens near Corte, and from these bred the well-known Corsican summer race, as a 2nd generation. These spring and summer forms, so suggestive of two distinct species, were therefore proved to be but successive generations of one species. Such incontestable confirmation of the reliability of the scale characters is very welcome, and coming to my knowledge at a moment when I was engaged in examining material from eastern localities, from which reliable records concerning this insect were not available, was all the more valuable. Bowden has very kindly placed examples of his captures and bred specimens at my disposal and also examples of his cross-bred specimens, for he has made a number of experiments in crossing *dubiosa* with other races. I am glad to say he is publishing a detailed account of all his work in connection with *dubiosa*.

In one of Bowden's specimens, captured at Venaco, Corsica, on 28th April 1964, I was surprised to find the scales were of a type I had previously only found in 3rd generation specimens; such as that figured (Warren, 1963 B, fig. 9). This type differs very distinctly from the normal 1st generation types (see Warren, 1963 B, figs. 1-3). How could this apparent abnormality be accounted for? The first idea that occurred to me was that this specimen was one that should have emerged the previous autumn, but for some reason was prevented doing so. Yet it did not seem that if this scale type had developed before the winter, the general features of the insect could have acquired the characteristics of the spring-emerging race. Further examination of the specimen showed that while it was apparently a spring example, it was not entirely typical of the spring form. It was smaller in size, and the black apical markings on the upperside of the forewings were reduced, though still more marked than in summer specimens, and there was no discoidal spot. Further, the very characteristic markings on the veins on the underside of the hindwings were not quite as strong as usually seems to be the case in spring specimens. On turning to my notes on a Spanish 3rd. generation specimen, taken at La Granja on 10th September 1935, I found it corresponded very closely to these details. It is therefore probable that this combination of markings and size are frequent in autumn generations; and could therefore be established before the usual date of the autumn emergence. When they appear in a specimen in the spring there is little doubt that this must be a retarded individual of the previous season. Not all autumn specimens are equally strongly marked on the underside, but the smaller size and upperside markings seem mostly constant.

I have already mentioned that Bowden has made several experiments in crossing *dubiosa* with Central European races. The scales of these hybrids have given us a number of important facts which I may briefly note.

Swiss *bryoniae* ♀ × *dubiosa* ♂, Corsica. The scales of this hybrid, a 2nd generation, point to its being an intraspecific cross. Their development is absolutely uniform and perfect; without any trace of malformation. The body of the scale is nearest the *dubiosa* formation; the total length is somewhat less than that of the 2nd generation scale in either parent. The primitive scale (normal to both insects), appears perfect in size and formation, similar to the figure I gave (1961, fig. 30); it seems to occur with much the same frequency as in the parents. The amalgamation of the two types seems perfect, neither predominating. In the intraspecific cross between *P. napi* and *napi adalwinda* this amalgamation is wanting, although there is no disruption in development or signs of malformation; but the scale of the southern *napi* gives place to that of the northern *adalwinda* (see Appendix A, Warren, 1961).

British *napi* ♀ × *dubiosa* ♂, Corsica. The scales of this hybrid indicate it to be an interspecific cross. There are clear signs of the dual parentage. The body form varies between the more or less oval formation of *bryoniae*, and that of the typical *napi* scale, with somewhat flattened sides, as in *dubiosa*. A slight amount of malformation occurs, the neck varies in length, and there is a tendency for the terminal tip of the scale to expand, after the manner that is seen in *P. segonzaci*. This expansion is variable, on occasions it can attain twice the width of the neck but is usually not so great. So far I have only found a very few primitive type scales, which is remarkable for these scales are by no means rare in *dubiosa*. This suggests that the *napi* strain predominates, but on the whole there is more likeness in the body formation to the *bryoniae* type than either *napi* or *dubiosa*. In the occasional appearance of malformation and the marked limitation of primitive type scales, this hybrid forms a remarkable contrast to the *bryoniae* × *dubiosa* hybrid. Comparison of the two indicates the difference in constitution that must exist between *napi* and *bryoniae*. This confirms the value of the data derived from the scales in the past (Warren, 1961). Yet another cross unexpectedly throws further light on the nature of the Corsican *dubiosa*.

P. napi ♀ (Zagreb race) × *bryoniae* ♂, Swiss. The ordinary scales of the 2nd generation of the Zagreb *napi* differ somewhat from those of the western *napi* (although the two races are conspecific), in that the sides of the body are a little flattened rather than rounded. In this the Zagreb *napi* makes an approach to *dubiosa*, yet the hybrid displays very different characteristics than those of the *dubiosa* × *bryoniae* cross. The length of the scales is variable, ranging from shorter than the normal 2nd. generation Zagreb *napi* to longer than those of the 2nd. generation *bryoniae*. Various malformations are frequent, including one which is probably a primitive type scale; this has the full length of the *bryoniae* primitive type but less than half the usual width. No other example was observed; indicating considerable suppression of the *bryoniae* strain. Considering these features one can only conclude they indicate the inability of two specific natures to combine when crossed; a very striking contrast when compared with the perfect amalgamation of characters in the *dubiosa* × *bryoniae* cross.

We may next consider some specimens from various eastern localities. Among the first specimens sent me by Hesselbarth was a small one from the Taygatos Mountains (Peloponnesus), taken on 24th September 1961. The scale, a somewhat short type, suggests one illustrated (Warren, 1963 B,

fig. 8), though slightly narrower with the constriction to the neck more gradual. From such a locality this is almost certainly a 3rd generation, but the scale is slightly larger than the Spanish 3rd. generation specimen illustrated (Warren, 1963 B, fig. 9). There is however, probably no exact constancy in scale formation in the late summer generations; that is any generation after the 2nd. Other Greek specimens came from the Kalliakouda Mountains (S. central Greece), taken at an altitude of 700 mm. in July 1964. These gave a well-developed 2nd. generation scale of full length, with one exception in which the scales were on average slightly shorter. A very characteristic primitive type was obtained in one specimen. This type of scale is decidedly scarcer in all eastern specimens of *dubiosa* that I have so far examined. Further specimens of *dubiosa* were from the Tymphristos Mountains in central Greece, taken at 1200 mm. in July. They showed a well-developed 2nd. generation *dubiosa* sacle. From one specimen several remarkable aberrant scales were obtained, of unusual length, but tapering gradually from base to tip, there being no definite body as distinct from the neck, the greatest width at the base being about double that of the tip. The scent cell had not formed, being represented by a short, thread-like tube of varying length. It is possible that these undeveloped scales are rudiments of the primitive type, for I have found somewhat similar, but much larger scales in an hybrid specimen (*napi* × *bryoniae*), which were obviously malformed *bryoniae* primitive scales (see Warren, 1963 B, fig. 10). No normal, primitive scales were found in any specimen from the Tymphristos Mountains, but this is not to say that such scales never occur in the race of that district. I have already noted that these scales are scarcer in the eastern area, and this peculiarity may be somewhat more marked in these mountains. Finally there was one 2nd. generation example from the Drenovo-Kavadar district in Jugoslavia, among Hesselbarth's specimens. This has normal *dubiosa* scales, such as is shown (Warren, 1963 B, fig. 7); it also gave an example of the primitive type scale. These specimens show that *dubiosa* is widely distributed in the southern Balkans, and it has been recorded from as far north as Herculesbad by various collectors. Rebel's works (1903; 1904 and 1913) support the idea that the insect is wide-spread all over the Balkans. His description of "*napaeae* Esp.", of which he only knew the June generation, almost certainly refers to *dubiosa*. *P. napi*, however, also occurs in various localities in the Balkans. It is known from the Zagreb district, from where the specimens used by Bowden in his experimental breeding came. I have had specimens from Lake Ochrida (Macedonia), to examine, so it seems certain that *napi* and *dubiosa* are both distributed over much of the Balkans and may quite possibly occur on common ground in that area. It is fortunate that the black, apical markings on the upperside of the forewings differ in the two species. The inner edge of the black pattern follows a perfectly even curve from the costa to the point where it ceases on the outer margin in *dubiosa*. In *napi* this edge is irregular and angled. Further, the black spot on the upperside of the hindwings is heavily marked in *napi*, and reduced to a thin line in *dubiosa*. These characters should enable the two species to be identified by anyone fortunate enough to come on them flying together.

P. bryoniae neobryoniae. This race has much in common with *dubiosa*, in fact, in the northern and western areas of its range where the females are mostly white, it might be said to be a northern form of

the latter. The low-level race of *P. bryoniae* which occurs at Meiringen and various other localities in the Bernese Oberland, is a link between *neobryoniae* and *dubiosa*. I described this low-level Swiss race as "*flavescens*" (Warren, 1961), because Müller connected it with that name in his great work (1939). The scales however, especially those of the 2nd generation, prove this race to have much closer affinities to *neobryoniae* than *flavescens*. Another of Hesselbarth's specimens, which came from the Marjanowka district of the Ukraine, taken on 5th July 1960, proved to be *neobryoniae*; the scales were typical, as illustrated (Warren, 1961, pl. 2). This is the most northerly and easterly locality from which I have as yet seen the race. The markings on the underside of the hindwings are stronger than is usual in the summer generation of the well-known western localities, but it is remarkable that the typical western scale-type persists, unmodified, in this eastern locality. The scales are the 2nd generation type (see Warren, 1961, fig. 31). It will be interesting to know if the females of this eastern race are at all varied in colour as the western *neobryoniae* females are, or if they are mostly white, as in the case of the Meiringen race; this seems most probable, otherwise the race would have been identified before. It should be noted that fully-developed primitive scales occur, though rarely, in typical *neobryoniae*, but a transitional type is more frequent. In the low-level Swiss *neobryoniae* the fully-developed primitive type is frequent, as it is in the south-western *dubiosa* from Spain and Corsica. The close similarity between the south-western Swiss *neobryoniae* race and the north-eastern one of the Ukraine, shows there was nothing to prevent the latter insect spreading south to Asia Minor (as *P. pseudorapae* has) and so gaining the eastern Isles of the Mediterranean; or the western Swiss race continuing its southerly drift to Spain and Portugal, where Querci recorded it as plentiful in the Serra d'Estrella in June, August and early and late October; the latter month actually being the period of greatest abundance. The affinity between the populations of the extreme south-west and eastern regions, may therefore not be so surprising as it seems. The apparent absence of *dubiosa* from north Spain, and the fact that it is doubtful if any *bryoniae* race exists in the Pyrenees, seem to oppose this theory. But there was one specimen from the eastern Pyrenees among Hesselbarth's specimens, taken between 1600 and 2100 mm. in July, that has the appearance of being a *bryoniae*. Unfortunately it has lost much scaling and the androconia obtained were few in number and not very typical of, but with most resemblance to, *bryoniae*. On the whole I feel the specimen is a somewhat abnormal *bryoniae*; perhaps racial in the eastern Pyrenee. I have not seen any records of *bryoniae* from the Pyrenees, but Higgins tells me (i.l.) that Oberthür in 1923 noted that the "spring" form of *napi* flies in the Cambre d'Aze district in "summer", which suggests that the insect Oberthür was referring to was not normal *napi*; it may have been some form of *bryoniae* with pale, or white females.

P. pseudorapae. This very remarkable species has been the cause of much uncertainty. Judging from records, it seems that the spring and summer generations have, more often than not, beeen taken for different species: the spring generation being attributed to "*napi*", the summer generation (or generations), to "*rapae*". It has also been mixed with the species I described as *P. higginsi* (Warren, 1961). Even Verity, who described as "*persis*" small or "extremely small" specimens from desert

localities in Persia, seems to have included specimens of both *Pseudorapae* and *higginsi* under that name. *P. higginsi* is so little known it may be well to note the chief characters that distinguish it and *pseudorapae*. The shape of the wings is noteworthy, *higginsi* is a much squarer insect, in both generations; in *pseudorapae* the wings are longer, narrower and more pointed. This alone, renders the two almost unmistakable. The discoidal spot upperside forewing in *higginsi* tend to have the outer edge straight, especially in the male, while the inner edge extends towards the base of the wing. This spot is normally absent on the underside, but can appear as a rare aberration. The underside of both wings is **without** markings and **almost white.** In *pseudorapae* the underside of the summer generations can be nearly as pale as in *higginsi*, but the hindwings show a **very slight** dusting of black scales as in the spring generation. The great difference in the underside markings of the spring and summer generations of most *Pieris* species is well-known, but the disparity in *pseudorapae* is even more pronounced. The dark scaling along the veins of the underside of the hindwings in the spring *pseudorapae* is much more extensive than in *napi*, and spreads to such an extent that not infrequently it extends almost from one vein to those on each side of it; in extreme cases the pale ground-colour visible between the veins is obscured to such an extent that it appears as narrow streaks; causing the specimen to assume a likeness to *S. callidice*! In the summer generations of *pseudorapae* this dark scaling is almost lost, only a **very slight** powdering of dark scales existing, giving the specimen the false likeness to *P. rapae*. I was glad to find in a small collection of spring Pierids from the Constantinople district specimens of *napi*, *pseudorapae* and *rapae* which had been taken by the late Mr. B. Embry in March and April 1923. (I am indebted to Mr. G. Youden who kindly gave me these specimens.) It is interesting to note that the males of *pseudorapae* are distinctly smaller than the *napi* in these Constantinople races. Unfortunately there were no females. This record of these two species flying on the same ground, often on the same day, is noteworthy; for though this is probably no unusual occurrence, there appears to be no certain records of the fact. At the time when Müller was writing about *pseudorapae* (Müller and Kautz, 1939, p. 119), the 1st generation was unknown, or rather unrecognized, and Müller commenting on the *rapae*-like underside of the 2nd generation still notes that it is difficult to understand why this insect should have been attached to *napi*: a remark made by Stichel 30 years before (Stichel, 1910). It is probable that both these authors included *higginsi* under *pseudorapae*.

There is considerable similarity between the androconial scales of *dubiosa* and *pseudorapae*, especially in the 1st. generation. In the scales of the latter the neck is short and broad as (Warren, 1963 B, fig. 5). Examples with scales more as those of *dubiosa* (Warren, 1963 B, fig. 1) are, however, not rare. The insects themselves, however, are easily identified by the characteristic marking of the underside in *pseudorapae*, which has been already described. The primitive type scale occurs occasionally in *Pseudorapae*, but does not attain quite as large dimentions as in either *dubiosa* or *bryoniae bryoniae*. *P. pseudorapae* has hitherto only been recorded in the eastern Mediterranean zone (Syria, Persia, etc.). Constantinople is unusually far north for the species. It was, therefore very surprising to come on a specimen from the Irpen district in the Ukraine: a male captured on 23rd. April 1961; among Hesselbrath's specimens. The

locality is certainly the most northerly as yet known for the species, and its presence there suggests that other races, supposed to be restricted to southern areas, may also extend north to localities from which they are not as yet recorded; such as *P. napi meridionalis*. Little is known of this race of *napi*, but we do not even know if typical *napi* may not occur in S. Italy or Sicily. I have not yet been able to examine the scales of *meridionalis*.

P. segonzaci. Thanks to the kindness of Dr. L. G. Higgins, I have recently been able to examine some more specimens of this fine insect. A curious character I had previously observed was the fact that a high proportion of the androconial scales showed a slight malformation. This was the more remarkable as typical, perfectly developed scales were plentiful. These were of a heavy, broad form as shown in my photographs (Warren, 1961, figs. 25, 26). The type of malformation that appears is of the same nature as is seen in some hybrids (see Warren, 1961, figs. 63, 64, 65). In such hybrids both basal prongs of the scale are affected; in *segonzaci* only one is, the other remaining normal. In the specimens given to me by Higgins I find the same mixture of partially malformed scales together with normally developed ones. The degree of contraction in the affected prong varies extensively. These two types of scales appear then as a normal characteristic in this species. One cannot imagine how such a combination can have arisen except by hybridization; the presence of a primitive type scale suggests that some *bryoniae* race must have been one of the original parents. The present habitat of *segonzaci* may seem to render such an idea impossible, but one finds support for it in the fact that the Palaearctic species *ochsenheimeri* provides a somewhat similar mixture of scale characters: normal scales occurring together with basally distorted scales, accompanied by a primitive type scale. This points to a similar mixture of strains having occurred in eastern Asia. Müller (1939), states that he holds *ochsenheimeri* to be an eastern counterpart of *blidana*, of which he includes *segonzaci* as a "var.". He also points out that the two species (*ochsenheimeri* and *blidana*) have various characteristics in common. Both remain at considerable altitudes and are supposed to produce only one generation in the season. The ground-colour of the underside of the hindwings, though somewhat variable in *ochsenheimeri*, tends to be very pale in both, often almost white. Müller questions if this colour amounts to the true "*subtalba*" feature, as known in *bryoniae*; but even if not, it may well be the result of a latent tendency to that peculiarity. The upperside markings in *segonzaci* and *ochsenheimeri* show various points of resemblance, in spite of the very considerable difference in the size of the two species. Müller of course did not know of the remarkable features of the scales. Taking these facts all together it is difficult to avoid the conclusion that both species (*segonzaci* and *ochsenheimeri*) are the outcome of parallel evolution following a union of somewhat similar strains in widely separated areas in a remote past. In neither case have the features of the dual ancestry been completely submerged. I had hitherto felt that the supposed hybrid origin of some *bryoniae* races was fostered by the excessive variation that exists in certain localities. In *segonzaci* and *ochsenheimeri* there is no such abnormal variability of visible markings or colours; it is the structural elements that indicate the loss of stability. One can only suppose that certain species, at some remote time, were brought into

close association (*bryoniae* and *napi* or *pseudorapae* strains would have provided the necessary characters), and possibly some irregularity in the periods of their emergence provided a stimulus to cross breed, which led by a process of perpetual recrossing to the elimination of either strain in a pure state, gave rise to a compound unity that has ultimately become hereditarily stable. The primitive type scale which is occasional in both *segonzaci* and *ochsenheimeri*, appears to have developed on separate lines. In *segonzaci* it is suggestive of the formation in all *bryoniae* races. In *ochsenheimeri* it is smaller and tends to lose length as it gains breadth, occasionally, as I noted previously (1936 B), becoming much more rounded. The malformation in the basal prong in *segonzaci* only appears on one side of the scale; in *ochsenheimeri* it is not so frequent but may appear on both sides or only on one (see Warren, 1961, figs. 37, 38).

P. rapae. It had not been my intention to go outside the species of the *napi*-group in this paper, but on examining a single example of *P. rapae* from Aksehir, Sultan-Dagh, Turkey, I was astonished to come on what is, unquestionably, a primitive type of a *rapae* scale. This is the only occasion on which I have found such a scale in **any** species of the *rapae* group. The specimen is a summer generation. Unlike what one finds in the *bryoniae* races, this *rapae* scale, in spite of its very considerable size, exhibits the typical formation of the normal type. It is at least 25% longer than the normal scale, and broad in proportion, but the development of the neck is perfectly formed and typical of the species. It appears that in the *rapae* group the primitive scale was in a much more advanced stage of development before it was replaced by the more numerous but smaller scales, than was the case in the *napi*-group species. In the *bryoniae* races the increase to the numerous, smaller scales was accompanied by a more perfect development of form. As this advance had been accomplished in *rapae* before the change in size took place, the transition was probably less protracted and more complete. The primitive type, therefore, almost ceased to exist in the *rapae*-group species. Since my discovery of this remarkable scale in *rapae* I have re-examined such mounts as I still have of *manni*, *canidia*, *krueperi* and *leucosoma*, of both generations, without coming on another example, which goes to prove that the primitive scale has been eliminated in this group of species, for considering its remarkable size one could hardly pass over it in any systematic examination of a mount, carried out with the aid of a mechanical stage on the microscope.

The discovery of this rare scale reminds one that there is, probably still much to be learned from a study of the androconia. It shows that these scales in the *rapae*-group species also originated from a larger type, as the androconia in other Pierid species have done; that the typical *rapae*-group scales have been completely distinct from those of the *napi*-group species, from the earliest times. Further, it emphasizes how widely separated in origin *P. ergane* must be from *rapae*. The superficial resemblance of these two species must be a relatively recent development (? mimetic). Finally, it follows that the specific characters of the androconia must be of much greater antiquity than the more obvious features of colour and pattern which are the results of chance, external influences.

Those who would disregard the androconia because of their small size, will do well to consider these facts. Structural deviations that have

evolved with specific nature must be among the most reliable indications of that nature obtainable. During the long period of time that the species has existed, the external appearance of its races have probably changed several times. The scales, like other fundamental structures will, however, have remained unaffected by the causes that brought about these changes in racial appearance. We are familiar with the wonderful changes in appearance that are seen in cases of mimicry, but we are apt to forget that no structural alteration accompanies such changes.

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Swallowtails in Devon

By An Old Moth-Hunter

In 1895 Tutt asked (*Ent. Rec.*, **7**: 15) "Can Mr. Dobree Fox tell us anything about Devonian *Papilio machaon*? I know they are captured to the number of three or four nearly every year. Has the ground been salted and the insects now endeavouring to hold their own, or is it a dwindled-down natural locality? If put down, naturalists would, I am sure, avoid taking specimens, in order to give the species a better chance of establishing a domicile there, but the fact should be duly recorded, otherwise the individual attempting the acclimatizing deserves tar and feathers—at least 'them's my sentiments'."

This matter was never mentioned again in the *Record*. So the likely inferences are: (1) That Canon Dobree Fox knew, or found out, all about those Devonshire *machaon* and wrote to Tutt that the insect had been 'turned down' by one of Tutt's own contributors (for it was by no means every lepidopterist who shared Tutt's opinions about 'turning down'); (2) Had Tutt found that the *machaon* had been 'turned down' by somebody for whom he had no regard his readers would have been told about it even though the name were withheld; (3) Had these Devon *machaon* been a native colony the Canon would assuredly have expressed this opinion to Tutt, and the Canon's note would have duly appeared in the *Record*, with a further plea to its readers not to catch the insect.

The following depicts an imaginary scene in a Court of Enquiry where the matter of these Devon *machaon* was examined. The preliminaries are omitted. Mr. Tutt is in the witness-box and has been asked by Mr. Probe, Q.C., about the *Record* and about his editorship of it.

Mr. Probe: I would like to draw your attention, Mr. Tutt, to a sentence which you wrote, or at least printed, in your magazine in September 1895. It refers to some specimens of a butterfly called *Papilio machaon*

in Devonshire. This is the sentence (*reads*): "I know they are captured to the number of three or four nearly every year." I take it, then—as of course all your readers will—that you had definite first-hand knowledge that three or four specimens of this butterfly had been caught in Devonshire nearly every year for, let us say, several years. Is it correct, then, for me—and for your readers—to assume that you had actually seen three or four specimens caught in Devonshire for several years and had spoken to their captors?

Mr. Tutt: No, I haven't actually seen them. But I have incontrovertible evidence of the fact.

Mr. Probe: Please tell the Court what that evidence is.

Mr. Tutt: It has been reported to me by several persons of unimpeachable—

Mr. Probe (*interrupting*): Please stop a moment, Mr. Tutt. Have you ever heard of a lawsuit called Bardell v. Pickwick?

Mr. Tutt (*raising his eyebrows*): Yes. It occurs in 'The Pickwick Papers' by Mr. Charles Dickens. But I haven't read it for some years.

Mr. Probe: Then I will refresh your memory about a sentence in it (*reads*). "You must not tell us what the soldier, or any other man, said, Sir," interrupted the Judge; "it's not evidence . . ." You will not need me to remind so erudite a person as yourself, Mr. Tutt, that 'hearsay' in general is not evidence. Please go on.

Mr. Tutt (*a little put out*): Anyhow I had no reason to doubt the veracity of persons of unimpeachable integrity whom I have known and trusted for years.

Mr. Probe: Quite so. I do not doubt that in the least. I am only pointing out that what you are saying is not evidence of a *fact* but merely hearsay of a kind not admitted in law.

Mr. Tutt: Then what kind of evidence do you require?

Mr. Probe: Direct evidence. To prove the truth of your assertion you must tell the Court that you have seen the butterflies in question and have been told by their captors that they were caught in Devonshire. You must satisfy the Court of the *bona fides* of the captors, and, since presumably some at least of them are still alive, produce them to corroborate your evidence.

Mr. Tutt (*annoyed*): I've already told you that I did not actually see the butterflies; but I have not the slightest reason to doubt the fact of their capture in Devonshire. Since apparently you do not believe me, I can produce the evidence of a friend who saw at least one of them recently.

Mr. Probe: By all means let us hear your friend.

(*Mr. Smith replaces Mr. Tutt in the box*)

Mr. Probe: You have just heard Mr. Tutt's evidence, Mr. Smith?

Mr. Smith: Yes, but I should say at once that I did not actually see the specimen to which he referred. It was exhibited at a meeting of our local natural history society a few months ago, and I was told about it afterwards by one of the members. I don't think there can be any possible dobut about it. The members of our society are all very reputable persons. In fact our President, Lord—

Mr. Probe (*interrupting*): I don't doubt your word for an instant, Mr. Smith. But it comes to this: that somebody present at a meeting told you some time afterwards about a butterfly alleged to have been caught in Devonshire, and you told Mr. Tutt, and Mr. Tutt told his

readers. Do you consider that satisfactory evidence of a *fact*?

Mr. Smith: Perhaps not, legally speaking, evidence; but—

Mr. Probe (*interrupting*): It is not evidence at all. It does not even come within the bounds of the hearsay evidence allowed by law. It is merely tittle-tattle, one person telling another what somebody else had told him, and the last person to be told prints it is his magazine prefaced by the words "I know".

Mr. Smith: I think you are a little hard on Mr. Tutt.

Mr. Probe: Then I apologise to him; for the last thing I wish to do is to be hard upon one to whom we all owe so much, so great a figure in the world of Entomology. But I have been briefed to find out, if that be possible, the truth, the whole truth, and nothing but the truth about these *machaon* alleged to have been caught in Devonshire. For all his genius, Mr. Tutt is a man such as we all are and therefore prone to man's failings. We are all apt to jump to conclusions, and the more attractive, even the more interesting, the conclusion the more readily we jump. But please notice that I have not accused Mr. Tutt of jumping to any conclusion. This exercise may have been indulged in before Mr. Tutt was told anything about the matter.

Mr. Smith (*wryly*): That is not very complimentary to me.

Mr. Probe (*smiling*): Present company is said always to be excepted. But seriously, Mr. Smith, any jumping to conclusions that has been done—and I think it has—probably began before even you came on the scene. Tell me now, are you, personally, assured that three or four specimens of this butterfly are caught in Devonshire "nearly every year?"

Mr. Smith (*hesitating*): That's rather a difficult question to answer. I have certainly been told more than once that other specimens have been caught.

Mr. Probe: 'Told', yes; but have you ever *seen* any of these "three or four" specimens caught "nearly every year".

Mr. Smith (*hesitating*): No; I don't think I have.

Mr. Probe: Have you ever spoken to any man who has told you that he hismself caught at least one of them?

Mr. Smith: I don't remember to have done so. But it is quite common knowledge that specimens of *machaon* are caught in Devonshire occasionally.

Mr. Probe: A county legend, in fact, such as St. Paul's landing in Pembrokeshire or that Herne the Hunter still inhabits Windsor Forest; legends so well known to everybody in the county that nobody would think of doubting them. Well, that is all I have to ask you, Mr. Smith. Mr. Tutt, would you mind taking his place again for a few minutes? I have one or two further questions to ask you.

(*Mr. Tutt re-enters the witness-box*)

Mr. Probe: Mr. Tutt, you attach very great importance to truth do you not?

Mr. Tutt: Not merely importance. Truth is Life itself. Without truth the world would be in darkness.

Mr. Probe: And your aim in conducting your magazine is to place the truth and the truth only, and nothing but the truth, before your readers?

Mr. Tutt: It is.

Mr. Probe: Have you ever been mistaken and put before your readers anything which is not the truth?

Mr. Tutt: That is possible. We all make mistakes. Entomology is a living science and our knowledge of it constantly increases. What we held to be a truth yesterday may be found to-day to be a fallacy.

Mr. Probe: I have here a list of statements in your magazine which are now acknowledged to be erroneous. I will read only one of them. You advise your readers to search for the cocoons of the Lappet Moth in wintertime, when they are more easily seen, in spite of the fact that at that season the cocoons would be empty. Is that an example of a truth of yesterday being found to be a fallacy to-day? Or has the truth about the Lappet Moth's life-history been known for many years?

Mr. Tutt: One of my correspondents sent that to me.

Mr. Probe: And you failed to verify it?

Mr. Tutt: One cannot verify everything that every correspondent sends one.

Mr. Probe: Oh! Then it must be not uncommon for your magazine to contain statements that are contrary to the truth?

Mr. Tutt: I do my best to check things; but no living being could check every single thing. Entomology is an ever-growing science and a man's life is a short thing.

Mr. Probe: So it comes to this, that you are bound, by the limitation of time, to print matter which is sometimes untrue; and as your work becomes more and more strenuous you are forced to trust more and more to your contributors, who may—for such is human nature—occasionally, and of course unwittingly, mislead you.

Mr. Tutt: Yes. That may be so. I should never get anywhere if I had to check everything myself.

Mr. Probe: And this matter of Devonshire *machaon* may be but another case of you having been misled, as it were, by one or more of your correspondents who may either have had more enthusiasm than discretion, or perhaps jumped to conclusions, or misheard something that was said to them.

Mr. Tutt: It is possible.

Mr. Probe: Then let me put to you this question. Are you now prepared to tell this Court of Enquiry, quite definitely, that three to four specimens of *machaon* are caught in Devonshire "nearly every year".

Mr. Tutt: Of course they may have been 'escapes'.

Mr. Probe: Quite so. But that is not an answer to my question. Let me put it this way. Are you prepared to vouch for the capture of three or four specimens of *machaon*, caught flying wild in Devonshire "nearly every year"?

Mr. Tutt: No. I cannot vouch for other people's actions or assertions. I have already said it is possible I had been misled.

Mr. Probe (leaning forwards): And those two words "I know"?

Mr. Tutt (hesitating): Perhaps you are right. I can only say that I had, quite certainly, been told by friends or correspondents upon whose words I rely implicity that the facts were as I printed them. I agree that I ought to have written, "I have been informed".

Mr. Probe: Thank you, Mr. Tutt. That is all I have to ask you. Before you leave the box I would like to say that your straighforward

answers to my questions have demonstrated once again—even as you yourself would have it—that Truth must, and in the last analysis always will, prevail over *Hearsay*.

(*He bows to Mr. Tutt, and the Court rises*).

Corsica, May and June 1964

By J. A. C. Greenwood, O.B.E., F.R.E.S., and Dorothy Greenwood

(Being a note to be read in conjunction with Bretherton, R. F., and de Worms, C. G., Butterflies in Corsica, 1962, and Johnson, Major General Sir George, an additional note, *Ent. Rec.*, **75**: 93-104.)

We visited Corsica from 26th May to 7th June, 1964. Most of our time was spent in areas different from those worked by the collectors mentioned above and we were there earlier in the year.

We, too, flew from Nice to Ajaccio, where we picked up our car. We had hired a Renault Dauphine and found it admirably suited to the work. Certainly a small car is an advantage on the mountainous secondary roads. Throughout our stay the weather was hot and sunny and the bathing much to be recommended.

Ajaccio. Monte Salario and the coast road west on the way to the Iles Sanguinaires provided our best collecting areas.

Bonifacio. On 29th May we drove to Bonifacio, the extreme southern point of the island, through very beautiful scenery, but rather a slow route, largely on twisting mountain roads. It took us five hours to reach Bonifacio and, as we wanted to be back before dark, there was little time to collect. The last part of the route passes through a strange area of wild, barren rock and finally crosses large stretches of saltmarsh. Around Bonifacio the country is well wooded and would obviously repay a stay. This is the only limestone district in the island.

Vizzavona. We paused en route from Ajaccio to L'Ile Rousse on 31st May. Altitude 3,000 feet, this lovely district was where Bretherton and de Worms stayed.

Corte. Another stopping place on the way to L'Ile Rousse. A minor tragedy here should be recorded as a warning. The male partner put his best net on the roof of the car to free his hands to take a photograph. Twenty miles further on we stopped and discovered the net was missing. We drove back, expecting to find the net on the road or verges, for there had been little traffic, but no trace. Presumably our best white nylon is now serving as a milk strainer, or perhaps a bride's veil. For the rest of our stay we were handicapped by having to rely on two smaller nets.

L'Ile Rousse. Our base from 31st May until 7th June. The Hotel is excellent, and there are a wide variety of interesting collecting grounds within comfortable reach by car or even on foot. The hillsides a mile or two inland were particularly rich in butterflies.

Forêt de Tartagine. A wonderful, mixed forest, basically Corsican pine but with many other trees, enclosed in a bowl formed by mountains 6,000 feet and more in height, the base being at about 2,000 feet. This would be a most interesting area to work thoroughly. It can only be reached by a somewhat hair-raising narrow and twisting rough stone track along the side of the mountains and stretching for ten miles from the end of the tarmac at Olmi-Cappella. We spent only one day there, the 3rd

June, but it might be possible to stay at the Maison Forestière. The forest is about 35 miles south by road from L'Ile Rousse.

Desert des Agriates. About twenty-five miles east of L'Ile Rousse on the road to Bastia. This is not a desert but a very sparsely inhabited and uncultivated district, extremely hot; hillsides thickly overgrown with shrubs including much arbutus. Ten miles further on, east of the port of St. Florent, there is a luxuriantly fertile valley and many butterflies.

The visitor will find even the coastal areas of the island very fresh in early June, while on the higher mountains there were still considerable quantities of snow. We thought the scenery extremely beautiful and found the island quite unspoilt. The main roads are excellent, and those of lesser importance quite adequate. With the car it was possible to move from our hotel near the sea into collecting grounds very rapidly, and the changes of altitude which could be obtained in a short drive helped us to record species not on the wing at sea level. The people were helpful and friendly, and even in the remoter districts we found metropolitan French readily understood.

Brief comments on the 35 species of butterfly which we recorded follow. We saw surprisingly few moths, apart from fair numbers attracted by the floodlights illuminating the gigantic statue of Napoleon which stands in a wooded park on the outskirts of Ajaccio.

Papilio machaon L. Generally common, some with very dark yellow markings. Almost all were in good condition. No *P. hospiton* Gene were seen.

Iphiclides podalirius L. Sparsely, but generally, distributed.

Leptidea sinapis L. Not seen below 1,000 feet. Numerous and fresh near Corte.

Authocaris cardamines L. One only seen and taken, a male near Corte.

Pontia daplidice L. Fairly numerous near the road from Ajaccio to Iles Sanguinaires. A few near Sartene, half way to Bonifacio.

Pieris (napi) dubiosa Rober. *dubiosa* sparsely in Forêt de Tartagine at 2,500/3,000 feet and very worn. Normal *napi* elsewhere but not common.

P. rapae L. Fairly numerous and quite generally distributed in all areas.

P. brassicae L. Very few seen, possibly only just emerging.

Gonepteryx cleopatra L. Very numerous in one area just outside Ajaccio near Napoleon's tomb and also at Bonifacio. Not seen in the north at all.

Colias crocea Fourc. Plentiful, some very small males, but only two f. *helice* Hb.

Charaxes jasius L. First seen two days before we left. On that day many observed and two caught in Desert des Agriates, probably only just emerging.

Limenitis rivularis Scop. A few seen, only in area near St. Florent.

Issoria lathonia L. Common on hillsides near L'Ile Rousse. Possibly not out when we were at Ajaccio.

Pandoriana major cyrnea Schaw. First seen at L'Ile Rousse on our penultimate day, newly emerged.

Vanessa cardui L. Fairly frequent in all coastal areas.

V. atalanta L. Only one seen, Forêt de Tartagine.

Polygonia c-album L. A few on Monte Salario near Ajaccio and in the Forêt de Tartagine.

Nymphalis polychloros L. Several in the Forêt de Tartagine. None seen elsewhere. Extremely difficult to catch, but one failed to avoid a fast sweep by the female partner. It was particularly delightful to see *polychloros* again, more than forty years after it was fairly common in Hampshire.

Pararge aegeria sardoa Vty. Frequent in shady areas everywhere.

P. paramegaera Hb. Common everywhere, but frequently damaged. Especially numerous on hillside roads near L'Ile Rousse.

Chortobius corinna Hb. Very abundant between Vizzarona and Corte, some in the Forêt de Tartagine.

C. pamphilus lyllus Esp. Common in restricted localities in many areas.

Pyronia cecilia Vallentin. Fresh males but no females, numerous at the end of our stay, in the railway cutting near L'Ile Rousse.

Maniola jurtina hispulla Esp. Very plentiful everywhere. A wide range of variation. Most females have very bold markings and are large.

Lycaena phlaeas aestivus Zell. Generally distributed but not common. some very dark with pronounced tails.

Lampides boeticus L. One only seen and taken, near L'Ile Rousse.

Lycaenopsis argiolus L. Monte Salario, Forêt de Tartagine and L'Ile Rousse, not numerous.

Philotes baton Beigstr. Began emerging during our last two days. A very large and well-marked race. Only seen on hillsides near L'Ile Rousse.

Glaucopsyche alexis Poda. A few very worn near Corte.

Lycaeides idas bellieri Obth. Two only near St. Florent on 5th June, probably just emerging.

Aricia agestris calida Verity. Common on Monte Salario, also near L'Ile Rousse and elsewhere.

Polyommatus icarus flavocinctata Rowl. Brown. Abundant. A few very small individuals.

Chrysophanus rubi L. Worn. In the Forêt de Tartagine only. Probably over elsewhere.

Carcharodus alceae Esp. To our surprise we saw this skipper only beside the railway on the edge of the beach at L'Ile Rousse, where it was abundant. It flitted, rather secretively, amongst tall dried grass and weeds where, in the early evening, it could be boxed easily when at rest.

Pyrgus armoricanus rufosatura Vty. We saw, and caught, only one at St. Florent.

As mentioned earlier, our collection of moths, without any night work other than inspecting lighted shop windows, etc., was sparse.

At Bonifacio we stirred up from the undergrowth three specimens of that fine moth *Minueia* (*Pseudophia*) *lunaris* L. (the lunar double stripe). These flew erratically at great speed so that we captured only one.

Larvae were very hard to find, although on one peach tree a number of larvae of *Limantria dispar* L. (the gipsy moth) were seen walking into a hole in the trunk. Three were collected and two moths emerged after our return.

Obituary

SAMUEL GORDON SMITH

Samuel Gordon Smith, F.L.S., who died on 7th February, 1965, at the age of eighty, was Chairman of W. R. Smith & Sons, Ltd., Tattenhall Bone Works, near Chester, and resided at Estyn, Boughton, Chester.

He was the compiler of an excellent and deservedly well-known list of Macro-Lepidoptera occurring in Cheshire and North and Mid-Wales, and the author or compiler of other Lepidoptera lists, and also published three booklets giving accounts of collecting Lepidoptera (one of them published jointly with E. Nevill Wilmer). He was an enthusiastic and very knowledgeable collector and breeder of Lepidoptera, and had one of the finest collections in the north of England, from which all the Geometridae and the types of *Arctia caja* L. described by him, also the Types of thirteen other aberrations in various other species, are now in the Rothschild-Cockayne-Kettlewell Collection of British Lepidoptera in the British Museum (Natural History) at Tring.

In 1919 he published a *List of Lepidoptera collected chiefly during 1918 in Cheshire and North Wales.* In 1921 he published *Records and Observations of British Lepidoptera during 1920.* (This was followed in 1922 by *Records and Observations of British Lepidoptera during 1921,* with E. Nevill Wilmer as co-author), and in 1923 by *Records of Experiments with Light for attracting British Moths, 1919-1923.* In 1947 the Chester Society of Natural Science, Literature and Art, of which he was Chairman of the Scientific Advisory Committee, published their *Report and Proceedings* for that year —the Robert Newstead Memorial Number—as Vol. i of their Natural History Series. To this he contributed a Foreword and some Lepidoptera records, also descriptions of new varieties of Lepidoptera from Cheshire and Denbighshire. From 1948 to 1954 parts of his well-known list of Lepidoptera occurring in Cheshire and North and Mid-Wales were published by the Chester Society of Natural Science, Literature and Art in their *Proceedings* for 1948, 1949, 1950 and 1951/1952/1953 (Vols. ii, iii, iv and v of their Natural History Series). In Vol. ii, in order to make the list as comprehensive as possible, he incorporated most of the records contained in G. O. Day's *List of Lepidoptera* (1903) and the Cheshire records contained in J. W. Ellis' *The Lepidopterous Fauna of Lancashire and Cheshire,* revised by W. Mansbridge, 1940, also records from A. O. Walker's *Macro-lepidoptera of the Chester District* (1885). Vols. iii, iv and v contained descriptions of new abberations of *Selenia bilunaria* Esp. In 1956, in the *Annual Report and Proceedings* of the Lancashire and Cheshire Entomological Society for 1953/54 and 1954/55, he published a list of Lepidoptera records for Lancashire and Cheshire and the Welsh counties dealt with by him in the *Proceedings* of the Chester Society of Natural Science, Literature and Art (their Natural History Series Vols. i to v), additional to those given in those volumes and additional to those given in J. W. Ellis' *The Lepidopterous Fauna of Lancashire and Cheshire,* revised by W. Mansbridge, 1940.

In co-operation with J. D. C. Boyes, he bred *Arctia caja* L. for over ten years, producing some remarkable aberrations, some of which were new. Many of these were described and named by him in *The Entomologist,*

The Entomologist's Record and the *Entomologist's Gazette.* Others were described and named by him and J. D. C. Boyes in the *Entomologist's Gazette.* Many of the descriptions were accompanied by figures. He carried out breeding experiments with a strain of *Lasiocampa quercus* ab. *olivacea-fasciata* Cockerell. An account of this work appeared in *The Entomologist,* Vol. 87: 225-227. He bred twenty consecutive generations of *Selenia bilunaria* Esp. and produced many new forms.

He was for many years Chairman of the Scientific Advisory Committee of the Chester Society of Natural Science, Literature and Art. That society awarded him the Charles Kingsley Memorial Medal in 1929.

He was a Fellow of the Linnean Society, and was made a Life Fellow about 1959. He became a Fellow of the Royal Entomological Society in 1919, and was one for forty years. He was a member of the South London Entomological and Natural History Society from 1920-1958. He joined the Lancashire and Cheshire Entomological Society in 1918, and was President in 1923 and from 1947-1957. He was made an Honorary Member of that Society in 1931, and an Honorary Elder Member in 1956 after he had been obliged to cease taking part in their activities owing to ill-health. He joined the Manchester Entomological Society in 1919, and was a member for many years.

A most generous and hospitable man, he was always ready to help others. He frequently had entomological friends to stay with him at Estyn and conducted them to various localities in Cheshire and North Wales to collect local species. At field meetings of the Lancashire and Cheshire Entomological Society all who attended were welcome to collect specimens after dark at his powerful portable electric light and his mercury vapour light, and where possible, all were entertained at tea by him at a local café in the afternoon. For a number of years he defrayed all the expenses in connection with the Annual Exhibition and Conversazione of that society, held at the Exchange Hotel, Liverpool. He also contributed handsomely towards the cost of publishing their Annual Reports and Proceedings.

He is survived by his wife and seven daughters. To them we offer our profound sympathy in their great loss.

R. C. R. C.

Current Notes

On 23rd-24th September, the Royal Entomological Society of London is holding a symposium on insect behaviour at the Imperial College of Science Mechanical Engineering Lecture Theatre, Exhibition Road, London, S.W.7.

The meeting commences at 2.20 p.m. on Thursday 23rd, and after an opening address by the President of the Society, Mr. E. O. Pearson, Professor G. Birukow will speak at 2.30 on Orientation behaviour in insects, followed at 3.30 by Dr. P. S. Corbet on the role of rhythms in insect behaviour. A tea interval follows and at 5.00 Dr. P. T. Haskell speaks on Flight Behaviour. At 6.30 there is a sherry party at the Society's rooms.

On Friday, 24th September, Professor Birukow will be in the chair, and the meeting opens at 10.00 a.m. with a paper on Feeding Behaviour by Professor V. G. Dethier and at 11.15 by Dr. A. Manning on Sexual Behaviour and at 12.15 p.m. by Dr. J. D. Carthy on Insect Communica-

tion. After luncheon, Professor E. O. Wilson speaks at 3.00 p.m. on Behaviour of Insect Societies and after an interval for tea, Dr. J. S. Kennedy, F.R.S., speaks on Some Outstanding Questions in Insect Behaviour, followed by closing remarks by the President.

A registration fee of £1 10/- will be payable (15/- in the case of undergraduates), not later than 31st July, and a fully-bound Symposium volume edited by Dr. P. T. Haskell will cost £2 5/- (£1 15/- to Fellows of the Society).

The application form for tickets may be obtained from the Registrar, Royal Entomological Society of London, 41 Queen's Gate, London, S.W.7.

Notes and Observations

BUTTERFLIES AT LIGHT.—May I be permitted to add my observations to the recent correspondence regarding the attraction of butterflies to mercury vapour light?

On the night of 4th October 1964, I was running my portable generator in a car park overlooking the sea near Swanage, Dorset. I kept the light on until about 11.30 p.m. and, up to that time, eleven specimens of *Vanessa atalanta* L. had visited the sheet. At one time they were all "sunning" themselves in the light, although several later went to sleep.

I do not know whether the following will count as a genuine record but, during the evening in question, a small *Colias croceus* Fourc. also visited the sheet and went away again. Just before it arrived I had been beating some brambles nearby, and I may have disturbed it.

During the night I had three more *atalanta* in two moth traps. Other migrants recorded on the 4th included 66 *Plusia gamma* L., 17 *Nomophila noctuella* Schiff. and two *Nicterosea obstipata* Fab., whilst the rest of that week produced eight more *atalanta* (by day), eight more *croceus*, 35 more *gamma*, 4 more *Leucania unipuncta* Haw., and five *Lithophane leauteri* Boisd.—R. HAYWARD, 41 Suffolk Road, Southsea, Hants. 11.iv.1965.

A NOTE ON ACOSMETIA CALIGINOSA HAW. (THE REDDISH BUFF).—A small brood of this species, reared from eggs, has recently emerged, and several points of interest were noted. The larva pupates on, or just under the surface, making a tough cocoon of silk and earth. It was noticed that immediately after the emergence of a moth, the front of the cocoon was quite wet. In order to observe what happened during this critical event, several pupae were removed from their cocoons. The emergence of a moth was seen on several occasions. The moth bursts open the front of the pupa case and pushes out its head and part of its thorax. It then remains quite motionless for five to ten minutes during which time a drop of clear, colourless liquid appears in front of the head. No doubt this liquid would normally be quickly absorbed by the cocoon which would thus be softened. Testing the liquid with red and with blue litmus paper showed it to be neither acidic nor alkaline. After the quiescent period, the moth suddenly becomes very active, and within a few seconds frees itself of the pupa case, runs up any nearby vertical surface, and settles down to the business of wing expansion.

An unusual feature was the tendency of females to emerge before the males. The first six specimens were females, then came a mixture of both sexes, and the last seven specimens were all males.—T. D. FEARNEHOUGH, 26 Green Lane, Shanklin, I.o.W. 21.iv.1965.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

THE ORIGIN OF SUGARING. D. E. ALLEN 117

NOTES ON THE AFFINITIES AND DISTRIBUTION OF VARIOUS PIERID SPECIES, DERIVED FROM A STUDY OF THE ANDROCONIAL SCALES. B. C. S. WARREN, F.R.E.S. 121

SWALLOWTAILS IN DEVON. AN OLD MOTH-HUNTER 129

CORSICA, MAY AND JUNE 1964. J. A. C. GREENWOOD, O.B.E., F.R.E.S., and DOROTHY GREENWOOD 133

OBITUARY 136

CURRENT NOTES 137

NOTES AND OBSERVATIONS 138

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (231)

TO OUR CONTRIBUTORS

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Swallowtails in Devon

By A. H. Dobson

When I read Old Moth Hunter's article 'Swallowtails in Devon' I felt a pang of sympathy for Tutt. Firstly, had he been present at an imaginary Court of Enquiry held at the present time, he would have had evidence, though certainly *not* to support his statement "I know they are captured to the number of three or four nearly every year". Secondly, one is still bedevilled with hearsay about *machaon* in Devon, and records have been difficult to obtain.

So to escape being examined by Mr. Probe, certain hearsay evidence about *machaon* being seen inland in S.E. Devon is being omitted from this discourse. The first piece of evidence and the freshest, is that Dr. R. H. Clarke observed for several minutes one flying on July 22, 1964, over bracken and heather at Bolt Head. Alas, he was unable to catch it or even observe it settle. The second piece of evidence is that in 1943 three occurrences were noted, though the third probably resulted from the second. On August 10, 1943, a specimen was reported taken on the cliffs of South Devon, one mile east of Sidmouth, by R. J. Sherlock, a thirteen-year-old boy. This was recorded in the October issue of the *Entomologist,* 1943. In the same year, in early July, in my raw youth when twelve years old, I found a nearly full grown larva of *machaon* on an umbelliferous plant at the edge of the upper lake in Cockinton Gardens, Torquay. The larva I identified from my well-handled and somewhat grubby edition of Observer Book of Butterflies. However, the poor creature was put out of doors in a cardboard box and duly escaped the next day. Alas, I had not at that time come under the care of an older and more experienced entomologist, to guide my footsteps, else that never would have happened. In the 1950's when conversing with the late Dr. Gough at the Torquay Natural History Museum about butterflies, I told him about my finding a larva of *machaon*. He commented with "That is interesting, as I saw a Swallowtail flying in my garden in August of the same year". Whether that specimen was the resulting imago of my lost larva or was from another larva or, indeed, a migrant specimen, I shall never know.

Whether the rare occurrences of *machaon* in Devon are due to escaped or released specimens I would not like to say. However, in the case of the specimen Dr. Clarke observed, I feel that it was a migrant as *croceus* and *cardui* were seen the same day. Through all the various contacts in the county I certainly have not met or heard of anyone who has allowed *machaon* to escape, or who has tried to establish the species. The trouble is that most of the specimens seen cannot be caught, or seen to settle at close quarters, so it cannot be determined whether the species are our sub-species *britannicus* or the French *gorganus*. The past appearance of *machaon* in this part of the country tends to become a legend. Nearly everyone is acquainted with this handsome fenland beauty either by seeing it in illustrations in books or as specimens in collections. So that when seen by people with little or a general interest in insects, they will certainly remember the beauty, but the data is not written down as they do not keep records of their observations. Years later one stumbles across a piece of information that a Swallowtail was seen by somebody, often

nameless, at some time in some area. In fact, the information is as good as useless and cannot be recorded. Another reason for data not being written down or even passed on to a collector or recorder is that every Swallowtail seen out of fenland, and perhaps Kent, is considered an 'escape', when in fact they could have been migrants from France which probably reached us via the south coast. So, regarding the legend of *machaon* in Devon, it certainly still exists, but I hope this disclosure will prove that there is a little fact; *machaon* has occurred in more recent years. I feel rather sorry for *machaon;* its rare occurrence in southern England is not treated like the 'hot news' of a *boeticus.* With all the publicity, I doubt if *machaon* will put in an appearance in the south or south west for a good number of years, but if anyone does see one, please do send full details to the recorder for the county concerned.

The Cossus Conundrum

By Dr. H. B. D. KETTLEWELL

It is a great pity that Commander Harper did not read my note on *cossus* more carefully before rushing into print, and I must therefore put straight certain errors:—

1. I have not concluded that *cossus* "habitually pupates in earth mounds" but have produced evidence that some individuals do so and that others choose wood.

2. To substantiate the former, I have not "only a single observation to work on". I quoted in fact the following:

F. C. Fraser—eleven plus others.

Miss Haines—two imagines plus "a number of empty pupa cases" (some of which may have been included in Fraser's record).

Scarsdale Brown—a "mass of cocoons and empty pupae" on a railway line near infested poplars.

3. Commander Harper, who seems somewhat preoccupied with statistical studies in both his papers, would, I am sure, concede that direct observations such as these must be made in the first place before statistics can be of use. Hypotheses (or models) can then be formulated to test a situation. Only then can statistical analyses be employed.

4. In spite of Commander Harper's protestations, it is now evident that two very different pupation sites are chosen. In view of this, I suggested one of a number of possible hypotheses to explain such a clear-cut behaviour difference.

5. Furthermore, Fraser and Haines showed that the larvae of *cossus* chose, and that the pupae survived in, nests of the ant *Lasius flavus* F.

Does Commander Harper really believe that any Lepidopteron could exist there without first coming to terms with the ants by producing either a repellent or attractant substance? I suggested the former as being the more likely, possibly specifically for this purpose. At a time when so much knowledge is being amassed on chemical repellents in insects both in this country and the United States, and when more and more habit differences are being shown to be controlled genetically, it seemed not amiss to have put forward such suggestions in regard to *cossus.* My object in doing this was to encourage others to contribute further field observations.

I regret that, in the final paragraph of his last paper, Commander Harper excludes himself from participation in further "statistical studies" on this species on the grounds that he cannot find it in Inverness-shire. This is indeed surprising as W. M. Reid of Pitcaple recorded it from Aberdeenshire, and Charles Barrett states that the species was "abundant and destructive" in Morayshire, which is further north.

Maybe Commander Harper should examine anthills!

Sub-Department of Genetics, Department of Zoology,
Parks Road, Oxford.

Insect Conservation: An Appeal

Since the publication of the appeal made by the Honorary Secretary of the Committee for the Protection of British Insects (1951, *Proc. R. ent. Soc. Lond.* (C), **16**: 23-24), that committee has been reconstituted as the Conservation Committee of the Royal Entomological Society of London. The original committee was instituted in 1925 as a result of many complaints in the entomological journals of that time about the activities of unscrupulous collectors; certain species were being threatened with extinction. Since its institution the Committee has met with considerable success, and some of those insects most threatened in 1925 are now considered to be much more firmly established.

Modern agricultural practices, the widespread use of insecticides and herbicides, urbanisation, the present heavy forestry programme, and sometimes the well-intended activities of local authorities, may threaten the existence of rare or local species through the alteration or destruction of their habitats. The Conservation Committee has taken an active part in minimising the risks that have arisen from such causes, and has been careful to co-ordinate its activities with those of other organisations interested in nature conservation, particularly the Nature Conservancy. With the co-operation of entomologists it is hoped to do even more in the future to preserve the natural conditions essential to the existence of particular insects.

These activities should be sufficient to safeguard rare or local species of the less popular orders, but some species of Lepidoptera are threatened with extinction at the hands of thoughtless collectors. It is with regret that the Committee has to record that reports are still sometimes received of collectors using methods of mass collection on local species; such methods may well cause populations of such species to be reduced below the survival level. Collectors are again earnestly requested to use the utmost restraint in taking any of the species listed below in any of their stages, particularly when adverse factors have reduced their numbers. The indiscriminate capture of large numbers of these species may not only endanger their existence but also render more difficult any negotiations taking place with a view to preserving them and their habitats.

Papilio machaon L. ..... Swallow Tail
Melitaea cinxia (L.) ..... Glanville Fritillary
Mellicta athalia (Rottemburg) ..... Heath Fritillary
Maculinea arion (L.) ..... Large Blue
Lysandra belargus (Rottemburg) ..... Adonis Blue
Strymonidia pruni (L.) ..... Black Hairstreak

Catocala fraxini (L.) ..... Clifden Nonpareil
Minucia lunaris (Denis & Schiffermüller) ..... Lunar Double Stripe
Colobochyla salicalis (Denis & Schiffermüller) .. Lesser Belle
Coscinia cribraria (L.) ..... Speckled Footman
Aplasta ononaria (Fuessly) ..... Rest Harrow
Thalera fimbrialis (Scopoli) ..... Sussex Emerald
Scopula immorata (L.) ..... Lewes Wave
Scopula nigropunctata (Hufnagel) ..... Sub-angled Wave
Eustroma reticulata (Denis & Schiffermüller) .. Netted Carpet
Epione paralellaria (Denis & Schiffermüller)
[*vespertaria* L. sensu Fabricius] ..... Dark Bordered Beauty
Zygaena viciae (Denis & Schiffermüller) ..... New Forest Burnet
Bembecia chrysidiformis (Esper) ..... Fiery Clearwing
Eucnemidophorus rhododactylus (Denis &
Schiffermüller) ..... Rosy Plume

In 1962 the Nature Conservancy, at the instigation of the Committee and the Devon and Cornwall Naturalists' Trusts, undertook the financing of an investigation into the status of *Maculinea arion* (the Large Blue), which has been declining in numbers for some years and is now at a very low ebb, with a view to taking the necessary conservation measures. This investigation, which took place during 1963 and 1964, has proved that the fears of the Committee were only too well founded. In 1963 some 80 specimens were seen and marked in the now very restricted locality for this species. During 1964, in spite of better weather, very few more specimens were seen, and the individual sites within the general locality had been reduced still further. In these circumstances it is imperative that collectors abstain from taking any specimens of this butterfly until its numbers have increased considerably; this species, which is evidently on the verge of extinction in England, will otherwise be lost.

The Committee would be glad to receive any practical suggestions from entomologists. In particular it would urge them to notify the Committee at the earliest possible moment of any observed threat to a rare or local species or its habitat, so that protective measures may be taken before it is too late.

T. R. E. Southwood, *Chairman*,
Conservation Committee.

41 Queen's Gate, London, S.W.7.
May 1965.

Church Property

By An Old Moth-Hunter

It was not the Vicar who started it: he had been an ardent lepidopterist from his youth and would never have allowed such a contretemps to occur. Nor was it Tom Burley, the village blacksmith who, as Longfellow informed us years ago, was a mighty man with large and sinewy hands, and the muscles of his brawny arms were strong as iron bands. He, too, wielded the butterfly-net on his afternoons off. It wasn't even the Squire, General Sir Julius Hunter-Bugge, whose addiction to entomology had started with the capture of a Ruddy Highflyer in the chapel at Eton during morning prayer and on being told the name of his capture by a biology

master, and coming of a sporting family, at once decided to begin collecting. Nor was it the village schoolmistress, Miss Priscilla Bottomless, who could tell a hawkmoth from a handsaw almost at a glance.

It was started by a little undersized choirboy who was so stupid that Miss Bottomless told his parents he had better take up the collecting of butterflies and moths or some such harmless pursuit for which no intelligence whatever was required. But he had a high if somewhat shrill voice, so Vicar and organist between them trained him to sing in the choir. They found that he had a sufficiently good ear to sing in tune, or more or less in tune—and what does half a tone matter when all the other boys are going flat out?—and he could take the E *in alt* with ease even if it were a bit squeaky. So Giles Bagnet became a favourite with the motherly part of the congregation and was made to sing at the village concerts, because he always said 'yes' to every question he was asked. Consequently when it became known in the village that Giles was keeping caterpillars in jam jars, that is to say was becoming a lepidopterist, everybody who found a caterpillar on his rhubarb or lettuce put it in a jar and sent it to Master Bagnet.

Now one day when Master Giles was standing beside the gardener at 'The Laurels' watching him cut some overhanging branches of a beech tree the man of the besom suddenly stopped and pointing to an object on the twig he was about to cut said, "Strewth! Just look at that ruddy great spider!", and with the tip of his shears he indicated a full-grown larva of the Lobster Moth. It was a natural mistake to make, for *S. fagi*, alarmed by the proximity of the gardener's shears or perhaps by the unusual movement of its twig, was squatting on its haunches with its six prolegs raised threateningly.

The moment Giles saw it he recognised it: it was exactly like the coloured picture of a Lobster Moth caterpillar in a book which the Vicar had given him.

"Don't you 'urt 'im", he squeaked. "It's a cattypillar, that's what it is. Give 'im to me".

"Caterpillar, is 'e?", said the gardener. "I knows better. 'E's a nasty stinging spider, 'e is. I'll show ye 'ow to deal with 'im", and he raised his shears menacingly to bisect *S. fagi*.

At this, Giles let out a shrill E *in alt* squeak. "Give 'im to me", he shrilled. "I wants 'im; I'll look arter 'im".

Just in time the gardener paused, then cut off the twig with *S. fagi* intact and handed the twig to Giles. "You look out", he said. "'E'll sting you something awful if you ain't careful".

So Giles carried his larva home and as his parents shared the gardener s opinion about Lobster Moth caterpillars, he put his capture in a small larva-cage which the blacksmith had made for him and carried it down to the forge. Tom Burley confirmed the identity of the larva.

It was unfortunate that Giles' parents did not share their son's affection for the Lepidoptera. "Nasty, creepy crawlies", Mrs. Bagnet called them. Mr. Bagnet said nothing, but when later that day he found a Yellow Underwing larva crawling on the window-sill he bent his forefinger on his thumb, close to the larva's posterior, and straightened his finger with such suddenness that Giles saw his caterpillar describe a parabola until it came to rest somewhere in the kitchen midden.

Master Bagnet therefore having no confidence in his parents, at least

where the Lepidoptera were concerned, and the next day being Sunday and not daring to take the risk of leaving *S. fagi* in the custody of his mother and father (who were backsliders), he carried the box containing his Lobster Moth larva to church and, going early before the other choirboys and organist had arrived, cast a surplice over the larva-cage, walked into the chancel, and put the cage beside the hassock at his place in the choir-stalls.

Now if only Master Giles had remembered that the larva-cage adjoined his hassock all might have been well; but it chanced that that morning there was a procession and when Master Giles filed into his choir-stall his mind was full of holy thoughts instead of Lobster Moths, and finding his hassock out of place he gave it a hearty kick. In fact it was not until he sat down at the end of the *Te Deum* that he remembered his *fagi* and, stooping, felt for the larva-cage. To his dismay he found that it was lying on its side with the door wide open! Under pretence of a fit of coughing he managed to shut the door and could only hope that *S. fagi* was still *in proprio situ.*

Imagine, then, Master Bagnet's horror when, chancing to look navewards he perceived his caterpillar sedately perambulating a moulding on the chancel screen, plainly making its way towards the pulpit!

What on earth was he to do? With his eyes glued upon *S. fagi* he watched it disappear at the end of the screen and was just beginning to hope that it had changed direction earthwards when it reappeared on the top of the pulpit-door!

The Creed had been recited and they were approaching the First Collect when, in an agony of mind, Giles saw his caterpillar hesitate at the end of the pulpit door. And there it stayed. The Vicar would be bound to see it the moment he mounted the pulpit-steps and opened the door. The Second Collect was recited, then the Third, and great was Giles' relief when he saw *S. fagi* resume its walk just as the Vicar approached the pulpit . . . .

Now the Vicar of Slopley Bugwash was a member of the Church Militant. That is to say he did not read placidly the sermon he had been at such pains to prepare during the preceding week. He preached extempore and he addressed his congregation as a band of sinners. He raised his voice; he leant over the edge of the pulpit; he waved his arms and pointed skywards. With horror Giles saw that his caterpillar had resumed its perambulation and now was very nearly in front of the preacher!

At this moment the Vicar reached the climax of his discourse. With hand raised on high he denounced the Devil and all his works and to clinch the matter brought down his first with a crash on the pulpit-rail.

The Lobster Moth escaped by inches; it had already survived the gardener's shears and Giles's boot; clearly it had a charmed life. But as the pulpit shook under the Vicar's denunciation, *S. fagi* reacted violently. It sat back on its abdominal somites, raised all its prolegs on high, and vibrated them with all its might. And it continued to vibrate them for nearly a minute.

It happened just then that the Squire, who with his wife occupied the pew immediately below the pulpit, saw the larva. He peered at it, then he put on his glasses and stared. Yes, it was undoubtedly a larva of *S. fagi*, a rare insect at Slopley Bugwash. "My dear", he said to his wife in a

loud whisper, "there's a Lobster Moth larva on the pulpit. Can you see it"?

"S-s-sh"! said Lady Hunter-Bugge.

"Well, but if the Vicar thumps the pulpit again he may squash it. Don't you think I'd better remove it?". And he pulled a glass-topped box out of his pocket and prepared to leave the pew.

"Don't be silly", said Lady H-B, catching hold of her husband's coat. "You can't possibly get it now. Wait till the service is over".

Happily at that moment the sermon came to an end. The Vicar descended from the pulpit leaving *S. fagi* in possession. Master Giles's cattypillar has passed out of its owner's field of view; but the Squire's eyes had never left it for a moment.

Never had the concluding prayers seemed so long to the Squire; but at last the Blessing was given, the choir filed out into their vestry, and as the congregation was shuffling towards the nave doors the Squire approached the pulpit and deftly flicked *S. fagi* (whose grip on the polished wood was none too secure) into his opened box. He then collected the alms-dish and carried it into the Vicar's vestry.

Meanwhile Master Bagnet having discarded his surplice was anxiously searching the pulpit for his Lobster Moth. He dared not mount the pulpit-steps to look inside but he searched every nook and cranny on the outside in which a full-grown Lobster Moth larva could secrete itself. All in vain. *S. fagi* had disappeared into the blue. Master Giles burst into a high-pitched blubbering.

"Hullo, young Bagnet", said a voice beside him. "What are you blubbering about?". It was Tom Burley, the blacksmith, who had watched the Squire's manoeuvre with interest.

"Boo-hoo. Wants my cattypillar".

"What caterpillar"?

"My Lawbster Mawth, same as what I showed you yesterday. 'E climbed on to the pulpit and I can't find 'im. Boo-hoo-hoo".

"You didn't oughtn't never to have brought him into church", said Tom Burley; and seeing how the land lay he hurried into the vicar's vestry. He was just in time to hear the following conversation:—

Vicar: "By the way, Squire, I noticed that you removed something from the pulpit just after the choir had left the chancel. What was it?".

Squire: "Something you missed, Vicar. Look at this". He took the little box containing *S. fagi* out of his pocket and handed it to the Vicar. "That's only the second specimen taken in Slopely Bugwash in ten years".

Vicar: "Very nice, and very good of you to get it for me. Many thanks".

Squire: "Er—if you don't mind, Vicar, I think I'll keep it for my own collection".

Vicar: "Sorry Squire, but as it was found inside the church, of which the contents are in my keeping, it is my duty to retain it".

Squire (*rather coldly*): "It is hardly necessary for me to remind you, Vicar, that the advowson of this church belongs to me. As such, I have a duty to the Ecclesiastical Commissioners to preserve this church's property. Please return the box to me".

At this point Tom Burley, who also coveted the larva and had long since made up his mind to offer young Bagnet a new threepenny piece

for it, put in his oar. "Sorry to differ from you, Sirs", he said, "but as People's Warden I must remind you that every non-litur-giccal thing brought into this church remains the property of the Parochial Church Council until the Council decides how to dispose of it. So if you'll excuse me, Vicar, I'll ask you to hand that box over to me on behalf of the Council". He held out a hand to receive *S. fagi.*

Vicar: "I dispute that. This larva is in the same class as the fruit with which the church is decorated at our harvest festivals. It is I who decide the destination of the fruit. So it is for me to say who shall have the larva. This church's property is vested in me so long as I am vicar of the parish".

Burley: "Why, Vicar, if you decides it's church property us'll have to apply to Bishop for a faculty to dispose of it, and that'll cost us a pretty penny. And then there'll be proceedings under Chancellor of the Diocese to pay for. Cost us a mint o' money, it will. 'Taint worth it. You give 'un to me and I'll see that it gets to its rightful owner".

Vicar and Squire (together): "But that's just what we want to find out".

At this moment a high-pitched "Boo-hoo" was heard and all three turned to face a nasty little boy with a blubbery face who was standing in the doorway. "Please, Zur", he sobbed, "I wants my cattypillar". For Master Bagnet had followed the blacksmith to the vicar's vestry and, standing in the doorway, had overheard the foregoing conversation.

Vicar: "Oh, it belongs to you, does it, Bagnet? Then how did it get on to the pulpit?".

Giles: "Please, Zur, I brought 'un into church 'cos my mum don't like cattypillars, and 'e got out of the box".

While they were all talking and trying to resolve this knotty point of ownership, the Vicar had put the glass-topped box containing *S. fagi* on a ledge under the air-intake of the electrical blower, and the organist, who was playing the voluntary, requiring the G *in profundo,* pressed hard on key and pedal, whereupon a sudden gust swept box and larva into the bowels of the organ.

The blacksmith saw it go. "That's torn it", he said, and as the Vicar and Squire looked at him enquiringly, he pointed to the empty ledge.

"Where's the box"? said the Squire.

"Gone to 'eaven", replied Tom. "We shan't never see that caterpillar no more".

The three men looked at one another but spoke no word. There was silence in the vestry, broken only by a high-pitched sobbing—

"Boo-hoo-hoo. Wants my cattypillar . . . ."

U.N. AGENCIES TO FIGHT FRUIT FLY IN CENTRAL AMERICA

The United Nations Special Fund has decided to support a project aimed at developing methods of eradicating the Mediterranean fruit fly in Central America.

The technique to be used, already employed with success against the screw-worm fly, consists of rearing, sterilizing and releasing billions of male insects, which then compete with the fertile males. If fertile males are sufficiently outnumbered by sterile ones, the species dies out.

The first problem is to raise large numbers of flies in captivity. When the screw-worm fly was eliminated in the south-eastern United States, 70 million flies were raised every week on a diet of 40 tons of ground meat and 4,500 gallons of beef blood to feed their larvae.

In Central America, the Mediterranean fruit fly first appeared in 1955, spreading from Costa Rica to Nicaragua and western Panama. The pest now does $7 million worth of damage a year, a figure that would rise to over $80 million if it infested all adjoining countries.

The Inter-American Institute of Agricultural Sciences in Turrialba, Costa Rica, began experiments several years ago on techniques of sterilizing the male fruit fly by gamma rays. By last August two million sterilized flies were being released each week. The results were so promising that international assistance was sought.

With $823,800 from the Special Fund, the project will be extended during the next three years by the International Atomic Energy Agency and the U.N. Food and Agriculture Organization. The threatened countries—Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama—will spend $425,000 on the project.

(UNESCO FEATURES)

Fifty Years Ago

(From *The Entomologist's Record* of 1915)

[So far as we have read there is no English name for that rather odd butterfly *Libythea celtis*, which spans about an inch and three-quarters and looks as though somebody had snipped off the tips of its forewings with scissors. The French call it "l'Echancrée' and its larva feeds on the nettle-tree, *Celtis australis* or "micocoulier", and as the nettle-tree is not a particularly common plant *L. celtis* is not to be found everywhere though it may be taken in southern Switzerland, in the south of France, in Corsica, Sicily, Sardinia, Cyprus and doubtless in Greece and the islands.—Ed.]

On the 10th July, returning [from Les Dourbes] we crossed the valley and came up to the Eaux Chaudes road, where my wife called me to look at a new butterfly. She does not herself collect, but from experience I never fail to hurry to the spot when any novelty arrests her attention. On the top twig of a high bramble overhanging the road I could see against the sky the unfamiliar outline of the upper wing of *Libythea celtis*. It was quite inaccessible, but after many attempts I threw some dust over it, and it flew lower down and into my net. It was evidently fresh out that morning. No others were visible, and a long wait at the spot was in vain, but when I passed the place two hours later there was *L. celtis* on the same twig. I have often noticed this demand and supply habit in butterflies; the loss is not repaired while you wait, but if you pass over the place the next day there is another . . . . One of the greatest moments of pleasure for a collector is to see and take for the first time a species which he has only seen in books or museum collections. I took eight *L. celtis* in all at different dates on the same bramble on the same twig. Then came a violent hailstorm, with the afternoon thunder, which knocked the blossom, already pink, to pieces, and I never saw *L. celtis* again.—Herbert L. Earl.

The Flight Period of Trichoptera (Caddis-flies) in Northern England

By A. Brindle

In the standard textbook on the Trichoptera by Mosely (1939) comparatively little indication is given of the flight period of the adults. Some species are described as autumnal, and the months in which certain rare species have been taken are also mentioned, but only rarely is the flight period in months given for a widely distributed species.

In order to find the suitable time of year in which to search for any particular species, therefore, it is necessary to find dated records, either from specimens in collections, or from published lists. Collections of Trichoptera are not particularly common, nor have an appreciable number of local lists been published. The most useful, as far as Northern England is concerned, includes a Yorkshire list, by Brown and Whitehead (1938), which was compiled from the records of the Yorkshire Naturalists' Union; a list of the Lake District Trichoptera by Kimmins (1943); and a Northumberland list by Philipson (1957). A short list of North-East Lancashire Trichoptera was compiled by the present author and published in 1956. In all these lists dates are given for the species mentioned. Perhaps the most useful lists for Southern England are those of Grensted (1935) for the Oxford district, and Crichton (1960) for the Reading district. In the latter, the flight periods of the Trichoptera taken by means of a mercury-vapour trap, operated over a number of years, were given, and are most interesting for comparison to the flight periods recorded from Northern England.

It was this lack of information which led the writer to compile a chart of the flight period of Trichoptera in Northern England, and the present paper, which includes a condensed version of this, is published in order to fill, at least partially, the gap in Mosely's book. Whilst the flight period given only covers part of Northern England, suitable adjustments should enable it to be used more widely.

The flight period has been compiled from two main sources, and covers the counties of Cheshire, Lancashire, and Yorkshire. The sources are:—

(1) the card index of records maintained at the Manchester Museum (Entomology Department), which cover Cheshire (v.c. 58) and Lancashire (v.c. 59, 60, 61). These records include most of those of Kimmins (1943). Only the Lancashire records are noted from v.c. 61, not the Westmorland records.

(2) the records of the Yorkshire Naturalists' Union, which cover v.c. 61, 62, 63, 64 and 65.

These have been supplemented by notes made by the writer over the past ten years.

The flight period of the caddis recorded from the area mentioned is shown in the present paper (pp. ??-??) as a continuous or discontinuous bar adjoining the name of the species concerned, the extent of the bar indicating the recorded flight period.

The recording of the dates was initially organised on a day basis, using large sheets of graph paper on which the exact day of each capture

could be plotted, and this is to be continued. For the present paper, however, this has been condensed, and is given on a weekly basis, assuming four weeks per month. Each month has been arbitrarily allotted weeks of seven and eight days alternately, i.e., week 1 includes the period 1st to 7th of each month; week 2 includes the period 8th to 15th; week 3 covers the dates between and including 16th to 22nd; whilst week 4 includes the 23rd to the 30th (or 31st). Each month has one column, and a bar across any quarter of that column indicates that a record exists in the above mentioned sources for at least one day in that particular week of the month.

A bar across the first quarter of the column headed June, for example, adjacent to *H. stagnalis*, indicates that a record exists for that species for at least one day from 1st to 7th of June. The actual year of the record, of course, is not given. Similarly, a bar across the second half of the column headed August, adjacent to *L. bipunctatus*, indicates that records exist for that particular species during the week 16th to 22nd, and also during the week 23rd to 31st of that month.

No attempt has been made to join adjacent bars on the same line (referring to the same species), but it can be assumed that in some cases a gap between adjacent bars indicates the absence of records and not that the flight period is necessarily discontinuous. However, these gaps may have some significance, as will be mentioned later.

The condensing of the records has one disadvantage, in that the record of the flight period is shown to be more continuous than in the original recording on a day basis. This may not be a serious disadvantage, but it certainly should be noted.

The effect of the large number of records available, which mainly date from 1920 in the Lancashire and Cheshire records, and from 1930 in the Yorkshire records, will tend to make the flight period longer than it really is for any one year, providing adequate coverage has been achieved. This is on account of the inclusion of early years, in which the emergence was early, due to weather conditions, and years in which the emergence continued later owing to an unusually mild autumn. For example, the flight period of *Philopotamus montanus* shown begins at the end of March, but this is not the rule in the area, since the first emergences are usually about mid-April. Isolated emergences should also be noted, such as the record for *Limnephilus rhombicus* in March. The months from December to February are not shown, for obvious reasons, but isolated records do exist of *Drusus annulatus* in February and of *Stenophylax sequax* in January. These unusual emergences offer interesting scope for further study.

Since the records are from widely separated localities, the flight period of any one species in one particular habitat may not exactly correspond with that given. *Athripsodes nigronervosus* normally occurs for a short period in the first fortnight in June at Malham Tarn (occasionally it has been taken in July), but the flight period over the entire area extends from the end of May to the third week in July.

No degree of abundance has been given, so that the result is to mask any possible peaks of abundance. *Rhyacophila dorsalis* has a flight period extending from the end of April to the end of October, but it is by no means equally common throughout that time, and there appears to be at least one peak of abundance in Spring and a second in Autumn.

The most satisfactory way of using the present information on the flight periods, therefore, is to regard the earlier and later parts as exceptional dates (where the flight period is very long and continuous), and to regard the middle period as the more likely time in which to search for the particular insect. *Mystacides azurea* has a flight period extending from the end of May to the end of September, with an isolated date in October. The best months in which to collect this species in the area are from the end of June to the end of August.

In Southern England one would expect the flight period to begin earlier, and end later. The flight periods shown in Crichton (l.c.) correspond reasonably well with these given in the present paper for the same species, but there are differences which may be due to the effect of latitude. Thus the flight period of *Limnephilus flavicornis* extends to early November, in Crichton (l.c.), whilst the present flight period of the species ends at the end of September. *L. lunatus* is shown by Crichton to begin in late May and early June whilst the first record of this species in the North is in the last week of June.

In Scotland one would expect the flight period to begin later and end earlier.

In the case of short flight periods shown, it may either be due to the scarcity of records, as in *Beraeodes minuta* which is only recorded from two localities, or it may indicate the true flight period. Some species have very short flight periods, even though the insects are in great numbers at that time. The classic case is that of *Oligotricha clathrata*, which is not recorded from the area, but which occurs in the county of Shropshire, and so may well be found in the area. When an emergence of this species occurs they are common in a restricted area, but the flight period does not appear to be longer than a week or so. Its close relative, *O. ruficrus*, although widely distributed, also has a short flight period, shown as five weeks in the chart, but probably no longer than three weeks or less in any one year in one locality.

In order to understand the pattern of emergence amongst the caddis better, it would be necessary to study the Trichoptera of one particular habitat thoroughly throughout the year, and over a period of years. Such a study as that made by the late Mr. P. F. Holmes (1963) on the Trichoptera of Malham Tarn, is most useful, and it is hoped to undertake similar studies in the future.

Hanna (1957, 1959) has shown that *Limnephilus politus, L. marmoratus, L. flavicornis, L. lunatus, Potamophylax stellatus, Anabolia nervosa, Molanna angustata*, and *Brachycentrus subnubilus*, all have a one-year life cycle, and this is probably true of most of the larger caddis. In the smaller species, such as the Hydroptilidae and the Glossosomatidae (*Agapetus*), it is apparent that the life cycle is much shorter. Hanna (1959) found that it was difficult to distinguish between successive broods of *Agapetus fuscipes*, and it probably has a number of broods during the year, the successive broods merging with each other so that an almost continuous flight period is achieved. In this species, however, it will be found that the insects are by no means equally common throughout the flight period.

The following comments are based on short term observations only, and are intended to be suggestions, which may or may not be confirmed by further study.

There appears to be two main types of emergence in the caddis, a normal flight period and a discontinuous flight period, the former characteristic of caddis which occur in ponds and lakes, and the latter possibly more characteristic of caddis which occur in running water.

Normal Flight Period

The basic pattern of emergence of caddis in a pond or lake follows the usual pattern. In a population of caddis resident in the pond, a certain number of the insects emerge each favourable evening during the flight period, the numbers emerging each night increasing towards the middle of the flight period, and declining towards the end. Thus the adult population tends to increase to a maximum for some time about the middle of the flight period. Males predominate in the earlier emergences, and females predominate in the later emergences. The proportion of sexes thus tends to vary according to the part of the flight period studied. If unfavourable cold nights occur, the emergences may be reduced or halted, and a succession of cold nights will produce a succession of maxima of the population rather than one maximum under normal conditions. Under these normal conditions the larger the population, and the longer the flight period tends to be.

In a small population of *Phryganea grandis* in the Leeds and Liverpool canal near Nelson, Lancashire, the flight period extends for about one month, from the last week in June to the third week in July. In the first week of the period, only males can be found by the use of light or by sweeping the surrounding herbage by night. In the middle of the period equal numbers of both sexes occur, whilst towards the end only females can be found.

In the much larger population of *P. obsoleta* at Malham Tarn, Yorkshire, the flight period is correspondingly longer, from the last fortnight in July to early September, a period of about seven or eight weeks, with a long peak of abundance in August. Again, only males can be found in the early part of the period, and only females have been recorded in September, whilst equal numbers of both sexes occur during August.

In this normal flight period, the insects can always be found during the relevant period by using suitable collecting techniques.

This simple plan of the emergence and the population changes during the flight period takes no account of any possible migration to and from the pond or lake, and this may be significant in lowland localities. In such isolated habitats as Malham Tarn, the evidence appears to suggest that migration is not important.

Discontinuous Flight Period

In some caddis whose larvae live in running water, however, there appears to be a discontinuous flight period, i.e., a number of broods which apparently are quite distinct from each other. This can be seen in the flight period shown for *Neureclipsis bimaculata*, though the gaps could quite easily be due to lack of records.

The emergence of this species has been studied at two localities:— Newby bridge, North Lancashire, and Capel Curig, North Wales, during the past few years, although it has not yet been possible to undertake systematic observations throughout the summer. The observations made

suggest that this insect has three broods per year, and the dates appear to correspond with those shown in the flight period chart, except that the October records are apparently exceptional emergences due to a mild autumn. It is not known if this species has a one-year life cycle in the localities mentioned; it is one of the smaller caddis, and it may well be that the latest brood is the progeny of the first brood of the year.

If this discontinuous flight period is true of a number of caddis restricted to running water habitats, it would explain the difficulty so often experienced of finding the insect during part of the summer. It is possible to obtain *Athripsodes cinereus* in certain lakes and ponds in the area at any time during the flight period, but it is certainly not possible, or at least extremely difficult, to obtain the same species by the River Ribble, during the same time. It is, however, abundant in the latter habitat at certain times.

From a study of the ponds and lakes in north-east Lancashire, lists of caddis resident in them are being prepared, and a visit to any one of them with light on a suitable night will produce the insects expected, with the addition of adventitious caddis (usually from nearby streams). Similar lists are being prepared of the caddis resident in the various streams and rivers, but a visit to these, with light, on a suitable evening, may be almost useless in finding the insects known to occur, whilst other nights, apparently identical in weather conditions, are very productive.

Measuring the lengths of individuals in collections of larvae, taken at the same time in one habitat, may assist to clarify the flight period. Collections of *Anabolia nervosa* larvae, for example, show the usual small range of sizes indicating that the population is uniform, and that the adult insects will emerge as one brood, whilst similar collections of *Philopotamus montanus* larvae show a discontinuous size range, indicating that the larvae are from more than one "brood", and that the adult insects will emerge as a number of separate broods. Note, however, that in the flight period chart, both these species have a continuous flight period according to the records, except for the unusual records of *Anabolia nervosa* in early summer. This might be expected if the broods of *Philopotamus* are not separated by more than a week or so, since small "gaps" in the flight period would be obscured by records taken over a long period of years.

It is tempting to regard the still water caddis as having a normal flight period and the running water caddis as having a discontinuous flight period, but clearly much more study on this subject is desirable and it is hardly likely that it is capable of such a simple explanation.

However, for collecting purposes, I should tend to regard the flight period of static water caddis as a good indication of the dates on which the particular species can be taken, avoiding the earliest and the latest dates. With the lotic water species I should also use the middle period of the flight period in which to search for the particular species, but I would not be as certain of obtaining specimens as with the static water species.

If a caddis has a discontinuous flight period, there may be a tendency for the gaps between successive broods to become less, especially if the insect has a short life cycle, so that one may find the successive broods merging, as apparently is the case with *Agapetus fuscipes*. This will

result in the adult having a long continuous flight period when recorded over a number of years. There may be also a tendency for the gaps between successive broods to become longer, and this would lead, eventually, to entirely separate populations if the caddis has a one-year life cycle. If reference is made to the flight period of *Stenophylax permistus*, it will be seen that this species is double-brooded, according to the records available. Since this is one of the largest caddis the life-cycle is evidently one year, and it is apparent that these two broods, if really distinct, form two quite separate populations. Mr. Kimmins has kindly allowed me to examine the data on specimens in the collections of the British Museum (Natural History), and almost all have been taken either during May-June, or from late August-October. There are two specimens which have been taken in July. Crichton (l.c.) in his flight period figure illustrates the same feature of a double brood in this species, where the May-June flight is smaller than the later one. An examination of the male genitalia of specimens taken both in June and in August has been made but no distinct difference has been seen.

It would appear that the environmental differences between static and lotic water would influence the emergence and general life-cycle of the caddis concerned. It seems significant that the caddis having the longest flight periods are both stream dwellers in the larval stage (*Philopotamus montanus* and *Rhyacophila dorsalis*), and both have a six-months flight period. The reservation made earlier in regard to the long flight period of *P. montanus* (p. ?) presumably applies equally well to other caddis, so that comparisons of the length of the flight period are admissable.

The caddis having five to five and a half months flight period also mainly of stream dwellers (*Stenophylax sequax, Agapetus fuscipes, Drusus annulatus*), though two of the static water species associated with shallow or temporary water, also have flight periods equally long (*Limnephilus centralis* and *L. auricula*). As the flight period shortens so the static water caddis increase in proportion of species.

The effect of temperature, light, and food, on the growth of caddis larvae are well worth investigating, as is the effect of temperature on the emergence of the adults. A number of caddis appear to emerge at dusk, or later in the evening, when the water is at the highest temperature of the day, and most caddis are found when the mean air temperature reaches its maximum in July and August.

There also appears to be some differences in the various families as to the part of the summer when most of the species are out (fig. 1).

The information in figure 1 suggests that the Phryganeidae reach their peak in July, as do the Leptoceridae, whilst the Polycentropidae may be somewhat earlier. The Limnephilidae apparently have a long period from June to September inclusive. The numbers concerned, and the frequent gaps in the flight period records which are due to lack of records, however, do not allow any firm conclusions to be reached, but suggest possible lines of further study. Crichton (1960) found that the Limnephilidae were mainly autumnal in occurrence, but his other findings agree reasonably well with the table in fig. 1.

A notable feature of the emergence of caddis is the rapidity of the wing expansion, whereas in the Lepidoptera this is rather a lengthy process. *Philopotamus montanus* appears to be capable of short flights very soon after emergence. On April 6th 1962, when collecting pupae of this

Family	May	June	July	Aug.	Sept.	Oct.
Rhyacophilidae	2	3	2	3	4	3
Glossosomatidae	3	4	3	4	3	—
Hydroptilidae	3	9	10	13	9	2
Philopotamidae	1	3	4	4	4	2
Polycentropidae	3	11	10	10	5	3
Psychomyiidae	3	4	7	8	3	—
Hydropsychidae	3	4	6	5	3	—
Phrygaenidae	3	5	8	4	2	—
Limnephilidae	24	32	33	32	34	18
Leptoceridae	6	15	21	18	12	2
Beraeidae	—	3	2	2	—	—
Sericostomatidae	3	7	6	7	7	1
(Odontoceridae)		1	1	1	1	
(Molannidae)		1	1	1	1	
Total	54	100	112	110	86	31
Percentage	36%	68%	76%	75%	59%	20%

Fig. 1 Number of species of Trichoptera in families recorded as adults in each month from May to October. Percentages calculated on total recorded from the area concerned—151.

species at Whitewell, Yorkshire, the adults were emerging from the pupae as these were brought from the water. The adults which emerged were difficult to catch since they jumped quickly from stone to stone, aided by wing beats, and disappeared towards the banks where they hid amongst the herbage.

Phyrganea obsoleta emerges at Malham Tarn in very large numbers, and the late Mr. P. F. Holmes has described to me the appearance of the Tarn waters on these occasions. The pupae swim to the water surface, the pupal skins split, and the adults emerge to "scutter" along the surface of the water towards the shore. The fully expanded wings are used, but the insects are apparently incapable of true flight, which is a biological disadvantage, since the trout find these evenings very rewarding.

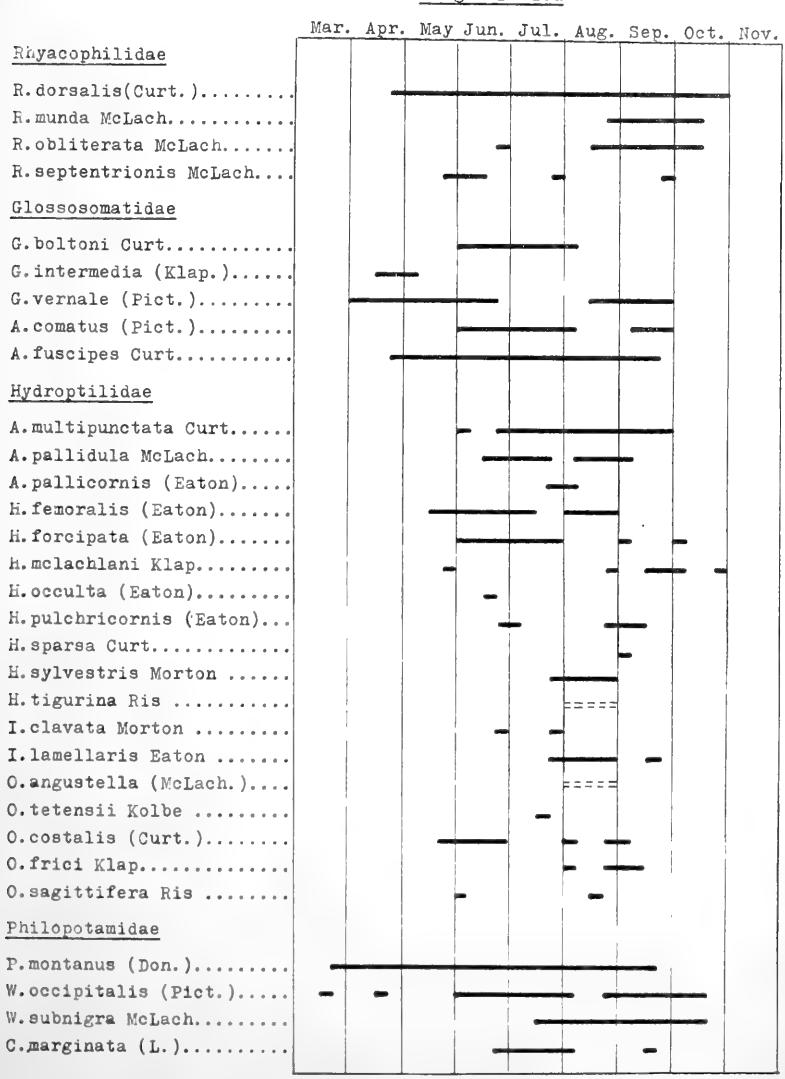
Limnephilus politus, however, in the same habitat, has a different method of emerging. The pupae swim to the shore, and the adult emerges on a stone, to climb up into the herbage to rest. The wings are almost whitish on emergence and do not attain their final colouring for some time. They cannot fly, and the insects seek to escape by running. It is not known what period must elapse before flight can take place.

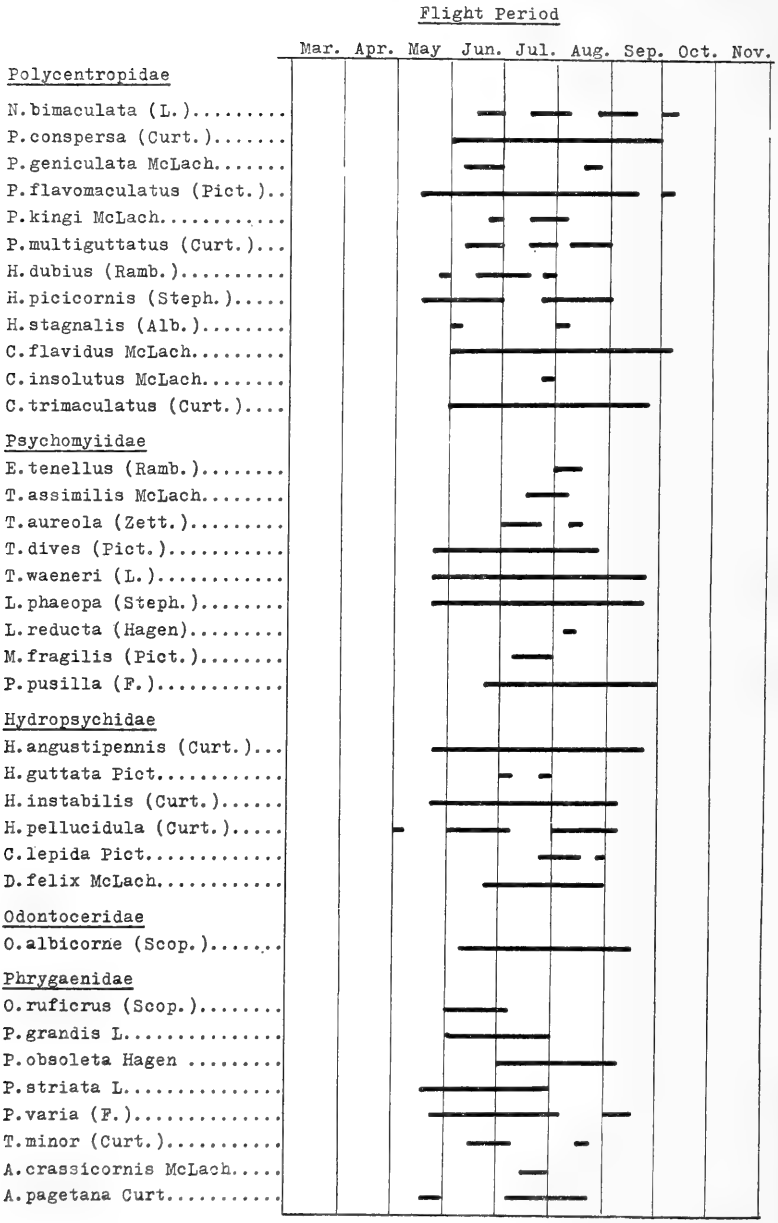
Whilst every care has been taken to ensure that all records are represented in the flight period chart, it is possible that some may have been overlooked. More records are also needed in the Hydroptilidae, and more species should occur in the area. The number of *Tinodes* is also small, and there should be one or two more species to be added. Both V.c. 69 and 61 are yet inadequately worked, and it is hoped to concentrate on these areas in the future.

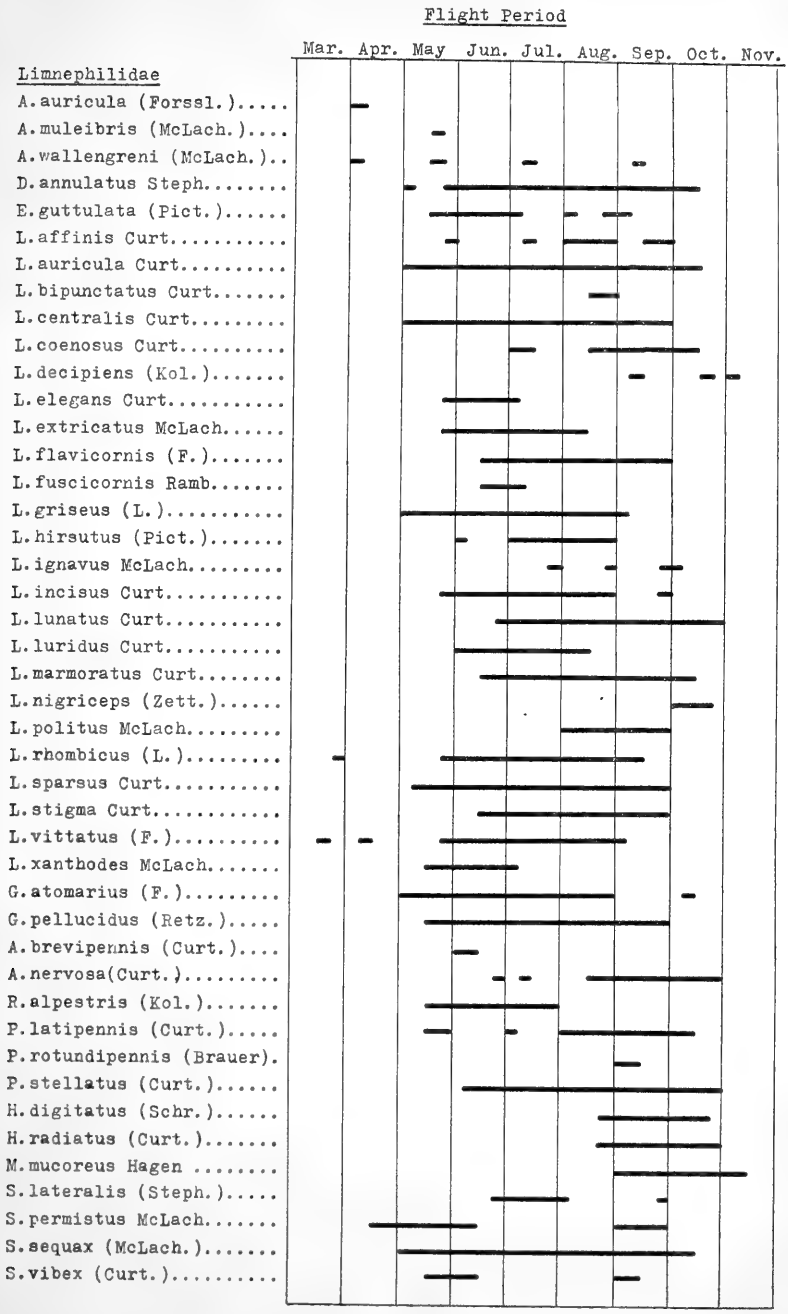
A record of *Tinodes rostocki* from Upper Gordale beck recorded in Holmes (1963) has not been included, since the specimens were females and the identification only provisional. The flight period of *Hydroptila tigurina* and *Orthotrichia angustella* are shown in dotted lines, since the only records available are simply for "August".

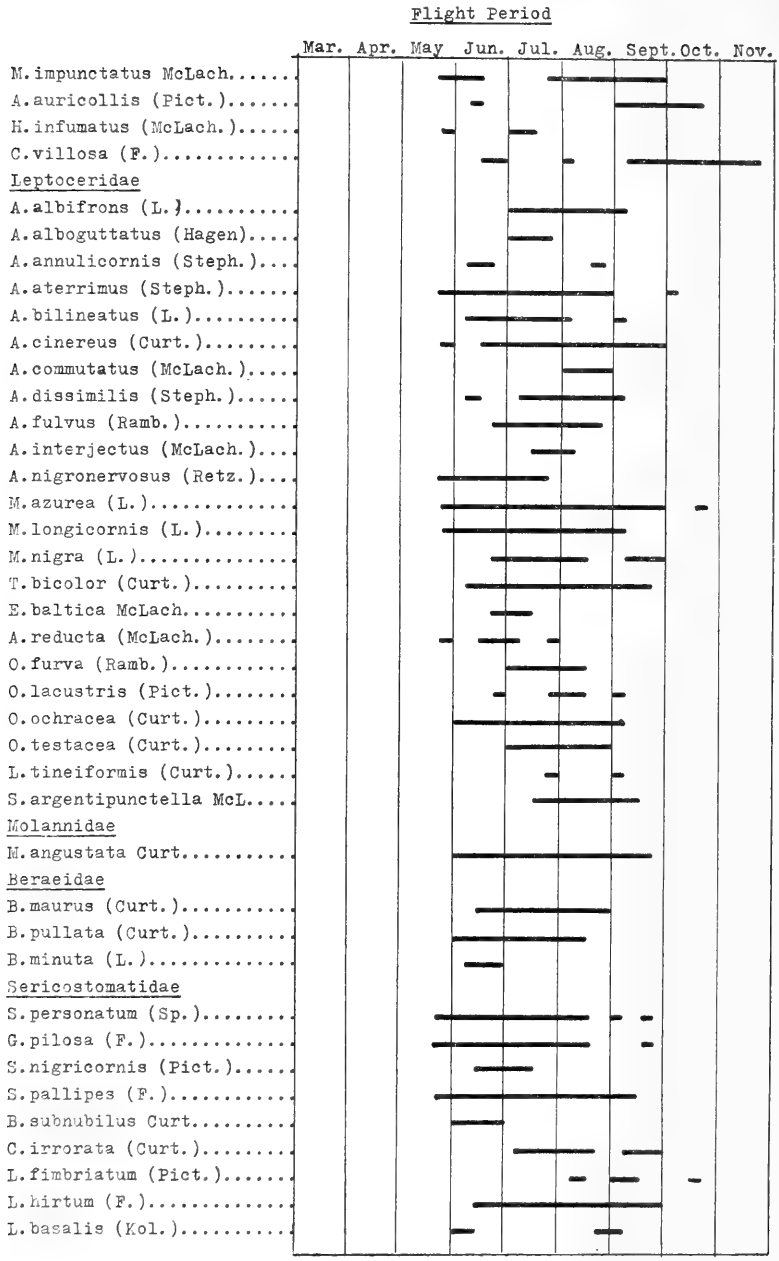
It has not been thought useful to acknowledge the names of the numerous entomologists whose records are in the sources mentioned. The counties concerned have had a long history of entomologists, mainly amateur, who have brought our knowledge of the distribution of these insects in the area to a high standard. It is hoped, however, to publish an account of the Trichoptera of the area in some detail later, including the distribution within the area, and in this, all authors of the records quoted will be given due prominence.

The nomenclature and arrangement in the flight period chart follows that in Kloet and Hincks (second edition) (1964).




Flight Period
Mar. Apr. May Jun. Jul. Aug. Sep. Oct. Nov.
Polycentropidae
N.bimaculata (L.).....
P.conspersa (Curt.).....
P.geniculata McLach.....
P.flavomaculatus (Pict.)..
P.kingi McLach.....
P.multiguttatus (Curt.)...
H.dubius (Ramb.).....
H.picicornis (Steph.).....
H.stagnalis (Alb.).....
C.flavidus McLach.....
C.insolutus McLach.....
C.trimaculatus (Curt.)....
Psychomyiidae
E.tenellus (Ramb.).....
T.assimilis McLach.....
T.aureola (Zett.).....
T.dives (Pict.).....
T.waeneri (L.).....
L.phaeopa (Steph.).....
L.reducta (Hagen).....
M.fragilis (Pict.).....
P.pusilla (F.).....
Hydropsychidae
H.angustipennis (Curt.)...
H.guttata Pict.....
H.instabilis (Curt.).....
H.pellucidula (Curt.).....
C.lepida Pict.....
D.felix McLach.....
Odontoceridae
O.albicorne (Scop.).....
Phrygaenidae
O.ruficrus (Scop.).....
P.grandis L.....
P.obsoleta Hagen .....
P.striata L.....
P.varia (F.).....
T.minor (Curt.).....
A.crassicornis McLach.....
A.pagetana Curt.....


Flight Period
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Limnephilidae
A.auricula (Forssl.).....
A.muleibris (McLach.)....
A.wallengreni (McLach.)..
D.annulatus Steph.....
E.guttulata (Pict.).....
L.affinis Curt.....
L.auricula Curt.....
L.bipunctatus Curt.....
L.centralis Curt.....
L.coenosus Curt.....
L.decipiens (Kol.).....
L.elegans Curt.....
L.extricatus McLach.....
L.flavicornis (F.).....
L.fuscicornis Ramb.....
L.griseus (L.).....
L.hirsutus (Pict.).....
L.ignavus McLach.....
L.incisus Curt.....
L.lunatus Curt.....
L.luridus Curt.....
L.marmoratus Curt.....
L.nigriceps (Zett.).....
L.politus McLach.....
L.rhombicus (L.).....
L.sparsus Curt.....
L.stigma Curt.....
L.vittatus (F.).....
L.xanthodes McLach.....
G.atomarius (F.).....
G.pellucidus (Retz.).....
A.brevipennis (Curt.)....
A.nervosa(Curt.).....
R.alpestris (Kol.).....
P.latipennis (Curt.).....
P.rotundipennis (Brauer).
P.stellatus (Curt.).....
H.digitatus (Schr.).....
H.radiatus (Curt.).....
M.mucoreus Hagen .....
S.lateralis (Steph.).....
S.permistus McLach.....
S.sequax (McLach.).....
S.vibex (Curt.).....


Flight Period
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sept.
Oct.
Nov.
M.impunctatus McLach.
A.auricollis (Pict.)
H.infumatus (McLach.)
C.villosa (F.)
Leptoceridae
A.albifrons (L.)
A.alboguttatus (Hagen)
A.annulicornis (Steph.)
A.aterrimus (Steph.)
A.bilineatus (L.)
A.cinereus (Curt.)
A.commutatus (McLach.)
A.dissimilis (Steph.)
A.fulvus (Ramb.)
A.interjectus (McLach.)
A.nigronervosus (Retz.)
M.azurea (L.)
M.longicornis (L.)
M.nigra (L.)
T.bicolor (Curt.)
E.baltica McLach.
A.reducta (McLach.)
O.furva (Ramb.)
O.lacustris (Pict.)
O.ochracea (Curt.)
O.testacea (Curt.)
L.tineiformis (Curt.)
S.argentipunctella McL.
Molannidae
M.angustata Curt
Beraeidae
B.maurus (Curt.)
B.pullata (Curt.)
B.minuta (L.)
Sericostomatidae
S.personatum (Sp.)
G.pilosa (F.)
S.nigricornis (Pict.)
S.pallipes (F.)
B.subnubilus Curt
C.irrorata (Curt.)
L.fimbriatum (Pict.)
L.hirtum (F.)
L.basalis (Kol.)

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A Note on *Criorhina** *ranunculi* Panz. (Diptera)

Mr. A. A. Allen's interesting paper headed "A Few Notable Diptera from Windsor Forest" in the April *Record* (*Ent. Rec.*, **77**, 105) has recalled a pleasant memory; for although unhappily I am not a dipterist I have always had a liking for the Syrphids and I once caught, not in Windsor Forest but in Montgomeryshire, a specimen of one of the most handsome of them all—*Criorhina ranunculi* Panzer.

The date when I caught my *C. ranunculi* was 6th April 1944 and it was this early date (compared with that recorded by Mr. Allen) that has prompted me to contribute this note to the *Record*. I should say at once that I have no knowledge of the dates (save one) on which other recorded specimens have been taken.

The place where I caught it was a glade among young birch bushes on the top of a hill which, according to the one-inch Ordnance map, is rather more than 800 feet above sea-level and just about a mile—as the aeroplane flies—from the river Severn.

On my copy of this Ordnance map, which is inscribed "revised in 1908 and published in 1912", the greater part of this hill and its western consort, from which it is divided by a small shallow valley, the two of them comprising about 647 acres, is mostly coloured green (denoting woodland), the eastern part being lettered "Bryn y Pentre Wood", the western one "Sgwilfa Wood".

But the splendid oaks and beeches which had covered these hills from perhaps 4,000 B.C. up to about fifty years ago have been felled and the vegetation there to-day is mostly coppice. There are some young oaks

*So Kloet & Hincks spell it, assigning the generic name to "Meigen 1822". Colyer & Hammond have it with three "r's". But Mr. R. L. Coe (*Handbook for the Identification of British Insects, Vol. X, Part 1 page 82*) spells it as Kloet & Hincks.

and ashlings†, a big chestnut or two, and a few large birches which have generated plentifully: their offspring by now will be ten or twelve feet high. Before the felling this wooded hill was part of the primeval forest of central Wales, and from my experience of it—and I walked about it nearly every day when it was fine, winter and summer, for five and a half years—even now it should be well worth a visit by a dipterist. Incidentally, I saw on that hill small moths ('micros') which I had never seen before.

So if any dipterist, or specialist in the smaller moths, would like to pay a visit to this hill he should make for the pleasant borough of Newtown, via Welshpool if coming from the east, drive down the main street, cross the bridge over the Severn and turn sharp left. Proceed for three miles by speedometer when he ought to see, on his right, the pretty church of Aberhafesp (which means "the mouth of the stream which runs dry in summer"). Half a mile further on he will see on his left, the blacksmith's forge together with a petrol pump. The blacksmith or his successor will show the visitor how to find the footpath which runs along the *east* side of the hill.

Follow this footpath (if it has not by this time become obliterated by the hateful bracken) for about three parts of a mile until it turns sharp left. Continue for about thirty paces from the corner, then push your way through the birches on the left until you find yourself in a secluded glade. It was in this glade that I found *C. ranunculi.*

Mr. Allen tells us that he netted this fine dipteron in Windsor Park on 1st July 1941 and that it should be "obtainable from hawthorn blossom". So *C. ranunculi* would appear to be on the wing for three months, to wit from early April to the end of June, and, as of course Mr. Allen rightly says, the most propitious time to look for the insect is during the month of May. But has the weather during the first three months of the year anything to do with the time of the insect's eclosion?

In 1941, when Mr Allen caught his specimen my diaries record that January was mild to the 10th. Then severe frost occurred nightly till the 18th, when it began to snow. The Severn was frozen over. Heavy snow fell almost continually till the 21st, by which date the snow was twelve inches thick on the roads on both sides of Aberhafesp and five feet thick in drifts. On the 29th, *The Times* reported: "fast-flowing rivers froze and great snowdrifts, some 15 feet deep, blocked roads and railways". There was 20°F. of frost in Yorkshire on the 28th.

In February the countryside (in Wales) was still under snow, but on the 1st the sun shone for one hour—"the first time we have seen it for fifteen days". Thereafter hard frosts and more snow. On the 4th "I walked to the top of Hen Diddly on frozen snow from 4 to 6 feet deep". But later on that day "I saw several Calliphorid flies sunning themselves in the garden". Next day there was a violent blizzard which lasted all day. Then a gale from the S.W., the glass falling from 30 in. to 29·4 in six hours. On the 16th "a dreadful day", bar. 28·5. But on the 22nd there was a tempest of rain from the west and it became milder. On a paling this day I found three *Erannis leucophaearia* Schf.

March was very wintry. On the 4th I recorded "every variety of inclement weather—frost, fog, rain, snow and bitter winds". It was after

†Portmanteau word = ash-sapling. Not in the dictionary, but ought to be.

such a winter that Mr. Allen caught *C. ranunculi* so late as 1st July.

In 1944, January, February and March were strangely similar to those months in 1941 which I have just described; yet *C. ranunculi* appeared in Wales on 6th April—and was recorded by Mr. Albert E. Wright at Grange-over-Sands on 8th April.

In 1945, following a very much milder winter, I looked for *C. ranunculi* every day in April in the glade in which I had found it, and found it not. And the previous three months had been exceptionally mild. Is a severe winter, then, more propitious to this insect than a mild one?

Forgive my immodesty if I relate the details of my capture. In 1944, then, I entered a glade at the top of Pentre Hill at 11.30 a.m., on the 6th April. Seeing no lepidoptera on the wing I walked slowly round the glade on the chance of finding a small larva or two of some of the early hatching and hibernating species. I was half-way along the north-east side when I saw sitting on a last year's bracken stem under a birch bush, an insect which I thought was a bumble-bee, namely *Bombus lapidarius*, since it had a black pubescent body and red ulterior somites. But as I approached to make certain, I saw to my astonishment that it was a dipteron of similar size and colouring.

"Acquaintance with the species of *Criorrhina* is one of the more exciting things which happen to the collector", wrote Messrs Colyer and Hammond (*Flies of the Brit. Isles*, 1951); but Mr. R. L. Coe remarks that it is "Frequent, Inverness (Kincraig), then N. Cumbs., southwards" (*Handbooks for the Identification of British Insects*, 1953, Diptera, p. 82). But frequent or not it was certainly the most exciting thing in the Diptera line that had hitherto happened to me! I stared at it and it turned round and stared at me. In fact it stared at my face so fixedly that it did not notice the hand holding a glass-bottomed box that was moving slowly, slowly, underneath it. It continued to observe me until the lid of the box had closed over it.

It did not buzz about in the box nor try to escape. It walked sedately round, then sat still and cleaned its palpi with its forefeet. And so we returned in company to Aberhafesp.

Even then I did not realise what a good capture I had made, for the only dipterous book I had with me suggested that it was *Volucella bombylans* Linn. So when I took it off the setting board I sent it to my friend H. W. Andrews with a letter asking him to accept a Welsh specimen of *V. bombylans*. He corrected me by return of post and so I recorded my specimen in *The North Western Naturalist*, which record duly appeared in Vol. xx at page 72. And on the same page came the announcement of another specimen caught by Mr. Albert E. Wright "at sallow bloom" at Grange-over-Sands two days later, namely on 8th April 1944. P. B. M. A.

Notes and Observations

A Note or Two About Sugaring.—There are one or two small matters which have occurred to me on reading Mr. D. E. Allen's excellent and very interesting article "The Origin of Sugaring" in the May issue of the *Record* (*Ent. Rec.*, **77**: 117, *seq.*). I could have wished that he had referred—though indeed he honours me by referring to me at all—not to the *First* edition of my *Moth-Hunter's Gossip* (1937) but to *The Second*

Edition, Revised (1947); for in the Preface to the revised edition I wrote· "I . . . . have rewritten the account of the invention of Sugaring given at pages 110-11 of the first edition".

At page 118 lines 13-14 of his article, Mr. Allen writes about Duncan's book "1836, p. 105—not 1834, *Entomologia Edinensis* as cited in error by Allan". The *Entomologia Edinensis* was written by James Wilson in collaboration with James Duncan and was published by Constable in Edinburgh and London in 1834. I suppose, for my notes have long since been destroyed, that it was to this book that I referred.

I fear that the memory of James English when approaching old age was not always reliable. The claims which he made for himself in a paper read before the Essex Field Club in 1884 were dealt with by Miller Christy in a note to the *Essex Naturalist* in 1888—see my *Talking of Moths*, 1943, pp. 5-6. Mr. R. H. Mays, who contributed an interesting memoir of Henry Doubleday to *The Essex Naturalist* in 1960, tells us that English was engaged by Henry Doubleday as an assistant collector. He was born in 1820, "the son of a gardener who was a former soldier in the Dragoon Guards" and died in 1888.

When I went to live at Epping in the 1920s there was living in the town a very old man, a Mr. Sworder, who was a mine of information about Epping and its folk in days gone by. He was a widely read man, interested in antiquities and archaeology. He remembered Henry Doubleday, who died in 1875, and knew English. In view of the inaccuracy of some of English's statements in the abovementioned paper which he read to the Essex Field Club, it would seem to be just as likely that it was the Doubledays who "introduced" sugaring to English as it was the other way round!

There must still be many letters, papers and diaries of entomologists who were famous in their day, still in private hands. Some years ago I was told of someone who had a large collection of letters by entomologists who lived in the first half of the 19th Century. So I wrote and asked if this person had any letters by Stainton. Almost by return of post came a parcel containing more than 400 of Stainton's letters. So it is quite likely that much more information about this matter of sugaring will come to light some day.

It is good to be able to report that Mr. Mays is now engaged on a full-length biography of Henry Doubleday. This will be welcomed by all naturalists—as is Mr. Allen's erudite article putting me right wherever I was wrong.—P. B. M. Allan.

Early Arrival of Migrants in Outer Hebrides.— On a recent visit to the Outer Isles, I found a specimen of *P. gamma* L. in a house at Ardkenneth, South Uist, on 14th May, and was told that it had come to light with two others on the preceding evening. At Castlebay in Barra I saw a specimen of *V. atalanta* L. in a garden on the morning of 16th May, and one has been seen on Canna on 20th May.

These are unusually early arrivals, especially for such a late spring, in which *P. napi* L. only made its first appearance on Canna on 10th May at least a fortnight later than usual.—J. L. Campbell, Isle of Canna.

I was interested to read my friend Commander Harper's remarks on the emergence period of *T. pronuba* in northern Scotland. On Canna the moth trap records tend rather to confirm the statement on the emergence period made in the last edition of South. These have now been kept for 14 years, and they show that *T. pronuba* is normally around (unfortunately) from about the middle of June until the middle of October. In 1959 a specimen appeared in the trap on 31st May. The latest date of capture is 22nd October.

This year the warm spell at the end of March produced a remarkably early capture of another species of moth, *T. or*, on 2nd April. *N. zonaria* turned up in the trap in greater numbers than ever before during this period, and *T. munda* was captured on Canna for the first time on 31st March.—J. L. CAMPBELL, Isle of Canna. 24.iv.1965.

FOODPLANT OF APATELE ALNI L.—With reference to two points raised by Dr. F. H. N. Smith in his article (*Ent. Rec.*, **77**: 105):

(1) I have found the larva of *Apatale alni* on hazel in such widely separated localities as Malvern (Worcs.), Bruton (Som.), Cranbourne Chase (Wilts.-Dorset border) and Bloxworth (S. Dorset). On p. 223 of the Natural History of the Oxford District, O.U. Press. 1926, it is stated that the larva has been found at Cothill (of *Callimorpha dominula* L. fame) and Tubney "usually on hazel", although I never found it there myself, and it was not for want of looking.

(2) As for *Polygonia c-album* L., I too have been wondering whether it is on the decline again. It is certainly much scarcer in Wessex localities from Whiteparish to Bournemouth and from Lyndhurst to Dorchester than it was fifteen or twenty years ago. My impression is that the numbers fell considerably in the early 50s, but that during the last five or six years they have been fairly static at the lower level (See *Ent. Rec.*, **73**: 129, 184 and 242; **74**: 25).—H. SYMES, 52 Lowther Road, Bournemouth. 24.iv.1965.

A VARIETY OF CALLOPHYRS RUBI L.—The green hairstreak is not given to variation as such, and I should like to record my capture of a male aberration at Puttenham, Surrey on 30th May 1964, which has the outer half of the forewings a banded border of a sooty grey colour.—E. E. JOHNSON, Wood Pigeon Hotel, Wormley, Surrey.

Current Literature

Forest Refreshed by Norman E. Hickin; Hutchinson, 184 pp. U.K. price, 25/-.

This book has, to me, the pleasing reassurance that the professional scientist can also be a human being, and I am pleased to say that Dr. Hickin is not unique in this. In his book, the author has noted down his memories of the many stages of his varied life, in the form of autobiographical notes.

These notes range from his boyhood and schooldays and into his present life as a professional scientist, and his private and scientific lives seem to have blended in a way which makes the book very good reading for all with a love of natural history.

The author and his wife are shown to have enjoyed a somewhat hard life in their courtship and early marriage, but both seem to be possessed of that happy asset, an enjoyment of overcoming difficulties. Most of the book is sited in the Wyre Forest district, but it is by no means chained there, and interesting accounts of the author's work on the caddis flies in Africa bring in anecdotes of various other animals and also of people he met. Surrey, his present homeland, is also brought into the picture.

His anecdotes of many and varied forms of wild life show Dr. Hickin to be an all-round naturalist in spite of his status as an entomologist, and the book is freely illustrated, mainly with drawings (with long and interesting notes by way of captions) in pen and ink and in scraper-board, from his notebooks, and these, without exception, are admirable, showing just the amount of detail required, and often catching a posture which will compel the beholder to know his identification of the subject, when seen in life, is correct.

The author's account of his "do it yourself" degree should help and encourage young men similarly situated, who are contemplating an external degree, to overcome their difficulties.

The title of the book indicates that notwithstanding the author's professional duties, he can still resort to the Forest as a place for relaxation after a period of strenuous work.

Bound in good cloth and well printed on good paper, this book should find a welcome to the library of any true naturalist. S. N. A. J.

Butterflies and Moths by Dr. Walter Robert Corti and illustrated by Walter Linsenmaier. The Odyssey Press. 48 pp. (roughly 6″ by 4″). 6/-.

A very beautiful piece of work is offered to us with this little book, and both the artist's painting and the colour reproduction of his work are of excellent quality. Explanatory captions to the illustrations and a very well selected text, which can be read through in less than half an hour, give the reader a very full outline of the life of these insects, the subjects of which are selected from many different parts of the world. The language is simple but not childish, and scientific names are used as well as vernacular names in a perfectly natural manner. The whole seems to be designed to appeal to the intelligent amateur wishing to know something of everything, but its interest cannot fail to make the reader wish to find out more about this subject.

Mr. Linsenmaier is also a collector of Lepidoptera, and his illustrations disclose his knowledge by showing his subjetcs mostly in natural postures, not in the formal "set" position, and this gives much aid to the observer in recognizing the species in the wild, and the artist's skill in selecting these postures so that a good idea of both upper and underside, irrespective of the fact that having to include perspective makes his task much more difficult, is much to be praised.

The book is printed on good paper and is bound in glossy boards with a cover design of the same quality as the inside illustrations. My first impression made me wonder why such beautiful work and erudite text should be compressed into so small a compass, but having read it and studied the illustrations, I agree that it is a book to command the interest of all who are attracted and interested by the beautiful things of nature. S. N. A. J.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

SWALLOWTAILS IN DEVON. A. H. DOBSON 139

THE COSSUS CONUNDRUM. Dr. H. B. D. KETTLEWELL 140

INSECT CONSERVATION: AN APPEAL 141

CHURCH PROPERTY. AN OLD MOTH-HUNTER 142

FIFTY YEARS AGO 147

THE FLIGHT PERIOD OF TRICHOPTERA (CADDIS-FLIES) IN NORTHERN ENGLAND. A. BRINDLE 148

A NOTE ON *CRIORHINA RANUNCULI* PANZ. (DIPTERA) .. 159

NOTES AND OBSERVATIONS 161

CURRENT LITERATURE 163

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT .. (239)

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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

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Zygaena fraxini slabyiana ssp. nov.

Fig. 1. Holotype ♂ (wingspan 25 mm.).
Fig. 2. Allotype ♀ (wingspan 26·5 mm.).

On *Zygaena (Agrumenia) fraxini* Ménétriés and a New Subspecies from Transcaucasia (Lep., Zygaenidae)

By Hugo Reiss, Stuttgart

Zygaena fraxini Ménétriés was first described[4] in 1832 from Talysh (Lenkoran) on the Caspian Sea. According to the literature, very few specimens have been taken since that time. In 1964, however, Professor Slabý, of Plzen, Czechoslovakia, had the good fortune to find and collect in quantity, a new subspecies of this *Zygaena* near Tbilisi (Tiflis) in Gruzia (Gruzien), Transcaucasia.

Before I describe this new subspecies, I would like to discuss the nominate subspecies and the other known subspecies of *fraxini*, and also the existing records in the literature.

In 1933, I wrote on *fraxini* and its subspecies in the *Entomologischen Rundschau*[5]. On the coloured plate, I figured 4 ♂♂ and 3 ♀♀, which I placed as ssp. *oribasus* Herrich-Schäffer, and on the half-tone plate, a ♂, labelled Manglis. Because of lack of space, I will repeat my explanations here only briefly. In this paper, I gave the descriptions of the holotype ♂ of *Z. fraxini* and the allotype ♀ of *Z. fraxini* ab. *scowitzii* Ménétriés. These descriptions were supplied by Mr. Filipjev, of the Zoological Institute, Academy of Sciences, Leningrad, who also sent photographs of the types ♂ and ♀ and a paratype ♂ of *fraxini*. The apical spot (5 and 6) of the forewing is not divided. The dark, hindwing border is only broad at the apex; before the inner angle, is a distinct, dark tooth in the male and female types; in the paratype ♂ this tooth is not so distinct. *Zygaena oribasus* Herrich-Schäffer can be placed as the subspecies of *fraxini* from Helenendorf and Elisabethpol in Transcaucasia. My original description [5] of *oribasus* Herrich-Schäffer reads as follows: "Oribasus Herrich-Schäffer hat nach den vorliegenden Stücken (8 ♂♂ and 5 ♀♀) häufig die Vorderflügelflecke 5 und 6 weit getrennt. Der fleck 6 ist manchmal stark verkleinert, hiermit ist eine Verbreiterung der Hinterflügelumrandung verbunden. Die ♀♀ tragen meistens an den Seiten des üblichen Hinterleibssegments Spuren eines roten Gürtels". Holik & Sheljuzhko [2] record 7 ♂♂ and 7 ♀♀ from Elisabethpol, leg. Kastshenko, in coll. L. Sheljuzhko. 4 ♂♂ and 1 ♀ of these specimens have the apical spot (5 and 6) of the forewings divided. In 1933[5], I figured in colour a male with widely separated spots 5 and 6. This specimen is from Helenendorf and is in the Staudinger collection (ex coll. Lederer). The ab. *cingulata* Sheljuzhko [8], described from Elisabethpol, has a more or less distinct, red abdominal belt or ring on one segment, and appears to be not especially rare. Holik & Sheljuzhko[2] recorded, from Elisabethpol, 1 ♂ and 2 ♀♀ of this aberration amongst a series of 7 ♂♂ and 7 ♀♀, leg. Kastshenko, in coll. Sheljuzhko, and from Helenendorf, 1 ♂ and 1 ♀ from 2 ♂♂ and 1 ♀, ex coll. Lederer, in coll. Staudinger (leg. Haberhauer). The female from Helenendorf, coll. Staudinger, was figured in colour by me in 1933[5]. When a comparison of the photographs of the types of *fraxini* was made with *oribasus*, it was seen that the forewing spots in the *oribasus* ♂ are smaller than those in the 2 ♂♂ from Lenkoran.

The synonymy of ssp. *oribasus* Herrich-Schäffer is as follows:

ssp. *oribasus* Herrich-Schäffer, 1844, Systematische Bearbeitung der Schmetterlinge von Europa, **2**, pl. 4, figs., 31-34: 1846, *ibidem* **2**: 46.

carneolica Freyer, 1842, Neuere Beiträge zur Schmetterlingskunde, **4**: 107, pl. 350, fig. 2 (preoccupied by *carniolica* Scopoli, 1763).

rognada Boisduval, 1848, Bull. Soc. ent. Fr. (2) **6**: xxx. Tremewan, 1961, Bull. Brit. Mus. (nat. Hist.) Ent., **10** (7): 254, pl. 51, fig. 9.

fraxini Ménétriés sensu Herrich-Schäffer, 1851, Systematische Bearbeitung der Schmetterlinge von Europa, **2**, pl. 14, fig. 102; 1852, ibidem, **6**: 45.

oribasus Freyer, 1852, Neuere Beiträge zur Schmetterlingskunde, **6**: 135, pl. 568, fig. 1.

fraxini Ménétriés sensu Seitz, 1907, Die Gross-Schmetterlinge der Erde, **2**: 27, 28, pl. 7e.

A further subspecies of *fraxini*, viz., ssp. *perdita* Staudinger, 1887[9], originated from the southern Caucasus and, according to Staudinger, was found near Nucha by Christoph. Holik & Sheljuzkho[2] give, as further localities, Kasumkent (southern slopes of the Caucasus) and Kurush. In 1933[5], I figured in colour, 3 ♂♂ and 1 ♀ of the original series of syntypes. In this subspecies, spot 6 of the forewings is completely absent. or spots 5 and 6 are separated by the dark ground colour. The dark hindwing border is fairly broad, with a strong tooth at the inner angle, while the red forewing spots frequently appear to be displaced by their white borders.

The somewhat damaged male, figured by me in 1933[5] on the half-tone plate as *fraxini* var., and labelled Manglis (about 40 km. west of Tiflis, as the crow flies), ex coll. Staudinger, is smaller than ssp. *oribasus* Herrich-Schäffer. The forewing spots are placed nearer to one another than those in *oribasus*, while spots 5 and 6 are separated by the dark ground colour. The hindwing border is narrower than that in *oribasus*, and is without the dark tooth at the inner angle. This is probably an aberrant specimen, showing a strong resemblance to the following new subspecies from the immediate neighbourhood of Tbilisi (Tiflis).

Zygaena (Agrumenia) fraxini slabyiana ssp. nov.

I have before me 31 ♂♂ and 20 ♀♀, labelled: U.S.S.R., Gruzia, Tbilisi, 28.5.-9.6.1964, Dr. O. Slabý leg., 8 ♂♂ and 5 ♀♀ are more or less bleached and worn through rain and bad weather. A further 60 specimens are in the possession of Prof. Slabý, who states (*in lit.*) that he found the species in the immediate vicinity of the town of Tbilisi (Tiflis) at a height of ca. 600-700 m., in a very dry and arid steppe locality with sparse vegetation. They flew during the whole period quoted above, and were not apparently over by the 9th June.

The wingspan varies from 24-28 mm. and the size is therefore very variable. The legs are blue-black, haired on the femora; the tibiae on the inside being dirty yellow in colour. The antennae are blue-black and very distinctive and in many specimens are thin with the club less thickened. The palpi and tegulae are blue-black. The whitish collar is completely absent in 8 ♀♀; in 11 ♀♀ it is rudimentary and only in 1 ♀ is it distinct. The body is blue-black, rather shortly haired, with a light blue gloss, or sometimes with a bluish green gloss. The wing shape of the males is narrow but in the females the wings are somewhat broader. The

ground colour of the forewings is blue-black with a light blue, sometimes blue-green gloss. The hindwing border, which is blue-black with a light gloss, is mostly present only at the apex, while the dark tooth at the inner angle is generally either missing or poorly represented, and is only well represented in 6 ♂♂ and 2 ♀♀.

The red of the forewing spots is a delicate, warm carmine, which in the hindwings appears somewhat brighter. In 1 ♀ the red is somewhat darker and this specimen has smaller forewing spots and a broader hindwing border.

In the males, the white bordering of the forewing spots 1 and 2 is very narrow and mostly rudimentary. With regard to the small specimens with enlarged spots 3 and 4, it is likewise small around these spots. This also applies to spot 5. In the variable spot 6, the white bordering is rudimentary in the majority of the males and is mostly around the lower half of the spot which is lightly confluent with spot 5. In 10 ♂♂ no white bordering is present around spot 6. Spots 5 and 6 are nearly always joined, and in only 2 ♂♂ are they narrowly separated by dark scaling.

In the females, the white bordering of the forewing spots is more distinctive, so that one can differentiate the females from the males on this character alone. In spot 1 the bordering is narrow or completely absent. Spot 2 is distinctly bordered outwardly, the bordering never attaining the inner margin. As in the males, spots 3 and 4 are enlarged. Spot 5 is bordered with white except where it is connected with spot 6, and in 5 ♀♀, this spot is greatly enlarged so that it nearly reaches the inner angle of spot 4. Spot 6, which is always connected to spot 5, is well represented, except in 1 ♀, where it is small. The white bordering of spot 6 is rudimentary around the upper half but distinctive around the lower half. In 1 ♀ this white bordering is absent around the upper half and around the lower half of the spot it is very narrow. In the 5 ♀♀ mentioned above, with enlarged forewing spots, spot 5 is joined with red to spot 6 for almost the whole of its breadth.

The underside of both sexes is similar to the upperside, but the coloration is somewhat duller. The shape of the wings, the position and size of the forewing spots, the strength of the white borders around the spots, and the width of the hindwing border can be seen in the illustrations (figs. 1, 2).

In 2 ♂♂ there is a trace of a red abdominal belt, placed dorso-laterally on the usual segment. In 6 ♀♀, a red abdominal belt is present on the usual segment and is also found on the ventral surface as well. 1 ♂ and 7 ♀♀ show only traces of a red abdominal belt on the sides of the usual segment.

Compared with the nominate subspecies of *fraxini* Ménétriés (comparison made with a photograph of the type), the new subspecies is smaller with narrower wings and larger forewing spots. Compared with ssp. *oribasus* Herrich-Schäffer, the red coloration of the forewing spots and hindwings of the new subspecies is brighter and warmer and the forewing spots are larger, while the hindwing border is narrower. Specimens with spots 5 and 6 separate, occur chiefly in ssp. *oribasus* Herrich-Schäffer but this form appears to be rare in the new subspecies. Also the form with five spots and very wide hindwing borders, which is not rare in ssp. *perdita* Staudinger(9), is not found in the new subspecies.

I name this new subspecies of *Zygaena* (*Agrumenia*) *fraxini* Ménétriés after its discoverer, ssp. **slabyiana** ssp. nov. Holotype ♂, labelled: U.S.S.R., Gruzia, Tbilisi, 28.5.-9.6.1964, Dr. O. Slabý leg., in coll. O. Slabý; allotype ♀ with the same data in coll. H. Reiss; paratypes in coll. O. Slabý and coll. H. Reiss.

My greatful thanks are due to my son, Dr. Günther Reiss, for the preparation of the photographs used to illustrate the specimens in the plate.

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Sampling The Butterflies of Sicily

By R. F. Bretherton, C.B., M.A., F.R.E.S.

Sicily is the largest of the Mediterranean islands, having an area of nearly 10,000 square miles, about one third the size of Ireland. It is also the least isolated, since the Straits of Messina are only two miles wide, and the mountain chain of the Peloriti, Nebrodi and Madonie, which occupies the north of the island, is geologically an extension to the Calabrian Apennines. This chain rises in places to nearly 2,000 m. It has a snow mantle in winter, and preserves something of a relict alpine flora and fauna. The lower hills in the centre and south of the island have less reserves of water and are mostly very barren and arid. In the east, the enormous volcanic cone of Mount Etna (3,313 m.) holds drifts of permanent snow, and its slopes, wherever they are not covered by recent lava flows, are very fertile and, in places, covered with woods; but it is geologically a "new" mountain, and the flora and fauna are for that reason rather disappointing. Besides a comparatively recent land bridge with south Italy, there were probably in very early times land connections with both Tunisia and Greece; and this may be reflected, for the butterflies, in the presence in Sicily of African species such as *Agapetes pherusa* Bdv., and *Zizeeria karsandra* Moore, and of the Balkan *Anthocaris damone* Bdv. and *Spialia orbifer* Hb. There seems never to have been any connection with Sardinia and Corsica, and the special butterflies of those islands are not found in Sicily.

Very little has been published in English about the lepidoptera of Sicily; indeed, I have found only two short records of collecting visits

there by Leech (1884) and Miss Fountaine (1897). There is some useful German literature, and E. Ragusa, who spent his life in the island, contributed notes to various Italian periodicals over a long period up to 1924. More recently, M. Mariani published a useful list in his "Fauna Lepidopterorum Siciliae" (1938), and R. Verity drew heavily on this, and on Ragusa's work, in his "Farfalle Diurne d'Italia" (1940-1953), in which he described and figured many of the Sicilian butterfly races, though it does not appear that he ever collected in Sicily himself. The map attached to Mariani's list suggests that large parts of the island have never been worked at all. At present, just under one hundred species of butterflies are known to exist there, after discounting some old and probably erroneous records. That it is still possible to make additions is suggested by the discovery of *Zizeeria karsandra* Moore by L. Bigot at Marsala in 1952, and by my own capture of *Lysandra amandus* Scheven on Mount Etna, which is referred to below. Though not rich in butterflies as compared with the Continent, Sicily has far more species than any other Mediterranean island, many of them with endemic forms.

My wife and I spent a fortnight in Sicily from 26th May to 8th June, 1965. As she is not an entomologist our purpose was to have a general holiday, seeing something of the island and its people, visiting the magnificent mediaeval and early Greek monuments, and doing such collecting as could be conveniently be fitted in with other plans. Despite this limitation, and the fact that we were too late for the early spring insects and too early for most of the second broods and for the heat-loving Satyrids, I managed to see half of the island's species of butterflies, together with a number of Zygaenids and other diurnal moths: we did not attempt any night collecting. We were also greatly impressed with the display of flowers. At low levels, though the grass was already mostly brown and dessicated, there were plenty of what in England would be July wild flowers—scabious, viper's bugloss, yellow, pink, and deep mauve thistles; and the gardens and roadsides were brilliant with bougainvillea, oleanders of various colours, and great banks of geranium. In the hills and on the lower slopes of Mount Etna large tracts were covered with yellow broom in full blossom; and on the highest ground we visited in the Madonie and the Nebrodi there was an interesting flora growing among the stones and in rock crevices. The weather generally was good: we had only two rather wet mornings and, more frequently, cloud in the late afternoons. At low levels at least it was too hot for much activity between 2 and 4 p.m., and most butterflies ceased to fly about 5 p.m.: so most of our collecting had to be done in the mornings, often during halts in our car journeys from one place to another.

We arrived at Pelermo airport (which is 30 kilometres from the city) in the small hours of 26th May, took an expensive taxi to our hotel, and picked up our small hired Fiat car there later in the day. We spent four nights in Palermo, where there is much to see but far too much noise and appalling traffic congestion—as, indeed, in most Sicilian towns both large and small. Relying on old references, I had hoped to find the very local Sicilian Marbled White, *Agapetes pherusa* Bdv., in the immediate surroundings of Palermo. But when we drove out to Monreale on the hills four miles from the city, to look at the wonderful Norman-Byzantine cathedral there, we could see that most of the localities mentioned had been engulfed by the great extension of the city which began about thirty years ago and seems to be going on ever faster. We made some search for

it two days later on the steep seaward slopes of Monte Pellegrino. But the ground there was already very parched and, apart from the commonest butterflies such as *Maniola jurtina hispulla* Esp. and *Polyommatus icarus* Rott., it yielded only a few fresh males of *Pyronia cecilia* Vallentin (*ida* Esp.) and many large *Zygaena purpuralis* Brunnich and *Syntomis phegea* L.

On 27th May—Ascension Day, and therefore a public holiday—we set out early for Ficuzza, in the mountains some 40 kms. south of Palermo. This is a onetime royal hunting preserve, and is the largest forest in this part of Sicily, where most of the woodland has long been destroyed. My main objective was the Fritillary *Melitaea aetherie* Hb., for which Ficuzza appears to be the only recorded Sicilian locality, and which is otherwise found in Europe only in south Andalusia. But owing to faulty map-reading we penetrated only into the lower part of the forest and, perhaps for that reason, saw nothing of the quarry. We did, however, see about twenty kinds of butterflies on flowers by the roadside and in clearings in the mixed woods of oak and ash. These included a number of *M. phoebe empipunica* Obth., which *M. aetherie* much resembles, *M. didyma meridionalis* Stdgr., brilliant and newly emerged, *M. athalia sicula* Trti (abundant), *Aporia crataegi augusta* Trti (abundant), *Limenitis anonyma* Lewis (*rivularis* Stichel), and *Pyrgus malvoides* Elw. & Ed. I was glad to find and confirm the last insect because there is some confusion in the literature about which of the grey-and-white Skippers do, and do not, occur in Sicily. I also took one worn male of *Pieris napi meridionalis* Heyne, of the spring form: we saw no more there or elsewhere, though I examined many of the countless *P. rapae* L. in the hope of finding some of the summer form of *P. napi* or examples of *P. mannii* Mayer, which is said to be rare in Sicily. We were probably just between broods for both species. After spending some three hours collecting in these woods we drove back to Palermo by a very picturesque road through Pian d'Albanesi; but short stops on the way did not yield any butterflies of interest.

We left Palermo on 29th May for the south west. Unfortunately the sun was behind a cloud when we stopped to investigate some promising slopes a little beyond Monreale, and we made our first long halt to explore the spectacular early Greek temple and theatre on the windy hillside at Segesta. But even here, at 350 m., the vegetation was parched and the butterflies were mostly of migratory species—*Pieris rapae* L., *Colias crocea* Fourc., *Pontia daplidice* L., *Vanessa cardui* L.—which we saw in fair numbers almost everywhere we went. From Segesta we drove on to Castelvetrano and, after securing a room in the hotel there, in the late afternoon we visited the ruins of the Greek city at Selinunte, beside the sea on the south coast. After being devastated by the Carthaginians most of the temples and other buildings were later destroyed by an earthquake, and, though parts of several are still standing or have been restored, most of the site is covered by a chaos of fallen columns and broken stones covered by a tangle of rank vegetation. This probably harbours a large insect population; but at 6 p.m. the only butterfly of interest which we saw there was the Skipper *Thymelicus actaeon* Rott., on the wing seven weeks earlier than it would be at Lulworth Cove in England. We noted that the adjoining lido village of Marinella, which has some small hotels, would be a pleasant base from which to explore this south west end of Sicily more thoroughly.

The next morning we had a wet drive eastwards along the coast to Agrigento, but the weather had cleared in the afternoon when we spent several hours in the even more extensive Greek remains outside the modern town. Here there had been no earthquake like that at Selinune, but centuries of local use as a stone-quarry have produced rather the same effect, though several of the temples which remain standing are a grand sight. Butterflies were fairly numerous, and we added to our list *Lycaenopsis argiolus* L. and the Skipper *Carcharodus alceae* Esp., which we did not see elsewhere.

On 31st May we turned inland for a cross-country drive to Petralia (1,000 m.), a small hill-town in the Madonie. Our route took us over some bad, unsurfaced roads through pleasant hill country, where there are many signs of activity by the Casa di Mezzogiorno in reafforestation, irrigation, and general restoration of the countryside: we saw more of this also later in the Nebrodi. We took our lunch break on a low pass, the Piatella Campanaro (903 m.), where there was a good assemblage of butterflies, including *Melitaea phobe* and *M. athalia*, *Pararge megaera* L. and some very fine *P. maera sicula* Stdgr., and a colony of *Adopaea lineola* Ochs., on a bank below a field full of pink gladiolus in full blossom. We reached Petralia in the early afternoon but, as usual, some late collecting below the town was not productive, except for a number of Burnets and Foresters. We had intended to make Petralia our base for four nights, but the deficiencies of the only hotel caused us to reduce this to two, which curtailed our plans for exploring the Madonie region. We devoted our one full day to making the ascent of the nearby Monte Salvatore (1,912 m.) which is the second highest summit in the chain. Having unwisely decided to follow the directions given in an out-of-date Baedeker we became entangled in a maze of field paths among the vineyards on the lower slopes and then, after crossing some sub-alpine pastures, had a steep scramble up a stony gully to get on to the summit ridge near the deserted chapel of pilgrimage, Madonna dell'Alto. There, to our joy, we found a fountain of pure, ice-cold water. The butterflies, though limited, were interesting. Low down worn *Leucophasia sinapis* L., a single magnificent *Hipparchia aristaeus* Bonelli, and the Burnets *Zygaena purpuralis*, *Z. lonicerae*, *Z. transalpina* and *Z. scabiosae* were caught. Damp places in the gully contained mixed colonies of Blues: *Polyommatus icarus* Rott., *Cyaniris semiargus* Rott., and *Eumedonia chiron nebrodensis* Ragusa, all in good condition, as well as a few less good examples of the tiny dark brown *Cupido minimus trinacriae* Verity, which is one of the Sicilian specialities. On and just below the ridge, where there is a growth of scrub beech as well as a brilliant stone flora, *Chrysophanus rubi* L. was still quite fresh, small examples of *Anthocaris cardamines turritiferens* Verity were flying freely, and there were many *Aglais urticae opima* Verity, far more brilliantly coloured than the English Small Tortoiseshell. The Fritillaries *Melitaea didyma*, *M. cinxia* L. and *M. athalia* were also common, and I took several *Pyrgus malvoides* and missed what was undoubtedly *Spialia orbifer* Hb. (of which more later). These presumably resident species were reinforced by many migratory *Colias crocea* (including f. *helice*), *Pontia daplidice*, *Vanessa cardui*, and by the only *V. atalanta* L. which we saw in Sicily. Altogether it was a fair reward for our hot climb and even more tedious descent, though I suspected that we should have done better if we had used a road up the valley to approach the mountain from a different angle.

Next morning we drove northwards to Cefalù on the coast, crossing two high ridges of the Madonie on the way and spending the middle of the day below the pilgrimage sanctuary of Gibilmanna (1,081 m.), where there are mixed woods like those at Ficuzza, with a very similar fauna. A steep south-facing hillside which adjoined them produced single specimens of two Skippers, *Reverdinus marrubii* Rbr. (*boeticus* Rbr.) and *Spialia orbifer* Hb. This last, of which we took another example two days later on the Mandruzzi Pass in the Nebrodi, was a real prize. The existence of this species in Sicily was for long disputed and is indeed very surprising, since *S. orbifer* is otherwise an east European and Balkan insect, whose place is taken in continental Italy by *S. sertorius* Hffsg. (*sao* Hb.). There seem to be very few specimens of Sicilian *S. orbifer* in collections, and our own experience of seeing it only singly, though in three widely separated places, suggests that it is rare. My specimens both have the characteristic round underside markings of *S. orbifer* well developed but are much larger than examples which I have from Constantinople (and also than any *S. sertorius*). Verity has attached the Sicilian form to the Macedonian ssp. *tesselloides* H-S.; but the examples which he figures ("Farfalle Diurne", I, pl. 3, figs. 85, 86) are smaller and duller than mine.

Cefalù gave me a wonderful sea bathe but no butterflies of interest; nor were there many on the following day when we drove along the picturesque but confined and overcrowded coast road eastwards to Milazzo, diverging to investigate the ruins of the ancient Greek city of Tyndarus on its windy hillside just off the route. On 4th June we turned south again to reach our final stopping place at the fishing village of Aci Trezza, on the east coast a little north of Catania, where we had already arranged to spend four nights over the Whitsun holiday. The first stage of the journey took us up a very beautiful road through Novara di Sicilia and over the Piatella di Mandruzzi (about 1,150 m.), which separates the Pelioriti from the Nebrodi mountains. The higher parts of the road were well wooded, and we stopped several times to investigate the collecting possibilities. The best ground was facing south at the top of the pass where, besides most of the species which we had seen at moderate levels elsewhere, there was an abundant colony of *Clossiana euphrosyne* L., small in size but with very conspicuous silver markings, and some Blues which turned out to be *Glaucopsyche alexis* Poda (*cyllarus* Rott.) of a very distinct race which has on the underside a great extension of dark blue basal scaling, combined with reduction of the size and number of the usual heavy spots. Verity ascribes it, rather uncertainly, to ssp. *valenzae* Pincitori-Marott: it appears to be peculiar to Sicily and very local there. Also seen on this ground were many fine *Pararge egeria* L., one *Reverdinus marrubii* Rbr., and, as mentioned above, our third example of *Spialia orbifer*. From this pass we dropped down through some arid country which is being irrigated and re-settled by the Casa di Mezzogiorno and, after passing through Randazzo, circled round the western slopes of Mount Etna. The road rose again to about 900 m., and we ate our sandwiches on a spectacular heath where masses of yellow broom and pink valerian contrasted with the black streaks of ancient lava stretching down from the still snow-covered summit far above. Here were a fine colony of Copper *Heodes alciphron aetnea* Trti. and a few fresh *Gonepteryx cleopatra* L., of both sexes, as well as many Whites and migratory species. On investigating a cluster of over a dozen male *Pieris rapae*, I found to my surprise that the attraction was in fact a freshly emerged *G. cleopatra*—an occurrence perhaps to be

explained by some similarity in the scent of the females of the two species, since their size and appearance are so different.

We reached Aci Trezza in the late afternoon after some intricate navigation through the string of big villages on the more fertile south side of Mount Etna. Unfortunately, though our hotel was beautifully situated, the country around it was too arid, when it was not too cultivated, to harbour many butterflies or, apparently, even night-flying moths. On 5th June we visited the famous resort of Taormina, along the coast to the north. But by the time we had bought our presents in the excellent shops and caught a single fine *Iphiclides podalirius* L. in the ruins of the Greek theatre it began to rain, and the weather remained wet or cloudy for the rest of that day.

Next morning, however, it was again brilliantly sunny when we set off early towards the summit of Mount Etna. We retraced our route through the villages to Nicolosi, and then turned up the excellent road which mounts as far as base of the final cone at nearly 2,000 m. At about 1,500 m. we stopped beside some rough ground covered with grass and scattered broom bushes, and I spotted a large Blue apparently drying its wings on a stem. This proved to be a male *Lysandra amandus* Scheven: a species which has not to my knowledge been previously reported in Sicily, though it has been found rather rarely on Aspromonte and in other parts of south Italy. I could not find any more either then or when we returned to the spot after mid-day.

From the top of the road we had hoped to cover the last 1,300 m. by the cable car which goes up to the Observatory built a little below the final, smoking, crater. But alas! the cars were closed for repairs, and we funked the alternative of a three hour climb, largely on cinders and rough lava. We did, however, spend some time on the grass slopes above 2,000 m., which were covered with patches of yellow and blue mountain pansies. There were good numbers of migratory butterflies, but it was probably too early in the season for any species which may breed there, except perhaps for a single *C. euphrosyne* whose larva may have fed on the pansies. For the rest of the day we descended slowly, making detours to explore, first, a pinetum which has been established at about 1,800 m., later a zone where scrub oak and chestnut were predominant, and, below that, a mixture of vineyards, rough fields, and quite sizeable trees. The butterflies seen included many *C. euphrosyne* and *M. didyma*, a single fresh *Nymphalis polychloros* L., both *Adopoea lineola* Ochs. and *A. flava* Brunnich, *Limenitis anonyma*, and, at about 1,200 m., several *G. alexis* mixed up with a large colony of *C. semiargus*.

On our last full day we returned to Taormina in the morning, and I did some extremely warm collecting in the lunch hour on the sun-baked slopes of Castel Mola, above the town. This gave a single *H. aristaeus* and a series of *P. ida*, of which the males were in abundance and the females just beginning to emerge. Then, after a delicious bathe in the sea below Taormina, we turned inland and drove back to Aci Trezza by a fine road which runs well up along the eastern slopes of Etna. Between Linguaglossa and Zaffarana it passes through the finest woods, mainly of oak and chestnut, which we had yet seen. Earlier in the day, these might have provided some good collecting; but by the time we reached them they were already largely in the shadow of the mountain, and the only noteworthy species seen was a single *Polygonia c-album f. hutchinsoni* Robson.

We spent our last morning, on 8th June, in visiting the castle museum where there are spectacular mediaeval paintings of the city walls lapped by lava flows from Mount Etna, and the cathedral in Catania. Then, after a quick swim from a beach near the airport, we handed in our hired car (in which we had driven 800 miles), and caught the 2.30 p.m. 'plane for Rome. During our three hour wait there the rain fell remorselessly; and we drove home after midnight from London airport in a thick fog! Thus ended what had been essentially a sampling rather than a serious study of the delights of Sicily, entomological and other. We left it with the feeling that there was much more to be done another time.

RHOPALOCERA SEEN IN SICILY, 26th MAY TO 8th JUNE, 1965

Papilio machaon sphyrus Hb. Widespread, but only singly.

Iphiclides podalirius podalirius L. Singly, mainly on hill-tops. The ground colour in this race is very pale, almost white.

Leptidia sinapis L. Monte Salvatore, 900 m., a few worn. 1.vi.

Anthocaris cardamines turritiferens Vty. Ficuzza, few; M. Salvatore, a dwarf form common at 1,700 m.

Euchloe ausonia romana Calberla. Agrigento, one of the summer form, 30.v.

Pontia daplidice L. Generally common; up to 2.000 m. on Mount Etna.

Pieris brassicae L. Widespread, in 2nd generation form, but not very common.

P. rapae L. Abundant everywhere, as 2nd generation.

P. napi meridionalis Heyne. Ficuzza, one worn male of the spring form.

Aporia crataegi augusta Trti. Ficuzza; Campanaro Pass; M. Salvatore; Gibilmanna; Etna. Local, but in abundant colonies among *Prunus*.

Colias crocea Fourc. Common generally at all levels; several of f. *helice* Hb. and f. *pallida* Tutt..

Gonepteryx cleopatra L. Segesta; Agrigento; Petralia; Gibilmanna; Etna; Taormina. Not common, but the emergence was clearly just beginning.

Limenitis anonyma Lewin (*rivularis* Stichel). Ficuzza; Gibilmanna; Etna. Not common.

Melitaea didyma meridionalis Stdgr. Ficuzza; Campanaro Pass; M. Salvatore; Gibilmanna; Etna. Locally common.

M. cinxia deva Hemming. M. Salvatore, above 1,600 m.; Mandruzzi Pass, 1,100 m.

M. phoebe emipunica Obth. Ficuzza; Campanaro Pass; M. Salvatore; Gibilmanna; Mandruzzi Pass. Common.

M. athalia sicula Turati. Ficuzza and Lupo; M. Salvatore; Gibilmanna; Mandruzzi Pass; Etna. Locally abundant.

Clossiana euphrosyne neston Frhst. Mandruzzi Pass, 1,100 m., abundant; Etna, 1,700-2,000 m., common.

Vanessa cardui L. Small numbers at all levels. Much variation in depth of ground colour, and also in size.

V. atalanta L. M. Salvatore, 1,500 m., one fresh (the only one seen in Sicily).

Polygonia c-album L. Etna, one f. *hutchinsoni* Robson 7.vi. in woods between Linguaglossa and Zaffarana.

Nymphalis polychloros L. Etna, one fresh, 1,600 m.

Aglais urticae opima Vty. M. Salvatore, above 1,500 m., common; Mandruzzi Pass; Etna, on heaths above Randazzo, and commonly from 1,500 to 1,800 m.

Pararge egeria sardoa Vty. Mandruzzi Pass; Etna. Not common.

P. megera australis Vty. Widespread and locally common at low moderate levels, especially round stone walls of vineyards, etc.

P. maera sicula Stdgr. Campanaro Pass; Petralia; Mandruzzi Pass. Locally fairly common, and a very striking race.

Maniola jurtina hispulla Esp. General at low and moderate levels, but not abundant.

Pyronia cecilia Vallentin (*ida* Esp.). M. Pellegrino, males only 28.v.; Taormina, males common and females just emerging, 7.vi.

Hipparchia aristaeus siciliana Obth. M. Salvatore, one at 1,100 m.; Taormina, one at 600 m.

Coenonympha pamphilus lyllus Esp. Widespread at all levels, but not numerous.

Heodes alciphron aetnea Turati. Etna, common on the heath above Randozza, and also on the eastern slopes 1,500-1,800 m.

Lycaena phloeas L. Widespread, but not common and mostly worn.

Callophrys rubi fervida Stdgr. Seen in many places above 600 m.; still fresh on M. Salvatore at 1,700 m.

Lycaenopsis argiolus L. Agrigento, one 30.v.

Glaucopsyche alexis Poda (*cyllarus* Rott.) *?valenzae* Pincitore-Marott. Mandruzzi Pass, on a bank covered with *Thymus*, a few; Etna, among stones and bushes at 1,200 m., three.

Aricia agestis calida Bell. Widespread at various levels, but all worn.

Eumedonia chiron Rott. (*eumedon* Esp.) *nebrodensis Ragusa*. M. Salvatore, a few flying with *C. semiargus* in damp spots at 1,500 m.

Cyaniris semiargus Rott. ?ssp. M. Salvatore, 1,400-1,700 m., common; Gibilmanna; Mandruzzi Pass; Etna, 1,200-1,800 m.

Cupido minimus trinacriae Vty. M. Salvatore, three taken in the gully at 1,600 m.

Polyommatus icarus pulcherrima Vty. Widespread at all levels, but very worn except high up on M. Salvatore.

Lysandra amandus ?bruttia Vty. Etna, one male at 1,600 m., 6.vi. Believed to be the first record for Sicily. It seems to agree with the race *bruttia* figured by Verity from Calabria.

Carcharodus alceae australis Zell. Agrigento, one, 30.v.

Reverdinus marrubii oberthuri Vty. Gibilmanna, one; Mandruzzi Pass, one seen but missed.

Pyrgus malvoides modestior Vty. Ficuzza, several; M. Salvatore, several at 1,700 m.; Etna, heath above Randazzo, one.

Spialia orbifer ?tesseloides H-S. M. Salvatore, 1,700 m., one missed; Gibilmanna, 1,000 m., one; Mandruzzi Pass, 1,150 m., one.

Adopoea lineola clara Tutt. Campanaro Pass; Petralia; Gibilmanna; Etna. Numerous in local colonies.

A. flava Brunnich (*sylvestris* Poda). Seen only on Etna, 1,200-1,800 m.

Thymelicus actaeon ragusai Vty. Selinunte; Agrigento; Taormina, common.

Ochlodes venata esperi Vty. Petralia, 1,000 m., one fresh male in a vineyard.

(49 species in all).

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More about *Cossus cossus* L. (Lep. Cossidae)

By H. C. Huggins, F.R.E.S.

From my own somewhat limited experience of the larva of this moth when pupating in earth, I am inclined to discount the ant theory as purely fortuitous. As regards its leaving its cocoon in Spring to seek a more suitable place for pupation I can only say that whilst I have met several dozen larvae wandering in late summer or early autumn in the course of my life, I have never yet seen one in the spring. In addition I have several times grubbed out cocoons from old willow trees in early spring, and once or twice opened one that had been made in captivity, and from these observations can only say that the larva then is pale, shrunken, and apparently in no condition to go anywhere.

As regards O.M.H.'s "In the Land of Shades", I thought that the identification of the goat moth larva with the Roman *cossus* had long since been abandoned. No doubt Roman tastes were different from ours but I do not think anyone could stomach this stinking revolting creature, however cooked. I have always understood that *cossus* was now identified as the larva of one of the larger wood-boring beetles, possibly *Cerambyx heros*.

In this connection it may be mentioned that in an article in the "Entomologist's Gazette" a few years ago, directions were given for the preparation of the larva of *Prionus coriarius* for the table.

To plunge into a sea of irrelevancies, I had a feeling that O.M.H. was inclined to weight the scales a little in favour of Pliny. From the little I have read of his works, I have been inclined to regard that industrious compiler of dubious facts as a monumental bore. But, to make a confession, I feel that most Romans were not very interesting companions. There were, of course, a few blackguards of genius like Julius Ceasar or Curio, with whom it would have been interesting to exchange visits (providing, of course, one had not a young and handsome wife) but consider a weekend with Cicero, apart from hearing ad nauseaum about his consulship and how he saved the republic, the author of De Amicitia and De Senectute was obviously "capable de tout". The only Roman I should really have cared to meet would have been the soldier-administrator-naturalist Quintus Sertorius, who would have been a charming companion for the evening, with his white doe popping in and out.

In discussing *cossus* as a food it should not be overlooked that the Romans ate it, sea-urchins, and snails for their supposed aphrodisiacal qualities. 65 Eastwood Boulevard, Westcliff-on-Sea, Essex. 16.vi.1965.

Spring Collecting in Morocco

By Baron DE WORMS, M.A., Ph.D., F.R.E.S.

Spring in Morocco! A most attractive thought and venue for collecting lepidoptera. But though numbers of our own compatriots have been there for this purpose and some, like the late Harold Powell and the late Eldon Ellison, have even resided for a considerable period in that delectable country, extremely little has appeared in the literature of their respective experiences and captures. Charles Oberthür, that famous student of palaearctic lepidoptera, published an account of collecting in various regions of Morocco and its lepidoptera (*Lépidoptérologie Comparée* (1922) XIX), but we have to turn to another celebrated collector, from Germany, C. Zerny who, with his companion Herr Schwingenschuss, spent most of the summer of 1933 in the Grand Atlas and eventually published a most comprehensive account of their captures, together with a very complete list of the butterflies and moths of Morocco (*Mémoires Soc. Sciences Nat. du Maroc.* XLII (Dec. 1935). Apart from these two papers, already quite ancient, we have very little else, certainly in recent years, to give us some idea of the richness and specialisation of the lepidoptera of this large area of North Africa.

Fired by the success of Dr. Lionel Higgins who covered most of the well-known localities during a tour of the Middle and Grand Atlas in the summer of 1964, I thought I would sample those regions during the earlier months of the year which have been somewhat neglected by most of the visiting collectors. I set out by air on April 13, 1965, reaching Casablanca via Paris in the early hours of the following morning. After a few hours at a hotel in that great city, I went on during the morning by a very good train which did the 150 miles to Marrakesh in four hours. The view of the towering and snowclad Grand Atlas as one approached this fine and ancient town, was indeed impressive. This was to be my headquarters for the next fortnight. I put up at one of the smaller hotels in the French city, the Katoubia, which was very comfortable and relatively inexpensive. That afternoon I explored on foot, in brilliant sunshine, some rocky hills on the outskirts and found *Euchloë belemia* Esp. in plenty. This was to prove by far the commonest Pierid. The next day, the 14th, I hired, by previous arrangement, a small car, a Simca, which negotiated all the mountainous roads extremely well. I was soon to find that apart from the cornfield Pierids one had to cross the large cultivated area of nearly thirty miles to the foothills of the Grand Atlas in order to discover a greater variety of lepidoptera. I did this on the 15th when I explored the Ourika Valley which lies to the south-east of Marrakesh. On the way I halted at a wayside cornfield which looked promising and found *Euchloë ausonia* Hbn. in the summer form in quantity flying with *E. belemia* Esp. and I also took a single, very late *Pontia daplidice* L. I also had my first introduction to the delightful little yellow Pierid *E. charlonia* Donz., as it flitted swiftly over the corn tops. En route towards the mountains the bird life was equally interesting, with rollers and bee-eaters at intervals along the telegraph wires, with an occasional white stork strutting about the fields. But on this occasion I found the noted Ourika Valley far from productive in spite of the brilliant weather, and virtually nothing was flying among the chênes verts. It did appear to be a late season, as was observed by Mr. A. G. Allcard who was in this region in March. On

Good Friday, 16th April, I did the 45 miles to Asni, a small village again in the foothills. It is reached by the main motor road through the mountains which it enters by a narrow gorge with the road running along a sheer ledge. Dr. and Mrs. Higgins had made the comfortable hotel there their headquarters the previous summer. It faces the highest peak, the Djebel Toubkal, rising to nearly 14,000 ft. But in this area too, there seemed to be a distinct dearth of butterflies, though I did catch sight of *Anthocharis eupheno* L., that lovely yellow Orange-tip peculiar to North Africa. It seemed virtually confined to the scrub oak, chênes verts, slopes, and never appeared in open country. *Colias croceus* Fourc. was well to the fore with an occasional *Pararge egeria* L. The next day, the 17th, saw me at the small habitation of Amizmiz, also at the foot of the mountains and much more to the west. I found a very steep and narrow road passing through the scrub oak, and halted at a spot with a slope covered with lavender and a galaxy of wild flowers, and here again *A. eupheno* was seen with a few Pierids and *E. charlonia* in some of the cornfields at the start of the ascent. Easter Sunday, the 18th, was another glorious day which I spent revisiting the Ourika Valley. At the head of the valley, which is reached through a narrow gorge, there is a good restaurant which I patronised and there found a lilac hedge covered with butterflies, with a good proportion of *Papilio feisthameli* Dup. which is regarded by many experts as a separate species from *P. podalirius* L., *Polygonia c-album* L. and *Pyrameis cardui* L. were also well to the fore. After another somewhate unproductive visit to Amizmiz on the 19th I thought I would try my luck in another direction in the hope of finding some ground still left uncultivated, yet not in the mountain chain. So on the 20th I set out early on the road to Ouazazarte which is at the southern end of the second big pass through the Grand Atlas and lying to the south-east of Marrakesh. After going about 30 miles I came across a rough hillside bordering the main road near a small village called Taffariate. When I pulled up in a lay-by, I noticed some small Lycaenids skimming over the ground, the first Blues I had seen. They turned out to be *Azanus jesous* Juerin, just freshly out, together with a small Skipper, like our *Adopaea sylvestris* Pod, but in fact *A. hamza* Oberthur. The small ditch along the roadside seemed the best locality for these two insects which, incidentally, were only to be found in this restricted area. I soon came across *Tarucus theophrastus* Fab. which feeds on the prickly bush, *Zizyphus lotus* and also the Brown Argus *Aricia cramera* Eschesch. which is the indigenous species in North Africa. It was here that I saw the first *Melanargia ines* Hoffgg., that handsome Marbled White of southern Spain and North Africa. In a cornfield, a little way further along the road, I found this insect more plentifully and it turned out to be the best locality for *Euchloë charlonia* which was flying in numbers along a rough dry avenue through the field. *Pararge megaera* L. was also on the wing in this locality which proved one of the richest in the whole region, especially as a nearby valley with slopes covered in cistus bushes seemed the home of many *Gonepteryx rhamni* L. and of *G. cleopatra* L. The weather broke for the next four days from April 21 to 24 when little profitable collecting was possible. However, it recovered by the 25th when I revisited Taffariate when more of the species already mentioned were on the wing. This was to be again my venue on the 27th in company with Maj.-General Sir George and Lady Ida Johnson who had arrived in Marrakesh the previous evening from England. On this

occasion we concentrated on a rough valley in an area designated for forestry. Among the long grass, *M. ines* was in plenty, with a fair proportion of females. Besides *A. hamza* we also found the local form of *A. actaeon* Rott. and also that delightful little Blue, *Zizera lorquinii* H.-S. which looks rather like *Plebeius argus* L. above and *Z. minima* Fuessl. on the underside. Several other skippers were also flying including *Carcharodus alceae* Esp. and the North African species *Pyrgus proto* Esp., *P. ali* Oberthur and the South European *Carcharodus baeticus* Rambur (=*marrubii*). All the usual Pierids were very plentiful.

While the Johnsons were exploring the Asni area on the 28th I thought I would venture to the heights and negotiated the very steep, and in some parts quite precipitous, mountain road leading from the Ourika Valley to the ski resort of Oukaimeden at nearly 9,000 ft. which I found was by then just below the snow line with the area at that altitude carpeted with *Narcissus bulbocodium*, but it was too high for any lepidopterous life at this season. A few days before, I had ventured up an even rougher and narrower road leading from just below Asni into the Ourika Valley, and passing through the main chênes verts region at nearly 5,000 ft., but the day was dull and nothing moving. On 29th April we all three went beyond Asni to a gorge in the range with the road bordering one of the many rivers. In rather a rocky spot with a sprinkling of scrub we saw a number of *Anthocharis eupheno* and along a stony path were flying *Melitaea phoebe punica* Oberthur, *Issoria lathonia* L. and *Melitaea didyma* Esp. in a very pale form. It was here that we saw the first *Turanana abencerragus* Pier., *Tarucus theophrastus* was also on the wing.

On the suggestion of Dr. Higgins I motored, on 30th April, 260 miles along the good main road crossing the central plain of Morocco via Kasbah Tadla, reaching Azrou, at 4,000 ft. in the Middle Atlas, in the late afternoon. The country is very picturesque in this region with rolling hills covered with thick forest, very different from the surroundings of Marrakesh. The Panorama Hotel there makes a very good and comfortable headquarters. As soon as I set out on the 10-mile route to Ifrane, lying at 5,000 ft., I at once realised how very much richer this region was in lepidoptera. On an open plateau between the forest belts half-way to Ifrane, I halted to look at the wild peonies on the edge of the wood when I spotted a large red butterfly skimming over the ground on the roadside. It turned out to be *Euphydryas desfontanii* Godart, a most striking insect—larger than our *E. aurinia* Rott. and with more rounded forewings. I soon found this grand species in numbers and just out, with some even drying their wings. With them was flying *Melitaea phoebe* Knoch and *M. cinxia* L. Later I went on to Ifrane itself, a modern French resort with many hotels and the Royal Palace perched on an eminence above the town. Just below the large new Ballima Hotel I spotted a hollow covered in wild flowers which looked an ideal locality. In fact it turned out quite a gold mine, since every species occurring elsewhere in the region, seemed to exist there, while the short stretch of road bordering the cedar forest in the direction of Timhadit was a veritable paradise for butterflies. The wooded glades were alive with *Anthocharis eupheno* with the females quite numerous, while *Zerinthia rumina* Esp. was sailing about in very fresh condition in a very large race of this fine insect. *Callophrys rubi* L. in a very pale form was also in numbers and still in good order, while

at the roadside was flitting *Zizera lorquinii* everywhere. It was on revisiting this locality on 2nd May, under very warm conditions, that I noticed a large Pierid perched on the tall stem of charlock growing beside the main road. I soon recognised it as *Zegris eupheme* Esp. This grand species is not mentioned in Seitz as occurring in Morocco, but it was apparently taken by Mr. Ellison in the early 1930s when he was consul at Fez, and has since been found to be widespread in the region. On my way back to Azrou that evening I found several at rest on their foodplant (*Sinapis incana*), their undersides making an excellent camouflage with the yellow flowerheads. *Thestor ballus* F. was only just appearing in this area as also was *Pyrgus ali* and *Aricia cramera*. This most attractive locality was once more my venue on the 3rd, another scorching day when *Zegris eupheme* was really quite abundant, even appearing in back gardens in the town. *Papilio feisthameli* was just freshly out and *E. desfontanii* was now flying among the carpet of flowers just below the hotel. The only surprising newcomer was a very worn *Nymphalis polychloros* L. Sir George and Lady Ida motored from Marrakesh to join me that evening at Azrou and we sallied forth at an early hour on 4th May to Ifrane where *Z. eupheme* seemed to be flying everywhere, most of them only just out. Our usual spot was even more productive as the hot weather was bringing the insects out fast. On this occasion we saw the first *Lysandra punctifera* Oberthur, like an outsize *L bellargus* Rott. but much brighter and with a heavy row of spots on the outer edges of the hindwings. All the species already mentioned were about in fair plenty with the addition of a single *Thestor mauritanicus* Luc. The only absentees were the bigger Satyrids which were not yet on the wing. My last morning at Azrou, 5th May, I spent on a grassy slope on the Midelt road and also along a side road running through a wood which I christened '*eupheno*' alley, since this Orange-tip was so numerous there. On the more open grassy areas beside the main road, were flying several *Zerynthis rumina* and an occasional *Zegris eupheme*, together with a good many Melitaeas, most of which turned out to be large forms of *M. phoebe*, but the very last insect I netted proved to be *M. aetherie* Hbn., much redder and with less black on the upperside. This species, General Johnson, who stayed on till 10th May, found in fair numbers at Ifrahe, on the open ground, just outside the main forest belt. During the next four days many of the Blues became much more plentiful there, especially *L. punctifera* and also *Lycaena bavius* Ev. in its North African form *fatma* Oberthur. In the same area he also obtained a few rather worn *Cigaritis zohra* Donz. which Oberthur (1922) only mentions from Mogador.

The afternoon of 5th May I motored the 200 miles to Casablanca via Meknes and Rabat and took the 'plane home overnight, via Paris, after what had proved to be a most successful and enlightening trip in the most attractive regions of North Africa.

During our sojourn, the moths had seemed very much in abeyance, certainly by night and even by day, very few geometers or day-flying noctuids being seen in the Grand Atlas area, or around Marrakesh. In some of the foothills I flushed an occasional Wave and also *Lithostege farinata* Hufn., but the Burnets were more interesting. In the Taffariate locality we found one of the family flying in plenty low over yellow flowers. It turned out to be *Zygaena favonia* Frr. and among longer

herbage I found a pair of a slightly large relative *Z. loyselis* Oberthür from which I obtained ova which are in the course of being bred up by Mr. W. G. Tremewan.

In the Ifrane region the chief daytime geometers were *Bichroma famula brunnea* le Cerf flying in abundance among the cedars together with *Chiasmia clathrata* L. and I found a *Toulgoëtia cauteriata* Staudinger at rest on the door of the local post office. On one of the windows of the Panorama Hotel at Azrou I found a female Puss moth which obliged with a batch of ova. This insect is referable to *Dicranura delavoiei* Gaschet which Seitz includes as a form of *D. vinula* L., but it is evidently a distinct species, since the ova are laid in batches and the larvae feed gregariously, unlike *D. vinula*. In addition, the adult larva which we bred, differs appreciably from that of *D. vinula* in that outline of the saddle is continuous and edged with yellow, whereas in *vinula*, it is edged in white and is very angled at the base of the central segments. It seems too, to prefer spinning up in leaves than to make a cocoon from wood. It will be interesting to compare the imagines. Two kinds of Forester taken at Ifrane proved to be *Procris reisseri* Naufock and *P. mauretanicus* Naufock.

List of Butterflies recorded from Morocco between 14th April and 10th May 1965.

(M)=Marrakesh - Grand Atlas area.
(C)=Casablanca.
(I)=Ifrane-Azrou region

Papilio feisthameli Dup. Getting over (C) and (M); freshly emerged (I).
Zerynthia rumina Esp. Few worn (M); fresh and plentiful (I).
Aporia crataegi Linn. Bred from larvae and pupae (I).
Pieris brassicae Linn. Few (M); more numerous (I); few (C).
Pieris rapae Linn. Fairly common (M), (I) and (C).
Pontia daplidice L. One seen (M).
Euchloë ausonia Hübn. Locally plentiful (M) and (C); numerous in its smaller first brood form (I).
Euchloë belemia Esp. Everywhere among corn and open country (M).
Euchloë charlonia Donz. In most places where corn is grown (M).
Anthocharis eupheno Linn. Scarce among the chênes verts (M); abundant in the forest region (I).
Zegris eupheme Esp. Becoming increasingly plentiful (I); Oberthur (1922) only cites two Moroccan records.
Gonepteryx rhamni Linn. Sporadic among chênes verts (M) and (I).
Gonepteryx cleopatra Linn. Fairly common among the scrub oak (M) and (I).
Colias croceus Fourc. A few (M); more numerous incl. *f. helice* (I).
Polygonia c-album Linn. Occasionally (M) and (I).
Pyrameis cardui Linn. A few seen (M).
Pyrameis atalanta Linn. One seen (C).
Nymphalis polychloros Linn. One hibernated specimen seen (I).
Issoria lathonia Linn. A few among the chênse verts in a small race (M).
Melitaea phoebe Knoch. Small race among scrub (M); large form numerous (I).
Melitaea aetherie Hübn. Becoming numerous early May (I).
Melitaea cinxia Linn. A few noted (I).
Melitaea didyma Ochs. A few seen (M) and (I).

Euphydryas desfontanii Godart. Very plentiful and just emerging f. *gibrati* Oberthur (I).
Melanargia ines Hoffgg. Plentiful, but very local (M).
Pararge egeria Linn. Scarce (M); more plentiful (I).
Pararge megaera Linn. Not common on rough ground (M).
Maniola jurtina Linn. Just appearing early May (M).
Coenonympha pamphilus Linn. Fairly plentiful (M) and (I).
Heodes phlaeas Linn. A few seen (M) and (I).
Callophrys rubi Linn. Common in forest region (I).
Polyommatus icarus Rott. Scarce (M); numerous (I).
Polyommatus thersites Gerh. Fairly numerous (I).
Lysandra punctifera Oberthur. Becoming plentiful early May (I).
Lysandra bavius Ev. f. *fatma* Oberthur. Emerging in numbers early May (I).
Azanus jesous Guerin. Only seen in one small area (M).
Tarucus theophrastus Fab. A few seen on rough ground (M).
Zizera lorquinii H.-S. A few (M); fairly common in forest belt (I).
Turanana abencerragus Pier. A few in the chênes verts region (M).
Aricia cramera Esch esch. Very local (M); scarce (I).
Thestor ballus Fab. A few freshly emerged (I).
Thestor mauritanicus Luc. A few worn examples (I).
Cigaritis zohra Donz. A few worn specimens (I).
Adopaea hamza Oberthur. Very local on rough ground (M).
Adopaea actaeon Rott. A few flying with the above species (M).
Carcharodus alceae Esp. A few in same area as the above (M).
Carcharodus baeticus Rambur=*Reverdinus marrubii*. A few, very local (M).
Hesperia proto Esp. f. *mohommed* Oberthur. Scarce on rough ground (M).
Hesperia onopordi Rmbr. A few probably emerged (I).
Pyrgus ali Oberthur. A few (M); more numerous (I).

Three Oaks, Woking.
16.vii.65.

Fiat Justitia . . . .

By An Old Moth-Hunter

It was in 1832 that Archdeacon Bree, a leading lepidopterist of his day, called attention in print to two fritillaries which he had noticed in Weaver's Museum at Birmingham. Richard Weaver (1782-1857) was perhaps the finest field entomologist in this country and was the discoverer in our islands of *Caenophila subrosea, Apamea exulis, Apatele myricae, Triphaena sobrina, Sterrha eburnata, Tholomiges turfosalis, Pysche opacella* and of a great many other insects, both Lepidoptera and Coleoptera. The two fritillaries were said to have been caught by him near Birmingham one in 1822, the other in 1826 or 1827. The mystery of them will never be cleared up. Weaver, who was the soul of truth and integrity, asserted that he caught two varieties of *Argynnis selene*, and by some quite inexplicable happening two specimens of *Melitaea dia* became substituted for the two *selene* vars, perhaps by one of his customers to whom he had sent them with other insects, on approval.

The controversy about these unhappy butterflies sounds incredible to-day. The lepidopterists of England became divided into two camps: those who championed Weaver and supported him against his traducers, and those who asserted that he was a rascal. Among the former were H. T. Stainton, N. A. Vigors, M.P. (one of the founders of the Entomological Society), the Council of the Zoological Society, and practically all the scientists. The vilifiers were the great body of "collectors", jealous men who suspected not only each other but every rarity alleged to have been caught in Britain.

The firing had hardly died down before there was a fresh *dia* scare. This time the captor was the son of a baron, and the compère was a Roman Catholic priest, the Reverend Bernard Smith of St. Peter's, Great Marlow, Buckinghamshire, who duly became a Very Reverend Canon and a noted field lepidopterist. Born in 1814 he died in 1903, having been universally beloved for his gentle unassuming modesty and unvarying kindness to all with whom he came in contact. As a specialist in the Notodontidae he contributed largely to contemporary knowledge of this Family. Among his many virtues was an acute (and sometimes most refreshing) sense of humour.

On 7th November 1857 he sent the following letter to H. T. Stainton, and it appeared in *The Entomologist's Weekly Intelligencer* on 21st November:—"*Capture of Argynnis Dia.*—A short time ago, among some insects brought to me to name by a young collector, the Hon. C. A. Ellis, resident near here, I observed a small Fritillary unknown to me; it had been knocked down by a village lad with his cap, and was pinned and set in corresponding style; still I insisted on its interest, and recommended that it should be sent to Mr. Doubleday to name. He has pronounced it to be *Argynnis Dia*, and, through the liberality of Mr. Ellis, the specimen is now in my collection. This fact will give deserved pleasure to Mr. Richard Weaver, whose capture of *Dia* near Sutton Coldfield, years ago, thus receives confirmation in Berkshire".

A fortnight later he added further details about the capture, ending his letter with a mild joke which was to become the *leitmotif* of the subsequent correspondence:—

"*Argynnis Dia.*—With regard to the capture of *Argynnis Dia*, I have to add that it was taken about the middle of September, which suggests to me the idea that it is double-brooded. The spot where it was taken is known to me, and although I do not deem it necessary to publish this precisely it agrees with the high ground near Sutton Coldfield on which Mr. Weaver took his specimens. I think it probable, from what he once told me, that the first brood will be found to synchronise with the appearance of *Euphrosyne* rather than that of *Selene*. As the fact of the capture seems to have been questioned in some quarters I hope that the doubt will be cleared up by a more circumstantial account than I am in a position to give. 'Fait justitia, ruat'—Dia".

Father Bernard was a prudent man and evidently thought it would be a good thing if the captor of the butterfly would now come forward and carry the baby himself; for in view of the almost universal scepticism about the *bona fides* of British *dia* it was not unlikely that the infant would prove fractious. He therefore persuaded the captor to make what was probably his first entomological incursion in print, and in the next issue of the *Intelligencer* Stainton printed a letter from Mr. Ellis, dated from Cookham Deane, Maidenhead, 8th December:—

"*Argynnis Dia.*—Seeing from the 'Intelligencer' of November 28 that some doubts have been expressed relative to the capture of *Dia*, I think it better to state that the specimen in question was taken about the middle of September last, in the Rev. S. Hodson's garden at Cookham Deane, near Maidenhead. As I killed and set the specimen myself I am quite certain that it is undoubtedly British, and I trust that this will set the question at rest".

Here I must interpolate that Charles Arthur Ellis was the son of a Lord Howard de Walden and was born in December 1839. He was therefore 17 years and 9 months old when he netted the *dia*. I have seen nothing further about him as an entomologist save that his name appears in Stainton's List of Entomologists printed in *The Entomologist's Annual* for 1859 as one who is interested in "European Lepidoptera".

This letter in the *Intelligencer* caught the eye of a hard-headed and hard-hitting Northerner, John Scott of Middlesbrough, who promptly sent Stainton the following:—

"*Fiat justitia*, Rue it, Dia.—Now this is no joke. 'Intelligencer' No. 60 says "it had been knocked down by a village lad with his cap, and *was pinned and set in corresponding style*". 'Intelligencer' No. 64 says, from the pen of another individual, "*I killed and set the specimen myself*" etc., and "I trust that this will set the question at rest". And, judging from these two distinct statements, my idea is that it makes the thing more doubtful than ever, and I trust the Honourable gentleman will excuse my putting the following question to all entomologists, as I am myself ignorant of the fact, *viz.* Are they aware of the Fritillaries being found in gardens?"

Before Mr. Scott's question could be answered the Reverend sponsor, who seems to have realised that the baby was growing rapidly, thought it advisable to take some delaying action. It would be as well to have a breather in order to consider what step should be taken next to consolidate the position. Moreover, that question about fritillaries in gardens might prove to be a welcome red herring . . . . He sent Stainton the following, keeping his end well up:—

"*Fiat Justitia*—Go it, Dia: All we ask is fair play, and I think the capture of *Dia* will have to be admitted by the most sceptical. Mr. Ellis is not in this neighbourhood at present, but on his return I will call his attention to the objections of Mr. Scott. If I mistake not, there were more witnesses of Dia's last dying speech and confession than one".

This most excellent letter had the desired effect: the hint that the Thames-side lepidopterists had still further shots in their locker kept John Scott quiet for a week or two and gave free play to the red herring. The succeeding week produced a letter from Harwood, the Colchester 'professional', testifying to the presence of *paphia* and *suphrosyne* in gardens, and one from an otherwise unknown Parson who had seen *paphia* in a garden at Chichester: "I see no reason therefore why *A. Dia* might not have been taken in a similar situation". But he too felt a little doubtful, for he added: "At the same time the two accounts recorded in . . . the '*Intelligencer*' seem so contradictory that a further explanation appears necessary if the reputation of the specimen is to be above dispute".

This was followed immediately by a counterblast to John Scott by another correspondent:—"I am surprised by the sceptical letter of your correspondent . . . to my mind the two accounts are by no means contradictory. I should say the fair inference from them was this: that a specimen of *Melitaea Dia* was "knocked down". in the garden named, by a

"village boy", that it was brought alive to Mr. Ellis, who "killed and set" it, though not very successfully, and by him taken to the Rev. B. Smith to be named. This is surely probable enough". He then went on to refer to the "well known fact that *A. lathonia* is not infrequently found in gardens on the Continent" and concluded: "When a capture is announced on the authority of gentlemen in the position of those who have figured in this *rue*-ful history of a British *Dia*, is there not something more than mere scepticism involved in a commentary such as that with which your correspondent has favoured us?"

Meanwhile the Yorkshireman, thinking perhaps that it would be wise to take the wind out of the parson's sails before the latter fired another salvo, wrote a further letter to the *Intelligencer*. It was as follows:—

"*Fiat-justita—Dia*-bolical Outrage.—My attention has been drawn still more to the statements in . . . the 'Intelligencer', and I perceive that the facts are reconcilable as there stated, as I presume the boy captured and pinned the insect, which was thus taken to the Hon. C. Ellis, who killed and set it". But he could not resist having a dig at the last letter printed in the *Intelligencer*:—

"Is the *Dire* occurrence intended for a joke? If so, I should be glad to see it".

The matter might have been allowed to rest here, but Stainton received a letter from a regular and valued correspondent, a Welshman named Thomas Parry of Merthyr, who was determined to worry the bone as long as any meat remained on it; and Stainton could not very well refuse to print his effusion:—

"*Dia again.*—The controversy as to this insect is becoming quite amusing. The first account states that the insect "was knocked down by a village lad with his cap, and pinned and set in corresponding style". The next is that it was taken (in a garden) "by the Hon. ———, who killed and set the specimen himself", doubtless in a style corresponding to the value of the insect and the position of the Hon. captor. The question now arises, are the village lad and the Hon. ——— one and the same person? Either they are so, or they are not, and in either case there is something like a misrepresentation . . . ."

This letter apparently worried another reader of the 'Intelligencer', a Mr. Morton of Ripon, for he at once sent Stainton his own "appreciation of the situation":—

"It would appear that some people will not read aright . . . . It is quite clear that this rare insect was captured in a rough-and-ready way by a "village lad" and was "pinned and set in the same style" by the Hon. C. A. Ellis, who was a "young collector". I cannot understand that the "village lad" did more than knock the butterfly down with his cap; he did not pin it, as Mr. Scott appears to think, nor was the insect "taken (in a garden) by the Hon. ———", as Mr. Parry conceives, but it was catured by the lad and presented to Mr. Ellis. Anyone interested in this *Dia*-tribe . . . must at once be convinced there has been 'much ado about nothing'."

With this last sentiment Stainton no less than his readers must have agreed; for to this letter he appended a note:—"The *Dia* controversy has now lasted long enough, and unless some new *facts* are elicited we must decline publishing further communications on the subject".

But the Reverend Father, with the wisdom of the ages, was not to be drawn into disclosing any 'new facts'; and as his triumph over the unbelievers was thus assured, that was the end of *l'affaire dia* of 1857.

Procus versicolor Borkh. (Lep. Noctuidae) in Kent

H. C. Huggins, F.R.E.S.

I read with interest Mr. Chalmers-Hunt's account of the above insect (*Ent. Rec.*, **77**: (233)) from which it appears that the only Kentish specimens of this moth so far traced are those in my possession.

In the interests of concision part of their history was omitted, also I did not tell Mr. Chalmers-Hunt one rather important fact as at the time it appeared to be irrelevant.

In 1954 Dr. Cockayne was interested in the subject of *P. versicolor* and asked me to let him see any specimens I had that might prove to be this species. Accordingly I took the Gravesend specimen, Heath's two Westwell ones and several other insects from here and Kent to Tring. After a careful examination he rejected all except these three, and pronounced these to be undoubtedly *versicolor*.

In 1958 I captured some very beautiful forms of a *Procus* on Tresco and resolved to take them to the B.M. When doing so in the following year I also took for comparison the three identified by Dr. Cockayne and some others from my garden. Rather to my disappointment the Tresco and Essex ones were all identified by Mr. Fletcher as *P. strigilis* Clerck, but at the same time he confirmed that the three Kentish ones were *P. versicolor*. As will be seen from Mr. Chalmers-Hunt's account Mr. Fletcher still held the Gravesend insect to be *versicolor* but on being pressed by him said he could not be absolutely certain without dissecting it as it was a female. In view of the previous identification by both Dr. Cockayne and Mr. Fletcher I did not consider this necessary, a position I still maintain.

One point is of interest concerning the Westwell specimens, they are absolutely identical so that it is quite unnecessary to trace Pierce's record of the mutilated one, incidentally, Dr. Cockayne was very annoyed that such a beautiful specimen should have been cut up, as it is quite superflous in dealing with the genitalia of a male *Procus*.

The Gravesend specimen was taken by me after dark with an acetylene lamp on a flower of the greater knapweed. In those days there was a cart track between Gravesend and Shorne which was seldom used and covered with the two knapweeds, the large scabious, toadflax, succory and other flowering plants, and *P. strigilis* was very common there, I often searched this place with an acetylene bicycle lamp and took many good insects and by day *Eremobia ochroleuca* Esp. was common there, occasionally above but usually tightly clasped under the seedhead of the greater knapweed. I also often saw *Loxostege palealis* Schiff. in the same place.

Mr. Chalmers-Hunt considers that the Gravesend moth looks like an abnormally pale *P. latruncula* Schiff. Unfortunately he did not mention this at the time he, Mr. Fletcher, and myself were discussing it, I do not recollect the name *latruncula* cropping up at all. Had he done so I should have informed him that I have in my short series of *P. versicolor* a very similar specimen, taken by Mr. F. H. Lees at Maidencombe which is luckily a male. Some years back Mr. Lees submitted a number of specimens of the genus *Procus* to the B.M. and when they were returned gave me four *P. versicolor* of which this was one. It bears the B.M. label "P. versicolor, det. D.S.F.". It is very similar to the Kentish insect in question, except that the ground colour is a reddish brown instead of reddish buff, in this respect being more like the usual *P. latruncula* than the Kentish one. The pattern and marking are identical.

Although I prefer my insects in an unmutilated state I am always willing, when I consider it necessary, to sacrifice them in the interests of science, as Mrs. Gamp did the remains of her husband. Last year to assist Mr. Baynes in tracing the Irish distribution of *Ortholitha umbrifera* Prout I allowed Mr. Fletcher to dissect most of my Irish *O. mucronata* Scop., some of them from localities like Dursey Head, Mizen Head and Windy Gap which I am never likely to revisit.

65 Eastwood Boulevard, Westcliff-on-Sea. 10.vi.1965.

Notes on some South African Tortoise Beetles (Cassidinae : Chrysomelidae)

By J. S. Taylor

The Tortoise Beetles or Cassidinae have a fascination of their own. The adults are often brilliantly coloured in various metallic hues while the larvae not only differ markedly from those of other members of the Chrysomelidae, but, as one author put it, often present a bizzarre appearance.

The immature stages of several South African species have been described and figured by Paterson (1941), also by Taylor (1930), and it is therefore unnecessary to repeat such here, but an account of some of the species met with from time to time by the writer may be of interest.

(1) *Aspidomorpha tecta* Boh.

This species has been under investigation for the last eighteen months at Wilderness, C.P. The golden markings on the elytra and pronotum of the adult render it a conspicuous insect, and although it is of common and widespread occurrence specimens are often brought in because of its bright golden appearance. Paterson (*op. cit.*) recorded it commonly in the Transvaal, while the present writer has found it in various localities in the Eastern Cape Province. Both adult and larva feed on the leaves of certain—although not on all-species of *Ipomaea* (Convolvulaceae). At George and Wilderness, C.P., the host-plant is *I. filicifolia*, a species often found in gardens and with a spectacular purple flower. *A. tecta* is particularly plentiful on a hedge of this *Ipomaea* in one of the main thoroughfares of George. During the summer months it occurs there in thousands and few leaves do not show signs of larval and/or adult feeding. In winter it largely disappears while the host-plaint dies back to a considerable extent, depending upon the severity of the weather. However, some adults survive and these commence activities again in the spring. No immature stages have been found during winter, and this would appear to be the case with other species of tortoise beetle as well.

With reared material at Wilderness it was noted that although adults emerging in autumn may then mate and feed for a time, they deposit few if any oothecae or egg-packets before the following spring. Taylor (*op. cit.*) in referring to *A. hybrida* Boh., the Solanum Tortoise Beetle, mentions that no hatchings took place from oothecae deposited after the middle of May. This was at Barberton in the Eastern Transvaal where the climate is sub-tropical as compared with the temperate climate of George and Wilderness.

In the case of a pair bred at Wilderness and which emerged on 29th February 1964, mating took place on 21st March but feeding only occasionally in warmer weather during the winter although kept indoors throughout. The male died during August while the female commenced oviposition on the 31st of that month, and continued to do so almost daily until 5th March 1965. This particular female eventually died on 11th March 1965, after a life-period of 376 days in the adult stage. During this period over 300 oothecae were deposited, and although some failed to produce larvae, especially those deposited in late September and early October, the majority contained fertile eggs, even the last fragmentary ootheca deposited on 5th March produced one larva.

Progeny of this long-lived female commenced to emerge on 20th October 1964 and were noted mating on 13th November. The female of one of these pairs oviposited on 18th November and continued to do so until her death on 20th February, the period of adult life in this case being 121 days. The male, which emerged at the same time, survived until 14th May, or for a period of 204 days. It mated readily with a fresh female after the death of the original female of the pair and up to the time of its death. Eighty-nine oothecae were deposited by the original female and 12 of these failed to produce larvae. In the case of another pair, emerged at the same time, the female lived for 81 days and deposited 46 oothecae, all but eight of which produced larvae, while the male survived for 92 days.

During October and November 1964 the writer was travelling in the Eastern Cape and Natal and had to take the original *A. tecta* and offspring with him. It was not always possible to find the correct host-plant and when this was the case oviposition, as well as feeding, ceased. Only *Ipomaea filicifolia* or closely related species were accepted: even some species of *Ipomaea* being rejected.

The colouring of the adult beetle varies considerably, some being almost all gold dorsally and others marked with shiny black to a varying degree. It was found that there is no sexual significance in the colouration of the adult, as both sexes occur in all degrees of gold as well as of black. The bright metallic adult colouration is attained some ten or more days after emergence. This was also noted in *A. hybrida* (Taylor, *op. cit.*). The male beetle is usually somewhat smaller than the female.

The number of larvae per ootheca has varied from one to thirteen, but the average works out between three and four. This being the case, one female is capable of producing over one thousand larvae, although it is doubtful if this figure is often attained under natural conditions. The incubation period occupies from eight to nineteen days, depending upon the prevailing temperature. It is, of course, considerably longer in spring than at midsummer when the average is ten to eleven days. The larval period occupies from 16 to 23 days, with an average of 20.3 days, and the pupal period 7 to 8 days. The pupa is found attached to the underside of a leaf.

A eulophid egg-parasite *Aceratoneura* sp., has been obtained in considerable numbers, especially during late summer, from oothecae collected on *I. filicifolia* in George. Attempts to rear the parasite have been made, freshly deposited oothecae being exposed to the adult parasite for varying periods, the adult parasites also being supplied with raisins for sustenance. A few parasite progeny were thus obtained and emerged in from 22 to 27 days after the oothecae were exposed to parasite attack. Adult parasites survived for 17 or more days under such conditions.

The coccinellid *Exochomus flavipes* Thnb., preys upon the young larvae of *A. tecta.*

The life-history of *A. tecta* follows closely that of *A. hybrida* as given by Taylor (*op. cit.*) in which case, also, the adult was found to be relatively long-lived.

(2) *Aspidomorpha puncticosta* Boh.

Specimens of this relatively large species—the adult measures some 22 to 23 millimetres in length—were in the collection of the Government Entomologist, Port Elizabeth, and were obtained from larvae feeding upon *Ipomaea* sp., growing on local coastal sand-dunes. It appears to be somewhat sporadic and erratic in its occurrence for when a request for oothecae was received from a British university shortly before the writer's retiral in 1963 no trace of the insect could be found then or subsequently. Apparently the ootheca has a high protein content and was required for experimental purposes in this connection. Being relatively large it would be more suitable in this respect than those of smaller species.

(3) There are several small green species of tortoise beetles which to a non-taxonomist look very much alike. Two of these were reared from *Lycium campanulatum* at Port Elizabeth. One was later determined as being *Cassida distinguenda* Spaeth., and the other as *Cassida* sp., at the British Museum. The following data apply to either or both of these tortoise beetles as until adults were sent to the British Museum they were thought to be one and the same.

The adult feeds upon the leaves of *L. campanulatum,* nibbling or chewing from the margin; the larva also feeds on the leaves. The egg is deposited singly or in pairs, less frequently in threes, on either the upper or lower surface of a leaf. It is oval and broad, about 1.5 mm. in length, pale watery green at first but turning brown later. The eggs are covered with a transparent envelope in which they appear to be embedded or held down. The sides of the cover or envelope where it joins the supporting leaf have an almost thread-like appearance of consistency. The cover or ootheca also turns brown later. The incubation period occupied 6 to 8 days in November. The pupa is bright green and is of the usual cassid shape; it is fixed to a leaf.

(4) *Cassida dorsovittata* Boh.

Another small green species which occurs abundantly at Port Elizabeth on *Amaranthus paniculatus* (Pigweed).

(5) *Cassida sphaerula* Boh.

Also a small green species found on *Combretum saliciforium* at Fort Beaufort, C.P.

(6) *Cassida convexa* Boh.

Obtained at Fort Beaufort, C.P., on *Zizyphus mucronata.*

(7) *Cassida 20-maculata* Thunb.

Adults were collected by the late Mr. F. H. Holland at Mont-aux-Sources in the Drakensberg Mountains, Natal, during June. They were found under stones, apparently hibernating.

(8) *Conchyloctenia punctata* F.

Reared from larvae on *Ipomaea* sp., at Fort Beaufort, C. P. Paterson (*op. cit.*) recorded it on *I. purpurea* at Johannesburg, but not nearly so

commonly as *A. tecta*. Details of the structure of the various stages and of the life-history are given by that author.

SUMMARY

An account is given of the occurrence of several species of South African Cassidinae or Tortoise Beetles, with particular reference to the Eastern Cape Province. The life-history of *Aspidomorpha tecta* Boh., is dealt with in some detail. The adults' longevity and the female's egg potential are considerable. It would appear that Tortoise Beetles hibernate in the adult stage.

ACKNOWLEDGMENTS

The writer is much indebted to the Director and Staff of the Commonwealth Institute of Entomology, London; Dr. D. P. Annecke, Institute of Plant Protection, Pretoria; and to Dr. B. D. Burks, United States National Museum, for insect determinations; also to Miss G. V. Britten, Botanical Survey, Grahamstown, for plant determinations.

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(2) Taylor, J. S. (1930). Notes on the Solanum Tortoise Beetle (*Aspidomorpha hybrida* Boh. Cassidae) with especial reference to the Eastern Transvaal. *S.A. Jl. Nat. Hist.* vi, 5, 382-385.

Wilderness, C.P. 25.v.1965.

Notes and Observations

MIGRANTS IN THE NEW FOREST.—There was a *Celerio livornica* Esp. in my m.v. trap this morning. It was a rather small male and not very fresh. Single specimens of *Laphygma exigua* Hubn. appeared on 15th and 23rd May. A single *Agrotis ipsilon* Rott. on 14th May. *Nomophila noctuella* Schiff. has appeared fairly regularly in small numbers since 15th May. So far, there have been only four *Plusia gamma* Linn. commencing on 16th May.—L. W. SIGGS, Sungate, Football Green, Minstead, Lyndhurst, Hants. 4.vi.65.

REARING HELIOTHIS ARMIGERA HÜBN.—On the 7th November 1964, a small larva of *Heliothis armigera* Hübn. was found in a tomato by a friend, Mrs. Channer, and given to me. The tomatoes had been imported from Alicante, Spain, and were on sale in Sussex. A second, but smaller larva was also found, but was not again seen after entering a tomato.

In its early stages the larva fed greedily inside halved tomatoes, but by the end of the month it had ceased to eat the pulp, and then concentrated on the skins, which it consumed voraciously and removed extremely neatly. For the last few days it showed reluctance to eat any part of the tomato, but accepted geranium leaves. It pupated on 12th December and the moth emerged on 2nd June 1965.—J. A. C. GREENWOOD, Woodcote, Horsell Park, Woking, Surrey. 5.vii.1965.

A. ATROPOS IN INVERNESS-SHIRE.—On 2nd June, a male specimen of *Acherontia atropos* L. in good condition was brought to me from Andverike House, Laggan, Inverness-shire. I consider that this insect is clearly an immigrant.—G. W. HARPER, Cdr., R.N. (Retd.), "Neadaich", Newtonmore, Inverness-shire. 4.vi.1965.

PARTHENOGENISIS IN GONODONTIS BIDENTATA CL.—Dr. Kettlewell has kindly sent me a letter from Charles Moseley to Colonel Bowater, under date of 14th October 1926, which reads:—

"Dear Sir,

Kindly pardon my delay in replying to your letter of enquiry re *bidentata*. I can assure you there is not the slightest suspicion of doubt in this case, and I was as much surprised as anyone else could possibly be.

The full circumstances are these. At the back end of last year I picked up casually a full-sized larva from off the pavement, which eventually "went down" in a small cardboard box in which were already three other pupae of other species. In the spring I looked into the box to see how matters were progressing, and found that *bidentata* had emerged and died, but had laid a supply of eggs before dying. Naturally I placed little value on these eggs, and was astonished some days later to find that they had hatched! None of the other pupae in the box had as yet hatched, the *bidentata* had never left her confinement, no other moth had ever gained access thereto, hence pairing had been impossible. Although I admit the unusual nature of the circumstances, yet I am absolutely convinced of the accuracy of my observations and statements. I have reared thousands of larvae of various species from boyhood upwards, hence am quite accustomed to the task. All the larvae from the above had gone down by the end of July, which is very early. *Bidentata* swarms hereabouts on almost every garden hedge, and even yet there are lots that appear to be feeding, judging by the frass on the wall tops. Probably the cold and wet of the present week will make them "turn in".

Personally I have never known of a case of parthenogensis in a lepidopteron before, but I am informed that odd cases have been known, and that it is a regular habit with certain micros.

Hoping my statement will satisfy and convince you.

Thanking you for your interest.

I remain,

Yours sincerely,

(Signed) Charles Moseley".—ED.

A MELANIC LYSANDRA BELLARGUS ROTT.—On 10th June I took an extreme melanic form of *L. bellargus*. The butterfly, a male, is so unusual that it seems worthy of a record.

The head, thorax and body are black, and the ground colour of the wings on the upper side is dark purple black, not dissimilar to a *Thecla quercus* L. male; the wing fringes are black. On the underside, the yellow lunules stand out prominently against the very dark smoky grey ground colour in which the usual spotting is discernible.

The butterfly was newly emerged, and I only spotted it through the attentions of another male which, from its actions, had mistaken it for a member of the opposite sex. I wonder whether this is a previously recorded aberration.—MAJOR GENERAL C. G. LIPSCOMB, Warminster. 10.vi.1965.

CELERIO LIVORNICA IN HAMPSHIRE.—I would like to record finding a specimen of *Celerio livornica* Esp. (striped hawk moth) at Kinson, close to my home, on 20th May this year. I am told that such a find at this time of year is of considerable scientific interest. It was at rest during the day time at the foot of a wall.—DAVID S. JONES, 45 Anstey Road, Kinson, Bournemouth. 8.vi.1965.

THE BEHAVIOUR OF LEPTIDEA SINAPIS L. (THE WOOD WHITE)—Having long wanted to photo the Wood White, I found it at last late on 19th May after a morning in Northants with *C. palaemon*. Having also done my homework, I knew that the book says that *L. sinapis* "takes frequent rests". But on four occasions this evening I walked through the undergrowth for 10 or more minutes following males which did not stop once. By then the frequent rests were taken by myself.

A week later the butterflies conformed to the book and I got my photos. But they never sat with wings open as one so often sees the common whites do, so I only have "undersides" pictures.

Hoping to learn more, I returned on 20th June, finding *sinapis* still flying and in fresh condition. Three times I saw a male approach a female, who settled on a stem after a perfunctory aerial chase. The male then settled in front of her and walked up face to face. She laid her antennae back and he caressed either her antennae or the costae of her forewings with his fully extended tongue, waving it and his head from side to side like a wand with a frequency of about ½ a second. The first of the three males also flipped his wings open and shut once or twice. On each occasion the female responded after a short while by rapidly flipping her wings open and shut. The engagement which had now lasted about 1½ minutes was then in each case broken off, apparently by mutual consent as each went its way.

I watched the first of these episodes standing above and behind the male. I had a good broadside view of the second and third, seated at a range of under two feet, through the tele-lens of my reflex camera. The time of day was 12 till 2 p.m. and the weather hot and sunny with many small clouds.

This courtship procedure struck me as being so refined and genteel compared with the familiar rather vulgar posturing of the common whites, that I thought it worth recording.—C. F. COWAN, The Cow Roast, London Road, Tring, Herts.

A NOTE ON CRIORHINA Meigen (Diptera).—There seems to be some doubt on the spelling of this generic name (*antea*, pp. 108, 159). Through the kindness of the British Museum (Nat. Hist.), I am able to check the source.

The reference is Meigen, J. W. (1822), *Syst. Beschr. Zweifl. Insekt.*, **3**: 236. The spelling here is *Criorhina* and, under Article 32 of the International Code, this must be correct.—CHARLES F. COWAN, The Cow Roast, London Road, Tring. 18.vi.1965.

C. LIVORNICA IN THE BRISTOL DISTRICT.—I wish to record the capture of two specimens of *Celerio livornica* Esp. (striped hawk moth) in my mercury vapour trap at Almondsbury, near Bristol, as follows: one female at 11.10 p.m. on 21st May 1965, and one male at 11.30 p.m. on 27th May 1965. Both these moths were in good condition: the weather at the time was cool and windy.—D. G. GIBB, "Allendale", Gloucester Road, Almondsbury, Bristol. 1.vi.1965.

Fifty Years Ago

(From *The Entomologist's Record* of 1915)

Bath Whites in the Desert.—One scarcely realises, until one actually sees it, the extraordinary proximity of the most fertile land probably in the globe with the most sterile; the dividing line is most strongly drawn, a yard even separating the two; the cause, of course, being the fertile alluvium brought down by the annual Nile flood. This makes it difficult to say, in many cases, what are actually desert species and what not, particularly among the Hymenoptera, as, owing to their powers of flight, they spread from cultivated districts far into the desert, being attracted at certain seasons of the year by the flora that grows in the bottom of the valleys, which meander far into the hills and which debouch on to the desert plains in close proximity to the Nile's overflow.

Dragonflies also are extraordinarily wandering creatures; though found usually in the neighbourhood of water they occur miles from it in the very heart of the desert, and some butterflies whose larvae feed on garden plants, by means I do not attempt to explain have thrown off their usual habits and have become entirely denizens of the desert. *Pontia daplidice* is one of these; on the continent of Europe, so far as I have observed it, this may be regarded almost as a garden insect, but I was surprised to find that the only locality, except for an occasional stray specimen, was the desert ravines miles away from cultivation of any kind.—Neville Manders.

Current Literature

Freshwater Life of the British Isles by John Clegg: Frederick Warne & Co., Ltd., 352 pp. + 67 Pl. (of which 16 in colour), 35/-.

The third edition of this book includes corrections, amplifications and additions to the second edition in order to bring the work up to date for students. A carefully chronological account of freshwater life is given in the first chapter, together with a rough account of the requirements of the various orders to illustrate their interdependance, and after explaining nomenclature, a list of the animal phyla represented in our freshwater biotopes is given.

Chapter II deals with the chemical and physical qualities of water in lakes, ponds, rivers and streams, and how variation of these suits or is inimical to certain forms of life. There follows an account of the various types of freshwater habitat, and the circulation of water in a shallow pond, and its restriction to zones in a deep one is illustrated diagramatically. Then there are diagrams showing the rise and fall of various forms of life at different times of the year, finally referring to the frontispiece, a diagramatic picture illustrating the inter-relationship of the various forms of life and the chemical processes continually taking place in a pond.

The following chapters deal with the various forms of life in some detail, commencing with the waterside and larger aquatic plants to the simpler vegetable life to the hydra, and then by way of round and flat worms, rotifers, true worms, crustaceans, insects, arachnids, molluscs, finally to the vertabrates.

There follows a chapter on the collection and examination of specimens, profusely illustrated, followed by one on freshwater biology in the service of mankind, including water supplies and sewage disposal, with a short final note on research into freshwater problems. A summary of the classification of the main groups of aquatic animals from Protoza to Amphibians concludes the main text. Appendices include "Hydrogen-ion Concentration and pH"; "Anglers' Names for Aquatic Insects" and a good bibliography divided into various categories of freshwater life, and finally the index.

This book should be invaluable to the student, but at the same time provides very interesting reading for the intelligent layman by reason of close impact of these forms of life on man himself, who is so dependant for his existence on freshwater. It is well printed on good paper, and bound in an attractive green cloth with gilt and black lettering. The text illustrations are excellent, and the plates show many interesting photographs of types of freshwater habitats, apparatus, and microphotographs of the freshwater life, and the coloured plates are of equal quality.

S. N. A. J.

Hawk Moths of Great Britain and Europe by L. Hugh Newman; 20 + 148 pp. + 23 coloured and many monochrome illustrations. Cassell, London. 50/-.

In his preface, the author points out that this book is not intended to be a scientific treatise on the Sphyngidae, but that it is written for the pleasure of those who are interested in breeding and collecting hawk moths, and to this end he has given the reader the benefit of his experience in this pursuit.

A very fine collection of colour photographs of the various species, mostly taken from life, and only a few from set specimens makes this volume aesthetically very attractive, and to the illustrations are added many in monochrome. The illustrations also include the larvae of most species in colour, and the book gives a good description of all stages of the twenty-three species dealt with, including our nine resident species, nine migrants which visit these shores occasionally, and five European species which have not been recorded in Britain. One omission, to my mind, is that of a static picture of the hummingbird hawk, which insect has received a great deal of attention and has some excellent action pictures.

Each insect is the subject of a chapter in which egg, larva, pupa and imago are described together with a note on distribution, and any interesting details of the habits of the insect and anecdotes connected with their collecting and breeding are included. At the end of the book are chapters on breeding these insects in captivity and on making a collection of hawk moths, finishing with the good advice that short series are enough for such a collection, to which may be added inflated larval skins and mounted pupae, with instructions on how to prepare these. Mr. Newman also suggests the benefit to the species, in these days of tragically diminishing numbers, of breeding our native species and then releasing the adults, whose numbers would very much exceed the numbers of wild broods reaching maturity.

The printing and paper are good and the book is well bound in strong cloth boards, in an attractive jacket, and the book would be a welcome addition to the bookshelves of any nature-lover. S.N.A.J.

A SELECTION FROM OUR PUBLICATIONS

BRADLEY, J. D. & MARTIN, E. L. 1956. An illustrated List of the British Tortricidae. Part I: Tortricinae and Sparganothinae. 6 pp., 10 pls. 6s. 0d.

BRADLEY, J. D. 1959. An illustrated List of the British Tortricidae. Part II. Olethreutinae. 21 pp., 19 pls., 23 figs. 12s. 6d. Bound copies of parts I and II available to order.

FLETCHER, D. S. 1963. Moths of the British Isles: A Supplement. 8 pp., 1 col. pl. (*Coridon* B 4). 5s. 0d.

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THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

ON *ZYGAENA (AGRUMENIA) FRAXINI MÉNÉTRIÉS AND A NEW SUB-*SPECIES FROM TRANSCAUCASIA (LEP., ZYGAENIDAE). HUGO REISS, Stuttgart ... 165

SAMPLING THE BUTTERFLIES OF SICILY. R. F. BRETHERTON, C.B., M.A., F.R.E.S. ... 168

MORE ABOUT *COSSUS COSSUS* L. (LEP. COSSIDAE). H. C. HUGGINS, F.R.E.S. ... 176

SPRING COLLECTING IN MOROCCO. Baron DE WORMS, M.A., Ph.D., F.R.E.S. ... 177

FIAT JUSTITIA ... AN OLD MOTH-HUNTER ... 182

PROCUS VERSICOLOR BORKH. (LEP. NOCTUIDAE) IN KENT. H. C. HUGGINS, F.R.E.S. ... 186

NOTES ON SOME SOUTH AFRICAN TORTOISE BEETLES (CASSIDINAE: CHRYSOMELIDAE) J. S. TAYLOR ... 187

NOTES AND OBSERVATIONS ... 190

FIFTY YEARS AGO ... 193

CURRENT LITERATURE ... 193

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... (243)

TO OUR CONTRIBUTORS

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A 12-year Survey of the Frequencies of *Biston betularia* (L.) (Lep.) and its Melanic Forms in Great Britain

By Dr. H. B. D. Kettlewell

(Genetics Laboratory, Zoology Department, University of Oxford)

1. FOREWORD

Biston betularia, the Peppered Moth (previously placed in the genera *Amphidasys* and *Pachys*), is one of about 100 species of Marcolepidoptera occurring in this country which are at present in the process of changing their populations from light to dark. This is referred to as Industrial Melanism. In nearly every instance it results in the substitution of a complex pattern by a dark or black coloration. Industrial melanism is found, in fact, only among those species which depend for their survival by day on their efficiency in harmonising with the specialised background on which they rest, such as lichened trunks, boughs, rocks or wood. It is not found in those species which exhibit other types of protective coloration. The black mutant is nearly always inherited as a simple Mendelian dominant. In compiling a survey, such as the one about to be described, it was necessary to choose a species which had the following attributes: it must be widespread, forming fairly continuous populations both in industrial and rural areas; it must indulge in considerable periods of flight to encourage gene-flow; and be easy to capture at mercury vapour traps or by other methods. *B. betularia* has all these qualifications. Accordingly, in 1952 I was fortunate enough to recruit a team of about 80 entomologists living in different parts of the country, and to them I owe my sincere thanks for more than 30,000 records of this species which they have sent me in the last twelve years.

2. THE PHENOTYPES

Typical *B. betularia* is whitish overlaid with innumerable thin black lines and dots. At rest on lichened boughs it is almost invisible. The first melanic appeared about 1848 in Manchester (Barrett, 1901), and is referable to as f. *carbonaria* Jordan (syn. *doubledayaria* Millière).

Another melanic form is known as *insularia* Th. Mieg. It is not as extreme as carbonaria and is variable. Occasionally it is difficult to differentiate from the *typical* form, and still less frequently from *carbonaria*. The number of individuals which fall into these categories is, however, small in most districts. There is a distinct possibility that f. *insularia* may be controlled by a series of alleles. *Carbonaria* is unifactorial and dominant to the *typica* form, and *insularia*, which is also dominant to the type, cannot be recognised phenotypically in the presence of *carbonaria*[1].

3. PREVIOUS INVESTIGATIONS

The following facts have been recorded by me and have a direct bearing on the distribution of the three phenotypes in Britain:—

[1] *Carbonaria* probably has several different alleles also, one of which has replaced another during the past 100 years.

(a) "To the human eye, *carbonaria* proved much better concealed on the lichen-free tree trunks, blackened by pollution near Birmingham, but this advantage was reversed in favour of the pale form in unpolluted country. *Insularia* possesses an intermediate advantage in both places" (Kettlewell, 1956*a*).

(b) Mark-release-recapture experiments showed that in the industrial area of Birmingham we recaptured more than twice as many f. *carbonaria* as *typica* in a total release of 584 of these two forms (Kettlewell, 1955). In contrast, a release of 969 individuals into an unpolluted and heavily lichened wood in Dorset resulted in twice as many of the *typica* form being recaptured as of the f. *carbonaria*. In both experiments, the recaptures were usually made within 24 hours of the release (Kettlewell, 1956*a*).

(c) This was shown to be due to bird predation. Six species of birds were recorded as taking part in this and filmed as they captured resting moths whilst under observation (by Dr. Niko Tinbergen). In Birmingham, Redstarts, *Phoenicurus phoenicurus* L., were seen to take 58 *betularia* which had been released in a 1:1 ratio, melanic:typical; 43 were *typica* and 15 f. *carbonaria*. On the other hand, in the unpolluted wood of Dean End, Dorset, when both forms were released in equality, 5 species of birds were observed to eat 190 *betularia*, of which 164 were f. *carbonaria* and 26 f. *typica*. These findings provided evidence for stating that "the difference in cryptic coloration alone could be responsible for the rapid spread of the Industrial Melanics".

(d) Nevertheless, we have provided certain basic evidence that there exist both physiological and behaviour differences between the melanic and typical forms (Kettlewell, 1956*b*).

4. EARLY HISTORY OF MELANIC SPREAD

Prior to the middle of the last century, there is every reason to believe that melanic forms were maintained in the population solely by recurrent mutation. For the next fifty years these melanics were much sought after by collectors, so that it is reasonable to suppose that their capture would be recorded assiduously when they first made their appearance. Table 1 gives a list of the earliest records of f.*carbonaria* from different localities, and it has been assumed that at these dates *carbonaria* would not be at a local frequency higher than say 1 per cent. In 1900, The Evolution Committee of the Royal Society began an investigation into the problem of industrial melanism. Referring to this in an earlier paper (Kettlewell, 1958), I stated: "It is unfortunate that approximate percentages only are given (Doncaster, 1906), but by this date scientific opinion had evidently become conscious of the biological importance of the rapid spread of the melanic forms. Only on two occasions, in fact, are there actual figures for random samples. The same unfortunate shortcomings are found in the later investigations of Mera (1925) and Adkin (1925). In fact nowhere are the figures given which would have helped so much in the present investigation".

Ford (1964) refers to this and pointed out the futility of presenting data thus. Showler (1965) more recently quotes Ford and condemns the practice but, I think wrongly, suggests that "it would seem better to simply express the changing percentages over the years by means of a graph". Surely this only presents the same futile data in a different way?

TABLE 1

Earliest records of f. carbonaria *in Britain. Approximate selective advantages (S.A.) have been estimated for a period of 100 years on the assumption that the local frequency of f.* carbonaria *was not greater than 1 per cent. when first recorded*

County Locality (recorder)	1st *carbonaria* recorded	1900-06 survey (when known)	S.A.	Locality (recorder)	1952-56 frequency sample size	S.A.	Locality (recorder)	S.A. over total period
BERKSHIRE								
(Barrett)	1885	..	..	..	11% (63)	..	Newbury (Saundby)	3%
CAMBRIDGESHIRE								
Cambridge (Farren)	1892	"now seen every year"	..	(Farren)	93% (88)	..	Cambridge (H.B.D.K.)	14%
Ely (Cross)	1895	..	..	..	..	..	..	15%
CHESHIRE								
Chester (Barret) .	Delamere 1860	83% sample 180	18%	Chester (Arkle)	94% (124)	5%	Chester (G. Smith)	10%
ESSEX								
Colchester (Harwood)	1892	..	..	..	86% (822)	11%	Bradwell (Dewick)	11%
Dovercourt (Mathew)	1902	..	..	..	"	14%	"	14%
GLOUCESTERSHIRE ..	..	"black not observed"	..	Stroud (Prideaux)	16% (185)	>6%	Nailsworth (Demuth)	>6%
HAMPSHIRE								
New Forest (Barrett)	1897	..	..	..	10% (324)	4%	Eastleigh (Goater)	4%
IRELAND						3%		
Castle Bellingham (Thornhill)	1894	..	..	..	7% (58)		Belfast district (Wright)	3%

S.A.=Selective advantage of f. *carbonaria* as calculated from Haldane's (1924) Table.

TABLE 1 (*continued*)

County Locality (recorder)	1st *carbonaria* recorded	1900-06 survey (when known)	S.A.	Locality (recorder)	1952-56 frequency sample size	S.A.	Locality (recorder)	S.A. over total period
ISLE OF MAN (Cassall)	1904 2 sps.	..	..	..	13% (69)	6% >12%	Santon (Hedges)	6%
KENT	..	"black not observed"	..	Farnborough (Christy)	73% (224)		E. Malling (Groves)	>12%
LANCASHIRE Manchester (Edleston)	1848	"black prevalent. Type occurs"	..	Manchester (Clutton and Tait)	98% (350)	..	Manchester (Michaelis)	15%
LINCOLNSHIRE (Barrett)	*c.* 1860	"both light and black"	..	(Fowler)	91% (158)	..	Louth (H.B.D.K.)	9%
LONDON DISTRICT Woodford (Mira and Bacot)	1897	37% (sample 27)	52%	Woodford (Main and Harrison)	90% (327)	8%	Whetstone (Lovell)	14%
MONMOUTH Newport (Wheeler)	..	"1870 two forms about equal"	..	..	..	..	..	..
NORFOLK Kings Lynn (Atmore and Baker)	1892	"Prevalent" (=50%)	>60%	(Atmore and Baker)	77% (137)	<3%	Fritton (H.B.D.K.)	10%
STAFFORDSHIRE Cannock Chase (Barrett)	1878	"all black" (=≥80%)	>25%	(Frere)	90% (42)	3%	Cannock Chase (Richardson)	11%

S.A.=Selective advantage of f. *carbonaria* as calculated from Haldane's (1924) Table.

TABLE 1 (*continued*)

County Locality (recorder)	1st *carbonaria* recorded	1900-06 survey (when known)	S.A.	Locality (recorder)	1952-56 frequency sample size	S.A.	Locality (recorder)	S.A. over total period
SUFFOLK								
Ipswich (Morley and Pyett)	1894	..	..	..	75% (56)	10%	Lowestoft (Burton)	10%
SURREY								
Croydon (Gower) .	1906	"black not observed"	..	Reigate (Meyrick)	77% (1615)	>13%	Woking (C. de Worms and Trundell)	>13%
					79% (1347)	>13%	Ottershaw (Bretherton)	>13%
SUSSEX	..	"black not observed"	..	(Hewitt)	16% (383)	>6%	Hastings (Astbury)	>6%
					26% (106)	>7%	Eastbourne (Ellison)	>7%
WARWICKSHIRE								
Birmingham	..	"50% black"	..	(Barrett)	87% (1611)	5%	Birmingham (H.B.D.K.)	5%
WESTMORLAND								
Kendal and Windermere (Moss)	1870	"black commoner than type" (=50%)	14%	(Barrett)	49% (47)	..	Kendal (Birkett)	..
WILTSHIRE								
Marlborough (Prentice)	1951	"black not observed"	..	Marlborough (Davis)	9% (460)	>45%	Marlborough College	>45%
YORKSHIRE								
Bradford (Butterfield) ..	scarce 1876	"black now prevalent" (=>50%)	>10%	(Butterfield)	96% (508)	<10%	Bradford (Briggs)	10%
								17%
Huddersfield (Porritt)	1861	"now only black" (=≥80%)	≥15%	(Porritt and Morley)	99% (409)	..	Sheffield (H.B.D.K.)	

S.A.=Selective advantage of f. *carbonaria* as calculated from Haldane's (1924) Table.

It is indeed unfortunate that still to-day, in spite of the warnings by others and my own personal exhortations to so many, such important records should be rendered useless for present and future analysis in this way (Johnson, 1964). Showler states that the " 'average percentage' is a value which may not be justifiably quoted unless the samples are very large"—but how large?—or how small? This must be the worry of every compiler of records. It cannot be emphasised too frequently that modern statistical methods, by using heterogeneity tests and by the application of fiducial limits, can make use of the smaller samples *provided* the actual totals are given. In the present survey, individual samples vary from 3,095 to 10. As Showler points out, the "average percentage" of the former must be more accurate than of the latter. But the sample of 10 may be of considerable value over the years, particularly if it consists of one phenotype only.

Nevertheless, certain information can be deduced from the earliest records obtained between 1900 and 1906. It appears that f. *carbonaria* was taken for the first time in many widely separated places between 1848 and 1900. Whether this represents migration from one centre, or numerous discrete mutations, will be discussed later. Secondly, very shortly after the initial captures, this melanic form increased rapidly in a brief space of time. Thirdly, until the end of the century, *carbonaria* was unknown in southern England. At this time it had a midland and eastern county distribution and was not taken in the London area till 1897. Fourthly, when these earliest records are considered with our recent data, the selective advantages for the *carbonaria* form can, with a reasonable degree of accuracy, be assessed for each locality over the period involved. The ability to do this in one of the most transient polymorphisms ever known, makes these earliest records valuable.

5. PRESENT SURVEY

In view of the inadequate nature of the data on the frequencies of the melanic forms at any one period in the past, I decided in 1952 to obtain as much data on *betularia* as quickly as possible, with the object of providing figures for future reference. By 1957 a great deal of information had been collected, and this was analysed and published in 1958 (Kettlewell, 1958).

Table 2 gives a list of frequencies of the three forms of *betularia* from many areas of Great Britain obtained in the last 12 years. It will be appreciated that the higher the frequency of *carbonaria*, the greater the error in assessing the *insularia* gene-frequency, and that even in large random samples from industrial areas the data are often inadequate.

A distribution map (fig. 1) of the frequencies of the three forms shows:

(a) A correlation between the frequency of the melanic forms and the industrial areas of Britain.

(b) A high frequency of *carbonaria* throughout eastern England though far removed from industrial centres. This is, in my opinion, the indirect effect of long continued smoke fall-out carried by the prevailing south-westerly winds from central England.

(c) Central areas of Wales and western England, with the exception of Cheshire, Lancashire, Cumberland and Westmorland (Kendal), are virtually melanic free.

(d) Northern Scotland has no melanic *betularia* but in the Glasgow district f. *carbonaria* is about 90 per cent.

(e) In Ireland, *carbonaria* has been recorded first in 1894 from the Belfast district and also Dublin later, but it is of rare occurrence. It has been found nowhere else. It does not appear to have spread widely there yet.

(f) The map shows multiple clines running out from the higher *carbonaria* frequencies in the centre of England. There may be a rapid decline from east to west as, for instance, from Cheshire to North Wales, or from Birmingham to Wyre Forest, or they may be gradual as always found in an easterly direction.

(g) The highest frequency of f. *insularia* phenotype is, for the most part, found in the Gloucester and Severn Valley district of England; also in the Isle of Man.

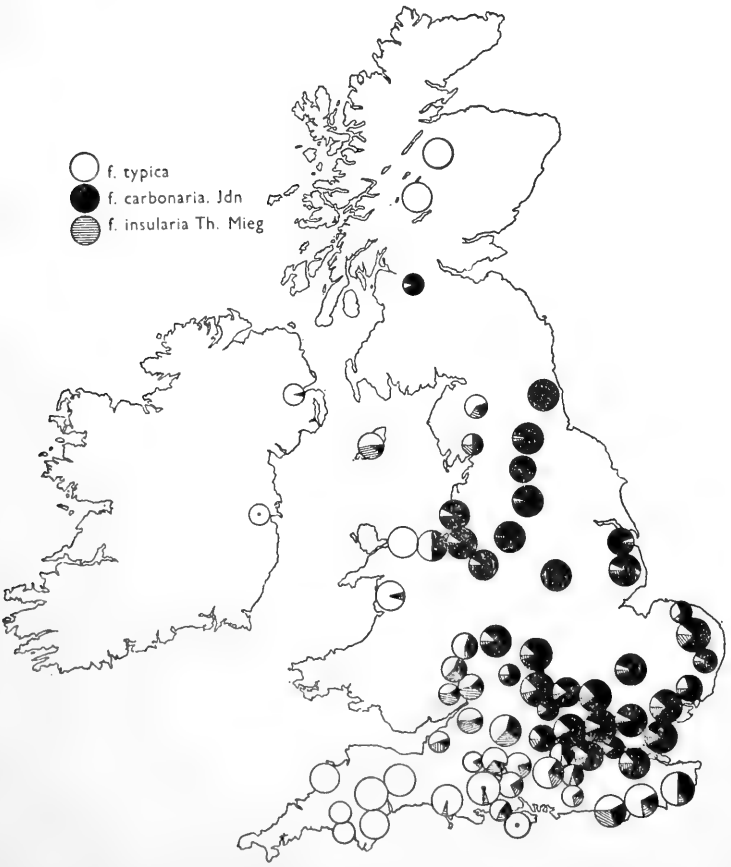

FIG. 1.—A frequency map of *Biston betularia* and its two melanics, f. *carbonaria* and f. *insularia* (1952-56), comprising more than 20,000 records from 83 centres in Britain.

6. ANALYSIS OF F. *CARBONARIA* FREQUENCIES

(a) *Evidence of mutation rate*

If one reviews the first county records, it is indeed difficult to resist the conclusion that the new mutant has radiated outwards from an original centre of mutation near Manchester. There is no doubt that following the original capture in 1848, the nearest counties to Lancashire were the next to record its appearance; Cheshire in 1860, Yorkshire in 1861, Staffordshire in 1878, and Westmorland in 1870. The London district, on the other hand, and southern England did not report a *carbonaria* until about twenty years later (1897). It is significant also that the eastern counties of Norfolk, Suffolk and Cambridge all recorded their first *carbonaria* practically simultaneously between 1892 and 1895.

All this is consistent with the spread of a successful gene with no ecological barriers, from its centre of origin. Furthermore, on the Continent, the same spread was taking place, being recorded by A. Hofman from Hanover in 1884, the Netherlands and Thuringia in 1888 "and in the next few years in various parts of the Rhine Valley" (Barrett, 1901).

In a short series of evening releases undertaken in open country near Louth, Lincs., in 1956, I attempted to find the distance which ♂ *betularia* fly per night. Using different releasing points, different markings, and several collecting centres of known distance apart, I was able to show that of 93 releases, 6 travelled 1½ miles, and 9 over half a mile within 48 hours. At Fritton in Suffolk, of 78 releases over three occasions, 16 were recaptured three-quarters of a mile distant, 12 within 24 hours. From this, having regard to the random flight of the releases, it can be accepted that ♂ *betularia* frequently fly a mile per night, probably much farther. Nevertheless, dispersal cannot be accepted as the actual cause of the widespread distribution of f. *carbonaria*. There is considerable evidence that recurrent mutation, at a fairly high rate, also takes place. *Carbonaria* has constantly appeared in isolated centres separated from others by usually impassable barriers. Thus it was taken in Dublin about 1950, near Belfast in 1894, the Isle of Man in 1904, and in 1956 at Torquay, each locality being separated by fifty miles or more from the nearest possible contacts. It is, in fact, likely that the *carbonaria* alleles have a high mutation rate. This is in contrast with certain melanics of other species, such as f. *nigra* of *Ectropis consonaria*. In this country, only on two occasions has the melanic mutation successfully maintained itself, first near Maidstone in Kent, and secondly near Stroud, Gloucestershire, where a sample of 121 recorded by me in 1956 were 43 per cent. of the melanic form. It would appear that this melanic mutation has not yet taken place near an industrial centre in this country. It has, however, in Germany where it has become an industrial melanic.

(b) *Period of adjustment*

Haldane (1924) pointed out that if in Manchester in 1848 the *betularia* population was 99 per cent. the *typica* form, and if by 1898 it was 99 per cent. f. *carbonaria*, this represents an approximate 30 per cent. advantage of the black form over the light. Magnitudes, only rather less than this, are borne out by Table 1.

It is now necessary for us to consider, therefore, the time lag between the original mutation and its arrival at the 1 per cent. level. At frequencies below this, it is unlikely to have been recognised in the population because

of the poorer techniques in sampling used at that date. Let us examine an hypothetical case and assume that in a local population of the order of a million, a single melanic mutation has occurred. With a 30 per cent. advantage, it would take about 29 years to reach the 0·1 per cent. level, and 38 years to 1 per cent. Fig. 2 is a diagram showing the type of spread expected from a new mutant from the time of its origin until it has reached a state of balanced polymorphism or, alternatively, has eliminated its allele from the population. Present data are in agreement with this type of curve. The period under present consideration is represented by BC on the abscissa, and if, in fact, there was only one mutation in Manchester, and by 1848 *carbonaria* represented 1 per cent. of the population, we can say that this original mutation took place in about 1810, which is approximately fifty years after the commencement of the Industrial Revolution.

During this initial period (BC), the black mutants, though having great cryptic advantage, nevertheless would find themselves in a gene-complex entirely fitted for the specialised pattern of the *typica* form. It is of interest that many of the earliest examples of f. *carbonaria* which I have obtained by searching innumerable old collections, are different from the

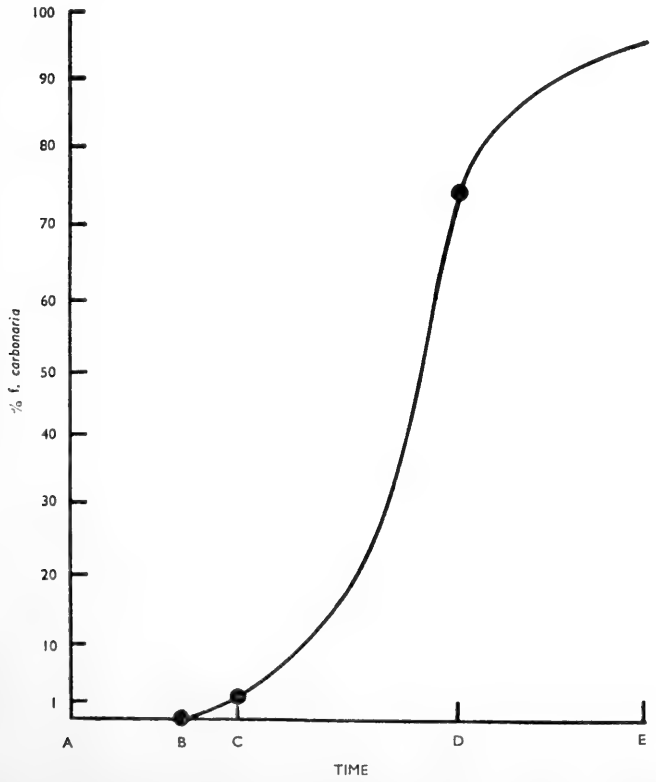

FIGURE 2.—Diagram showing rate of increase of a melanic (dominant) mutant with a mutation rate of one in a million, assuming a constant advantage of the heterozygote throughout (which in practice will not occur), with a 30 per cent. selective advantage over its typical form.

TABLE 2

Phenotype frequencies of *Biston betularia and its two melanics*, f. *carbonaria* and f. *insularia*, from 114 centres in Britain (1952-64)

(Samples of 50 and under; percentages in brackets because of small sampling up to date)

Locality	Date	Observer	Per Cent. *typica*	Per Cent. *carbonaria*	Per Cent. *insularia*	Total
BEDFORDSHIRE						
Woburn	1952-56	S.H.K.	(4·76)	(95·23)	0	21
Leighton Buzzard	1952-56	J.F.R.	15·43	82·28	2·29	175
BERKSHIRE						
Newbury	1952-56	R.S.	79·37	11·11	9·52	63
	1957-64	R.S.	69·26	14·34	16·49	244
Abingdon	1957-64	R.J.S.	(33·33)	(50·0)	(16·67)	6
BUCKINGHAMSHIRE						
Chalfont	1957-64	E.A.	17·78	78·1	4·12	315
CAMBRIDGESHIRE						
Cambridge	1952-56	H.B.D.K. B.O.C.G.	4·54	92·95	3·41	88
	1957-64	B.O.C.G.	4·35	94·78	0·87	115
CHESHIRE						
Chester	1952-56	S.G.S.	5·65	93·55	0·81	124
Delamere	1952-56	W.E.A.	6·68	90·86	2·46	569
	1961-63	C.G.M.	8·15	87·87	3·99	577
Heswall	1952-56	D.E.H.	(6·82)	(93·18)	0	44
Wirrall	1952-56	A.C.	1·56	98·44	0	192
Caldy	1959-64	C.A.C.	7·17	91·70	1·13	3988
Meols	1961-64	P.M.S.	11·86	87·12	1·02	590
CUMBERLAND						
Penrith	1952-56	W.F.D.	60·71	26·79	12·50	56
	1957-64	W.F.D.	77·78	11·11	11·11	72
DERBYSHIRE						
Chesterfield	1952-56	J.H.J.	0·59	99·41	0	170

TABLE 2 (*continued*)

Locality	Date	Observer	Per Cent. *typica*	Per Cent. *carbonaria*	Per Cent. *insularia*	Total
DEVON AND CORNWALL						
Torquay	1952-56	F.H.L.	100·0	0	0	100
Ashburton	1952-56	S.T.S.				
Bude	1952-56	A.H.				
Plymouth	1952-56	F.W.J.	100·0	0	0	500
Tavistock	1952-56	D.J.W.				
Tiverton	1952-56	F.H.L.				
Axminster	1957-64	T.J.W.	98·32	1·12	0·56	179
Bampton	1957-64	A.R.	98·8	0	1·2	88
Exmouth	1957-64	R.S.	(100·0)	0	0	20
Taunton	1957-64	E.G.N.	(94·74)	(2·63)	(2·63)	38
DORSET						
Dean End Wood	1952-56	H.B.D.K.	93·64	0·87	5·49	346
Broadmayne	1952-56	V.W.P.	97·02	0	2·98	168
ESSEX						
Bradwell-on-Sea	1952-56	A.J.D.	6·69	86·25	6·57	818
Westcliffe-on-Sea	1952-56	H.C.H.	5·95	85·55	8·5	353
	1957-64	H.C.H.	0	(85·71)	(14·29)	7
GLOUCESTERSHIRE						
Hardwicke	1952-56	R.D.	38·89	23·61	37·5	72
Nailsworth	1952-56	A.R.	48·65	15·68	35·67	185
Cheltenham	1957-64	R.S.J.	34·18	12·66	53·16	79
HAMPSHIRE						
Bournemouth	1952-56	F.M.B.C.	(60·00)	(30·00)	(10·00)	40
Chandler's Ford	1952-56	B.G.	82·1	10·49	7·41	324
Borden	1952-56	D.W.	65·43	20·29	14·28	3095
Fordingbridge	1952-56	P.J.B.	(86·84)	(5·26)	(7·89)	38
Fleet	1952-56	A.W.R.	47·31	46·03	6·66	315
Winchester	1952-56	R.S.M.W.	(84·85)	(15·15)	0	33
	1957-64	W.H.D. J.W.F.	78·00	12·00	10·00	200
Droxford	1957-64	J.R.L.	(77·78)	(8·33)	(13·89)	36

TABLE 2 (*continued*)

Locality	Date	Observer	Per Cent. *typica*	Per Cent. *carbonaria*	Per Cent. *insularia*	Total
HAMPSHIRE (*continued*)						
Hook	1957-64	J.W.F.	55·81	27·91	16·28	86
Lyndhurst	1957-64	J.R.G.T.	89·74	5·13	5·13	78
Minstead	1957-64	J.R.G.T. L.W.S.	90·54	7·14	2·32	518
Rowlands Castle	1957-64	F.C.S.	84·14	11·03	4·83	145
Southsea, Portsmouth	1957-64	J.R.L.	(88·89)	0	(11·11)	9
HEREFORDSHIRE						
Malvern	1952-56	R.K.J.	46·30	27·80	25·90	54
	1957-64	R.K.J.	38·27	36·27	25·49	102
HERTFORDSHIRE						
Bishop's Stortford	1952-56	C.C.	4·76	89·18	6·06	231
	1957-64	C.C.	8·76	87·55	3·69	217
Rothamsted	1952-56	C.B.W.	11·08	83·69	5·23	325
Tring	1952-56	L.G.	16·89	74·30	9·81	214
	1957-64	L.G.	22·42	72·12	5·46	165
IRELAND						
Belfast district	1952-56	W.S.W.	93·10	6·90	0	58
	1957-64	W.S.W.	94·12	5·88	0	51
Dublin district	1952-56	E.S.A.B.	(96·30)	(3·70)	0	27
	1957-64	E.S.A.B.	(86·05)	(13·95)	0	43
ISLE OF MAN						
Santon	1952-56	A.H.	50·70	13·11	36·20	69
ISLE OF WIGHT						
Freshwater	1957-64	R.K.J.	86·61	11·03	2·36	127
KENT						
Bromley	1952-56	M.G.M.	9·26	88·89	1·85	54
Folkestone	1952-56	A.M.M.	46·43	42·86	10·71	140
	1957-64	A.M.M.	(50·00)	(38·89)	(1·11)	36
Maidstone	1952-56	J.R.G.	21·43	73·21	5·36	224
	1957-64	J.R.G.	17·24	82·76	0	58

TABLE 2 (*continued*)

Locality	Date	Observer	Per Cent. *typica*	Per Cent. *carbonaria*	Per Cent. *insularia*	Total
KENT (*continued*)						
Aylesford	1957-64	G.A.N.D.	14·22	79·41	6·37	204
Ham Street	1957-64	H.B.D.K.	88·14	3·39	8·47	59
Orpington	1957-64	L.W.S.	16·06	76·60	7·34	218
Tunbridge Wells	1957-64	J.K.B.	(52·63)	(47·37)	0	19
LANCASHIRE						
Formby	1952-56	N.G.L.	5·32	94·68	0	94
Manchester	1952-56	H.N.M.	0	98·00	2·00	350
	1957-64	H.N.M.	0	99·02	0·97	410
Southport	1952-56	K.L.G.	10·00	90 00	0	120
Birkenhead	1959-63	W.R.	4·35	94·57	1·09	92
Liverpool	1962-63	C.A.C.	2·7	97·3	0	148
LEICESTERSHIRE						
Market Harborough	1952-56	H.A.B.	11·83	84·95	3·32	93
LINCOLNSHIRE						
Grimsby	1952-56	G.A.T.J.	7·41	88·89	3·75	81
	1957-64	G.A.T.J.	2·2	96·7	1·1	91
Louth	1952-56	H.B.D.K.	6·33	91·13	2·53	158
LONDON AREA						
Whetstone	1952-56	R.I.L.	5·81	90·21	3·98	327
	1957-64	R.I.L.	4·87	92·97	2·16	185
Mill Hill	1957-64	B.G.	11·22	84·69	4·19	98
MIDDLESEX						
Pinner	1952-56	W.E.M.	9·14	84·95	5·91	558
NORFOLK						
Cromer	1952-56	J.B.	(20·93)	(67·44)	(11·63)	43
Fritton	1952-56	H.B.D.K.	14·60	77·37	8·03	137
Stalham	1957-64	R.S.	(100·0)	0	0	7
NORTHAMPTONSHIRE						
Wellingborough	1952-56	P.J.G.	14·24	79·88	5·90	288
	1957-64	P.J.G.	11·54	82·05	6·41	78
Ashton	1957-64	C.L.	(15·15)	(72·73)	(12·12)	33

TABLE 2 (*continued*)

Locality	Date	Observer	Per Cent. *typica*	Per Cent. *carbonaria*	Per Cent. *insularia*	Total
OXFORDSHIRE						
Oxford district	1952-56	H.B.D.K. P.M.S. G.V.	41·00	34·03	24·97	717
Wytham	1957-64	C.J.C. S.L.S.	48·33	30·0	21·67	120
Steeple Barton	1952-56	H.B.D.K.	49·13	34·26	16·61	289
	1957-64	H.B.D.K.	45·93	31·94	22·13	479
Elsfield	1957-64	C.L.	(40·00)	(36·00)	(24·00)	25
SCOTLAND						
Glasgow	1952-56	H.B.D.K.	(10·33)	(89·66)	0	29
Kinloch Rannoch	1952-56	R.L.	100·0	0	0	285
Newtonmore	1952-56	G.H.	100·0	0	0	100
SOMERSET						
Portishead	1952-56	J.A.B.	(50·00)	(20·00)	(30·00)	10
STAFFORDSHIRE						
Loggerheads	1957-64	C.A.C.	49·03	49·03	1·94	155
SUFFOLK						
Lowestoft	1952-56	J.B.	17·86	75·00	7·14	56
SURREY						
Cobham	1952-56	J.B.P.	17·98	76·86	5·17	484
Cranleigh	1952-56	H.B.D.K.	(50·00)	(39·30)	(10·70)	28
Ottershaw	1952-56	R.F.B.	13·73	79·93	6·34	1435
	1957-64	R.F.B.	11·64	82·59	5·77	919
Woking	1952-56	C. de W. E.T.	16·84	76·66	6·88	1615
	1957-64	C. de W.	13·47	82·64	3·89	334
SUSSEX						
Brighton	1952-56	R.W.D.	(41·18)	(52·94)	(5·88)	17
	1957-64	R.W.D.	(47·06)	(47·06)	(5·88)	17
Eastbourne	1952-56	R.E.E.	40·57	26·42	33·02	106
East Grinstead	1952-56	M.G.	(66·70)	(53·30)	0	21

TABLE 2 (*continued*)

Locality	Date	Observer	Per Cent. *typica*	Per Cent. *carbonaria*	Per Cent. *insularia*	Total
SUSSEX (*continued*)						
Hastings	1952-56	C.F.A.	74·15	15·67	10·18	383
Petworth	1952-56	P.D.	79·66	11·86	8·47	59
Billingshurst	1952-56		86·82	11·63	1·55	129
Horsham	1957-64	P.H.L. R.M.L.	68·27	28·85	2·88	104
WALES						
MERIONETHSHIRE						
Dolgelley	1952-56	T.T.	95·37	2·78	1·85	108
CAERNARVONSHIRE						
Llandudno	1952-56	J.A.T.	100·0	0	0	100
Bangor	1957-64	M.J.M.	(96·15)	(3·85)	0	26
Tregarth	1957-64	M.J.M.	(90·0)	(10·0)	0	40
HEREFORDSHIRE						
Ross-on-Wye	1952-56	J.E.K.	(39·29)	(21·43)	(39·29)	28
WARWICKSHIRE						
Birmingham	1952-56	H.B.D.K.	8·94	87·09	3·97	1611
	1957-64	W.B.	16·00	80·00	4·00	75
Cannock Chase	1952-56	R.P.D. A.R.	(7·50)	(90·00)	(2·50)	40
Tysoe	1952-56	T.T.	(22·22)	(66·67)	(11·11)	18
Wyre Forest	1952-56	H.B.D.K.	31·34	64·18	4·48	67
WESTMORLAND						
Kendal	1952-56	N.L.B.	(40·43)	(48·94)	(10·64)	47
WILTSHIRE						
Marlborough College	1952-56	C.R.P. R.W.C.V. S.L.S.	79·78	8·91	11·30	460
	1957-64	D.M.C. A.G.H.	76·97	11·8	11·23	534

TABLE 2 (*continued*)

Locality	Date	Observer	Per Cent. *typica*	Per Cent. *carbonaria*	Per Cent. *insularia*	Total
WILTSHIRE (*continued*)						
Marlborough	1957-64	T.W.W.B. M.H.	72·63	6·67	20·7	285
Warminster	1952-56	R.J.	83·33	9·26	7·41	54
Codford St. Mary	1957-64		(73·08)	(11·54)	(15·38)	26
YORKSHIRE						
Aysgarth	1952-56	H.B.D.K.	4·00	94·00	2·00	100
Bradford	1952-56	J.B.	1·97	95·67	2·36	508
	1957-64	J.B.	3·52	96·48	0	142
Grassington	1952-56	G. de C.F.	0	100·0	0	60
Sheffield	1952-56	H.B.D.K.	0·50	99·0	0·50	409
Pontefract	1957-64	R.B.W.	2·17	95·65	2·18	92

majority of heterozygous *carbonaria* found to-day. Many of these show white markings on all the wings in both sexes greatly in excess of what are generally found to-day. The present-day heterozygote only occasionally shows minor degrees of white markings on the wings. On the other hand, the majority of *carbonaria* have white dots around the head and at the base of the wings. In the Sheffield area and, to a lesser degree, in other centres (Chester for example), these spots are also disappearing in present-day specimens, leaving a completely black insect. This must be brought about by modifying genes through the effect of natural selection. It provides evidence that during this period the gene-complex was adjusting itself to attain its greatest advantage. Furthermore, it suggests that in the early days f. *carbonaria* had not full dominance. Alternatively, it could be that the earliest *carbonaria* had their origin in a different and less extreme allele to those of to-day. No doubt both mechanisms have played their part in the production of present-day melanic forms.

TABLE 3

A comparison between early and recent backcross broods of Biston betularia *segregating for* typica *and* carbonaria *showing a deficiency of the two forms in opposite directions*

(*a*) Earliest broods recorded 1900-1905

T	C	Total	Breeder
123	109	232	Bacot
57	47	104	Main and Harrison
18	11	29	Fletcher
57	50	107	Harrison
225	217	472	C=46·6%

(*b*) More Recent broods 1953-1956

T	C	Total	Breeder	Brood no.
14	22	36	H.B.D.K.	B/2/52
7	10	17	H.B.D.K.	19/53
1	5	6	H.B.D.K.	30/53
28	30	58	H.B.D.K.	15/54
1	2	3	H.B.D.K.	19/54
14	39	53	H.B.D.K.	11/54
65	108	173	C=62·4%	

(*c*) 2×2 Table

T	C	Total	Year
255	217	472	1900-1906
65	108	173	1953-1956
320	325	645	

(*a*) $\chi^2_{(1)}$= 2·90; P 0·089

(*b*) $\chi^2_{(1)}$=10·20; P 0·0014

(*c*) $\chi^2_{(1)}$=13·27; P 0·0003

Of even more interest is the situation I have recently found in regard to physiological advantages and disadvantages. Lepidopterists nowadays frequently report that an excess of melanics occur in many of their backcross broods. Table 3 (b) gives a list of my own results of backcross *betularia* broods of industrial origin fed on unwashed Oxford Sallow (*Salix* sp.) which corroborates this fact. It will be seen that there is a significant excess of melanics. In contrast to this, Doncaster (1906) records figures which deviate in the opposite direction for backross broods occur-

ring between 1900 and 1906 (Table 3 (a)). It is probable that these also were fed on unwashed foliage. Both sets of data are homogeneous but are significantly different. (The $\chi^2(_1)$ is 13·27.) Furthermore, to-day no excess of melanics has occurred in broods in which f. *carbonaria* has been paired to f. *typica* obtained from areas where this black form does not occur, such as Cornwall. It appears, therefore, that in its early phases, the melanic mutant was not at a physiological advantage to the *typica*, and that only after a considerable period of adjustment did it become so. It is possible then that certain major modifying genes, previously adapted for keeping the complicated typical pattern in check, freed from cryptic responsibilities, were now able to exploit themselves in bringing about the best physiological advantage. This period then (BC) must be regarded as a time during which the gene-complex was adjusting itself to the new mutant. The disappearance of a complicated pattern may make it easier for modifying genes, previously adjusted to this end, to contribute more in other directions.

(c) *Period of rapid spread*

In theory, when once adjusted, the new mutant is free to spread, provided the selective pressure is maintained. As in the earlier periods, because backcross matings will leave a higher percentage of melanic offspring, this increase will proceed with great rapidity up to a time when 50 per cent. of the population is of the carbonaria form, and thereafter it will tend to slow down at a speed directly proportionate to the increasing *carbonaria* frequency when the number of heterozygotes in the population will commence to drop as pointed out by Fisher (1937). There is indeed some evidence that the most rapid spread of f. *carbonaria* occurs in those areas where this form was at a frequency of between 1 and 40 per cent. (Oxford, Marlborough, Nailsworth, etc.). This period of rapid spread is shown on the graph (fig. 2) as CD during which, under certain conditions, it is probable that f. *carbonaria* can change from being 10 per cent. of the local population to 70 per cent. within a period of ten to fifteen years, which reflects accordingly a minimum selective advantage of from 35 to 23 per cent.

(d) *Period of slow elimination of f.* typica *or alternatively a balanced polymorphism*

The data in Table 2 show that in every industrial area f. *carbonaria* is now at least 85 per cent., but in no large sample is the value 100 per cent. Even after one hundred years, Manchester and Sheffield still have 1-2 per cent. of non-*carbonaria* forms, and Lincolnshire 9 per cent. Furthermore, the only actual sample figures available are for Chester, which show that f. *carbonaria* rose in the last fifty years from 83 to 94 per cent. only, giving a selective advantage of 5 per cent., after having achieved the earlier frequency from 1 per cent. in forty-five years (=selective advantage 18 per cent.). All the available evidence goes to show that f. *typica* continues in the population however great are the apparent selective pressures against it. This period is referred to as DE in the diagram (fig. 2), and may represent many hundreds of years, depending on unknown variables. It is probable that by now, after experiencing over one hundred generations, the new mutant will have succeeded in achieving a gene-complex suitable for its optimum expression, and that by this time the

heterozygote will be at an advantage to both the homozygotes. This will have been brought about by Natural Selection. Modifying genes, disadvantageous in the homozygous state, but advantageous as heterozygotes, will have become more closely linked to the new mutant and one would probably find a figure below the expected 3:1 ratio as the result of heterozygous pairings in the wild, because of the elimination of the homozygous *carbonaria*. This will inevitably be followed by a balanced polymorphism.

A local survey by Prof. C. A. Clarke of Liverpool University, centred on the Wirral Peninsula, Cheshire, corroborates this. This particular undertaking is a model for others to follow who wish to contribute to knowledge in the future. Nowhere does the *carbonaria* frequency rise above 97 to 98 per cent. Even at this level the gene frequency of f. *typica* in the population is 15 to 20 per cent. (Table 4).

As a corollary of this, it can be anticipated that the rare f. *typica*, being eliminated on nearly every occasion because of its conspicuousness, and now finding itself in a gene-complex no longer adapted to it but to the melanic, should, in theory, diverge from its previous fixed pattern. I have, therefore, recently commenced to collect all the f. *typica* from districts where it occurs at a very low frequency. I do therefore ask all collectors who are working in industrial areas where f. *typica* is rare, to keep these specimens collected over a period of years in order to compare their degree of variability.

Conclusions on carbonaria *frequencies*

The autocatalytic or sigmoid curve, suggested by Haldane (1924) as representing the likely course of spread of f. *carbonaria*, has been fully borne out. The present investigation shows selective advantages for this mutant of a slightly lower magnitude than that suggested by him, and this, no doubt, reflects more accurate data for present-day frequencies than were available to him. Alternatively, an apparent lower selective advantage would be brought about if a stable polymorphism was taking place in populations with a high frequency of f. *carbonaria*.

7. ANALYSIS OF F. *INSULARIA* FREQUENCIES

The early history of f. *insularia* is unsatisfactory in every respect. It is generally agreed that it appeared about the same time as f. *carbonaria*, but in certain districts, particularly in the south, before it. Doncaster (1906) tried to differentiate "two distinct forms", a light and a dark, and he may in fact be correct. Furthermore, the earlier breeders were confused on finding that backcross *carbonaria* × *typica* broods, on some occasions, "produced intermediates" (=*insularia*), whilst on others Mendelian segregation took place (Doncaster, 1906).

Insularia occurred in Ireland in 1894, in Scotland (Kincardine) some time prior to 1906, and was found at the end of the last century in most central industrial areas. It was recorded on the Continent (Belgium) in 1886. All observers agree that it is an industrial melanic, and that it gets rarer following the upsurge of *carbonaria*.

It is not surprising that f. *insularia*, being intermediate in appearance between f. *typica* and f. *carbonaria*, is found most frequently at the present time on the periphery of industrial areas, outside centres with a high frequency of *carbonaria*, in whose presence it is impossible to detect phenotypically. Background scoring efficiency (Kettlewell, 1955), for the

TABLE 4

Frequencies of the three forms of *Biston betularia* within a 50-mile radius of the Wirral Peninsula, Cheshire (from information collected by Prof. C. A. Clarke)

(Samples of 50 and under; percentages in brackets because of small sampling up to date)

Locality	Recorder	Year	f. *typica*	f. *carbonaria*	f. *insularia*	Total	% *carbonaria*
WIRRAL PENINSULA							
Caldy	C.A.C.	1959	17	264	2	283	93·3%
		1960	11	213	2	226	94·3%
		1961	22	398	6	426	93·4%
		1962	50	782	8	840	93·1%
		1963	72	910	12	994	91·5%
		1964	87	884	11	982	90·1%
Caldy (Thors Wood)	C.A.C.	1962	18	116	2	136	85·3%
		1963	9	90	2	101	89·1%
		1964	NONE				
Meols	P.M.S.	1961	14	112	3	129	86·6%
		1962	9	99	0	108	91·7%
		1963	32	201	3	236	85·2%
		1964	15	102	0	117	87·2%
Birkenhead	W.R.	1959-1963	4	87	1	92	94·6%
NORTH OF THE WIRRAL PENINSULA AND WALES							
Broad Green, Liverpool .. (Lancashire)	C.A.C.	1962	3	89	0	92	96·7%
		1963	1	55	0	56	98·2%
		1964	NO TRAP				
SOUTH OF THE WIRRAL PENINSULA							
Delamere (Cheshire)	C.G.M.	1961	37	274	19	330	83·0%
		1962	10	233	4	247	94·3%
		1963	NO FIGURES				
Mostyn (Flints.)	G.W.	1961-1963	34	49	1	84	58·3%
Holywell (Flints.)	G.W.	1961-1963	35	64	1	100	69·8%

TABLE 4 (*continued*)

Locality	Recorder	Year	f. *typica*	f. *carbonaria*	f. *insularia*	Total	% *carbonaria*
Lixwm	G.W.	1961	15	12	0	27	(44·4%)
		1962	67	69	1	137	50·4%
		1963	31	44	0	75	58·7%
		1964	53	41	0	94	43·6%
Cilcain (Flints.)	G.W.	1962-1964	50	40	1	91	44%
Caerwys (Flints.)	G.W.	1962-1963	161	125	0	286	43·7%
Sychtin (Nr. Mold) (Flints.)	G.W.	1964	12	30	0	42	(71·4%)
Connahs Quay	G.W.	1964	24	107	0	131	81·7%
Flint	G.W.	1964	7	23	0	30	(76·6%)
Bagillt	G.W.	1964	6	34	0	40	(85%)
Tan Lan	G.W.	1963	11	10	0	21	(47·6%)
Loggerheads	C.A.C.	1963	76	76	3	155	49·0%
Buckley	C.A.C.	1963	6	16	0	22	(72·7%)
Ruthin	P.M.S.	1964	22	11	1	34	(32·4%)
Hawarden	A.H.C.	1963	18	99	1	118	83·9%
		1964	12	64	0	76	84·2%
Broughton	A.H.C.	1964	8	49	0	57	86·0%
Prestatyn	K.W.	1963-1964	124	125	5	254	49·2%
Dyserth	K.W.	1963-1964	45	29	1	75	38·7%
Rhyl	K.W.	1964	7	6	0	13	(46·2%)
St. Asaph	T.A.	1964	6	5	0	11	(45·5%)
Old Colwyn	J.C.	1963	12	1	0	13	(7·7%)
		1964	3	1	0	4	(25·0%)

(To extract the maximum information from these data, the original paper should be read. (Clarke, C. A. & Sheppard P. M., 1963.))

few releases undertaken by me, give *insularia* a position intermediate between f. *typica* and f. *carbonaria* in both industrial and rural environments. It is, in fact, admirably suited for resting on boughs covered with Pleurococcus and not lichens. Nevertheless, it must be pointed out that, in contrast with *carbonaria*, the phenotype frequency of *insularia* has never been found higher than 40 per cent. with one exception.

The recording of *insularia* has the great drawback, previously referred to, that its forms vary from those individuals which are indistinguishable from f. *typica* to those which are as dark as f. *carbonaria*. The frequency figures, unlike those for f. *carbonaria*, are, therefore, subject to personal error. To estimate this variability, four observers, all living within three miles of each other, and each rated as a most reliable lepidopterist, have supplied independent data over the last few years. It is clear from Table 5 that the estimates of *carbonaria* percentages do not differ very markedly. Comparing the four values by use of a 2×4 contingency table does, in fact, disclose some heterogeneity, since $\chi^2(_3)=7{\cdot}88$, and the 5 per cent. point is 7·81. Although this is formally significant, it does not contradict the view that variations between observers are probably small in respect of *carbonaria* classifications, since the total sample size of 3534 is large enough to detect very small differences:—

TABLE 5

Percentage phenotypes

T	C	I	Total	Name	I estimated frequency
18%	77%	5%	484	J.B.P.	22.32
14%	80%	6%	1435	R.F.B.	31.60
18%	78%	4%	1191	C. de W.	18.80
15%	74%	11%	424	E.T.	40.54

By contrast, the error in identification of f. *insularia* varies between 5 and 11 per cent.

Nevertheless, in spite of identification difficulties, f. *insularia* offers many points of considerable interest. As pointed out by Haldane (personal communication), high values of f. *insularia* are associated with low *carbonaria* frequencies namely from 10 to 30 per cent. Districts showing this, for the most part, are centred around the Severn Watershed and Gloucestershire which, without doubt, receive constant pollution fall-out from Bristol and South Wales. Also the Isle of Man, which is subject to occasional but definite smoke drift from the industrial areas of Lancashire, when the wind is in an easterly direction, has a high *insularia* frequency of 36 per cent. In those areas where *carbonaria* is common, the frequency of visible *insularia* falls, and the random sample, therefore, becomes less accurate, varying in direct proportion to an increased *carbonaria* frequency.

Unfortunately earlier records of f. *insularia* are, for the most part, lost, and what I have been able to extract is largely circumstantial. For example, the Giles Collection of Lepidoptera in the Folkestone Museum was amassed between the years 1880 and 1890. It was a local collection and in it is a series of 18 *betularia*, 12 *typica* and 6 *insularia*. They are by appearance not bred, in fact many of both forms are worn, and it is

likely that this is a small random sample, and reflects correctly a frequency of about 33 per cent. *insularia* at this date. *Carbonaria* did not appear in Folkestone until a very much later date, about 1927 (Morley, personal communication). As will be seen from Table 2, the present *insularia* frequency is about 11 per cent., with *carbonaria* standing at 42 per cent., which gives an estimated *insularia* frequency, on the assumption of there being no linkage, of 17 per cent. It has, in fact, dropped 16 per cent. in thirty years, during which time the frequency of *carbonaria* has risen from approximately 1 to 42 per cent. The true frequency of f. *typica* would, therefore, have increased during this period from 66 to 83 per cent. If this is true, f. *carbonaria* has expanded at the expence of f. *insularia* and not f. *typica* and it suggests that *insularia*, in the presence of heterozygous *carbonaria*, may interact in a disadvantageous manner.

At the upper end of the *carbonaria* frequency, there appear to be only one set of early figures available. Arkle (1901) took a sample of 180 *betularia* at electric light in Chester, and this can be compared with a sample of 124 taken during 1956 by S. Gordon Smith. In a period of over fifty years, the estimated frequency of *insularia* has dropped by only 7·5 per cent. in the population in spite of its cryptic disadvantage. Furthermore, if one includes the combined figures for Cheshire, the *insularia* gene-frequency is still 22·76 per cent.:—

TABLE 6

Percentage phenotypes

Year	T	C	I	Total	I estimated gene-frequency
1901	13%	83%	3%	180	20%
1956	6%	93%	0·81%	124	12·5%

The *insularia* records obtained in the last few years are a good deal more helpful. Nowhere have we so far obtained a phenotype frequency at a level higher than 53 per cent. This can be interpreted in any one of several ways. Either on every occasion f. *carbonaria* has swept through the population, an increase in pollution having taken place, thereby favouring this more extreme mutant and enabling it to overtake *insularia*; or, alternatively, homozygous *insularia* are at a considerable disadvantage to the heterozygotes. A third explanation could be that some forms of *insularia* are allelic to *carbonaria*, and that fewer *insularia* phenotypes appear in a population when the *carbonaria* is at an advantage to them. Future records will be able to settle what really happens, and their foundation is now laid in this paper. At the same time, it has served to point out that the natural history of the T-C-I complex in this rapidly changing countryside is likely to raise problems of unusual interest.

8. SUMMARY

1. The early history of *Biston betularia* and its two melanic forms in Britain, *carbonaria* and *insularia*, has been recorded. Selective advantages have been estimated for the period of over 100 years since the commencement of industrial melanism, and shown to be similar to those suggested by Haldane (1924) on the ground of theory, but slightly smaller.

The present survey includes 37,000 records of *betularia* from many districts of Britain which have been made by over 80 observers. A Table of these is given, and a frequency map has been prepared from them. The data show correlation between the industrial centres and high frequency of f. *carbonaria*, the more extreme melanic. *Carbonaria* is also abundant throughout the eastern half of England; this is probably the result of the indirect effects of smoke-drift following the prevailing south-westerly wind. The south-western parts of England and the whole of northern Scotland are free of melanics.

3. The rate of spread of *carbonaria* follows a sigmoid curve. The original light form is maintained at a very low frequency in all industrial populations. This may eventually lead to a balanced polymorphism if the heterozygous *carbonaria* are at an advantage to either homozygote.

4. The highest phenotype frequencies of *insularia* are found in populations having 10 to 30 per cent. *carbonaria*, and these are for the most part centred around the Severn Watershed, Gloucestershire and Oxfordshire. *Insularia* phenotype never occurs higher than 53 per cent., and this may be because the homozygote is at a disadvantage.

5. In populations of more than 65 per cent. *carbonaria*, the *insularia* gene-frequency may be either high or low, in spite of ever increasing loss of its earlier cryptic advantages.

6. This paper and the earlier one (Kettlewell, 1958) are intended to be a foundation for future records which may disclose the true behaviour of dominant genes rapidly and simultaneously spreading through a population.

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Thoughts on *Celastrina argiolus* L.

By H. Symes

The holly blue seems to have become very scarce in the last few years; at any rate, this is the impression I have formed as the result of my own observations, and questions asked and information received from other entomologists suggest that they share this view.

When I was a small boy living in West Kent, both broods used to occur regularly, though sparingly in my father's garden, where I have no doubt they bred, as we had several berry-bearing hollies and some old tree stumps covered with a suitable growth of ivy. Unfortunately, it never occurred to me to search for the larvae in those days, but I was soon able to complete a short series of the butterfly.

About thirty years ago, I used to see one or two *argiolus*, mostly of the first brood, in my garden at Bournemouth, usually flying round an *Olearia haastii*. They seem to have a preference for evergreens, that is perhaps associated with their principal foodplants, holly and ivy. Flowers in general do not appear to have much attraction for them. The spring brood visits flowers of holly not only to lay eggs there, and I have seen the summer brood on bramble flowers, delphinium and heather. On 21st August 1946, I took two females on heath (*Erica carnea*) near Silchester: one was a beautifully fresh specimen, but had a wedge-shaped chip missing from a hind wing, presumably the result of an encounter with a bird. On 29th July 1934, I saw three or four *argiolus* by a roadside in the southern Chilterns, settling on traveller's joy (*Clematis vitalba*), and I also saw one on 27th May 1960 flying around this plant near Whiteparish. I do not know whether it has any special attraction for this butterfly. Could it be that the larva may occasionally feed on the flower buds? "Holly blue caterpillars nibble old man's beard" would make a good headline for the popular Press.

In his "Natural History of British Butterflies", published some fifty years ago, F. W. Frohawk observes that "this species varies considerably in abundance: for a series of years it may gradually increase in numbers and become exceedingly common, then for a few years it may be very scarce". He goes on to say "that it seems generally becoming commoner and the increase of the foodplant may account for its greater abundance. Holly trees are much grown in suburban gardens". Much of this is true to-day, but I doubt if *argiolus* has been "exceedingly common" in any year recently. All butterflies vary in numbers from year to year, and in some cases there have been obvious reasons for a permanent reduction, e.g., the ploughing up or heavy grazing of downlands in Wiltshire, Dorset and other southern counties, involving the destruction of the foodplants of *Lysandra bellargus* and *L. coridon* Scop., but those of *argiolus* have actually increased.

South says the fluctuation in numbers is probably due to favourable or unfavourable weather, and it will be remembered that 1959 was a remarkably fine summer and 1960 was a good year for *argiolus*. We may well ask what has made it become so scarce since then. Perhaps one reason may be that 1961 was an exceptionally poor season for holly berries. Why! they were selling substitutes in shops at Christmas.

In his garden at Upwey, Brigadier H. E. Warry used regularly to see both broods, but during the past two years even the first brood has not

shown up. He puts the blame on the spotted fly-catcher, which he has often seen taking *argiolus* on the wing. In an average season, he tells me, the holly blue used to emerge in time to pair and get its eggs laid before the fly-catchers arrived, but two or three years ago these birds arrived before *argiolus* emerged, and mopped up the butterflies before they could lay. This explanation, however, does not apply to the scarcity in Bournemouth, for I have never seen a spotted fly-catcher in my garden, or anywhere in the centre of the town. There are probably too many cats about.

Considering how abundant holly trees are in the New Forest, it is strange that *argiolus* is not more common there. Mr. L. W. Siggs tells me that for seven years after he came to live at Minstead he never saw it at all. I know of two localities where one may count on seeing at any rate the spring brood, but apart from that I have seen only the odd specimen at scattered places in the Forest. In 1945 I found about a dozen larvae on a small holly on a garden at Brockenhurst. This year I picked two sprigs of holly flowers, mostly unopened buds, in a locality where I saw *argiolus* on the wing, and when I examined them on 14th May, I found four eggs, laid either on the outside of a flower bud or on its short stalk. On 25th May, one of the eggs had hatched: the others dried up. The larva started feeding on a flower bud, then on the cuticle of a very tender young leaf, and again on a flower bud: as soon as small berries were available it turned its attention to them. It grew very slowly at first, but rapidly in its final instar, and was full-fed on 17th June. Its colour now changed to purplish-brown, like the full-fed larva of *Mimas tiliae* L. Four days later it changed to a pupa.

As the male and female flowers of holly usually grow on separate trees, the female *argiolus* must be a remarkably good botanist to select the right tree, especially as the eggs are generally laid before the flowers open. Male flowers soon wither and fall to the ground, and larvae hatched from eggs laid on these by mistake would presumably have a short life. The holly blue differs from the other British blues in three respects. As Frohawk points out, it resembles the hairstreaks rather than the blues in its habit of flitting around tall hedges and bushes. When it visits holly trees it keeps well out of reach of the net for long periods, often without settling. This high flight no doubt is connected with the fact that the larva feeds on trees or bushes, and not, like the rest of the family, on low growing plants. Again, the other blues, with the exception of *Maculinea arion* L., tend to be present in large numbers where they occur at all: not so *argiolus*. Thirdly, it shows very little tendency towards variation, a characteristic so marked in the other species, especially *L. coridon*. A few years ago, an aberration was shown at the annual "South London" exhibition, in which some of the spots on the underside of the wings were connected by thin black lines, as if drawn by a very fine pencil. In 1947, I saw a specimen exactly like this in a small collection formed at Malvern by the late W. W. Boucher and his son fifty or sixty years ago. I do not know what has happened to it.

Mr. Percy Cue tells me that a few years ago (he thinks it was 1958) he saw a large number of holly blues, which he estimates at between twenty and fifty, flying round and settling on dog-wood (*Cornus sanguinea*) in the Warren at Folkestone. He writes: "I have only seen these singly as a rule but on this occasion more than twice I netted two and once

I caught three at a swipe". The last good year for *argiolus* seems to have been 1960. At Bournemouth the Rev. F. M. B. Carr saw large numbers flying at the top of the West Cliff, and I saw one in my garden on 7th August, the last time I have seen the butterfly here, and later found a few larvae on ivy flower-buds near the town hall. There are numerous references to *argiolus* in the Proceedings of the "South London" for 1960, especially on pages 9, 15, 16, 90 and 95. Recently I have heard from Mr. Cue that the first brood has been more common than usual in East Kent this year, but as far as I have been able to find out, this has not been the case in Hampshire and Dorset.

52 Lowther Road, Bournemouth.

Long Emergence of *Sesia apiformis* L. (Hornet Moth).

By C. W. Pierce

Long Emergence Period of Sesia apiformis *L.* (Hornet Moth).—During the month of June I searched almost every day the trunks of a group of 32 poplars (*Populus nigra*) not far from my home in Needham Market. These were planted about 30 years ago and in addition to the 32 mentioned there are numerous saplings, some of which are over 15 feet high.

My main object was the Poplar Kitten (*Cerura hermelina*) but I was not fortunate enough to find one, although other moths including the Seraphim (*Lobophora halterata*) and larva and ova of the White Satin (*Leucoma salicis*) were taken. I was most pleased, however, to take a female Hornet Moth on 27th June.

South states that the moth is out in May and June, so that this moth in common with many other species has emerged late this year in Suffolk. More surprising to me has been the long period of emergence as the following table will show.

June 27th	One female.
July 5th	One male.
July 6th	One male and one female on different trees.
July 7th	One female.
July 8th	One pair in cop.
July 10th	One pair in cop.
July 12th	One male.
July 15th	One pair in cop.
July 16th	One pair in cop.
July 28th	One male.
July 29th	One pair in cop, and one male.
August 1st	One pair in cop, found by Mr. H. E. Chipperfield.
August 2nd	One male.
August 5th	One female.

Daily search since up to date (14th August has revealed no further emergences. I was not able to visit the trees every day in June nor between the first and last emergences but did so on 4 or 5 days each week. It is possible that an odd moth may have appeared before 27th June. If this was so it would have made the emergence period of about 6 weeks somewhat longer.

There was certainly a period of about 2 weeks between 16th and 28th July when few if any moths emerged. This is surprising because the temperature rose during this time after a comparatively cool first fortnight.

It was interesting to note that none was found in the afternoon and none before 9.30 a.m. B.S.T. I was not fortunate enough to see one emerging although its pupa case was obvious near the base of tree. In no instance was the boring higher than three inches above ground level. Usually at 10.00 a.m. B.S.T. the moths were from 12 ins. to 18 ins. from the base of the tree, but at noon B.S.T. they were from 5 to 7 feet up the trunk and it was at this height that those in cop. were found. On 6th July when the male and female were found on separate trees the time was about 10 o'clock. I regret now that I did not return to see if the male had flown to the female and to check the height at which they would have been found.

Near Bramford, between Needham Market and Ipswich there is a larger group of poplars of the same age which I visited in the middle of July on 2 or 3 occasions. Here I found a few more moths, but as I had not gone there in June, I felt that little purpose would be served in trying to make a comparison between the two sites. All that could be surmised was that here, too, the emergence was late this year.

This is my first experience with this species and what I have written may already be well known. However, the late emergence, coupled with its extension over some 6 weeks, may be of interest to other lepidopterists.

14 Chalkheath Road, Needham Market, Suffolk.

RELEASE OF MARKED DANAUS PLEXIPPUS L (MONARCH BUTTERFLY) IN BRITAIN.—Dr. F. A. Urquhart's long term study of the orientation of migrant *Danaus plexippus* in North America is well known (see Williams, 1958, *Insect Migration*, London, pp. 198-200 and plate 8). Through one of his research worker's, Mr. T. R. Priddle, I have agreed to participate in his research programme this year by releasing several hundred live, marked *plexippus* in two places in England during mid-September. One half of the consignment, which will be flown over from Toronto by express airmail, will be released not far from Bristol, and the remainder further north at a locality not yet decided upon at the time of writing, but probably in the Oxford district. The butterflies will all be tagged with a special adhesive label bearing an address to which the finder should return it. These labels do not come off in wet conditions and should rule out confusion with genuine immigrants, except in those sightings where it is impossible to see whether or not the insect is labelled. However, this seems to be a risk worth taking. An entomologist or other naturalist who captures a marked specimen in good condition should consider releasing it again after noting the details on the label, and the date and place of capture; a re-capture by someone else would then be possible and might yield further information.

The object of this aspect of Dr. Urquhart's research programme is to obtain adequate data on the behaviour of *plexippus* removed from their regular "flyway" and liberated elsewhere. A southerly or south-westerly drift is anticipated and he will be interested to ascertain what happens when the insects are confronted with the English Channel.

I have informed the appropriate authorities in this country and it is planned to publicise the experiment among the general public. The precise localities and dates when the butterflies were released will be sent to this journal as soon as possible afterwards. It was originally hoped to release several thousand butterflies, but the breeding season in Canada has been most unfavourable this year.—J. F. BURTON, c/o B.B.C. Natural History Unit, Broadcasting House, Bristol, 8. 17.viii.65.

A Further Note concerning the History of Sugaring

By RONALD STERNE WILKINSON

To one who has collected material on the history of sugaring for some time, it was most pleasing to read Mr. D. E. Allen's paper on the origin of the practice, as well as Mr. P. B. M. Allan's ensuing remarks. Yet an area that surely remains to be explored is that of the introduction of sugaring to America.

In agreement with Mr. Allen's findings, there seems to be no evidence here that Edward Doubleday used any sort of artificial bait during his entomological tour of the United States in 1837-8. I have not determined that our Thomas Say knew of the discovery at the end of his life, and although Edward Doubleday met Titian Peale at Philadelphia in September, 1837, and carried on a warm correspondence with Thaddeus W. Harris after visiting him in 1838, there is no proof that either of these pioneer American lepidopterists were enlightened by the Doubleday method. It would seem from both the English and American evidence that the younger Doubleday thought his sugar-cask phenomenon to be nothing more than a curiosity—indeed, the method was described as a "singular" one in the *Ent. Mag.* note of 1833—and that it was not envisioned as a standard mode of collecting until the idea of painting trees with a brush was devised.

As for early use of the latter in America, investigation is complicated by the fact that there were no real collector's journals here during the period when sugaring was gaining ground in England and Europe. When the *Canadian Entomologist* appeared in 1868 the practice was already well established, as frequent captures at sugar are mentioned in its early pages. The American collector who wished to use bait was forced to adapt the advice given in such English manuals as Knaggs' *Lepidopterist's Guide* and Greene's *Insect Hunter's Companion* to his own conditions, as there were no aids of a similar nature published here.

The large American *Noctuidae* presented a problem; as example, an Illinois collector observed in 1876 that the strong-bodied *Catocalas* so plentiful in America did not intoxicate themselves sufficiently on the standard English mixture to make bottling easy, and when caught in the standard cyanide bottle, they tended to rub and scalp themselves before dying; thus alternate methods were proposed (*Can. Ent.*, **8**: 12-17). In his classic and witty *Butterflies and Moths of North America* (Reading, Pa., 1878), Herman Strecker suggested the addition of arsenic to the sugaring mixture, cautioning that "an old sheet should be spread on the ground beneath the tree-trunk, fence or other object that is anointed with the potion, to receive those which fall overcome by the poison". Fortunately the method did not become popular.

Stecker's work seems to be the first American handbook giving full directions for sugaring. He recommended "a preparation of rum and sugar, or beer and sugar mixed to the consistency of sirup", and warned that "windy nights ain't worth anything".

The practice had become acclimated enough in 1870 so that the veteran entomologist Charles V. Riley could comment in his *American Entomologist and botanist* (**2**: 374) that "the sugaring and sweetening process for catching moths is about as old as the science of Entomology itself", but the complete lack of evidence concerning the actual introduction of the method to America is to be lamented. The discovery of new MS. material would surely be welcomed.

University College, London, W.C.1

The Malaise Trap

By D. O. Chanter

Many insects fly upwards when they are trapped. A flight trap utilising this fact was first described by Malaise (1937) and later modified by Townes (1962).

The base of the trap is about six feet square and four feet high, and consists of fine netting arranged as shown in the horizontal section, Fig. 1, held in place by a wooden frame. Above the base is a pyramid of netting (horizontal section, Fig. 2), leading into a cone of gauze which bends over and enters the side of a plastic funnel, at the bottom of which is a killing jar. A photograph of the trap which is in use at the Department of Zoology, Makerere University College, Kampala, Uganda, is shown on Plate III.

The only regular attention the trap requires is removal of the specimens collected. One side of the pyramid, directly below the killing jar, is fitted with a zip fastener to facilitate this process.

A jar of alcohol may be used as the killing bottle. Alcohol is a suitable and convenient killing agent for most insects. It does not allow for good cabinet specimens of Lepidoptera, and probably other orders, and where these are an important consideration a dry killing agent such as potassium cyanide could be used. Good cabinet specimens can normally be obtained by other methods of collecting; the Malaise trap is best used for comparative work.

The mercury vapour light trap has proved itself as a reliable method of obtaining numerical records of nocturnal species, but the Malaise trap will operate by day as well, thus enabling numerical records to be kept of diurnal species. For ecological studies the Malaise trap is more suitable than a light trap because, although the numbers obtained are smaller, the flight trap uses no attractant and the specimens caught are those which fly into the trap by accident. This ensures that the catch is not contaminated with insects attracted from a nearby but ecologically different habitat.

Certain insects are more readily caught than others, notably Hymenoptera, Diptera, and Lepidoptera, but specimens of other orders, for example Strepsiptera, do appear.

The Townes-model Malaise trap was first used in the United States to

The Malaise Trap.

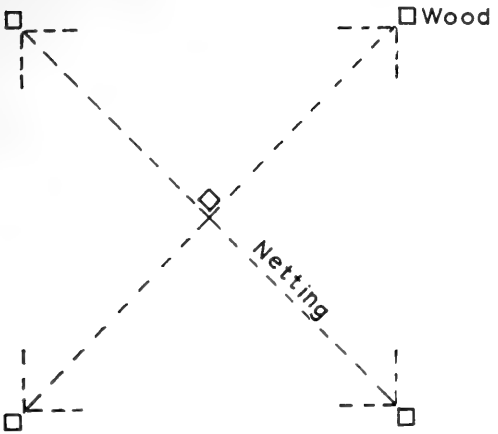

Fig. 1.

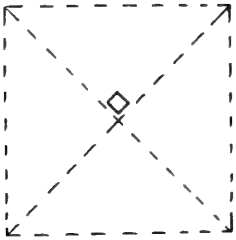

Fig. 2.

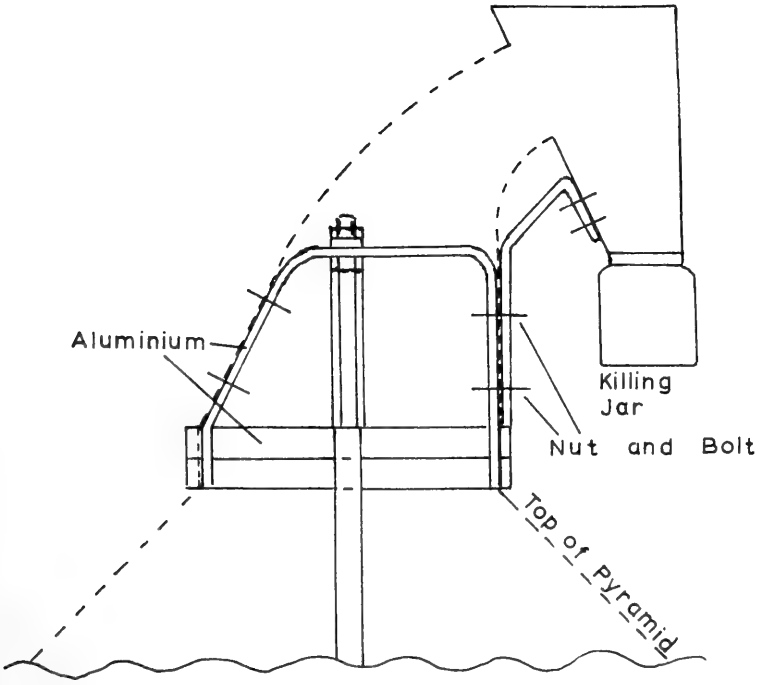

Fig. 3.

Fig. 1. Horizontal Section of Base. Fig. 2. Horizontal Section of Pyramid. Fig. 3. Vertical Section of Top of Trap.

collect Ichneumonidae for systematic work. The trap shown in the photograph is collecting insects from which information on seasonal variation of insect numbers in a tropical environment is being obtained. It is often said that there is little seasonal variation in numbers in the tropics, especially where there are no sharply divided wet and dry seasons, as at Kampala. However, weekly samples of 48 hours each have shown that many species exhibit marked seasonal fluctuations. Other uses of the trap are in studying the relative abundance of different species at any one time, and in comparing the fauna of different localities.

A sample catch is shown in Table 1. This is one 24-hour sample, and not the average of several catches. For those readers not acquainted with tropical fauna the figures obtained from a 4-hour operation of a mercury vapour trap nearby are included for comparison. Most of the Hemiptera and Diptera counted were minute. A large proportion of the Coleoptera taken at light belonged to the superfamily Staphylinoidea.

As far as I know flight traps of this kind have not yet been used in Britain. I am sure that ample rewards are awaiting anyone keen enough to build one. A more detailed design can be found in the paper by Townes. After several years running, Malaise traps could produce numerical evidence of population changes in the British insect fauna. In fact a Malaise trap would be an asset to anyone interested in numerical, ecological or systematic studies of any part of the flying insect fauna of the British Isles.

TABLE 1

Order	*Family or Superfamily*	*Malaise 24-hour*	*m.v. 4-hour*
Orthoptera		2	9
Dictyoptera	Mantidae	1	0
Isoptera		0	5
Hemiptera		12	307
Neuroptera		0	2
Lepidoptera	Pyralidoidea	24	149
	Bombycoidea	0	3
	Papilionoidea	4	0
	Hesperioidea	2	0
	Geometroidea	0	6
	Sphingoidea	0	1
	Noctuoidea	3	78
	Limacodidae	0	22
	Sesiidae	1	0
	Others	25	87
Diptera		445	301
Hymenoptera		66	112
Coleoptera		7	168
Strepsiptera		5	0

ACKNOWLEDGMENT

I would like to thank Dr. D. F. Owen of the Department of Zoology, Makerere University College, Uganda, for his permission to publish this article, and for his helpful comments.

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P.O. Box 101, Tanga, Tanzania.

Notes and Observations

BUTTERFLY RECORDS.—Notwithstanding the lesson to be learnt from the excellent article in the May issue, "Swallowtails in Devon", I should like to put on record an observation told me by a friend, who noted about a dozen *Polygonia c-album* L. (comma butterflies) on Hampstead Heath, London, in 1964.

An interesting mid-winter appearance of a butterfly was on 24th December 1958, when I saw an *Aglais urticae* L. (small tortoiseshell) flitting about actively on a cold, sunny morning in Highgate Village, north London.—M. J. HAMMERSON, 29 Riverside Drive, Golders Green Road, London, N.W. 12.

ARE HOVER FLIES (SYRPHIDAE) PARASITIC?—After a recent meeting of the New Forest Insect Conservation Committee held at Mr. R. W. Watson's home at Sandy Down, we were shown his collection, breeding cages, etc. In a cage of emerging Aglais urticae L. was a large black and white hover fly, the well known migrant, *Scaeva pyrastri* L. It had emerged a day or two previously and had been allowed to remain for my inspection. Mr. Watson suggested that it may have been introduced as a larva or pupa on the nettle used as food for the caterpillars. The larvae of the subfamily Syrphinae to which *S. pyrastri* belongs are suckers of aphides. I have bred the fly from a larva found amongst aphides and have seen a female lay an egg amongst a group of aphides. However, I have seen the larva of *Syrphus luniger* Mg. (=*Metasyrphus luniger* Mg.) attack and suck the larva of *Malacosoma neustria* L. (1947, *Ent. mon. Mag.*, **83**: 88) and Mr. R. L. Coe in his Royal Entomological Society's Handbook on Syrphidae mentions Luchese's record of *Xanthandrus comtus* Harris larva sucking the larva of an Eucosmid moth. But others have recorded Syrphidae as being bred from larvae of lepidoptera. In *Ent. mon. Mag.* for 1896, p. 256, Mr. R. C. Bradley recorded the supposed breeding of *Baccha elongata* F. from *Mamestra persicariae* L. but gave as his opinion that the fly was not parasitic but had been introduced with the food plant and added that he was "under the impression that no Syrphid has yet proved to be parasitic on Lepidopterous larvae".

In the same magazine in 1900, p. 244, the Rev. E. N. Bloomfield referred to Bradley's note and then stated "I have, however, lately met with three examples of the handsome, but common, *Catabomba pyrastri* L. (=*Scaeva pyrastri* L.), thus parasitic. Last autumn I received from Mr. Claude Morley a crippled specimen which a friend had bred from a pupa of *Plusia iota;* and this summer he sent me, from Southwold, several larvae of different species, asking if I could tell him what they were. Two or three at once spun up, and became pupae, and to my surprise in about a fortnight two specimens of *C. pyrastri* were disclosed; the empty pupae cases giving indubitable proofs that they had proceeded from them. The larvae were most probably *Plusia gamma*, and were at that time very abundant at the foot of the cliffs at Southwold".

If any of the many readers who rear Lepidoptera can give any further information relative to the possible rearing of Syrphidae from lepidoptera larvae or attacks of Syrphid larvae on caterpillars it would be appreciated. — L. PARMENTER, 94 Fairlands Avenue, Thornton Heath, Surrey. 25.vii.65.

PAMENE AURANTIANA STAUD., AT FOLKESTONE.—I was surprised to see an example of this local moth at rest on a leaf of *Centaurea scabiosa* on the down below Crete Road, Folkestone. The specimen was taken on 1st August 1965, and is in good condition. There are a number of well-grown sycamores at the foot of the downs below, and within some fifty yards of the place of capture.—J. M. CHALMERS-HUNT, St. Teresa, Hard-courts Close, West Wickham, Kent.

METZNERIA NEUROPTERELLA ZELL., IN KENT.—On the night of 4th August 1965, Mr. Wakely and I took four fine specimens of this very desirable Tineoid. They all occurred within a small area at Dungeness where there was plenty of *Centaurea nigra*. The three that I took appeared at about 10.45 and within a minute or two of each other, and were attracted to the Coleman lamp which I had placed on the ground for a moment. Mr. Wakely's specimen also came to light. I am not aware that *neuropterella* has been taken in Britain since the late L. T. Ford netted a few specimens at Lewes in 1936 and 1937.—J. M. CHALMERS-HUNT, West Wickham, Kent.

THALERA FIMBRIALIS SCOP., IN 1965.—This species appears to be more localised than formerly, but was nevertheless fairly numerous this year on Denge Marsh at the spot where I first found it in 1950, and where it has been observed by me since on many occasions (cf. *Ent. Rec.*, **64**: 10, **65**: 294; *Entomologist*, **86**: 106). On August 3, at about 10 p.m., it was an interesting experience to find a ♀ ovipositing in the wild on gorse, two ova being laid close to a top shoot, both of which duly hatched on 14th August, together with a number of other ova laid subsequently by the same individual in captivity. The larvae appear to relish gorse, and as this is a plant that keeps fresh when cut, and certainly far more so than yarrow, it may be a useful tip to those wishing to rear the insect in captivity.—J. M. CHALMERS-HUNT, West Wickham, Kent.

A NOTE ON LOBESIA EUPHORBIANA FRR., AND THE OCCURRENCE OF A SECOND GENERATION IN 1965.—On 29th July Mr. S. Wakely and I found many plants of *Euphorbia amygdaloides* at Folkestone to contain a larva of this attractive Torticid, as well as a number of pupae. Rather to our surprise, an imago emerged on 3rd August and to date (20th August), I have had about a dozen others emerge. There can be no doubt that at least some of these would have constituted a second generation in the wild and indeed on looking up Barrett (*Br. Lep.*, **11**: 68) I see he mentions a partial second generation in August and September.

A tenanted plant is immediately recognisable by the central leaves being spun together to form a kind of chamber into which fass is ejected. The larva eats well down into the stem, and when full grown, climbs out of the tube to spin a dense, white, rather flat silken cocoon between two leaves, in which it pupates. The feral pupa was always found to be situated amongst the central leaves and adjoining chamber formed from them by the larva, and in no case was the larva ever found to have pupated in the stem. It was noted that the larva eats very little of the leaf, but appears to feed initially on the shoot and thereafter almost entirely in the stem, so that one supposes it must also consume the bluish-white milk-like fluid that exudes from it.—J. M. CHALMERS-HUNT, West Wickham, Kent.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

A 12-YEAR SURVEY OF THE FREQUENCIES OF *BISTON BETULARIA* (L.) (LEP.) AND ITS MELANIC FORMS IN GREAT BRITAIN. Dr. H. B. D. KETTLEWELL 195

THOUGHTS ON *CELASTRINA ARGIOLUS* L. H. SYMES 219

LONG EMERGENCE PERIOD OF *SESIA APIFORMIS* L. (HORNET MOTH). C. W. PIERCE 221

A FURTHER NOTE CONCERNING THE HISTORY OF SUGARING. RONALD STERNE WILKINSON 223

THE MALAISE TRAP. D. O. CHANTER 224

NOTES AND OBSERVATIONS 227

TO OUR CONTRIBUTORS

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Some Butterflies in Greece, 1965

By Major-General Sir George Johnson, K.C.V.O., C.B., C.B.E., D.S.O.

A successful expedition to Delphi for the spring butterflies in 1964 encouraged me to plan a further visit to Greece later in the season with, in particular, *Colias aurorina heldreichi* Stgr. as an objective.

Articles in the *Entomologist* of July and August 1932 by Brigadier General C. van Straubenzee, C.B., C.B.E., were of the greatest value in planning this trip.

Flying out to Athens on 19th June, my wife and I motored next day 218 kilometres to Patras on the south side of the Gulf of Corinth, crossing the deep cut of the Corinth Canal en route. We arrived about lunch time at our hotel and in the afternoon motored out about 14 kilometres to the east, on the Kalavryta road, where we found a dry "wadi" in scrubby, hilly ground. A few *Pararge roxelana* Gr. were skulking in the bushes and here we met our first *Melanargia larissa* Boisd. We also noted a few *Pyronia cecilia* Vall., *Limenitis anonyma* Lewis, *Lysandra icarius* Esp., *Philotes vicrama* Moore and other more familiar species.

We spent the night in Patras and next morning motored 80 kilometres eastwards to the village of Kalavryta, under the great hill Mt. Chelmos (7,680 ft.). Much of the road was indifferent and very twisty and though once surfaced with tarmac, this had largely disintegrated throughout its middle length. It is, however, regularly used by both local and touring 'buses and is perfectly passable, though slow. We reached the Hotel Chelmos at Kalavryta about lunch time, after a short stop at our *roxelana* locality of the day before.

Kalavryta is quite a small place at an elevation of 2,500 feet. Our hotel was on its outskirts, quiet and reasonably comfortable, though the food, as usual in Greece, unless one is close enough to the sea for fish, was indifferent. The village is connected to the railway along the Gulf of Corinth by a narrow-gauge line, but the only roads are that to Patras and another winding south through the hills towards Tripolis.

It was a main base for successful guerilla activities in 1943. As a reprisal the Germans rounded up and shot some 1,200 youths of the district between the ages of 12 and 18 on a hillside overlooking the village. To-day, a large, modernistic, but rather impressive memorial stands on the spot where the boys were shot. I still would not care to have to admit German nationality in Kalavryta!

A flight place of *C. aurorina heldreichi* is on the Cherokobus plateau at 5,500 feet on the north side of the main ridge of Chelmos. In van Straubenzee's day the best approach was by a path running east from Kalavryta towards a small village called Sondena (still not marked on any map I could get in London. I believe there are no large scale maps of the Peloponnese).

About a mile short of Sondena, near a spur of Chemlos which overlooks the village, a second path leaves the first, turning sharply to the left and leading up north-eastwards through native silver fir forest. Eventually, near the tree line, this path debouches on to the open ground of the plateau whence it eventually reaches a village called Zaroukhla, linked by road to the Gulf of Corinth. Now a motorable road, unsurfaced but perfectly passable in dry weather, runs to Sondena, passing the war memorial as it leaves Kalavryta. What is more, a further road is now being driven from the ridge overlooking Sondena north-eastwards towards

the plateau. This road leaves the first one on the ridge and 14 Km. from Kalavryta. Half a mile of the new road was complete and if funds hold out and work continues it should be possible to reach the flight place of *C. aurorina heldrichi* by car next summer.

Van Straubenzee considered it took three hours to walk from Kalavryta to the plateau. After motoring half the way, it took me over two hours with a climb of 1,500 ft. under a Greek sun. I am filled with admiration for the Brigadier General's stamina!

We spent the afternoon of 21st June reconnoitring the road to Sondena and the approaches to Chelmos. In addition we visited a locality mentioned by van Straubenzee as being good for Lycaenids. This is a dry "wadi" crossing the dirt road just as it begins to climb the ridge above Sondena. Half-a-mile up the "wadi" bed there is a little water and small muddy patches which form a great attraction to butterflies. Here we found *Pieris ergane* H.G. (common), *Aporia crataegi* L. (abundant), *Nymphalis antiopa* L. (a few), *N. polychloros* L. (common), *Melitaea didyma* Esp. (a few), *Plejebus sephirus* Friv. (abundant), *Lysandra icarius* Esp. (*amandus* Schr.), *L. escheri dalmatica* Spr., *Cyaniris helena* Stgr. and several skippers including *Pyrgus philomidis* H.-S. and a fine form of *P. serratulae* Rbr.

On 22nd June we motored to the ridge above Sondena and walked to the end of the newly-made stretch of road. Thence we continued north-eastward through the forest until we struck the Sondena-Cherokobus path. This we followed, climbing quite steeply to the plateau. As we neared the top *C. aurorina heldreichi* began to appear in clearings by the path and as we debouched on the plateau it became common.

Males were numerous and fresh, females scarce, probably just beginning to emerge. The males spent most of their time fluttering up and down a low leguminous shrub obviously in search of females. This plant though it has a woody, shrub-like habit and is armed with many sharp spikes, has foliage and pink flowers very like our own *Astragalus* and is no doubt the foodplant. Its spines enable it to survive the activities of the ever-present goat, and it is, in fact, one of the two or three species of Spiny *Astragalus* found in the Eastern Mediterranean region.

The butterflies, though adept at dodging a side stroke of the net by dropping downwards, frequently settled, and were not so difficult to catch as *C. croceus* Fourc. flying in small numbers on the same ground. They are very distinct in colour, being actually a dark orange with a purple suffusion. In the strong light they have an almost olive green appearance very different from the bright yellow of *C. croceus*.

On the same ground a small form of *Parnassius mnemosyne* L. was flying and my wife caught a single, rather worn, specimen of *Lycaena anteros* Frr. in the exact spot described by van Straubenzee, just where the path debouches on to the plateau.

The plateau itself is open ground near the tree line, very stony with numerous small hillocks and ravines among which it is quite easy to get somewhat lost. It is dominated by the main peaks and ridge of Chelmos on its south side, still with many patches of snow at that date.

We descended by the path, which was very rough and stony, and were very glad to reach our car and a good drink. In addition to the roughness of the way and the heat, the local Tabanid flies were amongst the most vicious I have encountered. They included one as large as a small bumble

bee with a beautiful golden body and most vicious bite. Our respect for van Straubenzee was by no means diminshed.

On 23rd June we had a quiet day collecting along the railway line but did not find a great deal of interest. A few *M. larissa*, one fresh *Papilio alexanor* Esp. and some hairstreaks and skippers were the main items.

On 24th and 25th June we devoted our time to the "wadi" already mentioned on the road to Sondena. We found a spring of good water close to where the road crosses the "wadi" and spent most of our time between this and the puddles of water half-a-mile up the "wadi" bed. Beside *P. ergane*, *N. polychloros* was common at the water as were various blues and skippers. We secured several *N. antiopa*, and I was surprised to catch quite a series of fresh *Libythea celtis* Fuessl. at the water, though there were no nettle trees in immediate evidence. On stony ground beside the "wadi" we got a few male *Satyrus anthelea* Hübn., perhaps just beginning as most were fresh and we saw no females.

On 26th June we motored back via Patras to Aegion where we caught the ferry across the Gulf of Corinth to Itea for Delphi. The crossing took about two-and-half hours and we did not arrive at Delphi until evening.

We had four full days at Delphi, the last, 30th June, being overcast and ending with heavy rain in the evening. We found a good collecting area to be the Castalia spring where water was the main attraction for many *P. ergane*, a few of the summer brood of *P. krueperi* Stgr., *Polygonia egea* Cram., *N. polychloros*. *N. antiopa*, *L. celtis* and blues, including *Lysandra thersites* Cant Chapm., *P. sephirus* (both common), *Meleageria daphnis* Schiff., *Agrodiaetus admetus* Esp. and *A. ripartii* Frr. (a few each). Unfortunately, the spring was also an attraction for hordes of tourists, particularly on Sunday.

Another good area was a rough piece of ground above the Stadium at the foot of the cliffs where patches of thyme were an attraction for many butterflies, including *Satyrus ferula* F. (rather worn), hairstreaks, *L. thersites*, *A. admetus* (both common). A few *A. ripartii* were on the same ground. Three brimstones, *Gonepteryx rhamni* L., *G. cleopatra* L. and *G. farinosa* Zell. were in evidence. The last-named, though, a second brood was already going over. *M. larissa* was common everywhere.

On 1st July, a rather stormy day with light showers, we set out for the Athens area, stopping en route, in Attica at some low foothills covered with scrub and muck thyme, between Erithrai and Oinoi, 45 Km. short of Athens. Here we found both sexes of *Hyponephele lupinus* Costa numerous and fresh, but little else.

We arrived at our destination, the Mount Parnes Hotel, at 4,000 feet on one of the highest hills in Attica, in a mist. Next morning the weather reverted to normal and we were able to enjoy the view of Athens some 20 miles away and 4,000 feet below us. Heat haze for the rest of our stay, obscured the more distant views of the sea and Peloponnese. These hills were very steep, covered lower down with scrub and higher up with the native silver fir. Except for one rather barer and more gently sloping area a mile from the hotel, collecting was difficult off the roads. There were no very large numbers of butterflies but some species of interest. In contrast with the Erithrai area, there were no *H. lupinus*, but quite a number of *H. lycaon* Rott., mostly rather worn. At one spot on the road down to Athens, a mile from the hotel, we obtained a short series of *Meleageria daphnis* Schiff. *Satyrus ferula* and *Hipparchia semele* L. were fairly common, but only one example of *H. fagi* Scop.

was secured and one female *S. anthelea*. At a drinking trough on one of the forest roads half-a-mile from the hotel we noted *Hipparchia aelia* Hffmgg. (two), numbers of *H. semele*, a few *P. egea*, *N. polychloros* and one or two *N. antiopa*, *L. celtis*, and *P. roxelana*. *M. larissa* and *Pontia daplidice* L. were common everywhere.

On 5th July, a very hot day, we left, with regret, for Athens Airport, apparently just missing a minor earthquake which shook Athens that day.

A list of species noted follows:—

Papilio machaon L. (A.K.)
P. alexanor Esp. (K.)
Iphiclides podalirius L. (A.D.K.)
Parnassius mnemosyne L. (K.)
Pieris brassicae L. (A.D.K.)
P. rapae L. (A.D.K.)
P. ergane Hb. (D.K.)
P. manni Mayer (K.)
P. krueperi Stgr. (D.)
Euchlöe ausonia Hbn. (K.)
Pontia daplidice L. (A.D.K.)
Gonepteryx rhamni L. (A.)
G. cleopatra L. (A.D.K.)
G. farinosa Z. (D.)
Colias ausonia H-S. (K.)
C. croceus Fourc. (A.K.)
Leptidea sinapis L. (K.)
Melanargia larissa Hbn. (A.D.K.)
Hipparchia fagi Scop. (A.)
H. aelia Hffmgg. (A.)
H. semele L. (A.D.K.)
Satyrus ferula F. (A.D.)
S. anthelea Hbn. (A.K.)
Dira megera L. (D.K.)
Pararge aegeria Stgr. (K.)
P. roxelana Cr. (D.K.P.)
Hyponphele lycaon Rott. (A.D.)
H. lupinus Costa (A.)
Maniola jurtina L. (A.D.K.)
Pyronia cecilia Vall. (P.)
Coenonympha pamphilus L. (K.)
Limenitis anonyma Lewis (A.D.K.)
Vanessa atalanta L. (A.)
V. cardui L. (A.D.K.P.)
Aglais urticae L. (A.K.)
Polygonia c-album L. (D.K.)
P. egea Cr. (A.D.)
Nymphalis polychloros L. (A.D.K.)
N. antiopa L. (A.D.K.)
Melitaea phoebe Schiff. (K.)
M. didyma Esp. (K.)
M. trivia Schiff. (D.)
Fabriciana niobe L. (K.)
Argynnis paphia L. (K.)
Pandoriana maja Cr. (A.K.)
Issoria lathonia L. (A.K.)
Libythea celtis Fuessl. (A.D.K.)
Strymon spini Schiff. (A.D.)
S. acaciae F. (K.)
S. ilius Esp. (D.K.)
Heodes tityrus Poda (K.)
Lycaena phlaeas L. (A.D.K.)
Celastrina argiolus L. (A.K.P.)
Philotes vicrama Moore (P.)
Aricia agestis Schiff. (A.D.K.)
Plebejus pylaon Vrty. (D.K.)
Cyaniris helena Stgr. (K.)
Polyommatus anteros Frey (K.)
P. icarus Rott. (K.)
Lysandra thersites Cant.—Chapm. (D.)
L. escheri Hbn. (K.)
L. icarius Esp. (D.K.P.)
L. argester Bergstr. (D.)
L. bellargus Rott. (K.)
Agroiadetus admetus Esp. (A.D.)
A. ripartii Frr. (D.)
Meleageria daphnis Schiff. (A.D.)
Erynnis tages L. (K.)
Carcharodus alceae Esp. (D.K.)
C. orientalis Rev. (D.)
Reverdinus floccifera Hbn. (K.)
Pyrgus serratulae Rbr. (K.)
P. philomidis H.-S. (D.K.)
Spialia orbifer Hbn. (D.K.)
Adopaea lineola O. (K.)
A. silvestris Poda. (A.D.K.)
Thymelichus actaeon Rott. (A.D.)
Ochlodes venata Bremer & Grey. (D.)
Gegenes nostrodamus F. (P.)

A.=Attica, D.=Delphi, K.=Kalavryta and Mt. Chelmos, P.=Patras.

A Brief Visit to Switzerland, May 1965

By Baron de Worms, M.A., Ph.D., F.R.E.S.

I paid a ten-day visit to Switzerland, mainly to accompany a scientific party on a tour of special organisations, but I managed to fit in some collecting during the period. Setting out on 14th May by boat and rail via Basle, I reached Berne, our base, early on the 15th, and at once set out for Kandersteg, which was in a very different garb from when I last saw it in August 1959. The snow was still at a fairly low level in the valley leading to the Oeschinensee, but the village itself was well free, and many of the meadows harboured large patches of the spring gentian, but butterflies were by no means numerous. The only Pierids flying were *Pieris bryoniae* Freyer and *Anthocharis cardamines* L., in fact these were the only species on the wing. The good weather continued over the 16th, when I went up a small hill on the outskirts of Berne, the Gurtenculm. *A. cardamines* and the common whites were well to the fore and on walking down through the beech woods I took *Aglia tau* L., that fine Saturniid, already worn.

I did not have another opportunity for collecting until the end of the week when on 21st May I again travelled to Spiez and then took a train on the Zweisimmen line, getting out at the small town of Weissenburg, where the slope above the station was fairly productive. *Leptidea sinapis* L. was in plenty, *Melitaea athalia* Rott. was just appearing as also were *Brenthis dia* L. and *Papilio machaon* L., while *Cyaniris semiargus* Rott. and *Cupido minimus* Fuessl. were on the wing with many Pierids mainly *P. napi* L. and *A. cardamines*. I also took *Pyrgus malvae* L.

The next day, 22nd May, I travelled to Lausanne and then to St. Maurice in the Rhone valley, where I was met by Mr. E. P. Wiltshire, our Consul General in Geneva. It was a glorious day and we at once set to work since Mr. Wiltshire was staying in this region to try to determine the boundary between *P. malvae* to the north, and *P. malvoides* Elwes to the south. Both species seemed to meet in this narrow limit. At this point, just before the Rhône takes its remarkable right-handed turn northwards, the valley is almost at its narrowest with the steep wooded slopes on either side coming very close together. It was up a winding road to the north side that we first wended our way above the village of Collonge. While we were having our lunch along this wooded route, many *Nemeobius lucina* L. were flying, and it was the right hour for *Aglia tau* males to be disporting themselves, but they all seemed to elude our efforts to catch them. Later we moved on to further wooded slopes between Dorenaz and Folleterres which produced two *Pyrgus* which eventually proved to be *malvoides*. In this locality we also saw *Melitaea cinxia* L. and *Nymphalis antiopa* L. The weather deteriorated towards the end of that day, so we returned to the very nice motel where we put up for the night just to the north of St. Maurice. Searching in that vicinity after dark produced the geometers *Chlorissa cloraria* and *Scoria dealbata* Scop.

May 23rd dawned extremely well, turning to a very warm and sunny day, ideal for insects. Our first venue was the Bois Noir, not far from St. Maurice. Here we saw plenty of species including *P. machaon* and *Iphicledes podalirius* L., *Clossiana euphrosyne* L. and *Glaucopsyche cyllarus* Hübn. We then moved on to further woods near Vernayaz on the

west side of the valley. This was a very rich spot with some fine N. *antiopa* sailing up and down the wooded paths. *Nymphalis io* L., also hibernators, were much in evidence too. There were also a good many *Melitaea athalia* Rott. in its local form *celadussa*. *L. sinapis* also appeared with *Cyaniris argiolus* and we took a single *P. malvoides*, thus showing that this insect does not appear to extend north of St. Maurice. Our next stop was the western side of Martigny on the outskirts of Fully Wood overlooking the Rhone, which I last visited in 1954. This was another very productive spot. On the edges were again flying a good many *N. antiopa*, which I have never before seen so numerous in the spring. Around the bushes bordering the wood were flitting many *Everes coretas* Ochs. and *Lysandra bellargus* Rott., while the final capture on the edge of the adjoining vinyards was a female *Scolitantides orion* Pall. already past its best. In the first week of June, Mr. Wiltshire took in this same wood that magnificent blue *Iolana iolas* Ochs., the larva of which feeds in the pods of the bladder senna (*Colutea arborescens*). I believe it is some time since this fine species was taken in this area. As he had to leave in the afternoon to return to Geneva and there was still a couple of hours before my train to Lausanne and Basle left, I walked up the tortuous path leading to the round tower at Martigny, whence there is a grand view of the Rhone Valley stretching westwards towards Sion and Brig. This used to be famous as a locality for many choice species, but the only new one I came across was a fresh female of *Turanana baton* Bergstr. Here again *N. antiopa* was flying with many *Pararge megaera* L.

So ended a very interesting and quite prolific week-end in this delightful part of Switzerland.

Three Oaks, Woking. 12.ix.1965.

Fifty Years Ago

(From *The Entomologist's Record* of 1915)

PAINTED LADIES AT NIGHT.—The queerest experience of the night was with a butterfly—*Pyrameis cardui*. Each night I saw *P. cardui* very conspicuously at rest on the gorse along this lane, and was interested to note that certain bushes were favoured night after night, probably by the same individuals. On the last night as I passed along to the *craccae* ground at 10.30 p.m. there were three *P. cardui* at intervals of about twenty yards. Upon my return two hours later I looked for them and found the first one gone. The second was where I had left it, but what was my astonishment at finding the third one paired, doubtless with the first specimen.

There is no possibility of error in this fact, as in each case the particular position of the specimen was known to me exactly from observation of previous nights. *Cardui*'s habit of flying late into the dusk is familiar to me, but even assuming that my strong light had unsettled them at 10.30, such a proceeding as this is, as far as I know, quite without parallel. It would be interesting to hear if others have had a similar experience.—RUSSELL JAMES.

A Visit to Princethorpe Wood, Warwickshire

By M. J. Leech

Saturday, 17th July, was one of this year's all too rare summer days. Plans had been made to pay a visit to Princethorpe Wood, accordingly with two friends, Messrs H. G. A. Bates and D. Tozer, we set off down the Fosse Way into Warwickshire. The visit, my first made to the area, was of considerable interest as it was possible to make a superficial comparison of the lepidoptera of the district with those seen in more familiar surroundings in Leicestershire and Northamptonshire.

On arrival, down one of the rides, in the wood which is predominantly composed of mature oaks, we saw approximately a dozen *Limenitis camilla* L. This species seems to have disappeared from Leicestershire and is not now to be found in many of its Northamptonshire haunts. I returned with four specimens, all chipped, in the hope of obtaining ova. Every encouragement was given to the butterflies on the next day but I was unrewarded. *Aphantopus hyperantus* L. was common and a nice underside aberration was taken. There was unfortunately no sign of any of the Fritillary family.

After dark, in another part of the wood, we worked light in a small clearing bordered by sallows but with oak, birch and ash close by. Conditions were good and we had a steady run of moths from dusk until our departure. Of the 76 species listed for the night a few call for comment: *Miltochrista miniata* Forst., this insect, in very fresh condition, was a welcome surprise. South indicates there are few records for the Midlands and I certainly have no knowledge of it being met with in Leicestershire. There is, in addition, only one sixty-year-old record for Northamptonshire at Yardley Chase. Two other insects that made an unexpected arrival were *Leucoma salicis* L. and *Pyrrhia umbra* Hufn. The clearing in which we operated was devoid of bilberry but it was quite damp and, as already mentioned, was surrounded by sallow bushes. It was therefore not surprising to see a specimen of *Calocalpe undulata* L. come to light. Fortunately it was a female and I have now got many pupae which should produce a worthwhile series next season. Two specimens of the local *Euphyia unangulata* Haw. made an interesting addition to the night's catch. I have not yet come across this species in either of the other counties mentioned. A single female *Cosymbia albipunctata* Hufn. completes my observations on this locality. A few ova were laid and, at the time of writing, the resulting pupae are on the point of emergence.

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Hylecoetus dermestoides L. (Col., Lymexylonidae) in Leicestershire.—This insect may well be increasing its range as it has been recorded for the first time in Leicestershire this year. In early May I dug out a female specimen and eight pupae from an ash trunk in Swithland Wood. Later in the month mature insects were obtained from the same area, this time in a dead birch tree.—M. J. Leech, The Cottage, Hallgates, Cropston, Leicestershire. 11.ix.1965.

A Genuinely Portable M.V. Light Trap

By J. Heath

Although it is now some fifteen years since the introduction of the M.V. lamp as one of the most important items of the lepidopterist's equipment, no really satisfactory portable version of the M.V. light trap has become available.

If portable is defined as "capable of being carried in a rucksack for unlimited distances on foot irrespective of terrain" then the conventional high pressure mercury vapour lamp used in mains operated traps is unsuitable owing to the weight (at least 50 lbs.) of the power supply unit required to operate it.

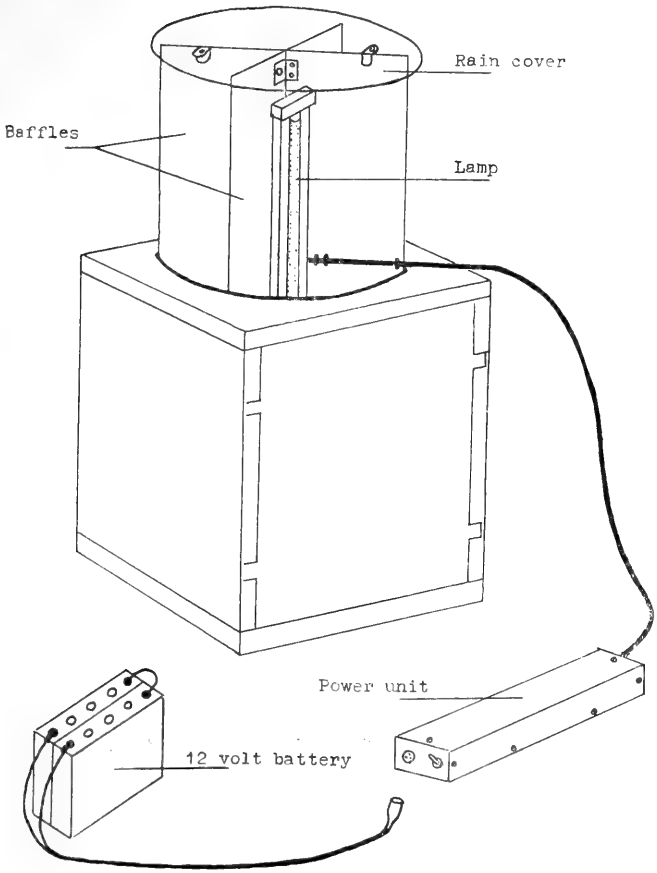
To conform with this definition of portable, the total weight of the equipment should not exceed about 15 lbs. Therefore it is obvious that a lamp with a much lower power requirement must be used. The most satisfactory alternative to the conventional M.V. lamp is the low pressure mercury vapour tube which, in its normal form, the fluorescent tube, is familiar to everyone. Special versions of this lamp are available which produce ultra-violet light much more efficiently than the high pressure lamp normally used in insect traps. They are available in a range of wattages, the smallest of which, the 9 inch long 6 watt tube is the most suitable for use in an insect trap. In addition to requiring very little power for operation it has the highest brightness of the range and is the most convenient to mount in a trap. A special transistorised power unit is available for this lamp which only requires an input of 12 volts at 0·9 amps. and it can therefore be run for a period of 12 hours, i.e. two summer nights, from a small accumulator weighing 9 lbs. without recharging. Also as it can be operated from a car battery and, with suitable control gear, from the mains, an extremely lightweight, versatile trap becomes possible. Such a trap has been designed and is described below.

Construction (See figure)

The trap consists of a collapsible aluminium box, 10 inches by 10 inches by 12 inches high, into the top of which a modified 8-inch diameter polythene funnel is fitted. The lamp is mounted vertically in the centre of four aluminium baffles which can be packed flat. These baffles fit into the funnel and project 8 inches above the top of the trap. A small polythene funnel, suitably modified, fits into the bottom of the trap to act as a rainwater drain. As the lamp runs almost cold it is unaffected by rain, but to prevent possible electrical trouble, a clear plastic disc can be clipped to the top of the baffles in very adverse weather. The usual arrangement of egg trays, cut to a suitable size, is used in the trap.

The lamp is connected to the transistorised power unit with a special cable and, for protection and ease of connection, the power unit is mounted in an aluminium box 11 inches by 2 inches by 3 inches, fitted with input and output sockets and a switch. Ordinary two-core cable connects the power unit to the accumulator.

When in operation, the power unit and battery are placed in a heavy gauge polythene bag for weather protection. The accumulator is also placed in this bag for transport, to prevent damage in the event of acid spillage.



The total weight of the trap and power unit is 5½ lbs. and when dismantled for carrying, measures 10 inches by 12 inches by 7 inches. Therefore, the total weight of the equipment is less than 15 lbs. and it is small enough to be packed in an ordinary rucksack.

Performance.

The trap was compared with a Robinson trap fitted with a 160 watt blended M.V. lamp using the method recommended by Williams (1951). The two traps were operated on each of twelve nights, each trap being tested six times in each of two similar positions about 250 yards apart. The two positons were selected so that the light from one trap was not visible in the position of the other trap. This showed that the catch of macro-lepidoptera was 56% and the number of species trapped was 68% of that in the Robinson trap.

Discussion.

When considering the performance of this trap the following points should be borne in mind:—

1. It can be taken anywhere, irrespective of terrain.
2. It can be placed in the actual habitat to be sampled.
3. It is completely silent in operation.
4. The lamp is unaffected by weather conditions.
5. The power unit requires no maintenance.
6. The power required is only 12½% of that of conventional equipment.
7. It can be operated from mains supplies, a car battery or a small portable battery.
8. The cost is much less than that of normal equipment operated with a generator.

Cost.

The lamps, which have a life of 5,000 hours, cost 12/- each. The trap, complete with lamp and power unit, can be produced commercially to retail at about £17. Suitable small accumulators cost £6.

Acknowledgments.

I should like to thank Mr. D. S. Lightburn of Messrs. Philips Electrical Ltd. for technical advice, and Mr. P. S. Rhodes for his assistance in constructing the trap.

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Merlewood Lodge, Windermere Road, Grange-over-Sands, Lancashire.

Notes and Observations

ENTOMOLOGICAL PINS.—The present supply of 'white' pins with their heads larger than of previous years has caused the Museum officials and the entomological dealers to complain, apparently to no avail. It has reminded me of the plea, with which I am sure many will agree, made by R. C. Bradley in 1894. This former president of the Birmingham Entomological Society, a well-known collector of Lepidoptera, Diptera and Hymenoptera, asked for the manufacture of pins without heads "which would be more convenient and possibly a little less unparliamentary language would be used". An editorial (*Ent. mon. Mag.*) note of R. McLachlan, F.R.S., was added "I quite agree with our correspondent's suggestion, so far as the small sizes are concerned. Of course the Editors of the Magazine" [C. G. Barrett, G. C. Champion, J. W. Douglas, W. W. Fowler, R. McL., E. Saunders and Lord Walsingham] "never (or hardly ever) use unparliamentary language, but the big heads of short small pins are a standing temptation they would like to avoid".—L. PARMENTER.

HERSE CONVOLVULI L. IN BEDFORDSHIRE.—On the night of 29/30 August a convolvulus hawk (*Herse convolvuli* L.) paid a visit to my garden. I found it on a potted Lombardy poplar bush about six feet from my moth trap which had been running that night.—R. C. REVELS, Top Field Farm, Dunton Lane, Biggleswade, Beds. 4.ix.1965.

Evasive Behaviour of Two South African Satyrid Butterflies.—While it is usual for many moths when disturbed in the daytime to fly for a short distance and disappear into any available vegetation, this behaviour is not often observed amongst butterflies when conditions are such that they are flying about in a normal manner; if alighting after being suddenly disturbed, they will generally remain visible to the observer.

Exceptions to the above have been noted in the case of two Cape Satyrid butterflies, *Melampias hyperbius* (L.) (a spring species) and a race of *Torynesis mintha* (Geyer) from the Piquetberg district, but only where certain individuals have been concerned.

In the former species, this was first noticed over thirty years ago when, on Signal Hill, Cape Town, a male specimen which had been alarmed flew for a few yards and then was suddenly lost to sight in the depths of a small bush and continued to remain there when the bush was shaken. Several similar instances of this happening have been noticed on later occasions.

As regards the second butterfly mentioned, a male which took fright flew for a little distance and then dived, in the same manner, into a thick clump of the grass (*Danthonia* sp.) used as a foodplant by this Satyrid, and failed to reappear in spite of repeated disturbance of the grass—this instance having been observed last April.

It would be interesting to know if the same behaviour has been witnessed to any extent amongst European Satyrids (or even other butterflies) under such conditions.

Such behaviour is not analogous to that of the African and Indian Satyrid, *Melanitis leda* (L.), which does not fly in bright weather during the daytime, and will thus naturally take refuge amongst dry leaves or other low vegetation near the ground after it has been flushed when resting normally.—C. G. C. Dickson, "Blencathra", Cambridge Avenue, St. Michael's Estate, Cape Town.

Agrotis obscura (ravida) (Stout Dart).—Many of the rarer moths seem very much on the decline in this area of East Anglia. I generally, however, continue to take at most one or two *ravida* each year, but much to my surprise, for about a fortnight at the end of July this year, this species turned up in considerable numbers on the windows of my garage and garden shed at dusk; about 18 in all, but so far none have come to light at the trap, only a few yards from these outbuildings.

I cannot imagine how these moths got into the buildings, as doors and windows of these are not left open, except at rare intervals. I wonder whether the species has been noted in numbers this year in other areas—and also whether other observers find that rarer species are declining in numbers or disappearing altogether, especially in rural areas. There does not seem to be so much crop spraying as formerly here; at any rate the smells which once hung over the whole village are not now noticed, so probably this is not the cause of the decline, but hedge removal and stubble burning may be having some effect. I could give a dismal and lengthy list of species, some even common here once, which are no more. No longer, for example, do I find 25 male *Zeuzera pyrina* L. (wood leopard) in the trap in one night, in fact I have not found one this year.—Guy A. Ford (Rev.), Balsham Rectory, Balsham, Cambridge. 24.viii.1965.

THE SEXUAL BEHAVIOUR OF LEPIDOPTERA.—I was much interested to read Colonel C. F. Cowan's description of the courtship of *Leptidea sinapis* L. (antea. 192) which almost exactly parallels and confirms my record of this behaviour in 1946 (*Entomologist*, **79**: 287). In 1946 also (*Entomologist*, **79**: 69) I recorded the courtship of *Pararge megera* L., and this was followed by Mr. E. P. Wiltshire's note (*Entomologist*, **79**: 134) and in the nineteen years which have elapsed since then I do not remember having seen in the entomological magazines any answer to the question which he asks in his last paragraph, namely whether all Rhopalocera, in which the males are equipped with localized patches of andraconial scent scales, behave similarly. Nor have I obtained any information on my own statement of ignorance of the scent scale distribution on the wings of male *L. sinapis*.

There are many different sense structures in the Lepidoptera as a whole, such as scent scale brushes on the legs of certain male Noctuids, female assembling scents, visual sexual dimorphism, and sound producing mechanisms, the *modus operandi* of many being imperfectly understood. May we hope that Colonel Cowan's note will stimulate lepidopterists to contribute many more observations of these interesting behaviour patterns to the pages of the *Record*?.—Commander G. W. HARPER, R.N.(Retd.), Neadaich, Newtonmore, Inverness-shire. 30.viii.1965.

FRITILLARY IN GARDEN.—Reference was made to fritillaries in gardens in the interesting and amusing sequence of events concerning *Melitaea dia* L. related by "an old Moth-hunter" in the July-August issue of the *Record* (antea. 184). This prompts me to record a recent unusual occurrence of a fritillary in my garden at Brentwood, Essex.

On returning home from work on 4th August this year, I scanned the *Buddleia* bush and was astonished to see a large fritillary in company with *Aglais urticae* L. and *Nymphalis io* L. I netted the specimen and found it to be a female *Mesoacidalia charlotta* Haw. (dark green fritillary). This was most surprising as I have not previously met this species in south Essex. Possibly this was a stray from south of the Thames where I find *M. charlotta* to be reasonably plentiful twenty miles due south of here, on the Kent downs.—K. W. GRIMWOOD, 32 St. Nicholas Grove, Ingrave, Brentwood, Essex.

HYDRILLULA PALUSTRIS HÜBN. IN WOODWALTON FEN.—After apparently no record of capture of this elusive insect during 1964, I am glad to be able to report its reappearance in the fen on the night of 11th June this year, a very warm and muggy one, when I was surprised to have this well-known locality entirely to myself. A perfect male arrived at my mercury vapour light at the top of the main drove, by the chalet, just after 1 a.m.—C. G. M. DE WORMS, Three Oaks, Woking. 14.ix.1965.

CRAMBUS FURCATELLUS ZETT. IN THE LAKE DISTRICT.—On 4th July 1965, a reasonably fine day, I went up to the plateau which forms a saddle just above the Honister Pass, and was pleased to find *Erebia epiphron* Knoch flying there in some numbers, with both sexes in good condition. As I was descending about 4 p.m., I noticed a *Crambus* species fluttering among the heather. It turned out to be *C. furcatellus*, always a difficult species to secure, since it is seldom seen much below 1700 feet, but I gather it has been met with on other mountains in the area at about this altitude.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking, Surrey. 14.ix.1965.

APATURA IRIS L. IN HAMPSHIRE.—Whilst collecting in a Hampshire wood on 28th July 1965, I saw two *Apatura iris* L. (purple emperor) flying round a group of oaks. They soon made off, chasing each other over the tree tops, but I stayed in the same place in the hope that they would return.

One did, and flew around the same group of oaks for a while and then settled on a branch near the top. My poles enabled me to reach up to a height of nearly 25 feet but I was still about six feet short. As it did not fly, I decided to have a closer look at it through my field glasses, and to my surprise I found it was *in cop.* I decided that my best chance of getting them was to knock them down from their perch. I made a direct hit on the branch, but they still remained there: after about another ten minutes, I hit the branch again, and this time they came flopping slowly down, and landed in a bramble bush. My attempts to get at them caused them to flutter right down to the bottom of the bush, and I eventually got down to them, cupping them in my hands, still together.

Not having any experience of getting eggs from this species (I understand that it is rather difficult) and also it being the first time that I have taken this species, I decided to kill them. It was not until I was setting them that I found that he female was a *semi-iole* (about two-thirds the way to full *iole*) and as this variety is much rarer in the female than in the male, I thought it worth recording.—R. C. REVELS, Top Field Farm, Biggleswade, Beds. 4.ix.1964.

APEIRA SYRINGARIA L., A BRED GYNANDROUS SPECIMEN.—In a previous note (*Ent. Rec.*, **76**: 297) on the disproportionate ratio of the sexes produced on rearing this species, mention was made of the fact that part of the brood of larvae had gone into hibernation. Many larvae, although apparently healthy all winter, failed to make the grade when eating was resumed in the spring. Those that fed up produced seven pupae. On emergence, four were females and one was a gynandrous specimen (right side male, left side female). Two pupae failed to emerge, but from their size, I think that both would have produced female specimens. How this peculiar state of affairs came about is still a mystery.—M. J. LEECH, The Cottage, Hallgates, Cropston, Leicestershire. 11.ix.1965.

PARARGE EGERIA L. IN INNER LONDON.—It may be worth recording that while taking a lunch time stroll in Lincoln's Inn Fields W.C.1 to-day, I saw a specimen of *Pararge egeria* L. (speckled wood butterfly). The spot was such an unusual one in which to see this butterfly that I waited until it had settled, which it obligingly did, to confirm its identity. This is the first time I have seen *P. egeria* in this locality in twenty years, although it may well have come to the attention of others more observant than I.—D. BURROWS, 22 Lime Tree Walk, West Wickham, Kent. 22.ix.1965.

AGRIPHILA LATISTRIA HAW. IN SOMERSET.—On 12th August 1965 I found a dead Crambid lying on a windowsill in my house, which I identified as *Agriphila* (*Crambus*) *latistria* Haw. As there are very few records of this uncommon moth in Somerset I sent it to the British Museum (Natural History) where Mr. P. E. S. Whalley kindly confirmed its identity.

Turner (*Lepidoptera of Somerset*, 1955) describes it as very rare in the county, mentioning only single records from Minehead in 1925 and North

Somerset, without details, in 1948 and 1949.—J. F. Burton, F.R.E.S., F.Z.S., B.B.C. Natural History Unit, Broadcasting House, Bristol, 8.

Current Literature

Microlepidoptera Palaearctica, Vol. I, Crambinae, by Dr. Stanislaw Bleszynski. xlvii + 553 and 31 coloured and 102 black and white plates, 4to. £23. The first of this very welcome series to appear is dated April 1965, and expands the author's *Revision of the European Species of the Generic Group Crambus F.s.l.* which appeared in Acta Zoologica Cracoviensia, **1**: 161-622 (25.iv.1957).

The preface is printed in German, English, French and Russian followed by a vocabulary giving the equivalents of scientific terms etc. in these four languages. Thereafter, the text is in German, commencing with a short preface and preliminary matter including a biological account of the various stages and the zoogeography of the Crambinae. There is a note on genitalia preparation, a list of authors and the abbreviations used for their names, a list of new genera, species and subspecies etc. in the classification, and a systematic list of the species included. Text figures are listed under the headings of the various parts shown, and there is a key to the genera.

The genera are then described with a key to the species in each, followed by descriptions of the species in each in the same pattern throughout. The genera have text figures of wing neuration, and where necessary, other anatomic details. This is followed by a list of errata, a long bibliography, a list of the localities mentioned, including three sketch-maps of China, and localities of material from the Höne'schen expedition and west and east Asia, and an index to the species.

The second part consists of the coloured plates by Dr. Gregor, which have to be seen to be believed, and line drawings of the male and female genitalia of the species mentioned.

The quality of this first volume makes one look forward to its successors, but the work obviously cannot be completed quickly, as so much original research is necessary when the species of a large family are brought together under one cover, often for the first time. The two parts are well bound in blue cloth boards with gilt lettering, and the printing and paper are of exceedingly good quality.

The work is one which should be in the libraries of every museum and society, and also in the libraries of all private entomologists able to afford them!

S.N.A.J.

Pond-life. By W. Engelhardt. 208 pp. + 9 coloured and 40 black and white plates. Burke, London, 12/6 boards, 7/6 paper cover. This book is one of a series of books entitled "The young specialist looks at . . .", and is a translation by Heather J. Fisher, M.A., of the original, and the English version is edited and adapted by Roderick C. Fisher, M.A., Ph.D., lecturer in zoology at University College, London.

The preface points out that the object of this book is to enable the young enthusiast to make a start with the study of freshwater life, and

at this stage, the microscopical subjects such as protozoa and the round and flat worms have been omitted, as also have the vertibrates, but a good selection of aquatic and waterside plants has been included.

The introduction outlines the various types of freshwater habitat, the apparatus and equipment for collecting, the aquarium, and methods for preserving the collected material. There follows a chapter on plant life, outlining for a start, the requirements of the various plants, explaining how they are "zoned" by the presence or absence of their requirements, and dividing them into classes accordingly. Three coloured and five black and white plants cover the plant species mentioned, and these follow the excellent system of devoting the opposite page to short descripitions of the species illustrated, thus obviating the necessity for keeping a muddy finger at the plate while the description is sought, a process which can be very annoying in the field.

The next fifty or so pages are devoted to animal life from sponges to snails, with good text figures illustrating particular features, so that with a little experience, the reader may know the genus of his finds, and refer to the animal life plates which follow, to get nearer to specific determination. The same system is adopted as with the flowers, and in both cases the plates are marked with a black rectangle at the top outer corner, carrying a white outline indicative of the families illustrated (explained by a key on p. 7). On p. 8 there is a millimetre and inch scale which should be useful in the field. Before the index there is a glossary of terms and a short bibliography.

The illustrations are by Irmgard Engelhardt, Claus Caspari, Hans-Christian Friedrich, and Erich Schuldt, and are of a quality which must appeal to all interested in the subject, and a very great deal of thought has gone into the production of the book to ensure a maximum of usefulness. The printing is good, and the option of boards or cloth suggests a paper cover for the field and boards for the library, thus keeping the library copy clean.

S. N. A. J.

Butterflies. By Georg Warnecke. 128 pp. + 32 coloured and 10 black and white plates. Burke, London, 12/6 boards, 7/6 paper. This is another of the young specialist books, translated, edited and adapted this time by Robert C. Goodden, which has come on the market here. The excellent illustrations show the insects mostly in natural poses as they might be seen in the field. These are by Walter Söller and are reproduced from the continental edition.

As the title of the series indicates, this book is designed to give the novice lepidopterist a good start in the study of the order. Naturally, a book of this size cannot even list all the species, but a good selection is given, which should be ample to enable the student to identify his finds at family level with reasonable certainty, and in many cases, to species level. The inclusion of some continental species and genera not found here should serve to combat the rigid insular outlook which cramped the subject in the past, and also broaden the picture of the European lepidoptera. The introduction is followed by a short list of five popular books on the subject which should eventually supercede

the present book, a note of six convential signs and abbreviations, and a list of suppliers of equipment and specimens.

Part one deals with the subject broadly, starting with metamorphosis, with each stage explained, and including a close look at structure including the pigmentation of the adult species. There follows a good note on breeding insects and their parasites, while the next section deals with collecting and preserving specimens, including a note on cabinet pests, the arrangement and the classification of the collection. The structure of adult and pre-adult stages is outlined, with a note on internal organs, finishing with the genitalia.

Part two deals with the actual species, which have been carefully selected to illustrate as many genera as possible, and there is a selection of larvae and pupae included where these are thought to be necessary. The species illustrated are named on the bottom of the page opposite the plate, but owing to the larger number of subjects illustrated, it has not been possible to confine the descripitions to the page opposite to the plate as in the previous book. However, the accounts are succinct and easy to follow, and the serial number of the species in the book is given with the plate captions, so that the descriptions are easy to find.

The macrolepidoptera only are treated, though, following continental practice, the Psychidae are included. The covering of the many species of microlepidoptera in a similar manner would have reacted to the detriment of both sections, having regard to the limited space available, but one would indeed be glad to see a similar book to cover the "micros" at some future date.

The printing and paper are good and this may be considered as one of the best books for beginners at present available to them, to act as a stepping stone to the popular standard works.

S. N. A. J.

Butterflies and Moths. By Alfred Werner and Josef Bijok. 126 pp. + 42 coloured plates, large quarto: Andre Deutsch, 75/-. This is a revised and enlarged edition of the original of 1956, and is mainly a very beautiful picture book illustrative of the great advances in colour photography and colour printing, but beside this, the authors have written a text giving a general word picture of the order Lepidoptera, and giving various references to the order throughout history. Further sections of the text give an idea of geographical range, also illustrated on the cover papers and explained by a reference on the fly sheet; difference in size and beauty through the lepidoptera; the importance of appearance, noting protective coloration warning colours, and also mimicry, and the migratory habits of some species. "Gems of the Tropics" extols the brilliance of some tropical species, pointing to the high lights by naming certain of the 137 species figured in the plates. Lepidoptera in poetry, art and lore is the heading of yet another chapter, and is self explanatory.

Josef Bijok writes on metamorphis and the structure of lepidoptera giving a short account of the main organs of the insect through its stages, finishing with a list of the more important families of lepidoptera. The whole has been edited and prepared by Norman Riley.

The plates follow, two of European butterflies and two of European moths, the remainder being of tropical and sub-tropical species without much attempt at systematics. The page opposite to each plate is occupied by a short account of the insect with habitat and distribution, and where known, their life histories.

The production of these plates is irreproachable both as regards photography and colour production, and the great pity is that the cost of production makes it impossible, for commercial reasons, to deal with any genus or group of genera in a work of similar quality, in a systematic manner which would convert such a work of beauty into one of really practical usefulness. The frontispiece is a hindwing of the brilliant Madagascan moth *Chrysiridia madagascariensis* "blown up" to about 12″ by 8″, showing prefect photography and reproudction, but with my mind, on its low level of practicalities, I regret that this plate was not used to illustrate another half dozen species.

The book is certainly an ornament to any lepidopterist's library, and may be relied on to provide long periods of browsing and pleasurable relaxation in contemplation of its beautiful pictures.

S. N. A. J.

Animals, Vol. 7, No. 3. 3.viii.1965. Parnell & Sons Ltd. 2/6.

The insect section of this number is devoted to an account by Mr. Austin Richardson of three additions to the British "pugs", two species and a sub-species, which have recently been made to the list, with accounts of their history to date, and habits. The article carries five coloured figures from photographs, showing larvae of all three insects, and imagines (x4) of *Eupithecia egenaria* H-S., and *E. phoeniceata* Ramb., the sub-species is *E. intricata hibernica* Mere. Articles of this description with coloured figures form a happy solution to the problem posed by the expense of reproducing coloured plates in the more technical journals, whose smaller circulations naturally increase the cost per plate to an exent which usually makes it impossible. The only difficulty is that the preservation of these separates is a little less simple.

S. N. A. J.

Entomops, Vol. 1, No. 1. 29.xii.1964.

I have received a copy of the first number of this new quarterly entomological magazine, which is published by a society of entomologists centred on Nice, and edited by F. Dujardin. The editorial with which the magazine opens explains its scope as covering south-west Europe, Corsica and north Africa, and invites writers in France and abroad to contribute articles on this region. Publicity is in the hands of Dr. R. Strobnio, 3 rue Bergondi, Nice, A-Mz, to whom subscriptions should be sent. The subscription is 15 francs for Franch and 20 Francs for foreign subscribers.

The present number carries articles by M. Dujardin on a new sub-species of *Lycia isabellae* and another on new sub-species and forms of *Zygaena* species from Europe and north Africa. J. Ochs contributes notes on some Carabid species from south France,

and P. Hervé describes two new species of Pselaphidae (Col.) A section for answering readers' queries is included, and this issue carries in this section some useful notes on the information which should be included in data labels. It is clearly printed on surfaced paper, giving good reproduction of the photographic illustrations. We wish this new magazine well: it should have a wide interest for the entomologists who converge annually on the country covered.

S. N. A. J.

I have received four interesting separates from Mr. Ramon Agenjo of Madrid. No. 127 is from Graeelsia XX 149-162 gives an account of the London Entomological Congress of 1964. No. 128, ibid 163-190 gives a list of Spanish vernacular names for the Spanish butterflies preceded by some interesting historical remarks on on the use of vernacular names.

No. 131 from Boletin del Servicio de Plagas Forestales, VII 14 (1964) is entitled "a Contribution to the knowledge of the Lepidopterous Forest Fauna of Spain". It is the first of a series, decided on after the author had noted in the material collected, species new to Spain and some new to the palaeartic region. The present series deals with *Spodoptera littoralis* B. on *Eucalptus, Dryobotodes occipitrina* Esp., *Phycita torrenti* Agjo. and *Spudaea ruticiella* Esp. on *Quercus ilex, Cosmia diffinis* on *Ulmus, Ennomos fuscantaria* Steph. on *Fraxinus, Polyochodes stipella* Chret. on *spartia,* a species new to the European fauna, *Laspeyresia pomonella* and *Ectomyelois cerantoneae* Zell. on nuts, and *Plodia interpunctella* Hübn. on acorns and on seeds of *Pinus halepensis.* Nuts for *pomonella* and acorns and pine seeds for *interpunctella* are particularly interesting notes. There is a fine coloured plate of 38 figures of the species mentioned and two plates of male and female genitalia; there are also text figures of genitalia and distribution maps.

No. 132, ibid 120-124 is on the subject of *Drepana uncinula* Bkh. the author having undertaken the study of its morphological differentiation and its geological and altitude distribution i nSpain, together with *D. binaria* Hufn. in which species the former had been sunk in spite of advice to the contrary by Milliere, Herbulot and Daniel on morphological and genitalia characters. In this article the genitalia of both sexes of both species are illustrated together with a coloured photograph of the male and female of both species, and there is also a map showing the distribution of both species.

S. N. A. J.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

SOME BUTTERFLIES IN GREECE, 1965. Major-General Sir GEORGE JOHNSON, K.C.V.O., C.B., C.B.E., D.S.O. 229

A BRIEF VISIT TO SWITZERLAND, MAY 1965. Baron DE WORMS, M.A., Ph.D., F.R.E.S. 233

FIFTY YEARS AGO 234

A VISIT TO PRINCETHORPE WOOD, WARWICKSHIRE. M. J. LEECH ... 235

A GENUINELY PORTABLE M.V. LIGHT TRAP. J. HEATH 236

NOTES AND OBSERVATIONS 238

CURRENT LITERATURE 242

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (251)

TO OUR CONTRIBUTORS

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Mines of *L. acerifoliella* ssp. *joannisi*—(1) upper, (2) under surface.
L. acerifoliella sp.v.—(3) upper, (4) under surface.

Observations on *Lithocolletis acerifoliella* Zeller (*sylvella* Haworth) ssp. *joannisi* Le Marchand (*platanoidella* Joannis *nom. preoc.*) and a Note of its Occurrence in Britain

By J. M. Chalmers-Hunt

Joannis (1920) described a *Lithocolletis* mining Norway Maple (*Acer platanoides*) as a species new to science, and named it *L. platanoidella*. As, however, there already existed an *L. platanoidiella* (of Bruand, 1903), Le Marchand (1936) considered *platanoidella* Joannis preoccupied, despite the slight difference in orthography, and renamed it *joannisi*. Both authors figure it together with other *Acer* feeding *Lithocolletis*, and point out that it differs from *L. acerifoliella* chiefly in regard to the shape of the first chevron; this being right angled in *acerifoliella*, but only slightly arched in *joannisi*. Although mention is made that *joannisi* varies much it seems both overlooked the fact that the facies in *joannisi* sometimes approach *acerifoliella* so closely as to render the two virtually indistinguishable from one another, at least as regards alar characters.

In an important paper on the *Alnus* and *Acer* feeding *Lithocolletis*, Gregor and Povolny (1950) include the results of an examination of the differences between *acerifoliella* and *joannisi* and an investigation of their biological relationship. They give excellent coloured figures of the respective imagines, as well as numerous diagrams of their genitalia. They conclude that the form mining *Acer platanoides* (i.e. *L. joannisi*) and the form mining *Acer campestre* (i.e. *L. acerifoliella*) cannot always be separated if their foodplants are not known, and thus do not consider *joannisi* specifically distinct, but treat it as a sub-species of *acerifoliella*.

The incentive to search for *joannisi* in Britain originated from an examination of the collection of micro-lepidoptera of Monsieur E. Janmoulle in the Brussels Museum, and of discussing with him the likelihood of its occurrence over here. That was in March 1964, and the following September a visit was paid to an avenue of well-grown Norway Maples near Orpington, Kent, when I was fortunate in discovering some 150 mines of *joannisi*. A further visit in October was much more productive, as by then the leaves had fallen, the larvae were more advanced, and the business of collecting them was rendered comparatively easy. They turned out to be extremely abundant, furthermore, a leaf often contained 2 or more mines, and in one I actually counted 9. Unfortunately, a high proportion of those taken were parasitised, and I only succeeded in rearing 8 specimens. A number of these parasites were submitted to Mrs. J. A. J. Clark (Br. Mus. (Nat. Hist.), S. Kensington), who kindly determined them as representing both sexes of a Chalcid, *Sympiesis sericeicornis* Nees.

It is an interesting fact that whereas the larva of *acerifoliella* very frequently mines within a folded-over edge or lobe of a leaf, that of *joannisi* rarely constructs its mine so, but is most often found in the median area of a limb of a leaf, and frequently on the angle formed by two large nervures. This is well shown by the accompanying figures drawn by Mr. S. N. A. Jacobs, from mines collected near Orpington, October 1965. Hering (1951) has also figured the mine of *joannisi*.

It is likely that *joannisi* will be found to occur in many other places in Britain, and indeed several specimens in Mr. S. Wakely's collection

that he bred from Denbies, Surrey, in 1962, from Norway Maple, have proved on examination to be this. On the Continent, *joannisi* has been recorded from Czechoslovakia (Gregor and Povolny); from Belgium, and from France where it is stated to be widely distributed but "Peu observé", but appearing in two generations: imago, iv-vi, vii, viii; larva, vi; x, xi (Lhomme (1935-49)).

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Ant Records and Observations for 1965

By K. E. J. Barrett

The following species have been noted during the past season.

Tetramorium caespitum Latr.

This species occurred abundantly in a sandy railway cutting at Belstead, E. Suffolk, on Bovey Heath and at Fingle Bridge, Drewsteignton in S. Devon, on the cliff-top at Eype, near Bridport, Dorset, and in a railway cutting at Dering Wood, near Pluckley, E. Kent.

Leptothorax nylanderi Först.

Workers were present on oak trees at Curtis Mill Green, S. Essex (a locality where *Lasius brunneus* Latr. also occurs) and at Holbrook Park, E. Suffolk.

Myrmica sabuleti Mein.

A further vice-county record has been obtained for this species. It occurred under stones on the banks of railway cuttings at Bentley and at Belstead, E. Suffolk, on the 27th June, 1965. The species has now been recorded from every vice-county division in Southern England except for E. Norfolk and Huntingdon.

Myrmica schencki Em.

A new vice-county record for Berkshire has been obtained and an old (1893, Rugby) record for Warwickshire has been confirmed. A single colony containing workers and males was found on the 1st August, 1965, in the turf above a railway cutting at South Moreton, near Didcot in Berkshire. The locality is situated on the Upper Greensand some 200 feet up in the East Berkshire Downs. A few small workers were also present on a grassy bank below a sandstone outcrop at Edge Hill, Warwickshire, on the 5th June, 1965.

Full details of the known British distribution of this scarce species have been supplied to Dr. F. H. Perring of the Biological Records Centre of the

Natural Environment Research Council who has kindly produced the 10 km. square distribution map illustrated in Figure 1.

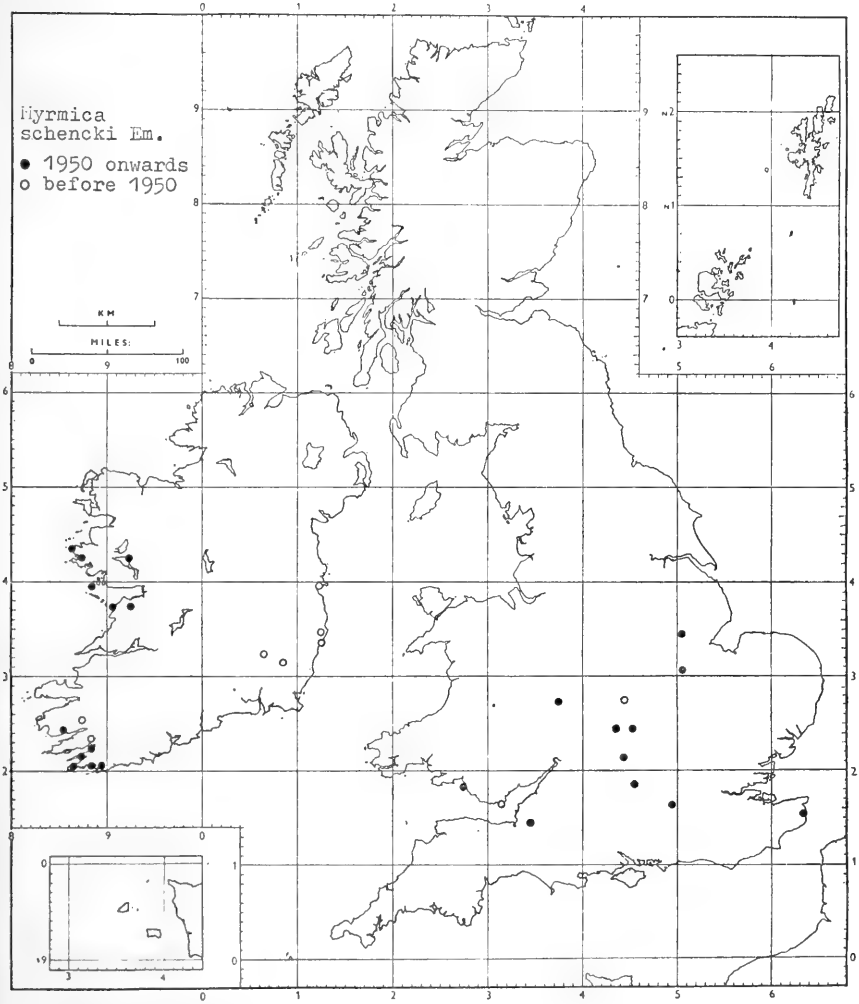

Figure 1.—10 kilometre square distribution of *Myrmica schencki* Em.

Lasius rabaudi Bond.

A deälated female was wandering on a heather bank at Ambersham Common, West Sussex, on the 13th August, 1965. This is the first record for this vice-county division. *Lasius alienus* Först. was also present in the same locality.

Lasius umbratus Nyl.

A winged female of this species flew into the living room of my house at Windsor on a warm evening on the 11th August, 1965. Mating flights have occurred here in previous years on the 1st August, 1963, and on the 27th August, 1964. On the same day, 11th August, mating flights of *Lasius niger* L. and *Myrmica rubra* L. took place all over the Windsor-Slough-Maidenhead District. In one case, males of the latter species were apparently attempting to copulate with workers around the nest entrance.

Formica sanguinea Latr.

This ant was recorded by H. M. Hallett from Trelleck Common, Monmouth, in 1931. A strong colony was found in a heather-covered bank along a forest ride in the same locality on the 26th August, 1965. Callow males were still present in the nest.

Formica cunicularia Latr.

Nests consisting of earth solaria were abundant on the banks of a railway cutting at Boreham, N. Essex. It also was present on Bovey Heath and at Trendlebere Down, S. Devon, with *Tapinoma erraticum* Latr. and at the former locality with *Formica exsecta* Nyl. A particularly red form of *F. cunicularia* occurred in the same locality as *Formica fusca* L. at Dering Wood, E. Kent (with J. C. Felton). One *F. cunicularia* colony occupied an earth mound shared with *Lasius flavus* Fab. and *Myrmica scabrinodis* Nyl. *Formica rufibarbis* Fab. has also been seen nesting in a similar situation at Chobham Common, Surrey. I am grateful to Mr. R. Lambourne for a sample of *F. cunicularia* from the cliffs at Polperro, E. Cornwall

Formica lemani Bond.

A new vice-county record has been obtained for Oxfordshire. It was found in a disused railway cutting near Bloxham in the East Cotswolds some 400 feet above sea-level on the 8th June, 1965. *Formica fusca* L. occurred in a similar situation at Wiggington, two miles to the West.

In Southern England *F. lemani* has been found in various upland areas in the West Country (Dartmoor, Exmoor, etc.) but this is the first record for the Cotswolds.

Formica rufa L.

Confirmation of previously published localities and new records obtained during 1965 are listed in Table 1.

An early record for North Essex was confirmed from Wickham Bishops but the species could not be found at High Woods, Colchester. Confirmation of records for West Suffolk (Assington Thicks) and East Suffolk (Bentley and Holbrook) could not be obtained.

F. rufa is not often found away from woodland. It was present in such a situation in a hedgerow of the lane leading north from Bridford, South Devon. Nests were constructed over boulders and tree-stumps.

The survey of the present British distribution of *F. rufa* is now largely complete but so far it has not been possible to visit or get information about the following recorded localities.

S. Devon: Virtuous Lady Mine.
N. Devon: Croyde.
Isle of Wight: Ventnor and Landslip.
Glamorgan: Cwrt-yr-ala, Cardiff, Taff's Well, Castell Coch, Brynau Valley, Swansea, Baglan, Briton Ferry and Pontneath-Vaughan.
Brecon: Ystradfellte.
Montgomery: Lyfnant Valley.
Merioneth: Towyn, Fairbourne and Barmouth.
Shropshire: Farley Common, Spring Coppice, Lyth Hill and Broseley.
Stafford: Burnt Wood and Bishop Wood, Eccleshall.
Denbigh: Llangollen.

The writer would be grateful for any information or specimens from these areas.

TABLE 1

Localities recorded for *Formica rufa* L. during 1965

10 KM. SQUARE	VICE-COUNTY	LOCALITY
SX 55	S. Devon	Plym Bridge
SX 56	S. Devon	Bickleigh
SX 77	S. Devon	Yarner
SX 78	S. Devon	Clifford Bridge
SX 79	S. Devon	Drewsteignton
SX 87	S. Devon	Gappah and Sandygate
SX 88	S. Devon	Bridford and Lower Ashton
SX 89	S. Devon	Longdown, Oldridge and Whitestone
SX 98	S. Devon	Kenton
SX 99	S. Devon	Stoke Canon
SY 08	S. Devon	Budleigh Salterton
ST 49	Monmouth	Chepstow Park Wood
SU 20	S. Hants	Vinney Ridge and Poundhill Inclosure
SU 30	S. Hants	Ladycross and Perrywood Haseley Inclosure
SU 40	S. Hants	Exbury (F. W. Pexton)
SU 41	S. Hants	Chilworth
SU 51	S. Hants	Wickham
SU 74	N. Hants	Long Sutton
SU 75	N. Hants	Hartfordbridge
SU 82	W. Sussex	Easebourne
SU 86	Berks	Wokingham and Little Sandhurst
SU 91	W. Sussex	Ambersham Common
SO 50	Monmouth	Trelleck
SO 51	Hereford	Great Doward
SO 60	W. Gloucester	Lydney
SO 61	W. Gloucester	Speech House
SO 62	W. Gloucester	Baileybrook
SO 72	W. Gloucester	Newent
SO 90	E. Gloucester	Daglingworth
TL 81	N. Essex	Wickham Bishops (with D. I. Chapman)

Formica lugubris Zett.

About two dozen large colonies were present in a Spruce plantation along the Dee Valley west of Ballater, S. Aberdeen, on the 10th September, 1965. I am grateful to Mr. M. J. Taylor and to Mr. N. J. Armstrong for samples of this species from Riccal Dale, Helmsley, Yorkshire, and from Dipton Wood, Slaley, Northumberland.

129 Smiths Lane, Windsor, Berks. 25.ix.1965.

Will-o'-the-Wisp

By P. B. M. Allan

In the nineties I spent a few years at an old house in the New Forest, and one evening at late dusk, returning from a visit to an entomological chum about a mile away, I was passing over the open ground at the lower end of King's Garn enclosure when I saw a light crossing my path a few yards ahead of me. It was moving about as fast as a man running slowly but I saw nobody although it was not yet dark enough to prevent me seeing a man fifty yards away. Of course, there were no electric torches in those days and the light could only have been—as I thought—the flame of a match. When the light was a little distance away it suddenly dived to the ground—just as though the match, as I supposed it to be, had been thrown down. Still I did not see anybody. It was a little eerie and I expect I quickened my pace.

The more I thought about it the more puzzled I became. When a man lights his pipe out of doors he stands still and, having lit his pipe, throws down the match; he does not run with the lighted match in his hand. Also I was certain I could have seen a man had there been one present. Moreover, what would a man have been doing at late dusk *crossing* the path and going over the rough ground which led to nowhere? A poacher going to set a snare in the plantation? Then why did he advertise his presence by shining a light for twenty or thirty yards? So, not wishing to invite a more or less—probably less—polite reflection on my veracity I said nothing about the matter to anyone.

Some years later, when I was far from the New Forest, the subject of Will-o'-the-wisps was mentioned at a dinner party. I was about to relate my experience near Bramshaw when my host closed the discussion by remarking that it was all nonsense and that the reported occurrences were all due to someone walking about with a lantern, a very necessary precaution when crossing swampy ground at night. So I still held my peace.

Later, I went to live on the high ground in the north of Hampshire and here, not far from my house, there was a swamp over which I used to shoot snipe and duck in autumn and winter. Sometimes, remembering my experience in the New Forest, I strolled over to this place of a summer evening, hoping to see the Jack o' Lantern again. But nary a one did I see, and the inhabitants of a cottage on the edge of the bog had never heard of such a thing. So probably the Will-o'-the-wisp is, as the entomologist would say, a local species.

Recently I chanced to take up the volumes for 1950 and 1951 of that excellent magazine *Weather* and there I came across some correspondence on the Will-o'-the-wisp. Most of the letters were concerned with the old theory that this phenomenon, the *Ignis fatuus*, was caused by the

spontaneous combustion of an inflammable gas or gases, such as marsh gas or methane. It seemed to me so unlikely that this should have been the cause of the light which I had seen in the New Forest on hard stony ground more than sixty years ago that I took an opportunity to look up the subject in various books and periodicals. This provided me with some interesting reading during a long spell of illness.

The correspondence in *Weather* was started by a contributor who, in recording a cloud of midges flying in columnar formation over his lawn, remarked "Whatever could it be? Some form of Will-o'-the-wisp or Jack o' Lantern perhaps imported from the Fen Country . . . . ." A few months later (December 1950) Mr. E. G. Bilham took up the matter and wrote:—"The reference made me wonder, not for the first time, whether any scientific description or reliable observation of this phenomenon actually exists. I gather that the appearance is supposed to take the form of a lambent flickering light, and is to be seen over marshy ground . . . . Marsh gas has often been mentioned as the source of the light, but I have not seen it clearly stated whether the gas is actually burning (in which case, how does it become ignited?) or is supposed to be self-luminous. Is *any* gas self-luminous?"

To this Mr. G. Thomson replied (February 1951): "Like Mr. E. G. Bilham, I have often wondered whether the usual explanation of the Will-o'-the-wisp is the correct one . . . ." And he went on to remark that when deep drainage channels were being cut through the peat in Somerset "the smell of gas (presumably marsh gas) was at times almost overpowering. The gas naturally had every opportunity to ignite, but even this concentration was apparently not enough to support combustion". In conclusion he suggested: "Is it not more probable that the appearance may be a phosphorescence caused . . . by such an organism as *Nostoc*? I have heard that a whole tree-trunk may be made self-luminous . . . by organisms of this type. The flickering appearance might be caused by rising currents of warm air".

The following month (March 1951) two more interesting letters on the subject appeared in *Weather*. In one of these Mr. C. Watts stated that in addition to methane "another gaseous product of marshy places is phosphine (phosphoretted hydrogen), which arises from the reduction of phosphates (from dead fishes and other animals?) Now phosphine when fairly pure is spontaneously inflammable in air and is, in all probability, the source of ignition of the methane . . . . The occurrence in the British Isles would be fairly infrequent as there must be no wind for quite a period to allow the methane to accumulate in the surface layers. Methane burns with only a slightly luminous flame, and the flickering and movement observed would doubtless be due to the flame following the zone of most concentrated gas with the occasional bubble igniting as it burst".

This interesting letter did not dispel my doubts about the gaseous origin of the *Ignis fatuus*. In the first place, how is the marsh gas (methane) which escapes from the surface of a bog prevented from mixing with the air—for methane mixed with air will explode violently if ignited? Moreover, phosphine does not become spontaneously inflammable until it reaches a temperature of about 100°C. Also several observers of the Will-o'-the-wisp noticed that it was travelling against the wind.

The other letter in this issue of *Weather*, from Mr. I. C. Roberts, is of considerable interest as it relates a personal experience of a Will-o'-the-wisp seen and recorded.

"About ten or eleven years ago", he wrote, "I was fortunate to observe one. It was on a Sunday night at the end of September. . . . On going home, after climbing up the hill . . . I noticed a light crossing a field which my brother and I thought was somebody with a lantern looking for something lost. The light passed over a hedge without any pause to another field and went over another hedge in the same manner. We were surprised as we knew the place well. As the light went on it came to the bed of a stream, followed its course for some distance, then at a bend took to the field on the other side and crossed three or four fields before disappearing over the horizon. It did not go out while we observed it, nor flicker, but it did oscillate when it came over more open ground. It resembled a small lighted balloon. Its direction was westerly, moving at the rate of four to five miles an hour. Probably it had started off from a marsh a short distance from where it was first seen . . . . It is one of nature's mysteries".

"In Welsh", added Mr. Roberts, "it is also called 'jac-y-lantar', 'Corpo's candle', 'Spectre light' and 'Goblin's fire'." So presumably it is well known in Wales.

The only other letters on this subject in *Weather* (April 1951) which I need quote were from Miss Cicely M. Botley and Mr. C. D. Walshaw. The former wrote: "It has occurred to me that there may be more than one cause for the phenomenon. Could it not happen that animals or (*sic*) birds might get luminous matter caught in their fur or feathers? This would account for some of the movements, as is stated to happen with owls in West Africa". Mr. Walshaw wrote (May 1951): "The spontaneous ignition of marsh gas is supposed to be due to the presence of a small amount of phosphine, arising from the decay of bones".

Note that with one exception (Mr. I. C. Roberts) none of these learned contributors of *Weather* produced any instance of the actual occurrence of the Will-o'-the-wisp and that at least two of them (Mr. Bilham and Mr. Thomas) were doubtful about the correctness of the marsh (or other) gas origin of the phenomenon: the interesting letter of Mr. Roberts (a valuable piece of first-hand information) cannot have done otherwise than increase their doubts. I hope to show in this article that their doubts were indeed justified.

. . . . . .

John Ray's friend and travelling companion Francis Willughby, who was an original Fellow of the Royal Society and died in 1672 at the early age of thirty-seven, seems to have been the first to study and write about the *Ignis fatuus*, at least in England. Neither he nor Ray was of a credulous nature; both were critical and animated by the spirit of research. If the truth was sometimes veiled from them by figments and fantasies it was only because those myths and errors were current coin in their day and had been accepted without question for centuries. It is sometimes wise, even in our own times, to bear in mind words which Michel de Montaigne penned nearly four hundred years ago—"How many things served us but yesterday as articles of faith, which to-day we deem but fables?"

Willughby, then, studied the *Ignes fatui* here in England and came to the conclusion that so far from being evil sprites (as was popularly sup-

posed) these phenomena were neither more nor less than luminous insects; and as the only luminous insect with which he was acquainted in England was *Lampyris noctiluca* Linn. he not unnaturally identified the *Ignis fatuus* with the glow-worm. This supposition was supported by the fact that when he and Ray had been travelling in Italy they had observed the *Luciola italica* (even then known as 'fireflies') careering about at night and must have been struck by their resemblance to the popular conception of Will-o'-the-wisps. Unfortunately, Willughby did not pursue the matter farther and, indeed, in view of the wild or anomalous habitats of the *Ignis fatuus* and the uncertainty of its appearance proof of his theory would have been difficult to obtain.

After Willughby had been in his grave for sixty years the Reverend William Derham, canon of Windsor, who was also a Fellow of the Royal Society, challenged Willughby's theory. In a paper which he read before that Society he asserted that the *Ignes fatui* were in fact no more than vapours. "It being the opinion of divers naturalists", reads the brief abstract of this paper which is all that has come down to us, "particularly Mr. Fr. Willughby and Mr. Ray, that the *ignes fatui* are only the shining of a great number of the male glow-worms in England, or of the pyraustae in Italy, flying together, Mr. Derham consulted his friend, Sir Thomas Derham, about the phenomenon, being informed that those *ignes fatui* are common in all the Italian parts . . . . But Mr. Derham has reason to think that insects are not concerned in the *ignes fatui* from the following observations: the first made by himself, and the others received from Italy by the favour of Sir Thomas Derham.

"His own observations he made at a place in a valley between rocky hills . . . in some boggy ground near the bottom of those hills. Where, seeing one in a calm, dark night, with gentle approaches he got up within 2 or 3 yards of it, and viewed it with all possible care. He found it frisking about a dead thistle growing in a field, till a small motion of the air made it skip to another place, and thence to another, and another.

"It is now about 55 years since he saw this phenomenon, but he had as fresh and perfect an idea of it as if it was but a few days. And as he took it then, so he is of the same opinion now, that it was a fired vapour. The male glow-worm Mr. D. knows emit their shining light as they fly; by which means they discover and woo the females: but he never observed them fly together in so great numbers as to make a light equal to an *ignis fatuus*. And he was so near that had it been the shining of glow-worms he must have seen it in little distinct spots of light; but it was one continuous body of light".

How an *Ignis fatuus* "frisking about a dead thistle" and skipping from one place to another could be reconciled with a vapour the Reverend observer did not relate, and indeed his succeeding words militated against his own theory. "They are most frequent in watery and morassy ground, and there are some such places where one may be almost sure of seeing them every night if it be dark . . . . They are continually in motion, but this motion is various and uncertain. Sometimes they disappear of a sudden, and appear again in an instant in some other places. Commonly they keep hovering about 6 feet from the ground . . . . In general these lights are great friends to brooks and rivers, being frequently observed along their banks".

This was the last occasion—so far as I have seen—on which the *Ignes*

fatui were to be discussed in print in this country for a century.

In 1817 the second volume of Kirby and Spence's *Introduction to Entomology* was issued. Its authors, both of whom were to occupy the Presidential chair of the Entomological Society of London, which they had founded in 1833, were wise, careful, and acute observers, and the modern reader, dipping into their four volumes, who fails to find matter of interest in their pages must be blasé indeed. They took very little on trust and were shrewd and perspicacious in their comments.

"Besides the insects here enumerated", wrote Spence (he had previously been discussing luminous beetles), "others may be luminous which have not hitherto been suspected of being so . . . . That some insects are luminous seems to afford a clue to the partial explanation at least of the very obscure subject of *Ignes fatui* and to show that there is considerable ground for the opinion long ago maintained by Ray and Willughby that the majority of these supposed meteors are no other than luminous insects . . . . That the *Ignis fatuus* mentioned by Derham as having been seen by himself, and which he describes as flitting about a thistle, was, though he seems of a different opinion, no other than some luminous insect I have little doubt". And he went on in his quiet way to support his opinion by quoting an observation related to him by a competent observer at first hand, giving chapter and verse:—

"Mr. Sheppard informs me that, travelling one night between Stamford and Grantham on the top of the stage (coach), he observed for more than ten minutes a very large *Ignis fatuus* in the low marshy grounds, which had every appearance of being an insect. The wind was very high; consequently had it been a vapour it must have been carried forward in a direct line; but this was not the case. It had the same motions as a Tipula, flying upwards and downwards, backwards and forwards, sometimes appearing as settled and sometimes as hovering in the air".

That observation alone was sufficient to blow Canon Derham and his vapours out of court; but proof of an even more irrefutable nature was at hand. In 1780 a remarkable event had taken place, no less a prodigy than the actual capture of an *Ignis fatuus* on the wing at Ickleton, in Cambridgeshire. Here is the learned William Spence's account of the event:—

"A learned friend" (whom he discloses in a footnote to have been the Rev. Dr. Sutton of Norwich) "has informed me that when he was a curate at Ickleton, Cambridgeshire, in 1780, a farmer of that place, of the name of Simpringham, brought to him a mole-cricket (*Gryllotalpa vulgaris* Latr.) and told him that one of his people, seeing a Jack-o'-lantern pursued it and knocked it down, when it proved to be this insect and the identical specimen shown to him".

In 1830 the subject came up again for discussion by the scientific world, this time by the Linnean Society. Richard Chambers, F.L.S., F.Z.S., read a paper headed *Observations on the Phenomenon termed Ignis Fatuus.* He likewise rejected Canon Derham's vapour theory *in toto* and proceeded to relate some interesting observations of the Will-o'-the-wisp, though unfortunately not personal experiences.

"It has been the opinion of many naturalists", he began, "that the luminous appearance known by the name of *Ignis fatuus*, Will-o'-the-wisp and Jack-o'-lantern, is not a meteor, as generally supposed, but a luminous insect; and in confirmation of this hypothesis I have collected not merely the opinions but the experience of many persons who have had repeated

opportunities of observing the singular phenomenon".

(Here perhaps I should interrupt Mr. Chambers to remark that until recent times a 'meteor' denoted any atmospheric phenomenon, not necessarily a shooting star or—in a modern dictionary's words—"a small mass of matter from celestial space rendered luminous by collision with the earth's atmosphere".)

"In the year 1814", continued Mr Chambers, "I had a conversation on this subject with my esteemed friend the late Mr. James Dickson, the celebrated botanist", and he went on to assert that Mr. Dickson felt confiident "the *Ignis fatuus* was not a meteor but a luminous insect, for he had seen it settle on a plant and fly off again". The very same thing had indeed been witnessed by his friend Mr. Curtis, another distinguished botanist to whom the world was indebted for the *Flora Londinensis*.

Mr. Chambers was not a little interested by these observations and he went immediately to his father, the late Mr. Anthony Chambers who, having lived for many years in the neighbourhood of Lincoln, where the *Ignes fatui* were frequently seen, was likely to know all about these mysterious natural phenomena. Mr. Chambers jun. was not disappointed, for the *Ignes fatui* were commonplace to Mr. Chambers sen. "He told me", said the F.L.S., "that, when a lad, returning in the dusk of the evening through Bultham Wood he observed behind him a Jack-o'-lantern, which followed him through the wood; and when this luminous appearance came to the gate at the end of the path it rose to clear the upper bar and flew into the adjoining meadow. At another time he observed, in the same neighbourhood, two of these Will-with-the-wisps flying about each other, apparently at play, which they did for a considerable time and at last settled on a furze bush".

After observing that these remarks corroborated the opinions of Mr. Dickson and Mr. Curtis, Chambers went on to refer to Canon Derham's paper and commented: "It is generally allowed that the male glow-worm (*Lampyris noctiluca*) is slightly luminous, yet not sufficiently so to put on the appearance mentioned by Derham. The following remarks by Mr. Arthur Aikin in his *Tour through Wales*, p. 60, will somewhat elucidate the subject:— 'I was not a little surprised to see the glow-worms, at our approach, darting over the hedges into the fields. Knowing the female alone to be luminous and at the same time destitute of wings, this phenomenon puzzled me a great deal; nor can I account for it except upon the supposition of the male bearing the female through the air when in the act of their amours'. Wishing to obtain all the information I could on a subject so interesting I spoke of it to Thomas Stothard, Esq., R.A. . . . . From this gentleman I received the following letter:—

"My good Sir,—Agreeably to your request I send you the best account my recollection will supply of the Ignis Fatuus we conversed about when last together. As I was returning from Plymouth early in June 1821, having travelled all the preceding day and night, and had passed Blandford early in the morning, considerably before sunrise, when objects were just distinguishable, I saw what was new to me and which fixed all my attention for the short time allowed to observe it while mounted on the outside of the coach, passing at the usual rate of 7 or 8 miles an hour. On my right hand, and the side on which I was placed, at the distance of 40 or 50 paces, appeared an irregular light, bounding or rising to the height of 3 or 4 ft. over some heathy shrubs which covered the high and

marshy ground spreading to a great extent: amongst these it sank and reappeared with a motion somewhat between flying and leaping. A friend who was with me observed it and exclaimed that it was the third appearance of the like phenomenen; and requesting him to give me more information he answered that when travelling the Bath road on a similar conveyance, at the same time in the morning and season of the year, he observed one, though not so distant from the road as the one we had passed: its flight was in the same direction with the coach, and several times it alighted on the shrubs or high grass on the border of a wet ditch near the road side. The experienced coachman pronounced it to be a Will-with-the-wisp. Yours, dear Sir, very truly, T. STOTHARD'.

"Mr. Stothard", continued Chambers, "was of opinion that the supposed Ignis Fatuus, from its motion being between flying and leaping, is the mole-cricket. He brought one from his cabinet and pointed to the structure of its wings in proof of this conclusion; for it could not fly high, nor long together; and the habitat of the Gryllotalpa being the same as where this luminous appearance is usually seen is another coincidence.

"In the summer of 1826 I went into the fens of Lincolnshire, hoping to see an Ignis Fatuus; but in this I was disappointed, From Joseph Simpson, an intelligent fisherman at Frieston Shore, near Boston, I obtained the following information:—That before the fens were drained his father had seen a dozen Ignes Fatui, apparently playing with each other like insects, the highest not more than eight or ten feet above the ground. He told me that since the draining of the fens they were not so common; yet he and several others had seen one settle on a hedge and on a post, and fly off again, and that it appeared to him to have a voluntary motion, for he noticed one flying towards a hedge, then rise and pass over it".

In conclusion Mr. Chambers said: "I have questioned many persons who have seen the Ignis Fatuus besides those whom I have mentioned, and they invariably concur in its having a voluntary motion, flying backwards and forwards, rising to clear hedges, resting on gates, pales, and other objects that lie in its route. From the facts I have been able to collect I think we may infer that many more insects are luminous than naturalists have imagined".

It is plain that this paper by Chambers caused something of a stir. The entomological interest of all nature lovers had been greatly stimulated by Kirby & Spence's book, of which five editions had been called for by 1828. *The Entomological Magazine* was founded in 1833 and it started a discussion on the *Ignis fatuus* in its first volume. *The Westminster Review* had printed, the previous October, a letter which called for further investigation of the subject, and this letter was reprinted by the editor of *The Entomological Magazine* (Edward Newman), who appended to it the following Note:—

"We shall feel much obliged by any information our correspondents may be able to furnish us with on this subject. Is the insect in question the mole-cricket? Our readers will bear in mind that we want facts only; we have theories on the subject in abundance".

The letter to which this Note was appended read as follows:—

"*Ignis fatuus.* This appearance has been strongly surmised to be a luminous insect. It is many years since the similarity of its motion was observed to that of an insect avoiding pursuit. A subsequent examiner has stated that he approached one near enough to see distinctly the form

of an insect with wings like a dragon fly. Two or three years ago an anonymous article in a country paper announced that some person, in digging up the mud of an old pond, had discovered two creatures which he surmised to be the insects in question and which he described as looking like cray-fish with wings".

In 1837 the discussion was continued in Loudon's *Magazine of Natural History*. The opening round in this Journal was fired by J. Main of Chelsea, and his letter is so interesting that I shall print the greater part of it verbatim, though I shall dispense with some of his commas.

"In one of your late numbers there appeared some discussion, and various opinions given, concerning the real nature of the Ignis Fatuus or Jack-with-the-lantern, a phenomenon very often seen, but of the real cause of its luminosity accounts are various and conflicting. One considers it to be an unctuous phosphorescent vapour arising from marshy ground; others that it is an accidental combination of some inflammable gas which becomes visible when floating in dense air; but the general opinion now appears to be that it is a winged insect which has some luminous member or apparatus attached to some part of its body, which renders the insect visible on nights.

"That the insect is the mole-cricket, as asserted by two witnesses, is feasible, in so far as mole-crickets usually abound where the Ignis is most frequently seen; but this cricket, like its congeners, is ill calculated for flight of any long duration. I have lived near a rivulet, the banks of which were honey-combed by the inroads of these crickets, but never observed one of them on the wing. When digged out of the bank (which they often were in forming drains) they would give a convulsive kind of leap to regain the broken ground; but this was very imperfect flight. It may happen, however, that at certain seasons, during darkness, they may exercise a volant power which they do not seem to possess by day, and from their habit of living constantly in the dark it is likely they may make their distant transmigrations, if any, in the night".

(*To be continued*)

Fifty Years Ago

(From *The Entomologist's Record* of 1915)

Rustic Shoulder-knots Ignore the Sugar.—The question of the attractiveness and otherwise of treacle is very mysterious, especially as regards individual species and a curious instance occurred this night. On every previous occasion I have found the commonest species on treacle at Wye to be *G. trigrammica* and *Apamea basilinea* (*exclamationis* being scarcely out before). On this occasion among the crowds of moths on the posts there was not a single *basilinea*, although the species was flying over the grass in some numbers both at dusk and later; *G. trigrammica* on the other hand was in quite its normal numbers. I have frequently noticed how certain species vary from night to night, quite out of proportion to the total numbers on the sugar, but never remember so marked an instance of this before.—Russell James.

Notes and Observations

CELERIO LIVORNICA ESP. (STRIPED HAWK MOTH) IN MALTA.—I read with great interest the recording of *C. livornica* in the British Isles early this year, viz by David S. Jones, Bournemouth, on 20th May (antea: 191), D. G. Gibb of Bristol on 21st May (antea: 192) and D. C. Snipe of Ryde, I.o.W., on the 24th May (*Entomologist*, **98**: 173).

This moth occurs in Malta and has been recorded since 1870, but it is not as common as *Hippotion celerio* L. (silver striped hawk moth), so much so that I had not recorded any specimens since May/June 1957, when I took four specimens at light. However, this year it has appeared earlier than usual and I managed to breed it quite easily.

On the 8th April this year I happened to be strolling along the sea front at Sliema late in the evening, and to my great surprise I noticed a *C. livornica* resting on the pavement close to an electric lamp pole. I had nothing with me to put it in, so I hurried to the nearest litter basket in search of some empty cigarette packets. On the way I noticed two other specimens by the next pole, and on finding the required recepticles I succeeded in securing the three moths. Unfortunatly I had no chance to look for more as I wanted to catch the last 'bus home. I tried again the following evening but not a single specimen was about.

I managed to get a pairing, as two of them mated in a breeding cage on the night of 14/15th April after feeding them on syrup. Fifty-three greenish eggs were laid on the night of 19/20th and tiny caterpillars started coming out on 1st May; these were whitish, with a black head and tail. They were fed on the tender leaves of the grape vine, fresh from the garden. By the end of the month, the first pupae were formed and by 6th June I had 38 pupae in all.

On 24th June the first moth emerged. As the temperature in late June and July was very high, well over 90°F., many of the pupae dried up.

There was surely a migration of this moth during April and possibly quite a number managed to reach northern Europe. Any records from the continent may help to link up with the early occurrence of *C. livornica* in Britain.—ANTHONY VALLETTA, F.R.E.S., 257 Msida Street, B'kara, Malta. 21.ix.1965.

PARASITIZED OVA OF APATURA IRIS L.—On 10th August this year I found a single egg of *A. iris* (the purple emperor). It had been laid on a leaf of the broad leaved sallow, and except for a few flecks of lighter colouring, was a uniform dark olive green.

On the evening of 20th August, when I was examining it through a powerful lens, I saw a minute fly, which to the unaided eye looked like a speck of dust, sitting on its surface. The following morning there were six of these flies either on the egg or in its immediate vicinity. There was no visible change in the appearance or colour of the egg, nor with my lens could I detect any emergence holes. However, I felt fairly safe in assuming that the flies had emerged from the egg.

I sent the egg and flies to the British Museum (Natural History) with a request that they should identify the fly. In a reply, Mr. J. A. J. Clark, a member of the Museum staff, states: "The tiny insect you sent for determination is *Trichogramma evanescens* Westwood, belonging to the super-family *Chalcidoidea* of the order Hymenoptera. These insects are

popularly known as 'fairy flies' and can occasionally be found on windows. They parasitize insect eggs and have been bred before from the ova of *Apatura iris*. They complete their life cycle, egg, larva, pupa, adult, inside the host egg. On emergence the winged adults will readily fly when the weather is sunny, usually in the direction of the prevailing wind".

In many years of collecting I have never before had the bad luck to experience a similar occurrence and my excuse for publishing this note is that it may prove of interest to other entomologists. Incidently Frowhawk, in his *British Butterflies*, states that occasionally in a day's search for the eggs of *A. iris* one or more may be found completely empty, but otherwise quite perfect, not in the slightest degree shrunken as is often the case with infertile eggs. It would seem to me then the likelihood is that these empty eggs had been parasitized by this almost invisible fly.—Major General C. G. Lipscomb, Warminster, Wilts. 25.ix.1965.

A New Predator at Mercury Vapour Traps?—While running my mercury vapour light trap in Norfolk this year, I found a new animal having a free meal from the moths coming to my light. Among the bats flying overhead and the two or three toads sitting patiently at the base of the trap, were two brown rats (*Rattus norvegicus*) dancing in the glare of the light and leaving a trail of moth wings around them. I do not recall having heard of rats eating moths like this before. Their identity was confirmed when eventually the rats were shot.—Timothy Peet, 49 Trinity Church Square, London, S.E.1. 1.ix.1965.

On Freezing and Storing Lepidoptera.—A popular American technique which seems to be little used in Great Britain is that of freezing freshly-caught specimens of Lepidoptera when, as happens so often after working a light trap or sugar run, more material is at hand than can be conveniently set at once. As most British collectors now have access to the freezing compartment of a refrigerator, the method deserves to be better known.

After being captured and killed, the insects are carried home in a tightly corked store bottle, so no moisture is lost. The bottle is then placed in the freezer until time is available for setting. Some collectors use cardboard freezing containers for storage, but a glass bottle with a good cork or ground stopper is surely best, as an air-tight seal is vital. The insects should rest on cotton-wool in the container.

The writer has kept Noctuidae frozen for several weeks in a glass-stoppered bottle; upon opening, they thawed immediately and appeared as fresh as newly-caught material, and considerably more limp. In fact, the most perfectly relaxed moths I have ever set had been frozen for some time. The key factor, of course, is preservation of the original moisture.

The method of keeping specimens relaxed with crystals of chlorocresol has, I think, been in use for some time. The insects are placed in a tight container with some crystals, and stored in a cool place. But chlorocresol is very expensive, and it does not keep specimens soft for very long; if a freezer is available, it is much the better substitute. Chlorocresol still has its place, as it is surely useful in collecting boxes in the field, and may well be coupled with the freezing procedure described above.—R. S. Wilkinson, 17 Croftdown Road, London, N.W.5. 2.x.1965.

MELANISM IN THE LYCAENIDAE.—Entomologists have been well acquainted over the years with melanism in certain species of moth, as, for instance, *Biston betularia* and many others, but very little has been mentioned regarding melanism in the Lycaenidae, especially in *Agriades coridon* Poda, which used to occur regularly at Shoreham, Sussex, between the years 1930 and 1950, but alas! no longer there, the few remaining *coridon* having reverted to type.

In these years (1930-1950) abs. *pulla, melanina, ultra-* and *supra-melanina* occurred in ones or twos each season, and ab. *pulla* more frequently. During this period, the pumping station at the waterworks adjoining the ground, was worked by coal- and coke-fuelled furnaces, which belched black smoke from its chimney continuously, thus covering the whole downs at frequent periods. Now that electricity has been installed to drive the pumps and the chimney no longer required, these melanic forms of *A. coridon* no longer occur.

I cannot believe this to be coincidence, and can only conclude that all these melanic forms of *A. coridon* were caused, or brought about by the smoke.

But still another question has to answered. How is it that one specimen in every 500 *coridon* was in any way melanic? I gladly welcome any answers to this problem.—A. E. STAFFORD, "Coridonis", 83 Colborne Way, Worcester Park, Surrey. 28.ix.1965.

HERSE CONVOLVULI L. IN THE NEW FOREST.—I took a male *H. convolvuli* in my mercury vapour light trap here on 26th September, in fairly good condition. This was following a day of continual rain: no doubt he was glad of some shelter.

This has been a very poor year for migrants here, only *Lithosia quadra* L. having held its own, and I have for some time wondered whether the New Forest *quadra* are, in fact, migrants.—L. W. SIGGS, Sungate, Football Green, Minstead, Lyndhurst, Hants. 27.ix.1965.

SORHAGENIA JANISZEWSKAE RIEDL (LEPIDOPTERA, MOMPHIDAE) IN KENT.—At Church Wood, Blean, on 13th June 1965, on the occasion of the South London Entomological and Natural History Society's field meeting there, I took a shoot of *Frangula alnus* Mill. (alder buckthorn) which was mined by a larva, from which I reared a female moth on 13th July. Mr. J. D. Bradley (Imperial Institute of Entomology) has kindly determined it as *S. janiszewskae* Riedl on examination of the genitalia. This is the first time this species has been observed in Kent to my knowledge. Until recently, *S. janiszewskae* and another species occurring in Britain, *S. lophyrella* Douglas, had been included under one species, *S. rhamniella* Zell. (Cf. Bradley, Ent. Gaz., **14**: 41-44). It is interesting to note that the foodplant of *janiszewskae* remained unknown until Mr. S. Wakely detected the larva and subsequently reared the moth from Hampshire this year.—J. M. CHALMERS-HUNT, St. Teresa, Hardcourts Close, West Wickham, Kent. 16.x.1965.

REARING HELIOTHIS ARMIGERA HBN.—With reference to Mr. Greenwood's note under the above heading (antea 190), larvae of this species used to constitute quite a pest on flowers of Antirrhinum, carnations, roses and hollyhocks in Calcutta, and I would suggest one of these flowers as an

alternative to tomatoes, which are rather messy as a foodplant. I have also reared it on flowers of Zinnia, Chrysanthemum and Cosmos, and it is a well-known pest of maize and cotton.

The larva is a confirmed cannibal, and if the second, smaller larva referred to by Mr. Greenwood was boxed with the first, I have no doubts as to its fate. Larvae of this species *must* be reared singly.—D. G. Sevastopulo, F.R.E.S., Mombasa. 6.x.1965.

The Good-Tempered Hornet.—Has any reader of this magazine been stung by a hornet? If so, it would be interesting to hear Why, Where, and When. In my experience the hornet is a docile insect and when annoyed by a human, provided it isn't attacked, it prefers to fly away. No doubt if one man-handled and squeezed or even teased a hornet, the insect would give tit for tat; but if treated in a gentlemanly way it never attacks one—at least, that has been my experience. 'Way back in the nineties when I sugared in the New Forest often two or three hornets would be found feeding on one's treacle, and when the light of a bull's-eye lantern was shone on them they would occasionally leave the sugar and settle on one's coat. But they never made any attempt to sting me and when I walked away with a hornet on my shoulder the insect soon flew off.

Once when carrying a small axe for the purpose of excavating clear-wing larvae from tree-stumps, I came to a large dead birch standing by itself in a clearing. Going up to it I smote the trunk with my axe. This produced a certain commotion inside the tree and some hornets emerged to investigate. None of them settled on me nor even flew at me; but remembering the saying that discretion is the better part of valour I absconded and stood not upon the order of my going. I should, of course, have stood still to see what the hornets would do. They might have settled on me and walked about me; but I feel sure that had I stood stock still they would not have stung me.

Some forty years ago a few hornets were noticed in my garden in Essex, and presently the gardener reported that there was a nest of them in a barn within biscuit-toss of my garden door. It was a very large nest, many times the size of a wasps', but only rarely did its occupants enter my house. When one appeared indoors on a window-pane I gently and unhurriedly opened the window, and the insect at once departed. None of my children nor anyone else in the village was stung.—P. B. M. Allan.

Dispersal of the Mottled Umber.—Can anybody tell me if the male *Erannis defoliaria* Clerck carries the female when paired? If so, does the body of the female hang below the male or do the female's legs clasp the male's abdomen? It seems plain that the males must be able to carry the apterous females, for the larva of the species has been found on almost every kind of native and naturalised deciduous tree and shrub. I believe I have even heard of the larvae being noticed on evergreens, such as Euonymus, Tamarisk, Laurustinus and so on.

Chapman dealt with this matter in *Ent. Rec.*, **15**, 45, and wrote: "How is the moth to find the foodplant on foot? It emerges from the earth and may tramp away anywhere. In the first place, however, it does it, we know it does it, and does it easily and abundantly. Probably pupation takes place where this shall be tolerably easy, where the ordinary upward

climb of a moth on emergence shall bring it to the stem of the required tree. Probably at these close quarters scent is not altogether inappreciable".

This was quoted by J. F. Bird two years later (*Ent. Rec.*, **18**, 24) who, having seen a ♀ *defoliaria* "running about on the glass outside a window . . . evidently drawn thither by the lamp in the room" conjectured that the light of the sky being sufficiently strong to attract the female, the moth would travel up "the first prominent object looming in sight". But one can often find the larvae of *defoliaria* on large isolated oak and other forest trees, and even if the forebears of such larvae have inhabited the tree ever since it was only a few inches high the female ancestor must have had someone to lend her a helping hand across perhaps a couple of hundred yards of rough grassland in wintertime in spite of that fact that she was an active runner.

If a male and female of this species be paired and placed one evening in an open cage in an open place will both have disappeared by the morning? Will someone younger than I please try this?—P. B. M. Allan.

A Middle Nineteenth Century Glass-bottomed Box.—Through the perspicacity of my wife, we have recently acquired a small circular box which may be of some interest relative to the history of insect collecting. The box is in essence a glass-bottomed pill-box. It is, however, made of horn, elegantly but simply turned, with a cairngorm mounted in the centre of the lid. It was obtained from an antique shop in Oxford, where it was described as a middle nineteenth century specimen box. It has an internal diameter of 6·5 cms. and depth of 1·4 cms., a little shallow, at least for butterflies. It is, however, difficult, in spite of its shallowness and decorative appearance, to conceive any purpose for the box other than as a container for freshly captured specimens; the glass is inevitably downwards in any really stable position, and it cannot therefore have been intended for the permanent display of anything. It is just possible that some collectors with long memories may be able to retrieve recollections of something similar.—G. E. Hutchinson, Osborn Memorial Laboratory, Yale University, New Haven, Connecticut, U.S.A.

Current Literature

Introducing the Insect. F. A. Urquhart. x + 258 pp. Frederick Warne & Co. Ltd. 30/-.

This book is designed as a basis for introducing the student to the subject of entomology. It is suitable both for the teacher of a biology class or for the individual hobbyist seeking to familiarize himself with his chosen subject. The book was first produced in Canada, but its subject is of world-wide interest, and editions have been produced in other countries, edited, where possible, to meet the needs of the country of publication. This is mainly in the vernacular names, which are altered to suit those in use in the land of the reader.

Practical advice on the making of a collection of insects is given, stating how and where to look for material. There is also instruction on the apparatus necessary to the collector, with much useful advice on

making certain items. This is followed by notes on anatomy and metamorphosis.

Identification by keys is explained very carefully and concisely, and there follows a key to the main insect orders. These orders are then treated chapter by chapter commencing with a key to the main genera in the chosen order, and followed by a more detailed account of chosen species typical of the genera, including life history. The final chapter gives a short account of the various kinds of insect gall.

Throughout, the keys are illustrated by delicate and accurate drawings by E. B. S. Logier, who has also supplied more detailed drawings to illustrate the species descriptions given.

The difficult task of deciding what to include and what to omit has been dealt with in a masterly manner, as one would expect from an author with Professor Urquhart's qualifications.

The book is bound in cloth boards with gilt lettering and cover design; it is well printed on good paper, and it can claim a place on the bookshelf of anyone interested in entomology, for personal instruction in the case of the novice, and to assist in answering the questions of the novice in the case of the advanced student.

The use of scientific names throughout is very skilfully controlled, so as not to frighten the beginner. However, before he has reached the end of the book, the reader should be thirsting for his next book in which the essential scientific names and terms will find their place.

S. N. A. J.

Grasshoppers, Crickets and Cockroaches. By David R. Ragge. xii + 299 pp. + 22 col. pl. Frederick Warne & Co. Ltd. 42/-.

This is perhaps the first time that the British Orthoptera have been the subject of a book, available to the layman, which treats the subject from practically all angles, a new feature being the recording of the songs of all species on a gramophone record available from bookshops selling the book, and also the diagrammatic recording of these songs in the text of the book.

The language used is designed to be simple enough for the comprehension of the layman, but detail is not sacrificed on this account. The long introduction covers general classification, ecology and habits, including a chart showing the times of appearance of the three stages of each species where known. The matters of capture, preservation of specimens and keeping the insects alive are also included. The book is explained, with a note on the uniform order for describing the various details of species, the way dimensions cited have been ascertained, and the distribution maps are explained with a full list of the Watson-Praeger "vice-counties" and a key map of the British Isles with the vice-counties numbered to correspond with this list. The standard method for making these vice-county records is explained very fully.

The coloured plates are explained with the posture of the subjects, pointing out that the wings of grasshoppers, etc., are slightly raised so that the colour of the abdomen may be shown. The song diagrams are explained very clearly, having in mind that this is the first time they have been included in a book. The prevalent use of vernacular names is mentioned, explaining that this is for the benefit of laymen, and the names given by Kevan in 1952 are used, the author having named the remaining

few. Finally there is a key to the families.

The families are dealt with chapter by chapter, each with a key to its species and individual descriptions of each species with, if necessary, a key to its colour varieties.

After the families have been dealt with, there is a chapter on casual visitors introduced by commerce and some by migration. There is another dealing with the actual quest for orthoptera, and one on the distribution and history of our Orthoptera.

Three appendices deal with scientific names and their use, the vice-county sub-divisions (supplementary to pp. 22-30), and a check list of the Orthoptera of the British Isles. A glossary, bibliography and index conclude the book.

The very excellent coloured plates are mainly the work of the late Mr. D. H. Swain, whose few unfinished plates were completed by Miss A. L. Waters and an additional figure of the newly added "lesser mottled grasshopper" is by Mr A. F. Stuart.

The book is large octavo size with an attractive gilt lettered cloth board cover. The printing and paper are good, and the book should have a special appeal to nature-lovers whose walks are cheered by the songs of these usually unseen singers.—S. N. A. J.

I have a separate from Manfred Koch of Dresden entitled Warum wandern einige Schmetterlingsarten? (*Entomologische Abhandlungen* 32 (1965) 203-212) Dresden Natural History Museum. It deals with the migration of several familiar species within North Africa and Europe, with a seasonal diagram showing the complete cycle of movement. The text is in German, of course, but translation should not present any great difficulty, and such effort will be well rewarded. S. N. A. J.

Fifty Years Ago

(From *The Entomologist's Record* of 1915)

Scarce Black-necks by Night.—My main objective was a 'bred' series of *Toxocampa craccae*. I have seen them there in immense numbers on the wing and at heather blossom, but the best of the captured specimens lack the rich bloom of those freshly emerged. I was nearly too late, and most of the larvae were full fed.

There are few things more fascinating to me than searching for larvae by night, especially in such a situation as *Toxocampa craccae* haunts—right down by a rocky beach at the foot of immense cliffs. I planned my evenings to work at dusk on another beach for *Dianthoecia luteago* var. *barrettii*, and there being no way round the foot, I had to descend the cliff path in the dark. Having prospected the ground in the daytime, and located the foodplant, I arrived about 11 p.m., and succeeded in getting enough on the first evening to breed a good series.

Subsequent visits added only a few, and had I been a week later I doubt if any would have been left feeding. Judging by the appearance of the foodplants, however, they had evidently been in great numbers, as in some places the plants were reduced to mere skeletons. Passing from one beach to the other, the way leads along a sunken lane across the top of the headland, with high gorse and heather-clad banks. Both these plants were covered with moths, the most plentiful being *Eupithecia pumilata* and *Agrotis strigula*, both in great numbers.—Russell James.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

OBSERVATIONS ON *LITHOCOLLETIS ACERIFOLIELLA* ZELLER (*SYLVELLA* HAWORTH) SSP. *JOANNISI* LE MARCHAND (*PLATANOIDELLA* JOANNIS *NOM.* PREOC.) AND A NOTE OF ITS OCCURRENCE IN BRITAIN. J. M. CHALMERS-HUNT 247

ANT RECORDS AND OBSERVATIONS FOR 1965. K. E. J. BARRETT 248

WILL-O'-THE-WISP. P. B. M. ALLAN 252

FIFTY YEARS AGO 259, 266

NOTES AND OBSERVATIONS 260

CURRENT LITERATURE 264

SUPPLEMENT—THE BUTTERFLIES AND MOTHS IN KENT: A CRITICAL ACCOUNT. PART II. J. M. CHALMERS-HUNT ... ... (265)

TO OUR CONTRIBUTORS

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The Recapture in 1965 of *Lithophane leautieri* Boisd. subsp. *sabinae* H.-G.

By E. P. Wiltshire, C.B.E., F.R.E.S.

Having several times myself found larvae of *Lithophane lapidea* on cypress and juniper in the Lebanon, and bred at least one imago from them, and having also read the recent articles of Boursin (1957a, 1957b and 1962) on the nomenclature and taxonomy of *lapidea* and *leautieri* (bona species) and of Haggett and Kettlewell (1957) on the biology of the latter, I naturally decided that one of my main entomological targets in Switzerland, where I began residing in 1963, would be the Swiss race of *leautieri*, namely subsp. *sabinae*. Warren-Seitz (1910) is misleading in referring to this race as an aberration. A description of its appearance is given in Boursin (1957a); it is more precise than that of Warren-Seitz, which points out its smaller size and paler, grey-blue tint. The race seems to be isolated from other forms of the species. Its genitalia agree with those of *leauteri*, not *lapidea*. Its biology, however, at least as regards foodplant and habitat, differs strikingly, as will be seen.

Whereas one, at least, of the European races (subsp. *hesperica* Boursin) has adapted itself to an imported foodplant (*Cupressus macrocarpa*) which has recently been increasingly planted, facilitating the moth's expansion, *sabinae* continues to fly in restricted corners of the canton of the Valais (Wallis), Switzerland, where *Juniperus sabina* grows.

Having seen photographs made in France of *leautieri* larvae feeding on *Juniperus communis*, I wasted two years beating this widespread bush in various places of Switzerland and in searching with a light in the autumn where it, but not *J. sabina*, grew.

This year, however, I saw *J. sabina* for the first time, not far from Leuk Stadt in the Valais. I was struck by the different character of the biotope from that of the places I had previously searched:—a dry steep rocky hillside, about 2500 feet above sea-level (800-900 m.), where the principal tree was pine, and *J. sabina* grew like heather abundantly on the ledges and slopes. It is a recumbent bush with tiny yellow-green scaly leaves (not needles) and small blue-white berries in autumn, very different from the prickly umbrella-like *J. communis* which also grew there. Beating these two bushes there in July, I was too late for the *sabinae* caterpillar, but felt sure I was now on the right track.

In September 1965 M. Marcel Rehfous communicated to the Geneva Entomological Society his rediscovery, in June, of the larvae of *"Xylina lapidea sabinae"* (as he called it, following Vorbodt) at a locality in the Mattertal near Visp. It was in fact near Zeneggen where the late Jean Romieux found *sabinae* larvae similarly about thirty years ago. M. Rehfous also exhibited a water-colour drawing of the larva and mentioned its peculiarities. Unfortunately, owing to foodplant difficulties (*J. sabina* does not grow near Geneva, where M. Rehfous returned at the end of his holiday) only one of his six larvae reached the imaginal stage, doing so on September 24th. This seems to have been the first recapture of *sabinae* since that of Romieux, which, in turn was probably the first since the captures of the previous century mentioned by Vorbrodt.

On October 16th, accompanied by my daughter Kaye, I worked with sugar and light two localities in the Valais—firstly, the Bois de Finges (Pfynwald), where Frl. de Rougemeont is reported to have obtained the

larva plentifully, and secondly the locality near Leuk already mentioned. At the former I found absolutely no *Lithophane*, nor was I surprised, as *J. sabina* did not grow there, as far as I could see after repeated searches of different parts of this beautiful forest (M. Rehfous confirms this!). But at the latter, i.e., the pine-covered hills east of Leuk Stadt, nine examples of *L. leautieri sabinae* came to my car-lights in the course of a halt of about 45 minutes between 7 and 8 p.m., together with such species as *Ammoconia caecimacula, Thera juniperata* and *firmata*, and *Chloroclysta citrata*. But nothing came to the sugar, perhaps because of the many flowers still blooming there despite the late season. The sky was completely covered over and it was a calm pleasant evening, after a dull day of "foehn" (south wind). The average span of the *sabinae* series was 39 mm.

Sketch of biotype of *L. l. sabinae*, showing in right foreground two species of juniper:—*J. communis* (upright bush) and *J. sabina* (horizontal bush). In background, Rhone valley and Illhorn; the Bois de Finges begins on the lower slopes of the latter, and lies on the left (far) bank of the Rhone.

My experiences have thus convinced me that it is useless to look for *L. l. sabinae* in places where *J. sabina* does not grow. Its absence from some of the localities where the moth was previously reported therefore raises problems. Have the biotopes radically changed in the intervening years, or were the records erroneous? They are listed by Vorbrodt in Vol. 1, p. 394. By modern standards the name Pfynwald cannot apply to the locality at Leuk Stadt, though this is not far away, but it is possible that Frl. de Rougemont so applied it, and that this explains the problem in that case. In the case of the Follaterres and Branson records (*J. sabina* does not now seem to grow there) it is possible that the moth was misidentified, e.g., perhaps it was *L. ornithopus* or *socia*. It may be, how-

ever, that the construction of new vineyards has obliterated all traces of former stands of the bush, and this is probably so as regards Salgesch.

It is indeed curious that the Swiss race of *leautieri* should be so local and monophagous, especially as the foodplant is also localised and rather aberrant, and there is at least one other rarity of the Valais, namely the very local moth *Lobophera sabinata*, which appears to be similarly restricted in Switzerland. It may be an example of the tendency of species to become more ecologically specialised—if isolated—at the fringes of their distribution than in the main centre of their range, of which the examples of *Papilio machaon* and *Malacosoma castrensis* in Eastern England, are well-known examples. Is it not possible that *L. l. sabinae* became isolated in the Valais and survived one or more glaciations, in association with *J. sabina* in conditions which temporarily killed *Juniperus communis*, etc., above the level of the main Rhone glacier? The creeping habit of the bush suggests that it has adapted itself to heavy snowfalls, though its present localities may not all be subject to intense snow-falls now.

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Butterflies at Gavarnie, 1965

By Major General Sir George Johnson, K.C.V.O., C.B., C.B.E., D.S.O.

Gavarnie, Hautes Pyrenées is a famous locality to collectors of European butterflies. Collecting there has often been described, one of the most recent accounts being by Baron de Worms in the Entomologist's Record, January 1964. Conditions vary from year to year, so a short account of a visit there this year may be of interest.

Leaving England on 25th July by the Newhaven-Dieppe car ferry, my wife and I motored south spending two nights on the way, and met Lieut. Colonel Cyril and Mrs. Mackworth Praed at Lourdes airport on 27th July. Together we motored forty miles to the Hotel des Voyageurs at Gavarnie, where we stayed throughout our visit.

The season seemed a late one, the harvest had not even started in northern France and was only just getting under way in the south. We were fairly lucky with the weather with four overcast and misty days out of fifteen.

The village of Gavarnie lies at about 4000 ft. in magnificent mountain country surrounded by towering peaks with permanent glaciers and snowfields. Its famous attraction is the Cirque de Gavarnie, a great amphitheatre of somewhat similar formation to a Scottish corrie, but with more preciptious sides and on a vaster scale. Several torrents fall

from the melting glaciers and snow fields above, one with a free fall of nearly 1000 feet. Unfortunately the Cirque has been exploited as a tourist attraction and every day in Summer the village is invaded by dozens of motor coaches and hundreds of cars. The tourists then proceed the three miles to the Cirque on foot or on horses and mules provided by a syndicate. The path up is a jostling mass of humans and animals from 9 a.m. to 6 p.m. Luckily most of the crowd go no further than the entrance to the cirque, and the Cirque itself is on such a grand scale as to absorb the remainder without being spoilt. Side valleys such as the Gave d'Ossue and Gave de Héas, though provided with motorable roads, were comparatively free from tourists.

On 28th July, our first day, we spent in the Cirque. Of the three Erebias which were our objective *Erebia neleus munia* Reverdin (one of the *tyndarus* group) was common and fresh on the grassy slopes near the entrance to the Cirque. We found *E. gorgone* Boisd. in good condition but not very numerous in stony areas and screes in the western part of the Cirque. Only two or three females were secured. On this day we failed to find the main stronghold of *E. lefebvrei* Bdv., but caught a few casual ones. *E. epiphron* L. was common with *E. meolaus* O. nearly over. *Boloria pales* L. was not uncommon in grassy places. Other insects included *Parnassius apollo* L., one or two *Synchloe callidice* Esp., *Colias phicomone* Esp. and a few *Dira maera* L. Blues were represented by *Lysandra coridon* Poda, *Lycaeides idas* L. and *Plebejus argus* L.

On 29th July we explored the Gave d'Ossue, motoring up to the end of the road 7 km. from Gavarnie and working back. Butterflies were very numerous particularly on the steep and ungrazed slopes in the lower part of the valley. *Erebia manto* Esp. was in small numbers at various points. *Hipparchia aelia* Hffmgg. was taken, though not common. *Heodes alciphron* Rott. and *H. virgaureae* L. were not infrequent. One or two *Lysandra escheri* Hbn. and *L. argester* Bergstr. were seen while *P. apollo*, *Aporia crataegi* L. and *L. coridon* were in swarms. Skippers included *Pyrgus accreta* Vrty., *Spiralia sertorius* Hffmgg., *Reverdinus floccifer* Hbn. and *R. marrubii* Obth. The fritillaries were represented by *Melitaea parthenoides* Kef., *M. didyma* Esp. and *M. phoebe* Schiff.

Next day we motored down to Luz and thence through Barèges to the Col du Tourmalet at 7250 feet. The hills high up were heavily grazed and not much was seen. *Erebia pandrose* Borkh. was flying in small numbers on grassy slopes above the road to the observatory. One *Parnassius mnemosyne* L. and one *E. lefebvrei* were caught crossing the road.

The 31st July and 1st August were wet and overcast, but by motoring down to Lourdes we found some sun and on a large patch of thyme noted *Minois dryas* Scop. and a few blues including *Lysandra thersites* Cont. Chapm., *Everes argiades* Pall. and *Lampides boeticus* L. On our return to Gavarnie, Colonel Mackworth Praed boxed a fresh example of *Strymon w-album* Knoch. at rest on the wall of our hotel.

On 2nd August, a fine day, I revisited the Cirque. This time *E. gorgone* including females were more numerous and a good slope was found for *E. lefebvrei* where the ground was smooth enough to make it comparatively easy to intercept them. A feature of this slope, on the way to the main cascade, was an abundance of flowers of *Geranium cinerarium* which dotted the ground.

Next day up the Gave de Héas running eastwards from Gèdre we found plenty of *E. manto* with *E. neleus murina* in swarms. *H. virgaureae* was also common with many females.

On 4th August we went to Cauterets and up the valley to Pont d'Espagne. Here on some heavily grazed flats near the bottom of the ski lift to the Lac de Gaube we found a few *Agriades glandon oberthuri* Stgr. on mud patches together with many *L. coridon* and *P. accreta.*

At the Gave d'Ossue we spent 5th and 6th August. Here at various springs at wet places we found many more *A. glandon* sitting on the mud with various skippers. The fine form of *H. alciphron* was very common on the thyme patches in the lower part of the valley though the males were mostly worn. *H. aelia* was by now fairly common.

On 7th August, another bad day, and on the 9th, when a final visit was paid to the Cirque, sunshine was only intermittent. *E. lefebvrei* was by now very worn.

For this year we undoubtedly timed our visit rather late as no species except *A. glandon* and some of the skippers was really fresh. The last fortnight in July is probably late enough to get the special Pyrenean Erebias in first class condition.

20.x.1965.

Where have all the Butterflies Gone?

By H. Symes

I suppose there may have been worse seasons for butterflies than 1965, but I do not remember one. I am referring not so much to rarities as to the commoner species, and to the observations not only of entomologists but of ordinary observant people who are quite capable of recognising a small tortoiseshell or a red admiral. No butterflies have been less in evidence than the Vanessids, which I always think of as a garden-loving family, haunting the Buddleias from the end of July and the Michaelmas daisies a month later. But this year I was just resigning myself to having passed the whole season without seeing a single *Vanessa atalanta* L. (red admiral) for the first time in my memory, when I saw one on 11th October in my garden. It spent about an hour on a clump of Michaelmas daisies and was in perfect condition, but rather small. And that was the only red admiral I saw this year. Recently I have spoken to several people, including entomologists, who have not seen one at all, and on 14th October there were two letters in *The Field* commenting on the scarcity of butterflies this year: one writer said he had seen no red admirals, painted ladies (*V. cardui* L.), peacocks (*Nymphalis io* L.) or commas (*Polygonia c-album* L.) in south Devon, and only two small tortoiseshells (*Aglais urticae* L.).

It was a cold, late spring, and the first butterfly I saw was a small white (*Pieris rapae* L.) on 29th April. Usually I have seen some hibernated *N. io* and *A. urticae* long before then. On 12th May I saw perhaps ten holly blues (*Celastrina argiolus* L.) in a New Forest locality: this was about an average number. There were several speckled woods (*Pararge egeria* L.) in worn condition and some brimstones (*Gonopteryx rhamni* L.). Mr. L. W. Siggs saw a comma. My next outing was on 25th May to Hod Hill, where I met Brigadier Warry. The chief object of our visit was to see the narrow strips enclosed by the Dorset Naturalists' Trust

with cattle-proof fencing, mainly to protect the foodplants of the greasy fritillary (*Euphydryas aurinia* Rott.) and the chalk hill and Adonis blues (*Lysandra coridon* Poda and *L. bellargus* Rott.). It seemed to be very effective. We were too early to see *aurinia* on the wing: the earliest date I have seen it at Hod Hill was 26th May (1955). We saw the orange-tip (*Euchloe cardamines* L.), the common blue (*Polyommatus icarus* Rott.), the brown argus (*Aricia agestis* Schiff.), and the grizzled and dingy skippers (*Pyrgus malvae* L. and *Erynnis tages* L.), and I found a nest of larvae of the lackey moth (*Malacosoma neustria* L.), in their penlutimate instar. I paid a second visit to Hod Hill on 29th September, a fine day but late in the season. I saw one male *bellargus* and three meadow browns (*Maniola jurtina* L.) on the hill top and two or three *egeria* at its foot. I should have expected to see *G. rhamni*, which certainly breeds there.

One butterfly that appeared in good numbers in 1965 was the silver-studded blue (*Plebejus argus* L.). It was plentiful at Morden Heath on 16th July, though not so abundant as in some previous years. The small heath (*Coenonympha pamphilus* L.) was as usual much in evidence, and the large and small skippers (*Ochlodes venata* Br. and Grey, and *Thymelicus sylvestris* Poda) were reasonably plentiful.

In July, when the Buddleias were at their best, I did not see a single Vanessid on their flowers, and in August I noted every appearance of any member of this family in my garden. The total is not large: *V. io*, 7th, 9th, 12th, 23rd, 29th August, 1st, 2nd, 4th, 9th September, never more than one: *A. urticae*, 20th, 27th, 29th August, 9th, 11th, 13th, 21st September, 5th, 9th, 21st Oct. (on *Ceratostigma wilmotiana*), all singletons; *P. c-album*, 25th August, a very worn specimen, sunning itself on a window ledge. I was surprised to see *P. egeria* in my garden on 16th September and one or two other days. I saw four of this species and a pair of *G. rhamni* when driving through the New Forest on 20th September, but not one *Vanessa*.

Among the commoner species of which I saw very little were *P. icarus* and the small copper (*Lycaena phlaeas* L.). Even the cabbage whites were compartively scarce, but I do not suppose many tears were shed over that.

After such a fine summer as 1964, why have butterflies been so scarce this year? The question was asked in a recent B.B.C. programme, and one reason suggested (and quite properly rejected) was an increase in the number of insectivorous birds. I do not think these birds are more numerous than they used to be, and many of them took a nasty knock in the severe winter of three years ago. No doubt there are a number of reasons, and I believe one of them to be the widening of country roads and lanes, necessitating the destruction of those grass verges that used to be the home of a variety of wild flowers and grasses (now often contemptuously referred to as "weeds") and the haunt of such species as the green-veined white (*P. napi* L.), the orange tip, the wall brown (*Pararge megera* L.), the gatekeeper, the common blue, the small copper (which used to frequent the flowers of fleabane) and four of the skippers. I remember that about 1900 there was a series of small handbooks for children on natural history. One of these was called "Down the lane and back." It was written, I think, by M. C. Cooke ("Uncle Matt"), and gave a short account of the flora and fauna that its readers were likely to see. Now-a-days, this might scarcely fill a single page. The grass verges and wild

flowers which attracted the butterflies and on whose leaves the larvae fed have all gone to join the dinosaurs.

The scarcity or even absence of familiar migrants was remarkable. This applied even to such a regular visitor as *V. atalanta* and still more to less regular invaders such as *V. cardui*, the clouded yellow (*Colias croceus* Fourcr.) and the humming-bird hawk moth (*Macroglossa stellatarum* L.). There must be some reason that made these insects hesitate to cross the Channel, and the poor summer, which incidentally is no new thing in England, must not be made to take all the blame.

I will end on a more cheerful note with two unexpected pieces of good news. Strange as it may seem, this was a good year for the large blue (*Maculinea arion* L.) in north Devon, and the holly blue was seen in good numbers towards the end of August locally on the south coast of that county. My source of information? In each case it came straight from the horse's mouth.

Will-o'-the-Wisp

By P. B. M. Allan

(Continued from Page 259)

"Travelling once by the Ipswich coach" continued Mr. Main, "I had for a companion a farmer who, from his conversation, appeared to be a man of veracity. He had been in his youth a cattle drover and salesman in Smithfield market but at the time of our journey was a Norfolk farmer.

"On passing Dedham Vale someone in the company mentioned that it was famous for Will-with-the-wisp seen dancing about on nights. My friend the farmer immediately exclaimed that all the world were mistaken with respect to this delusive light; for, said he, 'it is nothing but a fly'. My curiosity was raised to the highest pitch, as I had seen the 'fire-flies' in India and I naturally thought that something of the same kind might appear occasionally in this country. On further questioning him he gave the following account:—

"'I was once', said he, 'driving a drove of cattle from Aylesbury to London, and on my way from Little Missenden to Amersham, opposite Shardeloes Park, a Will-with-the-wisp appeared hovering over the backs of my cattle when it was just getting dark. Sometimes it was on one side of the drove and sometimes on the other; now it would be over the park pales, among the trees and bushes, and again hovering over the cattle. At last it came so near that I struck it down with my stick. I picked it up, but its light was extinguished, and it appeared to me exactly like a Moggy-long-legs. I carried it in my hat to the Crown Inn at Amersham and gave it to Mr. Fowler, the landlord, who will tell you the same story if you apply to him'.

"Now it so happened that I knew Mr. Fowler perfectly well as a most respectable man; and as I would have occasion to be at Amersham in about a month after my rencontre with the Norfolk farmer I congratulated myself on the prospect of having gained the knowledge of a new fact in natural history.

"Soon after my return into Buckinghamshire I visited Mr. Fowler, but was sadly disappointed to find that he could remember no such circum-

stance of receiving an insect or of any person bringing him one. Mr. Fowler added that as the circumstance happened several years back, and when he considered the motley group of drovers, waggoners, etc., who crowded his large kitchen every evening, he might well forget a matter which it was no part of his business to remember".

The last of this correspondence in Loudon's magazine which I shall quote was from the pen of W. H. White.

"In the days of my boyhood the Jack-o'-lantern, or will-with-the-wisp as this phenomenon was more commonly termed in Derbyshire, was, in one particular spot, in the spring of the year, of frequent occurrence. My late father frequently made observations upon these merry-dancers and observes, in one of his papers, he was fully convinced that the Ignis Fatuus was nothing more than male glow-worms at play, like gnats in the sunbeams.

"In the spring of 1813 I was riding between Sleaford and Lincoln when a Jack-o'-lantern caught my attention, proceeding in the same direction as I was travelling. Its motion was irregular, sometimes near the surface of the ground, and then suddenly rising to the height of five or six feet. I followed very cautiously for some distance, being determined if possible to obtain a near view of my luminous guide. As the night was rather dark I had everything favourable for observation. At length it rested just at an angle in the road. I dismounted and proceeded very cautiously, in the hope of capturing it ; but in this I was disappointed; for on my near approach, whether from the noise I made or some other cause, it suddenly rose from its resting-place, about two feet from the ground, cleared a high bank, and pursued its course in a direct line over the adjoining fields. The broad and deep dikes rendered pursuit fruitless; but my eyes followed its almost butterfly motion till the glimmering taper was lost in the distance. I have on one occasion witnessed a very similar flight, if I may so term it, of the Ignis Fatuus in Derbyshire, and near the same spot I have frequently captured female glow-worms".

This discussion in Loudon's magazine included two letters from Germany describing the numerous "small yellow flames" and "reddish yellow flames" which have sometimes been observed over pools of stagnant water and peat bogs on the Continent, and as plainly these phenomena are (whatever their origin may be) quite different from our *Ignis fatuus* I forbear to quote them. Both these observers were of opinion that the flames were due to a spontaneous ignition of gas arising from decomposing vegetable matter; and since one of them described the appearances as "a succession of flashes" carried along "always in the same straight line and in the direction of the wind" it is possible that these phenomena were caused by the successive ignition of a large number of contiguous small puffs of an inflammable gas issuing from the ground. The manner in which the first puff became ignited is not explained.

. . . . . .

There are three indisputable facts--indisputable because they are based on certain fundamental physical laws which prevail on this earth —which rule out, quite definitely, any supposition that the *Ignis fatuus* is an ignited gas. They will all have occurred to the reader who has read and pondered upon the preceding instalment of this article and he will have felt no less astonishment than I have that such an hypothesis

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Above: Male *Below*: Female

Both are life-size

By courtesy of 'The Entomologist'

should have lived so long. For the supposition that the *Ignis fatuus* is a flame of gas generated by decaying vegetable or animal matter and spontaneously ignited postulates physical laws which run counter to those which are known to—and indeed obviously do—prevail on our globe. I shall, therefore, take each of the three indisputable facts in turn and comment on them.

I. *An unconfined volume of an inflammable gas, if present in sufficient concentration to be ignited, whether it is heavier or lighter than air, will on ignition explode with a flash.*

If there is a strong smell of coal gas in an open place and you strike a match to see where it is coming from you may obtain a definite proof of the above assertion. A number of inquests have been held on persons who tried this experiment.

Granted the prodigy, at present unknown to science, of a gas heavier than air which burns out of doors so slowly that a small unconfined volume of it if ignited at its periphery would burn no faster than a crumpled-up newspaper to which a match has been applied, it is unlikely that the said volume of gas would behave like the recorded *Ignes fatui*. Certainly (*a*) it could not travel against the wind; (*b*) in the absence of any wind it would remain stationary; (*c*) if borne by a steady wind it would travel in a straight line on a level plane. If the ignited prodigy were lighter than air it would of course go up and up and up.

Canon Derham's 'vapour' was 'frisking' and 'skipping'. Others which this Reverend observer noted were "continually in motion", but their motion was "various and uncertain". Commonly they kept hovering about six feet from the ground. Mr. Sheppard's specimen was on the wing when "the wind was very high", and Spence sagely remarks that had it been vapour "it must have been carried forward in a direct line; but this was not the case". It had the same motion as a Tipula, "flying upwards and downwards, backwards and forwards, sometimes appearing as if settled and sometimes hovering in the air". Dickson's specimen settled on a plant and flew off again. The same thing was witnessed by Curtis. Both these men were scientists. Chambers' were "flying about each other, apparently at play" and Aikin's were "darting over the hedges". Stothard's was "bounding or rising . . . . with a motion somewhat between flying and leaping"; the one which his companion saw on the Bath road "several times alighted on the shrubs or high grass on the border of a wet ditch". Simpson's, like Chambers', were "playing with each other" and rose to clear obstacles. Other observers questioned by Chambers, described *Ignes fatui* as "flying backwards and forwards, rising to clear hedges, resting on gates, pales, and other objects". The flight of White's specimen "was irregular, sometimes near the surface of the ground, and then suddenly rising to the height of five or six feet". It rested and then "rose from its resting-place" and cleared a high bank. Could a gas or a vapour do all, or any, of these things.

II. *An unconfined volume of an inflammable gas can burn only until its volume is consumed.*

If a puff of methane, *unmixed with air*, were ignited as it issued from the ground and burnt with a pale flame it would be 'on its own' so to speak the instant it left the ground and could not be reinforced otherwise than by a series of closely contiguous puffs which enabled it to frisk

about dead thistles growing in a field, hover about six feet from the ground, and so on and so forth. It would indeed have to be a remarkably slow-burning gas if an unconfined volume of it the size of an insect could go on burning for at least several minutes and travel for such a distance as Mr. Roberts and other credible observers have recorded. No such gas is known to science and indeed it would be contrary to the properties of gases to suppose the existence of such a prodigy. When the tap below a gas-burner is turned off the light goes out at once. This phenomenon is well known to all domestic servants in England, though apparently it is not so well known elsewhere.

III. *The flame resulting from the ignition of a jet of an inflammable gas out of doors* (*a*) *cannot travel about at a distance from the jet, and* (*b*) *cannot become ignited only at the apex of the column thrown up by the jet.*

These facts are so obvious that no comment upon them is necessary. We can therefore relegate the gas or vapour theory to the limbo in which the hibernating-swallows-in-the-mud fable and suchlike myths have long since been deposited.

So it is plain that as the *Ignis fatuus* is not a gas nor a vapour it must be a solid body. The only solid bodies which possess volition (and are therefore able to avoid obstacles when in flight) are animals, and as the only animals which fly by night over marshes in England are bats and birds and insects it is equally plain that the Will-o'-the-wisp must be one or other of these.

A theory that the *Ignis fatuus* is a bat will not hold water. No British bat frisks about dead thistles nor hovers about six feet from the ground nor flies with the motions of a Tipula nor settles on plants nor furze bushes nor on high grass beside a wet ditch, nor in fact performs many of the evolutions attributed to the *Ignis fatuus* by reliable observers.

There are no luminous birds in Great Britain or Ireland except those which occur in (*a*) ballet, (*b*) pantomime, (*c*) fairy tales, and none of these is likely to be seen flying about a bog at night

We are, therefore, obliged to conclude that the *Ignis fatuus* is an insect.

Accordingly it falls to be determined *which* insect and *how*. And I may say at once that since I see no reason to doubt—any more than the late W. J. Lucas did* in 1920—the accuracy of Farmer Simpringham's discovery or to throw water upon the assumption of Thomas Stothard, R.A., I am going to suggest that it is just as feasible for a mole-cricket to emit light as it is for an earwig; neither more nor less.

The list of insects which possess the property of luminosity in one or other, or all, of their metamorphoses comprises several Orders. Luminous lepidopterous larvae, however, are not so common. A larva of *Eurois occulta* L. has been found sitting high up on a grass-stem and emitting a phosphorescent light, and Boisduval recorded some larvae which he thought were *Diataraxia oleracea* L. which also were luminous. None of them assumed the pupal stage, "either from want of care" (says a commentator) "or from their luminosity arising from disease". Some of my readers will have read T. P. Bigg-Wither's interesting account† of the railway-train caterpillar of South America, so-called by him because it resembles "a railway-train running at night with all its carriages lit

A Monograph of the British Orthoptera. Ray Society, 1920, p. 217.

†*Pioneering in South Brazil*. 2 vols., 1878.

up". A specimen of this larva was exhibited at a Meeting of the Entomological Society of London on the 7th June 1869, and Mr. Smith, its exhibitor, pointed out that it had "ten bright green spots, and the head was intensely red, so that the luminous properties of the creature might be compared to railway signals".

However, the railway-train caterpillars are not the only insects which make use of the British Railways system of signalling for Haase mentions (said Dr. Imms) certain South American species of Cantharid beetles which emit two series of lights—red and green.

Is it possible that the mole-cricket is luminous on occasion? I think it is possible and I am not alone in my opinion. Lucas, that excellent authority on the British Orthoptera whose book I have quoted in the footnote on a previous page, mentioned Farmer Simpringham's discovery and remarked: "Since there seems no reason for doubting the record, perhaps we may presume that this particular insect was rendered luminous through being attacked by a fungus". It has long been known that certain bacteria are luminous, and luminous fungi (*Agaricus* spp.) were described very many years ago. But that luminous fungi could be responsible for every case of the *Ignis fatuus* is stretching credulity too far. Moreover, heavy infestation by a fungus would not seemingly induce an insect to fly about like an *Ignis fatuus*, least of all to sport about another one in the air; and even if a Gryllotalpa were completely coated with luminous bacteria it could hardly emit so much light as to justify the name "Will-o'-the-wisp'. So I rule out bacteria and fungi as definitely as I discredit gases and vapours.

The fact that the mole-cricket does not possess—or, at least, has never been described as possessing—a luminous organ like the glowworm or fire-beetle is nothing to go by since specialized (photogenic) organs are not necessary to arthropods for the production of light. "In origin", says Wigglesworth, luminosity "was probably an accidental accompaniment of some specific process in metabolism (for many substances slowly oxidized at low temperature in the dark are luminous) . . . . Insects which show the phenomenon constantly generate the light in the course of their own metabolism". He goes on to mention a Collembolan, *Anurida* sp., in which there is a general distribution of luminosity throughout the body except the legs and antennae, so that the whole insect gives out a continuous pale greenish glow. The beetles, of course, provide the largest number of luminous species; but other Orders are by no means without them and some of these, *teste* Imms, "are not known to possess special organs for the purpose".

In some of the Fungus Gnats (*Mycetophilidae* Dipt.) the fat body seems to be the source of their luminosity, which, reports Wigglesworth, "gives out a very faint persistent light". The larva of a New Zealand species of this Order, however, *Bolitophila luminosa* (called "the New Zealand glow-worm"), is so strongly luminous that, according to that good lepidopterist, the late G. V. Hudson, "the light from a single individual kept in a caterpillar-cage may be seen streaming out of the ventilators at a distance of several feet".* The pupa and female imago of this species are also strongly luminous though neither possesses a definite light-producing organ.

In other classes of animals the luminosity is evenly distributed over

**Ent. mon. Mag.* 23 (1886-7), p. 99.

the body. Griesbrecht, working on certain marine arthropods (Entomostraca) found that the light was produced by a fluid secreted by certain dermal glands. In other copepods this luminous fluid hardens to form a protective case over the whole animal. Another observer, Alcock, found that in some of the deep-sea prawns a luminous secretion is discharged at the bases of the antennae.

The morphology and anatomy of the mole-cricket have been adequately described by several Continental entomologists; but I have been unable to find that anybody has ever studied its physiology. It has been taken for granted that its structures function in a way similar to the homologous structures of other insects. Doubtless this view is correct—but only up to a point, and if there is one Class of animals on this earth about which it is dangerous to jump to conclusions that class is the Hexapoda. I cannot find that anybody has ever studied, chemically and physiologically, the hypodermis of Gryllotalpa's integument or has investigated the secretions of its dermal glands*. Until this has been done and it has been proved that under no conditions can or could the dermae—or other—glands of the insect secrete a fluid (such as luciferin) which possesses the property of luminosity, or of becoming luminous when oxidized, I suggest that we should keep an open mind on this interesting subject. For so far as the *Ignis fatuus* is concerned no other insect seems to 'fill the bill'.

A Tipula will not do, in spite of the opinion of the cattle-drover who knocked down an *Ignis fatuus* and said that "it appeared to me exactly like a Moggy-long-legs", nor of the fact that Mr. Sheppard's specimen "had the same motions as a Tipula"; for the flight of the largest British Tipula is not sufficiently powerful to enable the insect to fly against the wind. But Gryllotalpa is known to have much the same flight as a daddy-long-legs. Gilbert White of Selborne had good authority for telling his friend Daines Barrington that "when mole-crickets fly, they move *cursu ondoso*, rising and falling in curves". Note how exactly this describes the flight of almost all the observed *Ignes fatui.* Moreover, an observer quoted by the writer in *The Westminster Review* "approached one near enough to see *distinctly* the form of an insect with wings like a dragon-fly", which is very much what a mole-cricket with wings expanded would resemble.

Beetles can be ruled out since luminosity in every species known to possess it is produced by definite photogenic organs and the habits of the few British species which possess this property are well known. Moreover, the flight of the *Ignis fatuus* does not resemble that of any English beetle. With the exception of the Stag Beetle (which does not inhabit marshes and flies somewhat sedately), all the beetles I have ever seen flying, both by day and by night, stand not upon the order of their going but go with a will. The large *Hydrophilus piceus* and *Dytiscus marginalis*, both of which I have seen a-wing, fly with considerable velocity, and so do *Carabus violaceus* and the Cockchafer. Friends who are coleopterists cannot suggest any beetle which flies like an *Ignis fatuus.* A moth will not do, for reasons plain to every lepidopterist; nor will an English hemipteron. Another orthopteron might prove to be luminous in certain conditions; but in view of the lucky *coup* by Farmer Simpringham's hind

*It is a difficult matter to resolve since chemical investigation of an insect's tissues can usually be carried out satisfactorily only after death, and death sometimes brings about a decomposition of the chemical constituents of tissue.

there does not seem to be any sufficient reason why another species of this Order should be suggested. There are large insects in several of the other Orders; but again the Iskleton *Ignis fatuus* renders it unnecessary to look elsewhere than towards the mole-cricket.

At the end of last century mole-crickets used to inhabit a small bog in the woods near Bramshaw in the New Forest, within a few hundred yards of the place where I saw my—as I believe—*Ignis fatuus*. Unhappily in those days I knew nothing about *Ignes fatui* and had never heard of Farmer Simpringham; so I never watched beside that bog of a summer's evening, net in hand. It was quite a small bog, not, I think, much more than half an acre in extent, and like many of the New Forest—and other—bogs it was not a place which one would try to walk across. But it was well sprinkled with little hillocks, like conical molehills covered with turf, and these were firm enough to stand on. They were also the 'warrens' of the mole-crickets, and if you stooped and dug the fingers of both hands well into the base of one of these hillocks and, with a sudden effort, wrenched it up entire, you would find that the hillock was traversed by burrows large enough to admit a finger. How deep these burrows extended I never found; for the bog was some distance from my home and I had no fancy to carry a spade about with me on the occasions when I went mole-cricketing.

The inhabitants of these burrows could be taken only in the evening; presumably they slept down in their warrens by day. But if you approached a hillock, as delicately as Agag—for the mole-cricket, like most other insects, is extremely sensitive to vibrations—at dusk, and tore it up with great suddenness, it was odds on that you would expose a Gryllotalpa, or perhaps two, and if you were nippy you could pick up the animal before it had time to find the ruptured entrance of its burrow. I kept a number of these insects, both males and females, in a cage half-filled with a hillock which I had carried home in a bucket; but not knowing then that they would eat sliced potato or carrot or turnip (and most probably parsnip) they did not thrive, and eventually I turned them down in another bog nearer to my house. Not unnaturally (for I knew nothing of ecology in those days) they soon disappeared therefrom.

And now that I have investigated the *Ignis fatuus* and have read all about Farmer Simpringham and the rest I am too old to revisit that bog. Dearly would I like to go there on an evening in May or June, with a camp-stool and a butterfly-net, and sit there quietly smoking my pipe until a Will-o'-the-wisp appeared. I have never seen a mole-cricket on the wing, but I can well believe that its flight is no less powerful than that of an Eyed or Poplar Hawk moth; for it has wings of considerable amplitude and is a strong and sturdy animal, which indeed you will soon find when you take up a full-grown one in your fingers. Gilbert White of Selborne considered that at night "they come abroad and make long excursions, as I have been convinced by finding stragglers in a morning in improbable places".

The mole-cricket is probably to be found in many places and several counties from which it has not yet been recorded. The modern books suggest that it is rarer than it used to be and attribute this, in part, to the draining of wet lands which has been going on for so many years; for Gryllotalpa inhabits only wet earth. But it is not an insect that obtrudes itself upon the notice of the entomologist and a systematic search would

probably reveal its presence in many unsuspected spots. Apart from my own solitary experience in the New Forest I can give no instructions how to set about finding it, but the books say that it occurs, in this country, in the banks of canals and rivers as well as in bogs. It has even been found in a saltmarsh. Edward Lhuyd, the naturalist,* writing from Oxford to John Ray on 12th December 1693, recorded "I observed near Kidwelly, in Carmarthenshire, this last summer, that the *Gryllo Talpae* live there in the sea-lands that are covered every tide. I brought one of them with me and cannot find that they differ from those of the midland counties. In Wales they are called 'Rhing y Les', q.d. *stridor aestivitatis*". And as it is known to occur in Scotland there is probably no English or Welsh county from which it is absent. Gilbert White found Gryllotalpa, at Selborne, in moist meadows and mentions kitchen gardens where "they occasion great damage . . . by destroying whole beds of cabbages, young legumes, and flowers"—but here, I feel sure, he is quoting from some Continental author. Certainly the mole-cricket has never been a pest in England though found occasionally in gardens bordering waterways.†

The Gryllotalpidae have an exceedingly wide distribution throughout the world, but differ little in appearance and structure. There is only one European species, *Gryllotalpa* Linnaeus (1758), *vulgaris* Latreille (1802). This species occurs throughout Europe, from Sweden to Spain. (Burr, in *Ent. Rec.*, **21**, 175).

*For some observations on the habits of a mole-cricket in confinement see an annonymous work called "*The British Naturalist*", London 1830, pp. 345-349.

†For an account of Edward Lhuyd (who d. 1709) see *Wild Wales* by George Borrow, chap. 89; also *Dict. Nat. Biog.*, **33** : 217.

POSTSCRIPT

The *Ignis fatuus* has also been recorded from Australia and there are several references to it in a book called *People We Met*, by A. C. C. Lock, Sydney (Angus & Robertson), 1950:—

(*Page 190*): "'Strange thing, that, the Min Min light . . . . No one's ever solved what causes it'. We . . . learned that the Min Min light was a night phenomenon of the Winto-Boulia country. It appeared in the form of a solitary ball of light, which seemed to hover just above the ground, and move along *with an undulating movement*" [my italics]. "A controversy has waged about it for years".

(*Page 184*): "Did you ever see the Min Min light?"

"Ever see the Min Min light? I saw it every night for a week once. A man chased it one night, but fell over a fence and broke his leg. They've argued about it for years".

(*Page 189*): "Have you ever seen the Min Min light"?

"I once saw it every night for a week when I was waiting for a cattle buyer to come out. I've often seen it at Slasher's Creek. I was waiting one night for a car, when I thought I saw it coming . . . but after a little the light went out and no one came. Then it reappeared . . . but no car came along. . . . Some say it is a phosphorescent night bird, others say it is a nocturnal mirage".

(*Page 194*): "Some people . . . say it is a reflection from a motor car, but that can't be the case, as it was seen long before motor cars ever came into the district.' That was the last reference we made to the Min Min light; being convinced it was no flight of distorted imagination on the part of the hundreds of people who had seen it".

Notes on the Life-History of *Aethiopsestis austrina nebulosa* Watson (Thyatiridae)

By J. S. Taylor

As long ago as June 1947 specimens of what were then thought to be noctuid larvae were received from Mr. C. J. Skead, having been collected by him on his farm Gameston in the Highlands area of the Albany district, some 15 miles south-west of Grahamstown, C.P. These as well as further specimens collected by Mr. Skead and the writer on the former's and also on adjacent properties were subsequently reared to the adult stage. Adult material was submitted to both the Transvaal and British Museums, and the verdict from each institution was that the material belonged to a new genus and species of Thyatiridae. While a considerable amount of life-history data was obtained at the time it was not possible to publish this owing to the fact that both species and genus were as yet undescribed.

In a recent paper (1965) Mr. A. Watson, of the British Museum, has described the genus as well as several species and subspecies of Thyatiridae, all from the Ethiopian region, from which the family was previously unknown. *Aethiosestis austrina austrina* Gen. spec. and subsp. novo., has been described from material from Southern Rhodesia, and *Aethiopsestis austrina nebulosa* subsp. novo., the subject of the present paper, from the Highlands material reared by the writer and from one adult collected in Natal by Mr. K. M. Pennington.

The following notes concern *Aethiopsestis austrina nebulosa*, and were made during the years 1947 to 1950 when the Highlands material was under investigation.

The host plants from which the larvae at Highlands were obtained were *Royena pubescens* Willd., and *Euclea undulata* Thunb., both indigenous bushes or shrubs belonging to the Ebenaceae.

Adult. The adult emerges during the evening or at night, and while under laboratory conditions emergences have taken place from September to June, it would appear to be unusual between September and February. The majority of adults obtained emerged during the second half of April. The adult has been taken in the field during mid-April.

The male moth has lived up to nine days in the laboratory, the female up to 16 days. The largest number of eggs deposited by one female was 187 (no eggs were found in the abdomen of this particular female after death). In a female which died without ovipositing 132 eggs were found.

The pale watery-green egg is ribbed longitudinally while there are irregular transverse lines between the ribs producing a reticulated appearance. It is somewhat elongated, being approximately twice as long as it is broad and measures *circa* 1 × 0·5 mm. It is rounded at both ends, the basal end on which it is deposited or fixed to the substratum being slightly narrower than the distal or uppermost end. Under laboratory conditions eggs were deposited in small and irregular clusters of varying number on the muslin covering the containing jars, on the sides of the latter or elsewhere, as well as on leaves and twigs of the host-plant. Normally it would appear that the eggs are deposited in single-layered clusters. The incubation period occupies a few days.

Larva. The general appearance of the full-grown larva is smooth; the ground colour is greyish-brown with a pinkish tinge and with darker

mottlings. There is a broad median dorsal line extending to the penultimate abdominal segment and which is bordered by a narrower and undulating black dorso-lateral line. Immediately below this is another and still narrower black line, while below this again a fainter lateral line separates the lateral and ventral regions. A pair of cream-coloured spots (or dots) is situated vertically on either side of abdominal segments 1 to 6 between the dorso-lateral black lines, and the stigmata are also cream in colour. The ultimate abdominal segment is tinged yellowish-brown dorsally, while the lateral line is both broader and darker on the last three abdominal segments. On the antipenultimate segment black markings occur dorsally. The ventral surface is greenish-grey. Black tubercles are situated laterally as well as on the bases of the legs and prolegs. The former are light brown while the head is mottled light to dark brown on a grey background. Short and scattered setae or hairs occur and are more plentiful on the head. The length of the full-grown larva is some 35 mm.

Patches of wilted foliage on the affected bushes indicate the presence of the larvae which, while still young, can be found in the curled-up wilted leaves. Older larvae frequent the lower branches and are to be found in cells or pseudo-cocoons consisting of a few leaves loosely spun together. Here they spend the day resting, one or two larvae per cell, leaving the latter at night to feed higher up on the bush concerned. During April to June the duration of the larval period varied from 43 to 52 days, while the average for 13 larvae was 46·8 days.

Pupa and Cocoon. The pupa, formed some nine days after the construction of the cocoon, is reddish-brown at first, but soon changes to dull black. It measures some 15 to 17 mm. in length, has a finely reticulated surface and a long cremaster. It is contained in a tough oval cocoon found under debris on the soil surface or beneath the latter to the depth of one inch. It is coated with soil particles which, when removed, reveal a tough and open network resembling a loofah in appearance. It is sparsely lined with larval hairs and measures 17 to 21 mm. in length.

The duration of the pupal period under the extremely dry laboratory conditions has varied from 101 to 294 days, while the average for 28 individuals varied from 201·3 to 222·3 days. Emergences of adults took place in the months of September, November and December (one adult in each month), the remainder from February to June, the majority during the latter half of April.

South, in *Moths of the British Isles* (Ser. 1), mentions the larval habit of spending the day in leaf-cells for most British species of Thyatiridae.

Natural Enemies. *Sturmia alacris* Curr. (Tachinidae) was obtained from the larva.

Summary

An account is given of the life-history and habits, together with a description of the earlier stages, of an Ethiopian thyatirid recently described as *Aethiopsestis austrina nebulosa* Watson.

Acknowledgments

The writer is much indebted to Mr. C. J. Skead for finding the larva in the first place and for the supply of specimens; also to Miss G. V. Britten, Botanical Survey, Grahamstown, for determining the host-plants.

Hilton, Natal. 9.xi.65.

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The Orthopteroid Insects of Easter Island

By D. Keith McE. Kevan, Dept. of Entomology and Lyman Entomological Museum, McGill University, Macdonald College, P. Que., Canada.

During late 1964 and early 1965, the World Health Organization and McGill University sponsored a medical expedition to Easter Island, one of the remotest islands in the Pacific Ocean. While, for some unknown reason, no entomologist was included among the members of the expedition, Dr. H. C. Gibbs, a parasitologist at Macdonald College and one of the several McGill University members of the expedition, was prevailed upon to bring back some insects for the Lyman Entomological Museum. Dr. I. E. Efford and Mr. J. A. Mathias of the Institute of Fisheries, University of British Columbia, who likewise accompanied the expedition, also collected insects, and their orthopteroids (with one exception) are also in the Lyman Museum. A comprehensive account of the natural history of Easter Island (including an expanded version of the present paper) is to be published later under the editorship of Dr. Efford, but, since the findings in respect of the orthopteroids have already been made public at scientific meetings, a brief advance account of these insects is given here.

The insect fauna of Easter Island, as its isolated geographical position and comparatively recent geological history would suggest, is poor, comprising, in large measure, species introduced from other parts of the Pacific. There are apparently some endemic species, or at least species known so far only from Easter Island, but these are few, and orthopteroids are not numbered among them. Conspicuous among the island's larger insects are the dragon-fly, *Pantala flavescens* (Fabricius), perhaps the most widely distributed species in the world and one which presumably colonized Easter Island by virtue of its own great powers of migration, and the tropicopolitan hornet-wasp, *Polistes hebraeus* (Fabricius), probably introduced on ships. Both species were among those collected by Dr. Gibbs; both have been recorded previously.

Earlier works referring to the insects of Easter Island are few and those referring to orthopteroids even fewer. Such records of the latter as there are will be found in the earliest general work on the Easter Island fauna (Fuentes, 1914), in short papers by different authors in Skottsberg (1921-40) [Sjöstedt (1924), Chopard (1924), Silvestri (1924)], in a short general paper dealing specifically with the insects by Olalquiaga Faure (1947), and in Rehn (1949a, 1949b)—a single record of an earwig. Zimmerman (1948) also sometimes mentions Easter Island in discussing general distribution of Hawaiian insects, but no original record is included.

In the following list of species, those marked with an asterisk (*) have not previously been recorded from Easter Island.

Order DICTYOPTERA — Suborder BLATTODEA

Blattidae

**Periplaneta americana* (Linnaeus) Hanga Roa and Vinapu.

Cosmopolitan, of African origin; widespread in the Pacific and not confined to domiciliary conditions.

Periplaneta australasiae (Fabricius) Hanga Roa, Rano Kao, Vinapu and the rocky islet of Motu Nui.

Cosmopolitan, probably also of African origin; widespread in the Pacific

like the last. It was previously recorded from Easter Island by Fuentes (1914), although without a name, and by Sjöstedt (1924), Olalquiaga Faure (1947) and Zimmerman (1948).

Melanozosteria soror (Brunner von Wattenwyl) Hanga Roa, Vinapu and Motu Nui Island.

This flightless species was, until recently, placed in the genus *Cutilia* Stål; it is widespread in the Pacific and probably of Indonesian origin. *M. soror* has not hitherto been recorded by name from Easter Island, but one of the unnamed species mentioned by Fuentes (1914) probably refers to it. It is not mentioned by other authors.

BLATTELLIDAE

Onychostylus notulatus (Stål) Rano Kao and Rano Raraku.

Until recently, this species was placed in the genus *Graptoblatta* Hebard. Formerly it was known as *Allacta notulata*. It is probably of Indo-Malayan origin, but is now widespread in Oceania. It was recorded from Easter Island by Sjöstedt (1924) and Zimmerman (1948). The species resembling "*Blatta strigata*", recorded by Fuentes (1914), probably was this.

**Blattella germanica* (Linnaeus) Hanga Roa and Rano Raraku.

Cosmopolitan, of north-east African origin; widespread in the Pacific, but mainly under domiciliary conditions. A single female from Rano Raraku (above) was taken on reeds; it is rather poorly preserved, but seems to belong to this species.

BLABERIDAE

**Pycnoscelus surinamensis* (Linnaeus) (?) Hanga Roa, Rano Kao and Vinapu.

Cosmopolitan, of oriental origin; widespread in the Pacific region. There are two so-called "races" of this species, a larger, parthenogenetic and a smaller, bisexual race. Recent work has shown that the two do not hybridize freely (if at all) and two species may be involved. The bisexual form, which is that found on Easter Island, may perhaps prove to be referable to *P. occipitalis* (Walker)—see Roth and Willis (1961). Only the parthenogenetic "race" (or species) has been found in the Western Hemisphere.

Diploptera punctata (Eschscholtz) Hanga Roa, Rano Kao, Rano Raraku, Puha and Motu Nui Island.

This species is widespread in the Indo-Pacific region and is better known by its synonym *D. dytiscoides* (Audinet-Serville). It was originally described from Hawaii (its synonym from Australia), but almost certainly originates from south-eastern Asia. It was previously recorded from Easter Island by Sjöstedt (1924), Olalquiaga Faure (1947) and Zimmerman (1948).

Order ORTHOPTERA, s.str. — Suborder ENSIFERA

GRYLLIDAE

Teleogryllus commodus (Walker) (?) Hanga Roa and Rano Raraku.

Teleogryllus species have previously been referred to *Gryllus* Linnaeus, *Acheta* Fabricius and *Gryllulus* Uvarov. The taxonomy of the group is still in an unsatisfactory state, but the species represented on Easter Island is, on the basis of its morphology (particularly the number of stridulatory pegs), referable, or very closely related, to *T. commodus*, and not to *T. oceanicus* (Le Guillou) to which it has previously been referred by Chopard (1924), Olalquiaga Faure (1947) and Zimmerman (1948). The

latter is widespread in the Pacific region and includes at least northern Australia in its range (published records, for what they are worth, exist for places as far apart as Malaya, Japan, South Australia and the Marquesas—the last being the lectotype locality). *T. commodus* is best known from Australia (although records, particularly from the northern parts of that continent need checking). It also occurs in North Island, New Zealand (the South Island form seems subspecifically different). From other oceanic islands, *T. commodus* has been recorded for Lord Howe Island, Norfolk Island, the Loyalty Islands and the New Hebrides, but the reliability of the records is now questionable.

Order EMBIOPTERA

Oligotomidae

Aposthonia oceania Ross Rano Raraku [det. E. S. Ross—one ♂ specimen, in California Academy of Sciences].

This species is known only from the Pacific islands, among which it is widespread, having presumably been transported from island to island by man. It has not previously been reported under the above name from Easter Island, but Silvestri (1924) records *A. vosseleri* Krauss (in the genus *Oligotoma*) from the Island. The latter is unknown east of New Guinea, and the species referred to would almost undoubtedly be the present one.

Order DERMAPTERA

Carcinophoridae

**Anisolabis maritima* (Bonelli *in* Géné) Anakena and Ovate beaches; Moto Nui Island.

Cosmopolitan, of uncertain origin; very widespread in the Pacific region.

Euborellia annulipes (Lucas) Hanga Roa, Vaitea, Rano Kao, Rano Raraku and Motu Nui Island.

Cosmopolitan, of uncertain origin; extremely widespread in the Pacific. It was previously recorded from Easter Island by Fuentes (1914), Sjöstedt (1924) [as *A. bormansi* Scudder], Olalquiaga Faure (1947), and Rehn (1949a, 1949b).

In conclusion, it may be of interest to compare the orthopteroid insects of Easter Island with those of the Mid-Atlantic Azores (see Kevan, 1965). The cockroaches *Periplaneta americana, Blattella germanica* and *Pycnoscelus surinamensis* are found in both. *Loboptera decipiens* (Germar) is a flightless introduced species in the Azores occupying a similar ecological position to *Melanozosteria soror* on Easter Island. *Gryllus bimaculatus* DeGeer, the introduced field cricket of the Azores, is analogous to *Teleogryllus* on Easter Island and the earwigs, *Anisolabis maritima* and *Eurobellia annulipes*, occur in both localities. The Azores, however, have a richer and more varied orthopteroid fauna, including Tettigonioidea, Acridoidea[1], and Phasmatodea, all of which are apparently absent from Easter Island. No Embioptera, however, are yet known from the Azores. Among the orthopteroids reported by Duffey (1964) for Ascension Island in mid South Atlantic are only two out of four introduced species of

[1]Kevan (1965), in discussing the occurrence in the Azores of *Schistocera gregaria* (Forskål) inadvertently omitted the record of that species for San Miguel given by Vayssière (1933).

cockroach, namely, *Pycnoscelus surinamensis* and *Periplaneta americana*, and one earwig, *Euborellia annulipes*, that are shared with Easter Island. Duffey does not record the cockroach *Diploptera punctata*, previously reported (presumably erroneously for *P. surinamensis*) from the island by R. Thaxter (See Roth. & Willis, 1960: 135; Princis, 1965: 358). *Gryllus bimaculatus* is present, together with two other introduced crickets, a migratory tettigonioid, two migratory species of Acrididae, an introduced termite and two species of Embioptera.

Note:—Since the above was written, further evidence has been obtained which indicates that the so-called parthenogenetic and bisexual races of *Pycnoscelus surinamensis* are indeed specifically distinct (Dr. L. M. Roth, personal communication, 1965). The Atlantic island form is presumably parthenogenetic.

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CIRRHIA GILVAGO ESP. AT WOKING.—Though this is a comparatively widespread species among wych elm, extending its range to Scotland, it is virtually absent from this immediate vicinity, probably through lack of its foodplant. On October 1st I was surprised to find a worn specimen in my trap here, the first I have seen here in fourteen years. The only other local record was one taken by Mr. J. A. C. Greenwood at his house in Horsell in September 1956. Mr. R. F. Bretherton never saw it at Ottershaw during the time he lived there from 1946 to 1963.—C. G. M. DE WORMS, Three Oaks, Woking. 22.x.1965.

A Note on *Leptomorphus walkeri* Curt. (Dipt. : Mycetophilidae)

By L. Parmenter

This species was originally described by John Curtis in 1831. It is one of the larer fungus-gnats, 11-12 mm. long with a reddish-yellow body marked on the thorax with three blackish-brown central stripes and a blackish-brown band close to the tip of the abdomen. The wing is covered with macrotrichia and the wing tip is clouded. A cloud also covers the area where the subcostal, radial and medial veins branch. F. W. Edwards recorded it as a showy species, "reputed rarity and few adults have been captured on the wing, it is really widely distributed and fairly common in Britain in all suitable places. The larvae feed chiefly on *Poria vaporaria* and I have rarely failed to find them on fallen branches well covered with this fungus". (1925, *Trans. Ent. Soc. Lond.*). The fungus mentioned is now known as *P. vaillantia* (DC) Fr., the chief British species of the group f species previously collected under the name of *P. vaporaria*. The fungus is a serious cause of wood decay in damp mines and buildings with leaking water.

The other day Mr. L. W. Siggs kindly gave me a male taken on a window of his house at Minstead, in the New Forest, Hants., on 4th September of this year. It is not new to the New Forest as the Rev. F. C. Adams took it in six of the years 1895-1910. However other records are few and far between. In Herts. A. Piffard took it on 1st October 1894, and in Suffolk C. Morley found it at Freston on 22nd July 1904. In Gloucestershire, H. A. Charbonnier caught it at Olveston and H. Audcent collected one on 29th September 1924, at Kingsweston. In 1926, A. H. Hamm recorded its occurrence on the windows of the University Museum, Oxford. The furthest north locality known to me is Madeley, Staffs., where H. W. Daltry secured a specimen on a window of a house on 10th June, 1945. In the London area it was taken by E. E. Austen at Northwood, Middlesex, on 4th October 1924, and more recently by R. L. Coe on 12th September 1951, at Chelsham, Surrey, and by H. Britten, jnr., on 11th July 1950, and 19th September 1954, at Old Coulsdon, Surrey. In 1964, I captured a male in Devil's Den Wood, Coulsdon on 9th June, and another male in that wood on 18th August of this year. Thus in this country adults are on the wing from at least 9th June to 4th October.

The specimen from Minstead varies from my Coulsdon specimens. It has a thin blackish-brown line on either side of the broad central thoracic stripe whereas in the Surrey males the thin stripes broaden towards the front so that they are a little more than half as broad as the central stripe.

It is a great pity that Dr. F. W. Edwards died before he was able to produce a monograph of the British species of this family and include the further data he must have had. British dipterists look forward to a volume on the family in the uncompleted series of Handbooks, of the Royal Entomological Society. But it is to be hoped that this lack of a good reference work will not deter entomologists from their study of the family and from breeding the gnats from fungi. In this connection it is worth re-reading P. A. Buxton's account in *Ent. Mon. Mag.*, **96**, of 1961, of his rearing 98 species of diptera from some 150 species of fungi. Unfortunately he did not find *Leptomorphus walkeri* in the 36 of the 400 or so British species of fungus gnats he reared.

The species has occurred in France, Switzerland and central Europe.

"Woodside", Pinewood Road, Ferndown, Dorset. 15.x.65.

Sale of the Woollett Collection of Lepidoptera

By Baron de Worms, M.A., Ph.D., F.R.E.S.

A sale of lepidoptera is quite a *rara avis* nowadays. After an interval of some two years Messrs Debenham, Storr and Johnson Dymond offered on 28th October 1965, the extensive collection formed by the late G. F. C. Woollett, who spent his early days in the Government Service in Borneo and had made an almost unrivalled collection of its lepidoptera. He had already left many of his type specimens to the Museum at South Kensington. During his years of retirement he became a keen collector of the British butterflies, especially of the Lycaenidae, of which he had himself taken some exceptional aberrations, particularly of *Cupido minimus*.

There was quite a big attendance at King Street, Covent Garden, and on the whole prices were especially good both for the exotic and British series. The sale opened with some exceptionally fine lots of Bornean Ornithoptera with a number of superb examples of the famous *O. brookiana*. The males sold in sets of four averaging 50/- a lot, while two pairs raised £5 each. Next came six lots of male *O. amphrysus* containing five in each which went for £5 10/-, and as much as £6 5/- a lot for large specimens, while the females of this species made £6 10/- for five, and a similar price for four specially fine specimens. The seven lots containing 29 males and four females of *O. miranda* went extremely well, four males and a female reaching £10 10/-, and one lot of five males rising to £7 15/-. Four superb females of this fine insect went up to £11 10/-. Four males of *O. helena* realised 38/- and three females 34/-, while pairs of *Kringana kludius* averaged 16/-. Two males and a female of this species made 28/-. Two males and three females of the rare *Amathuscidia amythaon* only realised 24/-. Among the Papilios, of which there was a very large selection, a lot of five males and a single female of *P. palinurus* made 85/- and nine fine males of the Bornean form of *P. neptunus* rose to £8. Most of the remaining exotics were sold by the drawer or half-drawer, or in mixed series. Four drawers of Bornean Lycaenidae fetched £33 15/- and two of the Hesperidae totalled £9 15/-. Some fine series of Swiss Rhopalocera were also offered, a drawer of coppers making £7 10/-, and two of *Parnassius* £3 10/- each. All these foreign butterflies realised just over £400.

The British butterflies comprised aberrations only, some extreme and possibly unique in a few instances. This part of the sale opened with a female *Pieris brassicae* with homeosis on the right hind wing. This remarkable insect was knocked down for £9. Gynandromorphs seemed to hold the day. A mixed one of *Anthocharis cardamines* soared to £19. This specimen was bred by Mr. Woollett, who also caught a female of this species having a male streak, which made £3 10/-. There were some especially outstanding *Pieris napi*. A gynandrous female, partly the yellow form *citronea* was sold for £8 10/- and a further example of this form with left side female and right mostly male went to £15 10/-, and another of this mixture reached £11. The highest price of the sale was £36 paid for a halved gynandromorph of the *citronea* range. The *Colias*

croceus also made some very good figures. A female with rayed forewing border taken in 1949 realised £5 10/- and an albinistic male secured in 1941 was bought for £6 10/-. A halved gynandromorph caught by Mr. Woollett in that famous *Colias* year, 1947, went up to £32. Among the *Clossiana euphrosyne* a rayed male taken in 1944 fetched £5. There were several varieties of *Euphydryas aurinia*, but most of them made disappointing prices, only a very melanic female going to as much as 34/-. However, a *Maniola jurtina*, all male one side and female the other was a good price at £17.

By far the most outstanding series of the British collection were the *Cupido minimus* which were offered *en bloc* in 16 lots comprising 32 insects, some which were perhaps unique. These included several buff coloured forms and a number of *radiata* types as well as a female with obsolete forewings and black-streaked hindwings. All these very remarkable forms were bought for the National Collection at Tring for a total of £115. Among the rest of the blues an extreme *radiata* of *Plebejus argus*, obtained in 1943, went to £14 10/-, while a halved gynandromorph of this species realised £16 and a less extreme one £11 10/-. Of the fine series of forms of *Lysandra bellargus* a mixed gynandrous example, mostly male, taken at Dorking in 1948 made £4 10/-. The *L. coridon* were very well represented by many extremely fine aberrations. A grand female albino from Shoreham, Sussex, in 1940 reached £6 5/- and one of the best female ab. *fowleri* ever seen went up to £9, while an extreme male of this form only reached 24/-. A male ab. *pulla* realised 42/-, but a fine male *radiata* from Alton Barns was not dear at £14, and a couple of very rare *transversa* forms only made £7 10/- and £11 10/-. The total for this fine collection was some £1075 including a Brady cabinet at £98 for 40 drawers. Also sold were five *Lycaena dispar* from the Leivers collection making £60 10/- in all with two grand males going for £14 10/- and £13 respectively. In contrast, 23 butterfly aberrations from the Fraser collection only totalled £11 7/-.

Notes and Observations

PLUSIA NI HUBN. IN CO. KERRY.—After experiencing a series of windy and wet evenings, it was a relief for Mr. J. L. Messenger and myself to have a very still and muggy night for collecting on September 2nd, when we pitched our mercury vapour light near the quarry on the step heather-clad cliff a few miles along the coast road west of Inch. Insects began coming freely, including a couple of good *Luperina nickerlii* Frey. Just before midnight a solitary *Plusia* suddenly appeared and to our astonishment it proved to be a very dark female example of *Plusia ni*, which we kept for a few days in an unsuccessful attempt to induce it to lay. Mr. E. S. A. Baynes in his recent "Macrolepidoptera of Ireland" only records one other specimen for that country since the war, taken by himself at Glenageary in July 1956. Previous to that, the only other records were eleven examples taken in 1931 at Timoleagus, Co. Cork, all now in the Tring collection. Incidentally, our capture must be the most westerly for this insect for the British Isles, if not for the whole of Europe as well.—C. G. M. DE WORMS, Three Oaks, Woking. 22.x.1965.

A NOTE ON THE GOTHIC MOTH.—*Phalaena (Naenia) typica* Linn. is rather a curious insect. In a Note in this magazine (*Ent. Rec.*, **18** (1906), p. 213) a correspondent, C. W. Colthrup, wrote:—"The larvae of this insect are very plentiful in the gardens here [East Dulwich] every year on the leaves of the common flag (*Iris*), but what puzzles me is, where does the perfect insect go to when it takes its flight? I have watched the flowers, and have sugared with no success, and during seven years' residence here I have never taken it at light. Can any of your readers enlighten me? Of course I have bred the insect freely".

I too have bred the insect, but I have observed it only casually and know very little about it and its habits in the wild. There was no response to Mr. Colthrup's request for information, so it may be that most readers of the *Record* in those days knew as little about *typica* as I do.

The larva is polyphagous. In addition to the iris mentioned by Colthrup, larvae have been found on apple, pear, blackthorn, hawthorn, sallows and willows, and—but only after hibernation—low-growing plants such as primrose, goosegrass (cleavers), docks, garden auricula and polyanthus, willowherb and other herbage. So far so good: there is nothing 'curious' about that. But how has it come about that although the autumnal fall in temperature with consequent withering of the leaves on its 'native' tree forces it to descend to the herbage at the foot of the tree and hibernate among moss and debris, it does not ascend the tree again and feed on the young leaves in spring, the foodplant to which obviously it had been 'conditioned'? Plainly the onset of hibernation replaces its heliotropism by geotropism, and earthbound the insect remains until the imaginal stage is attained. Also it loses its conditioning for its native food. The casual larva of a species which normally pupates before the onset of cold weather has no such power of adaptation and is killed by, usually, the first frost. (See my *Talking of Moths*, 1943, pp. 96, 97, concerning *Notodonta ziczac*).

Occasionally I have found the larva in its first instar. The eggs are laid in a batch on the upper surface of a leaf, and for some days the emergent larvae remain, packed as closely as sardines, on the leaf. (Some of the modern textbooks say that the eggs are laid on the *underside* of a leaf; but Edward Newman, a good observer, was quite right when he wrote: "I have always found them on the upper surface of the leaf . . . . the young caterpillars proceeding at once to devour the upper cuticle and parenchyma of the leaf, leaving the lower cuticle entire, dry and brown . . . . " *Illus. Nat. Hist. of Brit. Moths*, 1869). The larvae are extremely sensitive to vibration and on the two or three occasions when I have found them they hurled themselves off the leaf the instant the leaf or its petiole or even twig was touched.

Since it is likely that the female moth lays at least a couple of hundred eggs, and there would not be room for more than half that number of larvae on the surface of the leaf, it would seem that two or perhaps three batches of eggs are laid, whether on one night or more. On one occasion (26th July 1948) a female which I boxed from sugar laid several small batches of eggs on the side of the box. They were white, the usual Noctuid shape and with the usual Noctuid reticulations. They hatched on 6th August, growing (on apple and pear) very slowly and hibernating at the first frost. This was the only occasion when I reared the insect from egg to imago, and I did not try to assemble with a newly emerged female.

I hope others who know more about this insect than I do will record their experiences in these pages, also that they will call my attention to any printed account of the insect's life-history, particularly in the magazines and especially in the early numbers of *The Entomologist*, where Edward Newman was so industrious in recording the life-histories of species; for I have not the opportunity at present to make a search myself.

The only occasions when I have seen the imago in the wild have been at sugar, to which it comes freely, and on my way to and from a sugaring beat beside a stream. Mr. C. Craufurd and I used to sugar posts and pollared willows round a meadow in the town where we live, and throughout July *typica* was a regular visitor. The path which led to our beat was along the side of a stream, and often, when returning, our torches would show *typica* slowly weaving their way—the moth flies almost incredibly slowly when going about its lawful affairs—in and out of the rushes and *Digraphis* and sedges growing in the stream, only a few inches above the surface of the water.

What were these moths doing? They could hardly have been searching for females, for the male Noctuid in search of a mate hurries to get there first—at least that has been my experience when assembling, and for years I did much assembling with moths of many families. Nor could they have been females looking for suitable sites for egg-laying; for, as already mentioned, the eggs are laid on trees and shrubs.

I have found the moth and its larvae only on low-lying ground, whether at sugar or when searching trees and shrubs in copses and fields near watercourses. Does *typica* also occur on high ground.—P. B. M. Allan.

Spaelotis ravida Hübn. Indoors.—The Rev. Guy Ford, in the October issue (antea) mentions that he found *Spaelotis ravida* Hübn. in some numbers flying at dusk on the insides of the windows of the garage and garden shed at the Rectory at Balsham, Cambs., and wonders how they got inside, as the doors and windows were seldom open.

This prompts me to record an unusual capture of *ravida*, not far from Balsham, on 11th August last. My wife and I went to look at the old—very old—church at Hadstock, sometimes called "Canute's Minister". On a table in a side chapel was huge old bible, lying open. My wife turned to the title page to see the date of publication, which was 1770, and as she did so a fair-sized noctuid flew out and settled on a nearby pew. It looked rather like *Triphaena comes* Hübn., but I saw no flash of yellow when it flew, so I followed it up. I saw to my astonishment that it was a very fresh *ravida*, which is a rare moth in the area where I live. My wife went back to the car to fetch a glass-topped box, while I kept an eye on the moth. It was not very happy on the pew, and its wings were slightly raised and quivering gently. I was extremely anxious lest it should fly up into the roof before she returned but all was well and the moth was duly boxed.

I wonder how it got into the church. No windows were open, and the only door not locked and bolted was that of the vestry, separated from the church itself by another door. Does *ravida* make a habit of getting inside buildings, or do the larvae crawl inside and pupate in odd corners? Perhaps someone more familiar than I am with the habits of *ravida* can suggest an answer.—R. Saundby, Air Marshal Retd., Oxleas, Burghclere, Nr. Newbury. 23.x.1965.

PUPATION SITE OF THE GOAT MOTH.—In *The Entomologist's Monthly Magazine* of 1871 (Vol. 8, page 70) there is an interesting note about the wandering of a larva of *Cossus cossus* L. (*ligniperda* Fab.) and its pupation in earth. In view of recent correspondence in the *Record* we have asked the Editor of that magazine for permission to reprint it here, and Dr. Hobby has kindly permitted us to do so. So here is the Note in full:—

Note on the economy of Cossus ligniperda.—Near the bowling-green here is a birch tree much infested with *Cossus* larvae. Up to the present time I have always believed the full-grown larvae spun up among the frass and debris under the bark and inside the tree. About a fortnight since, this view was considerably shaken, on finding at some short distance from the tree two empty pupa cases, close to circular holes in the earth corresponding in size to the pupa. At once I suspected the larva had spun up underground, and yesterday I had the best proof that this view was correct, by finding a large ♀ moth, just emerged from the green turf of the bowling-green, the pupa case lying close beside her, and within an inch or so a circular hole from which I extracted the stout cocoon with my finger. This was at least 20 yards from the birch tree.—GEO. NORMAN, Cluny Hill, Forres, N.B. 1st July 1871.

A CURIOUS SITE FOR OVIPOSITION.—On 25th October my gas stove lighter, which is of a type where a jet of gas is lighted by an electrically heated platinum wire, failed to work. I had only recently renewed the battery, so I removed the cap and found a largish batch of apparently dipterous ova on the platinum wire I removed these and put them in a tube to pass to a dipterist should one be at the next South London meeting. On 29th there was another batch of eggs in the same position, and there have been further batches on 5th and 11th November. I gave the first batch (whose larvae had hatched in the warmth of my waistcoat pocket) to Mr. E. E. Syms, and the others to Mr. L. Parmenter, in the hope that the insect responsible could be reared and determined. I had seen no fly about the kitchen, and the egg laying seemed to be nocturnal or at latest early in the morning.

It at first occurred to me that some fat had somehow got on the lighter, and I washed it in carbon tetrachloride. As the egg laying continued, it would seem that the larger proportion of methane sent out to consumers these days may have suggested carrion to the insect.—S. N. A. JACOBS, 54 Hayes Lane, Bromley, Kent. 15.xi.1965.

SPAELOTIS RAVIDA SCHIFF. AND ENNOMOS AUTUMNARIA WERNB.—I was very interested in the Rev. Guy A. Ford's note on the comparative abundance of *Spaelotis ravida* at Balsham in the October "Record". Like him I have taken one or two in most seasons in Suffolk, but it is very rarely that they are good specimens. They seem to have very soft wings and are usually damaged. However, this year I took a perfect specimen on 31st July and from 27th August until 7th September there were up to seven specimens in my light trap each morning. Of these, quite a high proportion were good specimens, which probably indicates that they had bred locally.

On 21st September there was a male Ennomos autumnaria in the trap and this species was present on most mornings until 2nd October. The late Claude Morley in the Memoirs of the Suffolk Naturalists' Society

1937 had not heard of this species in Suffolk. I recorded the first specimen for the county on 2nd October 1952, and took a second specimen on 3rd October 1954. Subsequently the Rev. Guy A. Ford took a specimen near Mildenhall. It would appear, therefore, that the species has extended its range to Suffolk since 1937 as it is unlikely that all the entomologists who worked the county prior to that date would have missed it.

Mr. Charles W. Pierce of Needham Market had very similar experiences to mine with ravida and autumnaria this year. On one occasion he had no less than eight specimens of autumnaria in his trap. Incidentally, quite a number of this species which came to my light did not enter the trap but sat around on the vegetation nearby.—H. E. CHIPPERFIELD, 27 Chilton Avenue, Stowmarket, Suffolk. 2.xi.1965.

LEPIDOPTERA IN IRELAND 1965.—A short (21-28 May) visit to Ireland this year revealed some interesting insects, as well as coinciding with one of this summer's rare periods of good weather. My wife and I stayed at Ardnagashel on Bantry Bay, Co. Cork, where we were looked after with extraordinary hospitality.

Anthocaris cardamines L. was plentiful everywhere. Fresh *Callophrys rubi* L. were seen at wind-swept Mizen Head, and around the shores of Bantry Bay. *Pararge megera* L. and *P. aegeria* L. were both out, and *Lycaena phleas* L. and early *Polyommatus icarus* Rott. were also seen. A single *Colias croceus* Fourc. was noted on 26th May, its arrival possibly coiniciding with that of *Laphygma exigua* Hübn. taken the previous night.

I made few trips to the surrounding countryside but noted two *Eupethecia satyrata* Hübn. at Ladies Look, above Killarney, on 25th May, and *Phytometra viridgria* Clerck and *Bapta temerata* Schiff. on the Bantry to Macroom road.

Mercury vapour trapping at Ardnagashel produced, among many other insects the third Irish record of *Drymonia dodonea* Schiff. (all from Co. Cork). A few *Pterostoma palpina* Clerck were seen, the insect being a new county record. *Celema confusalis* H.-S. was frequent, but disappointingly uniform. *Cycnia mendica* Clerck was well out, with both pure white and the slightly smoky forms of the male taken. *Hadena bombycina* Schiff., *H. capsophila*, a single *H. conspersa* Schiff., and *H. rivularis* were seen. *Lithacodia fasciana* L. was just emerging in long grass by the hotel, three were taken and others seen. A single *Cosymbia linearia* Hübn. was taken this being a scarce and local insect in Ireland. One *Eupethecia tripunctaria* H.-S. was taken, a new County record. *Colocasia coryli* L. was present as a large, bright form, in contrast to a minute race of *Thera obeliscata* Hübn.

I am grateful to Mr. Baynes of Dublin for adding extra facts to mere records. His recent book 'Irish Macrolepidoptera' is an essential accompaniment to any lepidopterist visiting Ireland.—T. N. D. PEET, L.R.C.P., M.R.C.S., 49 Trinity Church Square, London, S.E.1. 29.x.1965.

COLIAS CROCEUS FOURC. AND PYRAMEIS CARDUI L. IN EIRE.—Owing to the apparent general scarcity of migrant butterflies this year, I have thought it of interest to record that Mr. J. L. Messenger and I saw a male clouded yellow at Tramore, Co. Waterford, on August 17th last, and another of the same sex in a cove on the south side of the Dingle Peninsula on September 3rd. We also had a close view of a rather worn painted lady at Ardmore,

near Youghal, on August 17th, and on the next day in Miss Cynthia Longfield's garden at Cloyne, Co. Cork, we saw two *Nymphalis atalanta* L. (red admirals) also in very small numbers this year. —C. G. M. de Worms, Three Oaks, Woking. 22.x.1965.

Burnets and Foresters (Zygaenidae) in Sicily: A Correction.—In my article on Sicilian butterflies which appeared in the July/August number (*Ent. Rec.*, **77**: 168-176) I made incidental references to the occurrence of several species of *Zygaenidae* which were unfortunately based on faulty identifications. Mr. G. M. Tremewan has since very kindly examined the specimens which I brought back from Sicily, and he has sorted them out as follows:—

Zygaena erythrus albipes Verity: Agrigento, 30.v., Monte Salvatore, 1.vi.; also seen in many places round Palermo.
Z. romeo romeo Duponchel: Monte Salvatore, 1.vi., Mandruzzi Pass, 4.vi.
Z. punctum ledererei Rambur (*contaminoides* Stdgr.): Monte Salvatore, 1.vi., Mandruzzi Pass, 4.vi.
Z. trifolii trinacriae Verity: Monte Salvatore, 1.vi.
Z. filipendulae siciliensis Verity: Monte Salvatore, 1.vi.
Procris tenuicornis Zeller: Gibilmanna, 2.vi.
P. statices Linn.: Petralia, 31.v.
P. manni Lederer: Mandruzzi Pass, 4.vi.
—R. F. Bretherton, Folly Hill, Birtley Green, Bramley, Surrey. 13.xi.65.

Eupithecia plumbeolata Haw. (Lead-Coloured Pug).—The larvae feed entirely *inside* the flowers of cow wheat. About the end of July they are full grown and are easily detected by holding the pale yellow flowers against the light when occupied blossoms show up plainly. I have found the pupa inside withered flowers but usually the larvae pupate among debris on the ground.

The pupae are golden yellow and are thus unlike any other "pug" pupae. Larvae which pupated in July 1963 emerged partially in the spring of 1964 and partially in the spring of 1965.—P. Cue, "Lhasa", Malvern Road, Ashford, Kent. 22.x.1965.

An Exotic Saturniid at Woking.—On the morning of 5th October I was amazed to find in my trap here a huge tailless Saturniid, nearly four inches in expanse and looking like an outsize emperor moth. With the help of the National History Museum I discovered that it was a male *Caligula jonasi* Butler, a fairly common insect in Japan, where its normal time of appearance is in the autumn months. On enquiry from one of the leading dealers, I found that it is one of the so-called silk-moths which have been imported on a large scale in recent years, mainly for supplying private collectors and zoos, though I am not aware that these insects are used for any type of scientific research or for educational purposes. I have heard of several others of this tribe turning up at light traps over the country and the fact that they are at large raises the question from an economic standpoint whether their larvae may become established on a large scale and prove potential pests, or from an aesthetic point of view, whether we want our countryside and lepidopterous fauna contaminated rather than embellished by such exotic showpieces.—C. G. M. de Worms, Three Oaks, Woking. 22.x.1965.

THE NEW FOREST CICADA.—Is *Cicadetta montana* Scopoli taken from time to time in the New Forest nowadays? I caught one on Bramshaw Common in 1898; its 'churring', or whatever its stridulation is called, attracted me and I saw it sitting on a bracken. Whereupon I netted it. I wish I still had it, for it is a handsome insect.

Daniel Bidder, who was sent by Dr. Leach to the New Forest to collect for him, took it in 1815. I don't know in what part of the Forest; probably it was near Brockenhurst, where William Bentley and other 'professionals' used to stay in those days and where it would be easy to obtain accommodation. Bidder was a Spitalfields weaver and an enthusiastic collector; according to Noel Humphreys he was the first of that fraternity who attempted to arrange his collection scientifically.

Richard Weaver of Birmingham found a locality—or possibly Bidder's locality—for *C. montana* in 1826 and gave an interesting account of it. "In July 1826", he wrote, "while ranging in the New Forest, Hants., between Lyndhurst and Brockenhurst, persevering in my search after rare insects, I was delighted at length on discovering a specimen . . . of Cicada haematodes, resting on the stem of the fern (*Pteris aquilina*). The sun was shining at the time, and the day was intensely hot. I had previously been at a very great loss in what manner I should procure a specimen of this scarce insect for my museum,—knowing that it had been vigilantly sought after by the most diligent collectors for many years, and that its history and manner of secreting itself had never been recorded by naturalists . . . I have, nevertheless, spent numbers of dreary hours in that extensive forest at these periods, without the desired success, and was certainly fortunate in my discovery at last, by accident rather than by intention.

"I may here observe that the insect either appears sluggish in its habits or is altogether unconscious of its danger, as it suffered me to approach and take it off the stem of the fern without making the slightest effort to escape. A few days after taking the first I discovered a second and very fine specimen in the same situation; and two days after this I caught another in my net. From the nature of the flight of this I had imagined it to be Aestrus bovis, as it exactly resembled the flight of this insect, except that the duration of the flight of the Cicada haematodes is short. The first insect had evidently flown some time, from the wasted state in which I found it . . . .

"I have taken five specimens in the course of my researches, by watching their passage, going immediately to the spot, and taking them up with my finger and thumb. The cicada moves only when the sun shines, and in the direction through the New Forest from Lyndhurst towards Brockenhurst, keeping on the left hand side of the turnpike road, about the space of from half a mile to a mile within the forest; and this I believe to be the only locality in which it has hitherto been taken. The reason why more have not been captured I should imagine to be this, that from its flight it has been generally imagined to be a very common insect".

John Curtis found out, perhaps from Bidder or Weaver, where the insect was to be taken, and he accompanied the elder Dale to the New Forest in June 1831; the result of their expedition being the figure of *C. montana* (then called *haematodes* or *anglica*) in Curtis's 'British Entomology'. Pickard-Cambridge caught two specimens at or near Brockenhurst in June 1854, and I expect the Gullivers knew where it was

to be taken, and took it. There must be many later records which I have not seen. If anyone has caught this cicada at Bramshaw since 1898 I should be grateful if he would mention it . . . Has it ever been taken in another county and is it still taken in the New Forest every year? Also, is there an account of its life-history in any English book or magazine?—P. B. M. ALLAN, 4 Windhill, Bishop's Stortford, Herts. 1.xi.1965.

[There is an account of later captures of *C. montana* in *Entomologist* for January 1910 (**43**: 1) which brings the record down to 1908 and adds a few details to the early history of the insect. J. R. Wise (*Hist. of the New Forest*, 1862) reported that a specimen was taken in June 1858 by a Mr. Farren and that in June 1862 he caught two more. Houghton (*Sketches*, 1877) said that *C. montana* "has been occasionally seen in great numbers in the New Forest; on the other hand Dallas in his *Elements* wrote that it had been found only in the New Forest and even there seems to be of very uncommon occurrence". A specimen was exhibited at the "South London" in 1896 which was said to have been one of three taken by Mr. Heasler in Surrey, and Barrett also recorded it from that county (*Ent. mon. Mag.*, **1**: 1864-5). In 1901 G. Lyle netted a specimen on the wing near Lady Cross, Brockenhurst, and in the same year C. W. Colthrup took another one. Lyle also reported that in 1907 empty pupa cases were found apparently in the same locality, and Claude Morley wrote that in June 1907 he took a pair *in cop.* on a bracken stem. In 1908 Lyle and W. J. Lucas found ten empty pupa cases. More recent records seem to be lacking, but I remember the late Dr. E. A. Cockayne exhibiting a specimen taken in the Chiddingford district of Surrey at a meeting of the "South London" on 23rd June 1936.—ED.]

Current Literature

Man and Insects, by L. Hugh Newman; 252 pp. quarto; Aldos Books (W. H. Allen & Co.) 45/- . This book is one of the "Modern Knowledge" series, and Mr. Newman has made the most of this ever-interesting subject by presenting it in a way which makes it absorbing to the initiated and uninitiated alike.

The introduction gives a good picture of the place of the insect in the world in relation to that of man, and in the following chapters the author goes into detail of a great variety of examples of insect assistance to and encroachment into the welfare of man.

The first section is based on the study of insects, and after an introductory note on entomology and the scientist, goes on to discuss form, metamorphsis, reproduction, parasites, both of the insects themselves, and insect parasites of man and other animals, migration cycles of insect populations, and their natural and artificial spread. Illustrating examples are taken from all parts of the world, and classic examples quoted, including the Colorado and Japanese beetles, the *Phyiloxera* attack on French vineyards during the 19th century, and myxamatosis in rabbits.

Section II is entitled "Living with Insects" and goes into many outstanding cases, including Sir Ronald Ross's research into malaria and other steps to control this plague; sleeping sickness and the tetse fly, the plague flea and its rat hosts, locust control, and a long account of steps taken for crop protection, including biological control of both insect and weed pests. Bees and their behaviour receive good attention as is due to

such an interesting society life.

Section III, "From Field to Laboratory" commences with methods of collecting wild insects for the purposes of laboratory study and breeding. The author goes on to give an account of breeding methods, and the butterfly farm established by his father, L. W. Newman and continued by himself. An interesting account is given of the breeding of locusts in captivity for material on which to experiment with control measures. An ultra-modern turn in the fight to control over prolific insect pests is the mass breeding of these subjects and sterilising one sex by means of radio activity and releasing them so that the coming generations may be materially reduced. An account is given of this treatment of both malaria mosquitoes and of "screw worm fly" in Arizona.

A short table of the insect orders suitably illustrated with line drawings, an index and credits conclude the book. It is well bound in light grey buckram and will make a handsome addition to the bookshelf. The cover papers reproduce two pages from Moffat's work with its coloured illustrations in the margins, and the book is profusely illustrated both in colour and in black and white, by photographs, drawings and diagrams. These illustrations are well selected and include reproductions of many ancient plates, covers and manuscripts of great beauty as well as interest.

S. N. A. J.

Creatures of the Earth's Crust, by Fritz Martin Engel; Trans. J. R. Foster: 206 pp. + 46 pl. of which 8 are in colour. Harrap, 30/-.

This remarkably interesting book is not one to be reviewed in a hurry. It is packed with good reading, and covers a very wide account of the development of the globe and the life picture of the animal inhabitants.

The introduction gives an account of the earth's cooling and becoming a solid mass, shaped by shrinkage in cooling and later by the erosion of its surface by wind and water and later still by vegetable erosion of rocks and the digging and feeding habits of living creatures spreading to land from the sea. It goes on to give an account of how, through millions of years, the creatures have changed in attempts to adapt themselves to their changing biotopes.

Throughout the book, the author gives continuous examples of evolution in all forms of life with extremely interesting detail. The final chapter points the lesson to man that he must be guided by higher motives than the mere greed which is so much in evidence to-day, and have regard for his natural functions and obligations to the mass of different creatures so closely caught up in his food chain if he wishes to survive. He has also a duty to the ecological biotopes which he now has the power to control to such a very great extent, for better or worse.

The book is well illustrated with line drawings, photographs, coloured photographs and coloured drawings. It is well printed on good paper and bound in blue cloth with black lettering.

Surely this is a book to be read by all who have an appreciation of beauty and a love of nature.

S. N. A. J.

Univerisity Reviews in Biology: (1) The Behaviour of Arthropods, by J. D. Carthy, 148 pp., 12/6; (2) Reproduction in the Insects, by K. G. Davey, 96 pp., 12/6; (3) The Metabolism of Insects, by Darcy Gilmour, 195 pp., 15/-. Paperbacks, 8½″ × 5½″; Oliver & Boyd, Edinburgh and London, 1965.

These three contributions to an admirable series of cheap but very

well produced and compendious little monographs, by an eminent authority in England, Canada and Australia respectively, comprise between them a mine of up-to-date information. They should be on the bookshelves of every entomologist whose curiosity about the lives of the objects he studies or collects extends beyond the most superficial. A conspectus of chapter-headings will best convey an idea of the ground covered: (1) The Arthropod Nervous System—Posture and Pattern—Feeding Behaviour —Host Finding—Courtship and Mating—Brood Care and Social Life— Migrations and Dispersals—Rhythms (including use of 'clocks' in Sun-navigation)—The Sources of Arthropod Behaviour (learning, habituation, etc.). (2) Problems—The Male System and the Spermatozoa—The Female System and the Eggs—The Transfer of Semen—Ovulation, Fertilization and Oviposition—Unusual Methods of Reproduction (parthenogenesis, viviparity, polyembryony, alternation of generations)—Hormones and Reproduction. (3) [M.=Metabolism] Energy M. (production, expenditure; many sections here)—Carbohydrate M.—Lipid M.—M. of Insecticides—M. of Amino-acids—M. of some N-Cyclic Compounds—Protein M.—The Control of M.

A brief explanatory preface, many text diagrams, bibliography and index are provided in each case. There is in (2) a very short glossary of some of the main anatomical terms used; and we feel that in (1) the non-specialist reader would have welcomed a glossary of the technical terms whose application is neither fully self-evident nor defined in the text. Having regard to the subjects, one cannot of course pretend that any of these books makes really easy reading; they are designed for the serious student already familiar with the highly complex background of modern biological science; nevertheless they are all three lucidly written with the least possible indulgence in 'jargon'. From its wider terms of reference (1) is the most generally accessible to the interested layman or amateur and presents a wealth of fascinating facts (it is about two-thirds to three-quarters entomological). Technicality and specialization naturally reach their highest level in (3), which will hardly appeal to anyone without some previous knowledge of biochemistry. Yet we do not hesitate to affirm that even the minimally equipped reader will find in any of the volumes much food for thought; while from the three together, one derives at the very least a vivid sense of the wonderful diversification and intricacy of the life-mechanisms of the most successful of all animal groups.

A. A. A.

OUR TREASURER

With the end of this year we take leave of our treasurer, who has for so long filled this important office for "The Record". Clifford Craufurd stepped into the gap left when A. C. R. Redgrave was compelled to resign at the end of 1958 when increased business responsibilities had reached a point where he could no longer spare time for the Record's affairs. Since taking over at the end of 1958, Craufurd has guided the finances of the magazine and by his careful and kindly handling of the matter of subscriptions and subscribers has fostered good feeling in all directions. Our very heart-felt thanks go out to him for the years of our friendly relations.

His place is now being taken by L. Parmenter, well known to our readers as a member of the editorial panel for many years and a regular contributor on the subject of the Diptera. Notices have already gone out to subscription agents and to the banks of all who pay by banker's order, but for the benefit of those who send their subcriptions themselves, we give his address:—"Woodside", Pinewood Road, Ferndown, Dorset.—Ed.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

CONTENTS

THE RECAPTURE IN 1965 OF *LITHOPHANE LEAUTIERI* BOISD. SUBSP. *SABINAE* H.-G. E. P. WILTSHIRE, C.B.E., F.R.E.S. 267

BUTTERFLIES AT GAVARNIE, 1965. Major General Sir GEORGE JOHNSON, K.C.V.O., C.B., C.B.E., D.S.O. 269

WHERE HAVE ALL THE BUTTERFLIES GONE? H. SYMES 271

WILL-O'-THE-WISP. P. B. M. ALLEN 273

NOTES ON THE LIFE-HISTORY OF *AETHIOPSESTIS AUSTRINA NEBULOSA* WATSON (THYATIRIDAE). J. S. TAYLOR 281

THE ORTHOPTEROID INSECTS OF EASTER ISLAND. D. KEITH McE. KEVAN 283

A NOTE ON *LEPTOMORPHUS WALKERI* CURT. (DIPT.: MYCETOPHILIDAE). L. PARMENTER 287

SALE OF THE WOOLLETT COLLECTION OF LEPIDOPTERA. BARON DE WORMS, M.A., Ph.D., F.R.E.S. 288

NOTES AND OBSERVATIONS 289

CURRENT LITERATURE 296

TO OUR CONTRIBUTORS

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The Entomologist's Record and Journal of Variation

SPECIAL INDEX

VOL. 77, 1965

PAGE

LEPIDOPTERA

abbreviata (Eupithecia) 16
abencerragus (Turamana) .. 179, 182
abietella (Dioryctria) 70
acaciae (Strymon) 232
accreta (Pyrgus) 270
acerifoliella (Lithocolletis) 247
acteon (Thymelicus) 170, 175, 179, 182, 232
admetus (Agrodiaetus) 231, 232
adusta (Eumichtis) 30, 102
advena (Orthosia) 67
advenaria (Cepphis) 30
aegeria (Pararge) 58, 61, 64, 104, 135, 172, 175, 178, 182, 232, 241, 271, 293
aelia (Hipparchia) 232, 270
aeriferana (Ptycholomoides) 22, 69
aescularia (Alsophila) 16
aetherie (Melitaea) 170, 180, 181
aethiops (Erebia) .. 44, 53, 55, 58, 61
aethiops (Xenolechia) 92
affinis (Cosmia) 31
agestis (Aricia) 60, 62, 102, 104, 135, 175, 232, 272
aglaia (Argynnis) 56, 61, 65, 102, 240
ain (Plusia) 62
alberganus (Erebia) 53, 55, 61
albicolon (Heliophobus) 31
albimacula (Hadena) 37
albipuncta (Leucania) 49
albipunctata (Cosymbia) 235
albulata (Perizoma) 30
alceae (Carcharodus) 135, 170, 175, 179, 182, 232
alciphron (Lycaena) 53, 172, 175, 270
alcon (Maculinea) 60, 61
alexanor (Papilio) 231, 232
alexis (Glaucopsyche) 135, 172, 173, 175, 233
algirica (Hipparchia) .. 171, 173, 175
ali (Pyrgus) 179, 180, 182
alni (Apatele) 30, 105, 163
alpicola (Amathes) 101, 102
alternaria (Semiothisa) 32
alveus (Pyrgus) 53
amandus (L. icarius)
amathusia (C. titania)
amphrysus (Ornithoptera) 288
amythaon (Amathuscidia) 288
angustella (Alispa) 93
annulata (Cosymbia) 42
anomala (Stilbia) 24
anonyma (Limenitis) 53, 134, 170, 173, 174, 229, 232

PAGE

anteros (Lycaena) 230, 232
anthelea (Satyrus) 231 232
antiopa (Nymphalis) 53, 57, 59, 61, 230, 231 232, 233, 234
apiformis (Sesia) 221
apollo (Parnassius) .. 57, 58, 60, 270
applana (Agonopterix) 23, 91
arcania (Coenonympha) 61
areola (Xylocampa) 16, 36, 112
arete (E. claudina)
argester (Lysandra) 60, 62, 104, 232, 270
argiades (Everes) 53, 54, 270
argiolus (Celastrina) 62, 65, 135, 171, 175, 219, 232, 234, 271
argus (Plebejus) 62, 65, 104, 179, 270, 272, 289
arion (Maculinea) 56, 61, 104, 141, 220, 273
aristaeus (H. algirica)
armigera (Heliothis) 190, 262
armoricanus (Pyrgus) 135
atalanta (Vanessa) 17, 21, 49, 54, 61, 62, 64, 65, 101, 102, 104, 134, 138, 162, 171, 174, 181, 232, 271, 294
athalia (Melitaea) 53, 55, 58, 61, 104, 141, 170, 171, 174, 233, 234
atropos (Acherontia) 17, 42, 54, 62, 190
augur (Graphiphora) 42
aurantiana (Pammene) 228
aurinia (Euphydryas) 65, 179, 272, 289
aurorina (Colias) 229, 230
ausonia (Euchloë) .. 174, 177, 181, 232
australis (Aporophila) 32
australis (Colias) 60, 104
austrina (Aethiopsestis) 281
autumnaria (Ennomos) 32, 292
aversata (Sterrha) 98
baeticus (R. marrubii)
ballus (Thestor) 180, 182
barrettii (Hadena) 266
basilinea (A. sordens)
baton (Philotes) 135
baton (Turanama) 234
bavius (Lycaena) 180, 182
belemia (Euchloë) 177, 181
bellargus (Lysandra) 60, 62, 65, 104, 141, 180, 191, 219, 232, 234, 272, 289
betulae (Thecla) 65, 99
betularia (Biston) 49, 67, 96, 195, 262
bibulus (Lachnocnema) 112

PAGE

bicolorana (Pseudoips) 31
bicolorata (Hadena) 37
bicolorata (P. rubiginata)
bicruris (Hadena) 37
bidentata (Gonodontis) .. 67, 84, 191
bifaciata (Perizoma) 31
bifida (Harpyia) 221
bilunaria (Selenia) 137
biplaga (Erias) 50
blandiata (Perizoma) 62
blidana (Pieris) 127
boeticus (Lampides) .. 135, 140, 270
bombycina (Hadena) 2, 293
brassicae (Pieris) 60, 64, 104, 105, 134, 174, 181, 232, 288
brevilinea (Arenostola) 31
britomartis (Melitaea) 58, 61
brookiana (Ornithoptera) 288
brunneata (Itame) 57, 62
bryoniae (Pieris) 59, 60, 104, 121, 233
buoliane (Rhyacionia) 70
caecimacula (Ammoconia) 268
caesiata (Entephria) 57, 62
caja (Arctia) 136
c-album (Polygonia) 57, 61, 65, 105, 135, 163, 173, 174, 178, 181, 227, 232, 271
caliginosa (Acosmetia) 138
callidice (Pontia) 126, 270
camilla (Limenitis) 53, 59, 61, 65, 235
canidia (Pieris) 128
capsophila (Hadena) 293
capucina (Lophopteryx) 67
cardamines (Anthocaris) 64, 104, 134, 171, 174, 233, 272, 288, 293
cardui (Vanessa) 14, 17, 62, 64, 65, 87, 102, 105, 134, 139, 170, 171, 174, 178, 181, 232, 234, 271, 293
carmelita (Odontosia) 29, 67, 100
cassioides (Erebia) .. 53, 56, 57, 58, 61
castanea (Amathes) 32
castigata (Eupithecia) 14
castrensis (Malacosoma) 269
cauteriata (Toulgoëtia) 181
cecilia (Pyronia) 135, 170, 173, 175, 229, 232
celerio (Hippotion) 260
celtis (Libythea) 147, 231, 232
cerantoneae (Ectomyelois) 246
ceratoniae (Euzophera) 14
ceto (E. alberganus)
charlonia (Euchloë) 177, 178, 181
charlotta (A. aglaia)
chiron (Eumedonia) 171, 175
chrysidiformis (Bembecia) 142
chrysitis (Plusia) 43
cilialis (Nascia) 17
cinxia (Melitaea) 141, 171, 174, 179, 181, 233
citrata (Dysstroma) 268
clathrata (Chiasmia) 108, 181
claudina (Erebia) 55, 57, 61
clavipalpis (Caradrina) 43

PAGE

cleopatra (Gonepteryx) 134, 172, 174, 178, 181, 231, 232
cloraria (Chlorissa) 233
coerulata (Hydriomena) 93
comes (Euschesis) 291
compta (Hadena) 31
confusa (H. conspersa)
comitata (Pelurga) 42
comma (Hesperia) 62
confusalis (Celama) 293
conspersa (Hadena) 37, 293
contaminei (Zygaena) 4
contigua (Hadena) 30
convolvuli (Herse) 17, 42, 48, 54, 62, 63, 68, 105, 138, 262
cordigera (Anarta) 2
coretas (Everes) 234
coridon (Lysandra) 3, 59, 62, 65, 104, 219, 262, 270, 272, 289
corinna (Chortobius) 135
coronata (Chloroclystis) 68
coryli (Colocasia) 293
cossus (Cossus) 1, 90, 96, 103, 110, 140, 176, 292
craccae (Lygephila) 266
cramera (Aricia) 178, 180, 182
crataegi (Aporia) 32, 42, 104, 170, 174, 181, 230, 270
crenata (Apamea) 24
cribraria (C. cribrum)
cribrum (Coscinia) 142
crinanensis (Hydraecia) 13
cristana (Acleris) 93
croceus (Colias) 12, 14, 32, 33, 48, 60, 62, 64, 105, 134, 138, 139, 170, 171, 174, 178, 181, 230, 232, 273, 289, 293
cruda (Orthosia) 43, 67
cucubali (H. rivularis)
cuculata (Euphyia) 68
cucullina (Lophopteryx) 30, 31
curtula (Clostera) 67
cydippe (Argynnis) .. 57, 60, 61, 65
cyllarus (G. alexis)
damone (Arthocharis) 168
daphnis (Meleageria) 231, 232
daplidice (Pontia) 134, 170, 171, 174, 177, 181, 193, 232
dardanus (Papilio) 115
dealbata (Scoria) 233
deceptoria (Lithacodia) 22
decrepitana (Olethreutes) 70
defoliaria (Erannis) 25, 263
delavoiei (Dicranura) 181
desfontanii (Euphydryas) 179, 180, 182
dia (Clossiana) .. 59, 61, 182, 233, 240
diamina (Melitaea) 104
dictynna (M. diamina)
didyma (Melitaea) 53, 59, 61, 170, 171, 173, 174, 179, 181, 230, 232, 270
diffinis (Cosmia) 246
diluta (Asphalia) 32
dilutata (Oporinia) 44

PAGE
diniana (Zeiraphera) 70
dispar (Limantria) 135
dispar (Lycaena) 289
dissoluta (Nonagria) 31, 42
dodecella (Exoteleia) 70
dodonaea (Drymonia) 293
dodoneata (Eupithecia) 42
dolabraria (Plagodis) 67
dominula (Panaxia) 103, 163
dorilis (H. tityrus)
douglasella (Depressaria) 91
dryas (Minois) 53, 54, 59, 60, 61, 270
dubitata (Triphosia) 48
duplaris (Tethea) 93
eburnata (Sterrha) 182
egea (Polygonia) 231, 232
egenaria (Eupithecia) 245
egeria (P. aegeria)
elpenor (Deilephila) 68
emortualis (Trisateles) 30
ephialtes (Zygaena) 8, 89
epiphron (Erebia) 55, 56, 58, 61, 240, 270
ergane (Pieris) 128, 230, 231, 232
eriphyle (Erebia) 58
eros (Polyommatus) .. 53, 56, 58, 62
erythrus (Zygaena) 294
escheri (Lysandra) 230, 232, 270
eupheme (Zegris) 180, 181
euphemus (M. teleius)
eupheno (Anthocharis) 178, 179, 181
euphorbiana (Lobesia) 228
euphrosyne (Argynnis) 61, 64, 172, 173, 174, 184, 233, 289
euryale (Erebia) .. 56, 57, 58, 61, 104
exclamationis (Agrotis) 43
exigua (Laphygma) 43, 190, 293
extimalis (Evergestis) 91
exulis (Apamea) 182
fagaria (Dyscia) 101
fagi (Hipparchia) 231, 232
fagi (Stauropus) 29, 48, 67, 143
famula (Bichroma) 181
farinata (Lithostege) 180
farinatella (Cedestis) 70
farinosa (Gonepteryx) 231, 232
fasciana (Lithacodia) 293
fasciaria (Ellopia) 70
fausta (Zygaena) 4, 88
favonia (Zygaena) 180
feisthameli (Iphiclides) 178, 180, 181
ferula (Satyrus) 231, 232
festiva (D. mendica)
festucae (Plusia) 31, 48
filicivora (Teichobia) 22
filigrammaria (Oporinia) 16
filipendulae (Zygaena) 9, 10, 88, 89, 101, 294
fimbrialis (Thalera) 142, 228
firmata (Thera) 268
flammea (Panolis) 67
flammeolaria (Hydrelia) 42
flava (Adopoea) 173, 175
flavicornis (Achlyia) 67, 100
flaviventris (Aegeria) 92
floccifera (Reverdinus) 232, 270
formosana (Eulia) 70
formosana (Lozotaenioides) 91
fraxini (Catocala) 142
fraxini (Zygaena) 165
fuliginaria (Parascotia) 31, 68, 83, 93
fulvaria (I. brunneata)
funebrana (Laspeyresia) 15
furcatellus (Crambus) 240
furcula (Harpyia) 67
fuscantaria (Deuteronomos) 246
galathea (Melanargia) 58, 60, 61
gamma (Plusia) 17, 43, 54, 62, 67, 102, 138, 162, 190, 227
gilvago (Cirrhia) 286
glandon (Aricia) 270
glareosa (Amathes) 32
glauca (H. bombycina)
gnoma (Pheosia) 67
gorgone (Erebia) 270
gothica (Orthosia) 43, 67
gracilis (Orthosia) 16
granella (Nemapogon) 23, 24
griseola (Eilema) 68
grossulariata (Abraxas) 44, 49
gysselemiella (Cedestis) 70
halterata (Lobophora) 221
hamza (Adopaea) 178, 179, 182
haworthii (Celaena) 31
helena (Cyaniris) 230, 232
helena (Orthoptera) 288
helvola (Anchoscelis) 102
hermelina (H. bifida)
hiera (Pararge) 104
higginsi (Pieris) 125
hilaris (Zygaena) 5
hippocrepidis (Zygaena) 9, 89
hippothoe (Lycaena) 56, 62, 104
hispidaria (Apocheima) 29
hornigi (Monochroa) 50
hospiton (Papilio) 134
howenworthi (Plusia) 58
hucherardi (Hydraecia) 32
hyale (Colias) 12, 60
hyemana (Acleris) 93
hylas (L. argester)
hyperantus (Aphantopus) 58, 61, 65, 235
hyperbius (Melampias) 239
icarius (Lysandra) 169, 173, 175, 229, 230, 232
icarus (Polyommatus) 62, 65, 104, 135, 170, 171, 175, 182, 232, 272, 293
ida (P. cecilia)
idas (Plebejus) 59, 62, 135, 270
ilia (Apatura) 57, 61
ilius (Strymon) 232
immorata (Scopula) 142
immundana (Epinotia) 93
incerta (Orthosia) 43, 67
ines (Melanargia) 178, 179, 182
insigniata (Eupithecia) 29
interpunctella (Plodia) 246

PAGE
interrogationis (Plusia) .. 49, 62, 102
intricata (Eupithecia) 245
io (Nymphalis) 61, 63, 65, 234, 240, 271
iolas (Iolana) 234
iota (Plusia) 227
iphis (Coenonympha) 59, 61, 104
ipsilon (Agrotis) .. 17, 43, 67, 102, 190
iris (Apatura) 26, 28, 31, 53, 57, 59, 60, 61, 65, 113, 241, 260
isabellae (Lycia) 245
janiszewskae (Sorhagenia) 262
jasius (Charaxes) 134
jesous (Azanus) 178, 182
joannisi (L. acetifoliella)
jonasi (Caligula) 294
juniperata (Thera) 14, 268
jurtina (Maniola) 58, 59, 61, 65, 135, 170, 175, 182, 232, 272, 289
karsandra (Zizeeria) 168
kludius (Kringana) 288
krueperi (Pieris) 128, 231, 232
lapidea (Lithophane) 267
lariciata (Eupithecia) 42
larissa (Melenargia) .. 229, 231, 232
lathonia (Argynnis) 56, 61, 134, 179, 181, 232
lathyrana (Grapholita) 93
latistria (Agriphila) 241
latruncula (Procus) 186
lavandulae (Zygaena) 86, 88
leautieri (Lithophane) .. 33, 138, 267
leda (Melanitis) 239
lefebvrei (Erebia) 270
legatella (Chesias) 32
lepida (Hadena) 37
leucographa (Gypsitea) 29, 100
leucophaearia (Erannis) 161
leucosoma (Pieris) 128
levana (Araschnia) .. 53, 57, 59, 61
libatrix (Scoliopteryx) 48
lichenea (Eumictis) 13
lienigella (Cosmopteryx) 19
ligea (Erebia) 53, 55, 57, 61, 104
lignea (Blastobasis) 69
ligustri (Sphinx) 111
linearia (Cosymbia) 293
lineatella (Anarsia) 94
lineola (Thymelicus) 62, 170, 173, 175, 232
littoralis (P. litura)
litura (Prodenia) 246
liturata (Semiothisa) 70
livornica (Celerio) 190, 191, 192, 260
lonicerae (Zygaena) 11, 16, 88, 101, 171
lophyrella (Sorhagenia) 262
loreyi (Leucania) 54
lorquinii (Zizera) 179, 180, 182
loti (Zygaena) 7, 8
loyselis (Zygaena) 181
lucens (Hydraecia) 13
lucilla (N. rivularis)
lucina (Hamearis) 104, 133
lunaria (Selenia) 30, 67
PAGE
lunaris (Minucia) 135, 142
lunula (Aporophila) 15
lunula (Calophasia) 101
lupinus (Hyponephele) 231, 232
lupulina (Hepialus) 48
luteago (H. barrettii)
lutosa (Rhizedra) 63
lycaon (Maniola) 54, 60, 61, 231, 232
lychnitis (Cucullia) 29
machaon (Papilio) 31, 59, 60, 129, 134, 139, 141, 174, 232, 233, 269
madagascariensis (Chrysiridia) 245
maera (Pararge), 61, 104, 171, 175, 270
maja (Pandoriana) 134, 232
malvae (Pyrgus) 64, 233, 272
malvoides (Pyrgus) 170, 171, 175, 233, 234
manni (Procris) 294
mannii (Pieris) 128, 170, 232
manto (Erebia) 53, 56, 58, 61, 270
marginella (Dichomeris) 68
maritima (Chilodes) 31
marrubii (Reverdinus) 172, 175, 179, 182, 270
mauritanicus (Thestor) 180, 182
mauritanicus (Procris) 181
mediopectinella (Ochsensheimeria) 91
medusa (Erebia) 104
megera (Pararge) 65, 171, 175, 178, 182, 232, 234, 240, 272, 293
melampus (Erebia) .. 53, 55, 57, 61
mendica (Diarsia) 102
mendica (Cycnia) 293
meolaus (Erebia) 270
meticulosa (Phlogophora) .. 24, 43
miniata (Miltochrista) 235
minimus (Cupido) 171, 175, 179, 233, 289
miniosa (Orthosia) 29
mintha (Torynesis) 239
minorata (Perizoma) 62
miranda (Ornithoptera) 288
mnemosyne (Parnassius) 230, 232, 270
molesta (Grapholita) 94
moneta (Polychrisia) 68
monoglypha (Apamea) 43
mucronata (Ortholitha) 24, 187
multistrigaria (Colostygia) .. 29, 100
munda (Orthosia) 163
muscerda (Pelosia) 31
myricae (Apatele) 182
myrmidone (Colias) 54, 59, 60
nana (Hada) 37
napaea (Boloria) 56, 58, 61
napi (Pieris), 60, 64, 101, 122, 134, 162, 170, 174, 233, 288
nausithous (Maculinea) 53
neleus (Erebia) 270
neptunus (Papilio) 288
nerine (E. stirius)
neurica (Nonagria) 31
neuropterella (Metzneria) 228
neustria (Malacosoma) 227, 272
ni (Plusia) 24, 289

PAGE

nickerlii (Luperina) 289
nigra (A. lunula)
nigropunctata (Scopula) 142
niobe (Argynnis) 53, 55, 56, 57, 61, 232
nivalis (Erebia) 53, 58
noctuella (Nomophila) 102, 133, 190
nostrodamus (Gegenes) 232
obeliscata (Thera) 70, 293
oblitella (Heterographis) 15
oblonga (Apamea) 31
obscura (S. ravida)
obstipata (Nycterosea) 30, 32, 43, 94, 105, 133
obtusa (Pelosia) 48
occipitrina (Dryobotodes) 246
occitanica (Zygaena) 5, 6, 85
occulta (Eurois) 13, 16, 17, 42, 58, 63, 102
ocellaris (Cirrhia) 29, 32
ocellata (Smerinthus) 68
ochroleuca (Erenobia) 186
ochsensheimeri (Pieris) 127
oculea (Hydraecia) 13
oeme (Erebia) 58, 61
oleracea (Diataraxia) 49
ononaria (Aplasta) 142
ononidis (Parectopa) 92
onopordi (Pyrgus) 182
opacella (Psyche) 182
optilete (Vacciniia) 55, 57, 62
or (Tethea) 30, 163
orbifer (Spialia) 168, 171, 172, 175, 232
orbitulus (Albulina) 53, 56, 57, 58, 62
oribasus (Z. fraxini)
orientalis (Carcharodus) 232
orion (Scolitantides) 54, 234
ornitopus (Lithophane) 33, 268
palaemon (Carterocephalus) 104, 192
palaeno (Colias) 56, 60
paleacea (Enargia) 23, 48
palealis (Loxostege) 186
paleana (Amelia) 14
pales (Boloria) 53, 56, 58, 61, 270
palinurus (Papilio) 288
pallens (Leucania) 43
palpina (Pterostoma) 293
paludum (Buckleria) 22
palustris (Hydrillula) 240
pamphilus (Coenonympha) 61, 65, 104, 135, 175, 182, 232, 272
pandrose (Erebia) 270
paphia (Argynnis) 54, 57, 59, 60, 61, 184, 232
parallelaria (Epione) 142
paramegaera (Pararge) 135
parthenoides (Melitaea) 270
pedaria (Phigalia) 25, 100
peltigera (Heliothis) .. 31, 32, 48, 105
persicariae (Melanchra) 49, 227
petasitis (Gortyna) 16
pharte (Erebia) 56, 58, 61
phegea (Syntomis) 170
pheretes (A. orbitulus)

PAGE

pherusa (Agapetes) 168, 169
phicomone (Colias) 53, 56, 58, 60, 270
philomidis (Pyrgus) 230, 232
phlaeas (Lycenae) 62, 65, 135, 175, 182, 232, 272, 293
phoebe (Melitaea) 170, 171, 174, 179, 180, 181, 232, 270
phocniceata (Eupithecia) 245
piceaella (Recurvaria) 70
pinastri (Hyloicus) .. 31, 68, 70, 113
piniaria (Bupalus) 70
pinicolana (Rhyacionia) 70
pinivorana (Rhyacionia) 70
pisi (Ceramica) 43
platanoidella (L. acerifoliella)
plecta (Ochropleura) 43
plexippus (Danaus) 105, 222
plumbaria (Ortholitha) 24
plumbeolata (Eupithecia) 294
plumigera (Ptilophora) 33
poae (Elachista) 92
podalirius (Papilio) 59, 60, 124, 173, 174, 178, 232, 233
polychloros (Nymphalis) 58, 61, 135, 173, 174, 180, 181, 230, 231, 232
polycommata (Trichopteryx) .. 29
pomonella (Laspeyresia) 15, 246
populata (Lygris) 16, 62
populeti (Orthosia) 67
populi (Laothoe) 68
porcellus (Deilephila) 68
porphyrea (Peridroma) 17, 43
proboscidalis (Hypena) 48
promissa (Catocala) 31
pronoë (Erebia) .. 53, 54, 57, 58, 61
pronuba (Noctua) 24, 43, 64, 67, 102, 163
proto (Pyrgus) 179, 182
pruni (Strymonidia) 141
prunivorana (Laspeyresia) 15
pseudorapae (Pieris) 125
pulchella (Utetheisa) 42
pulveraria (Anagoga) 30
pumilata (Gymnoscelis) 266
punctifera (Lysandra) 180, 182
punctum (Zygaena) 294
pupillana (Eucosma) 91
puppillaria (Cosymbia) 48
purdeyi (Clavigesta) 70
purpuralis (Zygaena) 4, 16, 101, 170, 171
putris (Axylia) 48
pygmina (Arenostola) 16
pylaon (Plebejus) 232
pyrina (Zeuzera) 239
quadra (Lithosia) 31, 43, 68, 262
quercinaria (Ennomos) 42
quercus (Lasiocampa) 101, 137
quercus (Thecla) 31, 65, 191
ramburii (Zygaena) 88
rapae (Pieris) 60, 64, 104, 128, 134, 170, 172, 174, 181, 232, 271
ratzeburgiana (Zeirophera) 70
ravida (Spaelotis) .. 31, 239, 291, 292

PAGE
reisseri (Procris) 181
repandata (Alcis) 58
reticulata (Heliophobus) 142
revayana (Nycteola) 31
rhadamanthus (Zygaena) 8
rhamni Gonepteryx) 55, 60, 64, 178, 181, 231, 232, 271
rhamniella (Sorhagenia) 262
rhododactyla (Eucnaemidophorus) 83, 142
ridens (Polyploca) 67, 100
ripartii (Agrodiaetus) 231, 232
rivularis (Hadena) 37, 293
rivularis (L. anonyma)
rivularis (Neptis) 53, 57, 61
romeo (Zygaena) 294
rotundella (Agonopterix) 23
roxelana (Pararge) 229, 232
ruberata (Hydriomena) 25
rubi (Callophrys) 65, 100, 163, 175, 179, 182, 293
rubi (Chrysophanus) 135, 171
rubi (Diarsia) 43
rubiginata (Plemyria) 62
rubiginea (Dasycampa) 67
ruficornis (Chaonia) 16, 67
rumina (Zerynthie) 179, 180, 181
ruticiella (Spudaea) 246
sabinata (Lobophera) 269
sacraria (Rhodometra) .. 15, 43, 54, 105
salicalis (Colobochylia) 142
salicata (Colostygia) 101
salicis (Leucoma) 221, 235
sao (S. sertorius)
sarpedon (Zygaena) 3, 4
satyrata (Eupithecia) 293
satyrion (Coenonympha), 53, 56, 61
scabiosae (Zygaena) 171
secalis (Apamea) 43
segonzaci (Pieris) 123, 127
selene (Argynnis) 59, 61, 64, 104, 105, 182
semele (Eumenis) 231, 232
semiargus (Cyaniris) 56, 62, 104, 171, 173, 175, 233
semirubella (Phycita) 14
sephirus (Plebejus) 230, 231
serena (H. bicolorata)
serratulae (Pyrgus) 62, 230, 232
sertorius (Spialia) 172, 270
silaceata (Ecliptoptera) 101
similella (Nephopteryx) 83
sinapis (Leptidea) 58, 61, 64, 104, 134, 171, 174, 192, 232, 233, 234, 240
siterata (Chloroclysta) 33
sobrina (Euschesis) 182
socia (Lithophane) 42, 48, 268
sordens (Apamea) 259
sororiata (Carsia) 16
sparganii (Nonagria) 32, 48
spini (Thecla) 232
stabilis (Orthosia) 43, 66
statices (Procris) 294
PAGE
stellatarum (Macroglossum) 33, 62, 273
stigmatica (Amathes) 31
stipella (Polyochodes) 246
stirius (Erebia) 53, 54, 59, 61
strataria (Biston) 67
strigilis (Procus) 186
strigula (L. varia)
suasa (Hadena) 37
sublustris (Apamea) 42
subrosea (Caenophila) 182
subtusa (Zenobia) 68
suspecta (Parastichtis) 31
sylvella (L. acerifoliella)
sylvestris (Thymelicus) .. 62, 64, 178, 232, 272
syringaria (Apeira) 48, 241
taenialis (Schrankia) 32
tages (Erynnis) 64, 104, 232, 272
tanacetella (Isophrictis) 93
tau (Aglaia) 233
tedella (Epinotia) 70
teleius (Maculinea) 53, 59, 62
temerata (Bapta) 69, 293
templi (Dasypolia) 32, 102
tenerana (Epinotia) 92
tenuicornis (Procris) 294
terebrella (Euzophera) 70
testacea (Luperina) 13
tetralunaria (Selenia) 67, 100
thalassina (Hadena) 37
theophrastus (Tarucus) 178, 179, 182
thersites (Polyommatus) .. 182, 231, 232, 270
thore (Clossiana) 104
tiliae (Mimas) 68, 220
titania (Clossiana) 53, 61, 104
tithonus (Maniola) 65
tityrus (Heodes) 57, 62, 232
torrenti (Phycita) 246
transalpina (Zygaena) 89, 171
transversa (Eupsilia) 100
tremula (Pheosia) 67
trepida (Notodonta) 67
tricolorellum (Caryocolum) 92
tridens (Celamia) 26
trifolii (Scotogramma) 37
trifolii (Zygaena) 11, 88, 89, 294
trigrammica (Meristis) 259
tripunctaria (Eupithecia) 293
trivia (Melitaea) 232
tullia (Coenonympha) 104
turfosalis (Hypenodes) 31
turfosalis (Tholomiges) 182
typhae (Nonagria) 31
typica (Naenia) 290
umbra (Pyrrhia) 31, 235
umbrifera (O. mucronata)
umbrifera (O. plumbaria)
unangulata (Euphyia) 235
uncinula (Drepana) 246
uncula (Eustrotia) 30
undulata (Rheumaptera) 31, 235

PAGE

unionalis (Palpita) 13, 15
unipuncta (Leucania) 32, 63, 105, 138
unitana (Tortrix) 14, 15
urticae (Aglais) .. 25, 49, 54, 61, 63, 65, 102, 171, 175, 227, 232, 240, 271
vaccinii (Conistra) 100
varia (Lycophotia) .. 24, 43, 64, 67
variata (Thera) 43
venata (Ochlodes) .. 62, 64, 104, 175, 232, 272
venosa (Simyra) 31
venustula (Hapalotis) 30, 67
verbasci (Cucullia) 29
verberata (Coenotephria) 62
versicolor (Procus) 136
vespertaria (E. parallelaria)
viciae (Zygaena) 89, 142
vinula (Cerura) 181
vicrama (Philotes) .. 60, 62, 229, 232
viretata (Acasis) 16, 83
virgaureae (Lycaena).. 53, 56, 60, 62, 270
virgaureata (Eupithecia) 14
viridaria (Phytometra) 48, 293
viriplaca (Heliothis) 31
vitellina (Leucania) 49
vulgata (Eupithecia) 14
w-album (Strymonidia) .. 65, 99, 270
w-latinum (Hadena) 37
xanthographa (Amathes) 43
zollikoferi (Apamea) 26
ziczac (Notodonta) 67
zohra (Cigaritis) 180, 182
zonaria (Nyssia) 163

DIPTERA

abiens (Xylota) 107
aeneum (Calliopium) 82
aerea (Fannia) 79
aerosus (Gymnopternus) 80
aestiva (Empis) 80
affinis (Hebecnema) 79
affinis (Helomyza) 79
agilis (Tachydromia) 81
alacris (Sturmia) 282
albimana (Clusiodes) 81
albimana (Ptychoptera) .. 20, 21, 82
albimanus (Platycheirus) 82
albipes (Dolichopeza) 20
albitarsis (Chirosia) 80, 81
albocostata (Sciomyza) 81
albostriatus (Syrphus) 82
albula (Delia) 79
alpium (Tipula) 20
amoena (Asteia) 79
anale (Scatophaga) 82
annulata (Tachydromia) 79, 80
annulata (Thereva) 81
annulimanus (Sciodus) 109
annulipes (Aedes) 82
annulipes (Chyliza) 21
annulipes (Enicta) 81

PAGE

annulipes (Tachydromia) 80
antennata (Agathomyia) 79, 81
anthracina (Agromyza) 82
anthracina (Melinda) 82
anthriscii (Phytomyza) 82
apicalis (Scaptomyza) 82
apiformis (Pocota) 108
aquosa (Dicranomyia) 20
arbustorum (Eristalis) 79
argyria (Argyra) 20, 82
aridella (Chamaemyia) 82
armatus (Fannia) 79, 81
armatus (Campsicnemus) 79
arrogans (Sciodus) 80
asilica (Criorrhina) 108
assimilis (Phorocera) 82
aterrima (Phora) 80
atra (Platypeza) 78
atricornis (Phytomyza) 82
austriaca (Pipiza) 107
autumnalis (Musca) 79
barbata (Rhamphomyia) 81
bardanae (Tephritis) 81
baumhaueri (Dioctria) 78
berberina (Criorrhina) 108
bergenstammi (Cheilosia) 107
bicolor (Brachyopa) 21
bicolor (Helomyza) 80
bicolor (Pegomyia) 83
bimaculatus (Brachypalpus), 80, 107
bisignatus (Tabanus) 78
bombylans (Volucella) 82, 161
brevicornis (Swammerdamella) .. 81
buccata (Oedoparea) 81
caecutiens (Chrysops) 78
caesar (Lucilia) 80
campestris (Pipunculus) 79
campestris (Rhingia) 82
carbonaria (Phytobia) 80, 82
carnaria (Sarcophaga) 80
caspius (Aedes) 80
caudatula (Empis) 81
cautum (Chrysotoxum) 78
cava (Tipula) 81
chalybeata (Beris) 78
chalybeata (Chrysogaster) 107
chaerophylli (Phytomyza) 82
cheethami (Tipula) 20
chiopterus (Culicoides) 80
chorea (Dicranomyia) 20, 21
cibaria (Calobata) 80
ciliaris (Tachydromia) 80
cilicrura (Delia) 83
cincta (Tricimba) 81
cinctellus (Syrphus) 20
cinctus (Lasiopogon) 80
cinerascens (Cheilotrichia) 20
cinerea (Bolitophila) 80
cingulata (Hilara) 82
claviger (Dolichopus) 81
claripennis (Tricyphona) 20
clavipes (Beris) 82
clavipes (Trichina) 79, 80
coarctata (Parydra) 82
comtus (Xanthandrus) 107, 227

PAGE

confusus (Dorylomorpha) 81
conica (Hydrophoria) 80
conspersa (Smidtia) 82
coracina (Fannia) 81
corrigiolata (Micropeza) 78
crassicornis (Actia) 80
crassicornis (Haematopota) 21
crassirostris (Rhamphomyia) .. 109
crassiseta (Chirosia) 81
Criorhina 192
cristatus (Chrysopilus) 20
cuprea (Ferdinandea) 81
cupreus (Chrysotus) 82
cupreus (Gymnopternus) 80
curvipes (Campsicnemus) 82
cynipsea (Sepsis) 80
denticornis (Cerodonta) 81
dentipes (Hydrotaea) 82
desoutteri (Sympycnus) 81
detritus (Aedes) 80
diaphanus (Syrphus) 107
didyma (Dicranomyia) 20
dispar (Neoascia) 82
dissecta (Nupedia) 83
disticha (Parascaptomya) 82
Drosophila 116
dubia (Sciomyza) 81
dumetorum (Dicranomyia) 81
elongata (Baccha) 227
eligans (Syrphus) 82
erythrocephala (Calliphora) 80
erythropthalma (Rhamphomyia) 106
extricata (Tachydromyia) .. 78, 81
febrilis (Dilophus) 21, 79
femorata (Pachymeria) 78, 80
femoratus (Dilophus) 79
femoratus (Hybos) 109
fenestralis (Scenopinus) 80
fera (Tachina) 82
ferruginea (Phylidorea) 80
ferruginosa (Diadoicidia) 79, 81
filiata (Rhamphomyia) 80
flava (Clusia) 81
flava (Rhamphomyia) 109
flaveola (Dryomyza) 82
flaveola (Liriomyza) 80
flavicornis (Microchrysa) 81
flavipalpis (Chamaemyia) 79
flavipes (Leptopeza) 79
flavipes (Philygria) 81
flavitarsis (Cryptonevra) 79
floccosa (Criorrhina) 108
florea (Myiatropa) 82, 108
florum (Xylota) 109
fraterna (Cheilosia) 107
frit (Oscinella) 79
frutetorum (Helophilus) 79, 80
fugax (Pegohylemyia) 79
fulgens (Pegomyia) 80
fulgens (Sepsis) 82
funebris (Drosophila) 80
fuscicornis (Helomyza) 79, 80
geniculata (Siphona) 82
genupuncta (Pegomyia) 83
gentilis (Clusiodes) 80, 81

PAGE

germinationis (Opomyza) 82
glabricula (Ocydromyia) 82
glechomae (Napomyza) 82
gracilis (Anthomyza) 79
graminum (Scaptomyza) 82
granditarsa (Pyrophaena) 79
griseipennis (Erioptera) 81
griseola (Hydropota) 82
griseola (Leucopis) 79
griseus (Molophilus) 21, 81
guttata (Dolichocephala) 80
haemorrhoa (Sarcophaga) 81
halterata (Androvandiella) 79
hederae (Ormosia) 21
heraclei (Philophylla) 82
herbarum (Chamaemyia) 82
histrio (Eustalomyia) 81
holmgreni (Oedalea) 78, 80
hortorum (Morellia) 82
hortulana (Tipula) 21
hyalinata (Sapromyza) 82
hybridus (Helophilus) 108
hypostigma (Chlorops) 79
immaculata (Heleodromia) .. 80, 106
impressa (Cheilosia) 79
impuncta (Helina) 82
incisilobata (Sarcophaga) 82
inflata (Valucella) 108
inscripta (Neoleria) 81
insensilis (Brachyopa) 107
intersecta (Delia) 83
inusta (Minettia) 78
irritans (Hydrotaea) 82
irrorata (Dolichocephala) 80
johannis (Bibio) 80
juncorum (Chamaemyia) 82
lacteipennis (Dexiopsis) 79
lacustris (Dexiopsis) 81
laevifrons (Helomyza) 80
lardaria (Polietes) 82
lasiophthalma (Helina) 81
leachii (Themira) 80
lenta (Xylota) 107
leucoephala (Argyra) 82
leucocephala (Metopia) 78
leucopterus (Bibio) 79
lineatus (Helophilus) 79
litorella (Schoenomyza) 81
littoralis (Alloneura) 79, 81
livida (Empis) 109
loewiana (Paroxyna) 81
longicornis (Tachydromia) 79
longicornis (Trichopeza) 110
longipennis (Minettia) 78
lonicerae (Phytagromyza) 82
lucens (Lipara) 79
lucidus (Empis) 109, 110
lucorum (Leucozana) 82
luminosa (Bolitophila) 277
lundbecki (Hilara) 82
luniger (Syrphus) 227
lutea (Erioptera) 20
luteola (Myiolepta) 107
macularis (Drosophila) 108
maculata (Rhipidia) 21

	PAGE
maculata (Solva)	106
marci (Bibio)	21, 79
maura (Hilara)	82
maritima (Fucellia)	81
meadei (Lasiomma)	83
melaleuca (Psilocephala)	106
melanocephala (Phyto)	80
melinum (Melanostoma)	82
meridiana (Mesembrina)	82
metallicus (Gymnopternus)	81
minuta (Tachydromyia)	79, 80
mitis (Dicranomyia)	20, 21
nana (Morinia)	82
neglectus (Chrysotus)	80, 81
nemorum (Xylota)	81, 107
nigra (Bicellaria)	79, 80
nigricolor (Hebecnema)	80
nigrinus (Nemotelus)	82
nigripes (Cheilosia)	80
nigritarsis (Empis)	79, 80
nigritarsis (Pegomyia)	83
nigritarsis (Tachydromia)	80
nigriventris (Bibio)	80
nigropunctata (Limonia)	81
nitidissima (Oscinella)	79
nobilis (Orthoneura)	79
nobilitata (Thereva)	82
nodulosa (Ormosia)	21
notata (Helomyza)	80
notata (Tachydromia)	109
nubeculosa (Liminia)	20, 21, 80, 81
nubila (Tachypeza)	82, 94, 109
nubilus (Dolichopus)	79
nigra (Earomyia)	79, 80
obscuripennis (Baccha)	82
occulta (Amalopsis)	20
ocellaris (Epiphragma)	80, 81
ochracea (Austrolimnophora)	21, 81
orbonella (Liriomyza)	81
ornatus (Eumerus)	107
ornatus (Xanthochlorus)	79
oscinina (Siphonella)	79
pallida (Helomyza)	79
pallida (Megophthalma)	81
pallidiventris (Lyciella)	80
pallidiventris (Tachydromia)	79
pallipes (Rhacodineura)	80
pallipes (Syntormon)	81
palpata (Phaonia)	81
parvicornis (Chirosia)	81
pavida (Dicranota)	21, 79, 80
peltatus (Platycheirus)	82
pellucens (Volucella)	82
pendulus (Helophilus)	79
pennatus (Dolichopus)	81
personata (Pocota)	108
pertinax (Eristalis)	82
petrophiloides (Medeterus)	81
phalerata (Drosophila)	80
phragmitidis (Agromyza)	80
picta (Drosophila)	108
pictitarsis (Tachydromia)	81
pilipes (Trimicra)	21
pilosella (Diploneura)	81
pipiens (Syritta)	79
planifrons (Chlorops)	79
platycephala (Lyciella)	78
platypterus (Sciopus)	82
pleuralis (Megaselia)	80
plumicornis (Minettia)	82
plumipes (Dolichopus)	82
pluvialis (Haematopota)	21
polita (Microchrysa)	82
posticata (Oscinella)	81
praeusta (Tricholauxania)	78
pratorum (Meromyza)	81
primulae (Phytomyza)	82
procellaris (Anthomyia)	83
prodomus (Empis)	80
projecta (Megaselia)	80
protuberans (Helina)	79, 81
pulicaria (Coenosia)	80
pulicaria (Megaselia)	80
pulicaria (Melanagromyza)	81
pumilionis (Chlorops)	81
punctata (Anatopynia)	80
punctata (Empis)	109
punctatus (Anisopus)	82
punctulata (Trypetoptera)	81
pusilla (Alophora)	81
pygmaea (Coenosia)	79
pyrastri (Scaeva)	227
quadrifasciata (Neurigona)	79, 80
quadrifasciata (Urophora)	81
quadripustulata (Winthemia)	82
quinquemaculata (Palloptera)	79
ranunculi (Criorrhina)	108, 159
ranunculi (Phytomyza)	82
reptans (Agromyza)	82
ribesii (Syrphus)	79
richardsi (Lucilia)	82
rivosa (Minettia)	82
robusta (Tetanocera)	79
rorida (Lyciella)	82
rosae (Psila)	82
rufilatera (Monoclona)	79
rufina (Tipula)	20
rufipes (Agromyza)	82
rufiventris (Tephrochlamys)	79
ruralis (Hydrophoria)	80
saltatrix (Meromyza)	82
saxatilis (Medeterus)	81
scalare (Melanostoma)	79
scita (Tropidia)	78, 79
scolopacea (Rhagio)	20, 80
scutellaris (Phaonia)	82
segnis (Xylota)	82, 107
semicinereus (Lasiops)	79
serva (Dicranomyia)	81
silvatica (Tetanocera)	81
similis (Fannia)	80
simplex (Dolichopus)	21, 82
simplicipes (Bicellaria)	80
sociella (Fannia)	81
solstitialis (Chrysogaster)	107
speciosa (Callimyia)	81
speciosa (Calliprobola)	108
spinimanum (Norellia)	82
squalens (Phylidorea)	20
stagnalis (Scatella)	81

PAGE

stercoraria (Scatophaga) 80
stercorea (Empis) 81, 109
stigma (Macrocera) 81
stigmosa (Rhamphomyia) 109
stigmoides (Macrocera) 79
strenua (Hylemyia) 83
strigata (Liriomyza) 82
subfasciata (Lyciella) 82
submaculosa (Nephrotoma) 80
subnodicornis (Tipula) 20
sudeticus (Tabanus) 76
sundewalli (Elgiva) 82
sylvarum (Xylota) 107
sylvatica (Tetragoneura) 81
sylvatica (Ula) 80
tarda (Xylota) 107
tarsata (Rhamphomyia) 78, 79
tenax (Eristalis) 82
tenella (Gonomyia) 80
tessellata (Empis) 79
tibialis (Paragus) 81
tibiella (Rhamphomyia) 80
Tipula 275, 278
transversa (Dactylolabis) 21
tricolor (Coenosia) 78
trigonus (Dysmachus) 79, 81
tripunctata (Limonia) 81
tuberculatus (Eumerus) 82
tumida (Megaselia) 79
umbrosa (Cordylura) 79
unca (Tipula) 20
ungulatus (Dolichopus) 20, 81
univittata (Pegomyia) 80
urbana (Mydaea) 80
vagans (Diastata) 80
vaginalis (Lonchaea) 80
variabilis (Cheilosia) 79
variabilis (Hylemyia) 79
variana (Megaselia) 81
variata (Hylemyia) 83
variegata (Helomyza) 82
variipennis (Tipula) 20
varipes (Pipizella) 80
vastata (Oscinella) 81
venustus (Syrphus) 82
verralli (Empis) 110
versicolor (Helophilus) 79
vescicularis (Conops) 78
vibrissina (Drosophila) 78
virginea (Pegomyza) 80
vulgaris (Piophila) 82
walkeri (Leptomorphus) 287
wiedemmanni (Goniglossum) .. 81
wiedemmanni (Sciopus) 82
zetterstedti (Azelia) 82

COLEOPTERA

analis (Amischa) 46
anceps (Notothecta) 46
angulata (Thiasophila) 45, 46
angusticollis (Monotoma) 45
armiger (Odontaeus) 30
aurata (Cetonia) 46
brevis (Quedius) 45, 46

PAGE

canaliculata (Drusilla) 45, 46
Cassida sp. 189
Cassidinae (S. Africa) 187-90
cerealis (Chrysolina) 49
clavicornis (Noterus) 19
conicicollis (Monotoma) 45, 46
convexa (Cassida) 189
coriarius (Prionus) 176
crassicornis (Noterus) 19
dermestoides (Hylecoetus) 235
dissimilis (Heterothops) 46
distinguenda (Cassida) 189
dorsovittata (Cassida) 189
emarginata (Lomechusa) 47
flavipes (Exochomus) 189
flavipes (Notothecta) 45, 46
formiceticola (Oxypoda) 45, 46
funesta (Zyras) 46
haemorrhoa (Oxypoda) 46
heros (Cerambyx) 176
hybrida (Aspidimorpha) .. 187, 188, 189
italica (Luciola) 255
limbata (Zyras) 46
major (n.c.) (Noterus) 19
marginalis (Dytiscus) 278
märkeli (Dinarda) 46
melanocephalus (Gyrohypnus) .. 46
melolontha (Melolontha) 278
minor (n.c.) (Noterus) 19
montandoni (Acrotrichis) 45
myrmecophilum (Ptilium) 46
noctiluca (Lampyris) .. 255, 257, 274
paradoxa (Lomechusa) 46-7
piceus (Hydrophilus) 278
pubescens (Staphylinus) 112
punctata (Conchyloctenia) 189
puncticosta (Aspidomorpha) 189
pygmaeus (Dendrophilus) 46
quadripunctata (Clythra) .. 45, 46
sphaerula (Cassida) 189
stercorarius (Staphylinus) III-2
talpa (Atheta) 45, 46
tecta (Aspidomorpha) 187-9
vigintimaculata (Cassida) 189
violaceus (Carabus) 278

COLLEMBOLA

Anurida sp. 277

DERMAPTERA

annulipes (Euborellia) 40
auricularia (Forficula) 42
maritima (Anisolabis) 42
minor (Labia) 42
riparia (Labidura) 42

DICTYOPTERA

americana (Periplaneta) 39, 77
asynamorus (Tachycines) 77
chavesi (Ariblatta) 41
chavesi (Zetha) 41
decipiens (Loboptera) 39, 40
fortunata (Loboptera) 41

PAGE
freyi (Zetha) 41
germanica (Blattella) 39
gigantea (Blabera) 116
lapponicus (Ectobius) 77
maderae (Leucophaea) 41
orientalis (Blatta) 41
surinamensis (Pycnoscelus) 41

HEMIPTERA

glauca (Hancenia) 115

HYMENOPTERA

Aceratoneura sp. 188
alienus (Lasius) 249
Apanteles sp. 105
aquilonia (Formica) 45, 46
brunneus (Lasius) 248
caespitum (Tetramorium) 248
crabro (Vespa) 263
cunicularia (Formica) 47, 250
erraticum (Tapinoma) 250
evanescens (Trichogramma) .. 250-I
exsecta (Formica) 250
flavus (Lasius) 1, 3, 140, 250
fuliginosus (Lasius) 46
fusca (Formica) 250
Habrobracon 116
lemani (Formica) 250
lugubris (Formica) 45, 46, 252
niger (Lasius) 250
nitidulus (Formicoxenus) 46
nylanderi (Leptothorax) 248
rabaudi (Lasius) 249
rubra (Myrmica) 46, 250
rufa (Formica) 45, 46, 250-1
rufibarbis (Formica) 250
sabuleti (Myrmica) 248
sanguinea (Formica) 250
scabrinodis (Myrmica) .. 46, 47, 250
schencki (Myrmica) 248
tibialis (Pteronidea) 92
umbratus (Lasius) 250

MECOPTERA

hyemalis (Boreus) (Hyemalis boreus *in error*) 1

ODONATA

leucosticta (Brachythemis) 25

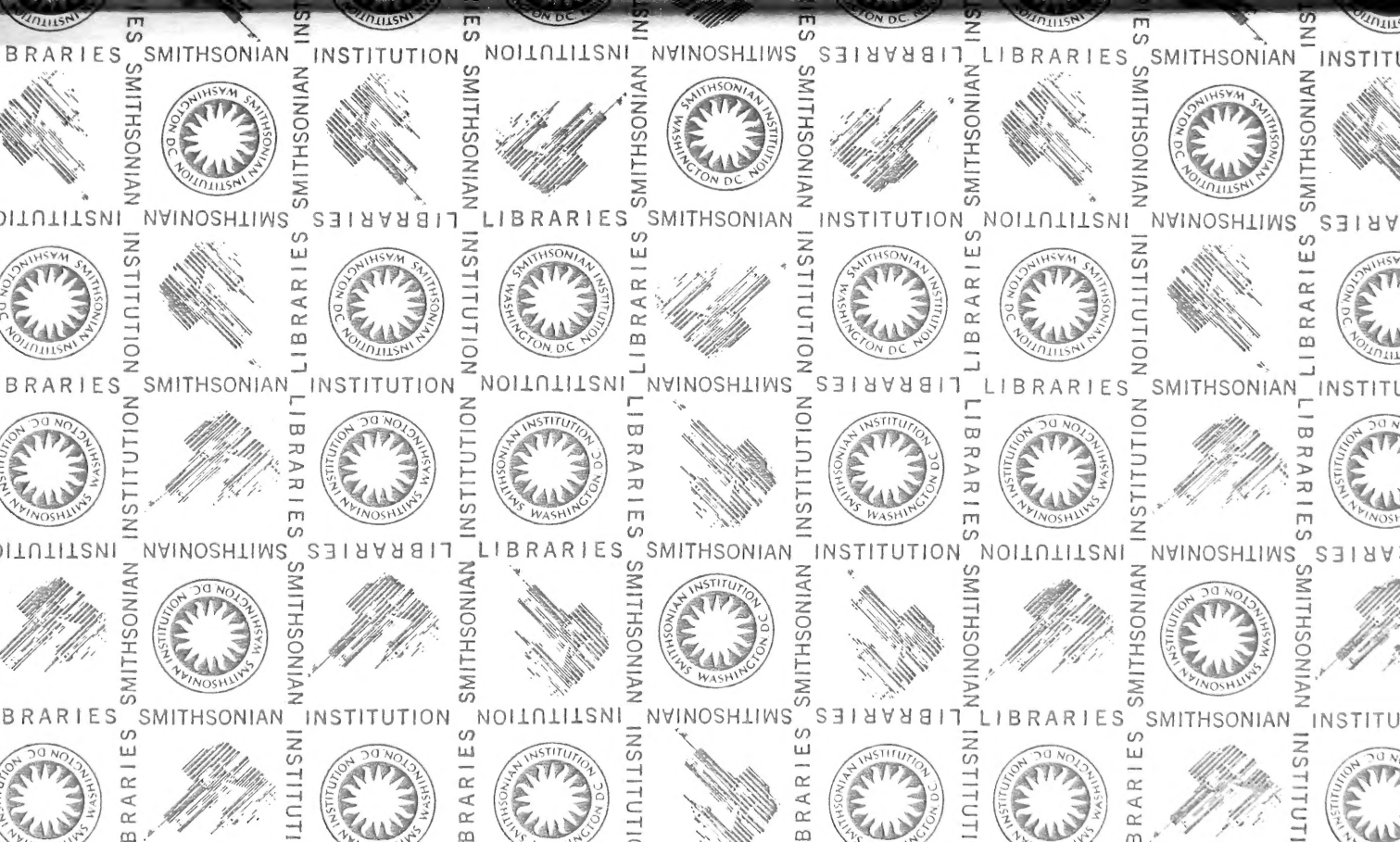
ORTHOPTERA

(Book review ..... 265-6)
albifrons (Decticus) 40
albomarginatus (Chorthippus), 72, 75
bimaculatus (Gryllus) 40, 41
brachypterus (Metriopterus) .. 73, 75, 76
brunneus (Chorthippus) .. 72, 73, 76, 77
burdigalensis (Tartarogryllus) ..40
caerulescens (Oedipoda) 41
campestris (Gryllus) 41
canariensis (Oedipoda) 40, 41
chavesi (Conocephalus) 41
discolor (Conocephalus) 77
domesticus (Acheta) 41
dorsalis (Conocephalus) 74, 75
falx (Platycleis) 40
fuscocincta (Oedipoda) 41
gregaria (Schistocerca) 41
griseoaptera (Pholidoptera) .. 72, 73, 75, 76, 77
grossum (Stethophyma) 74, 75
gryllotalpa (Gryllotalpa) .. 256, 258, 259, pl. V, 277, 278-80
maculatus (Myrmeleotettix), 73, 76
laticauda (Platycleis), *see* falx
lineatus (Stenobothrus) 72
migratoria gallica (Locusta), 40, 41
nana nana (Phaneroptera) 40
parallelus (Chorthippus) 72, 73, 75, 76
punctatissima (Leptophyes) 72
quadripunctata (Phaneroptera), *see* nana
rufipes (Omocestus) 73, 76
rufus (Gomphocerippus) 72, 73
sabulosa (Platycleis) 39, 40
stigmaticus (Stenobothrus) 77
subulata (Tetrix) 73, 74, 75, 77
f. bifasciata 73, 75
sylvestris (Nemobius) 41, 76
thalassinum (Meconema) 72, 77
undulata (Tetrix) 74, 75, 76
variopicta (Cyrtaspis) 41
verrucivorus (Decticus) 75
viridissima (Tettigonia) .. 72, 73, 75, 76
viridulus (Omocestus) 73, 76

TRICHOPTERA

(Spp. in N. England, chart of flight period ..... 155-8)
angustata (Molanna) 150
angustella (Orthotrichia) 154
annulatus (Drusus) 149, 153
auricula (Limnephilus) 153
azurea (Mystacides) 150
Beraeidae 154
bimaculata (Neureclipsis) 151
centralis (Limnephilus) 153
cinereus (Athripsodes) 152
clathrata (Oligotricha) 150
dorsalis (Rhyacophila) 149, 153
flavicornis (Limnephilus) 150
fuscipes (Agapetus) .. 150, 152, 153
Glossostomatidae 154
grandis (Phryganea) 151
Hydropsychidae 154
Hydroptilidae 154
Leptoceridae 153, 154
Limnephilidae 153, 154
lunatus (Limnephilus) 150
marmoratus (Limnephilus) 150
minuta (Beraeodes) 150
Molannidae 154
montanus (Philopotamus) .. 149, 152, 153

	PAGE
nervosa (Anabolia)	150, 152
nigronervosus (Athripsodes)	149
obsoleta (Phryganea)	151, 154
Odontoceridae	154
permistus (Stenophylax)	153
Philopotamidae	154
Phryganeidae	153, 154
politus (Limnephilus)	150, 154
Polycentropidae	153, 154
Psychomyiidae	154
rhombicus (Limnephilus)	149
Rhyacophilidae	154
rostocki (Tinodes)	154
ruficrus (Oligotricha)	150
sequax (Stenophylax)	149, 153
Sericostomatidae	154
stellatus (Potamophylax)	150
subnubilus (Brachycentrus)	150
tigurina (Hydroptila)	154
Tinodes	154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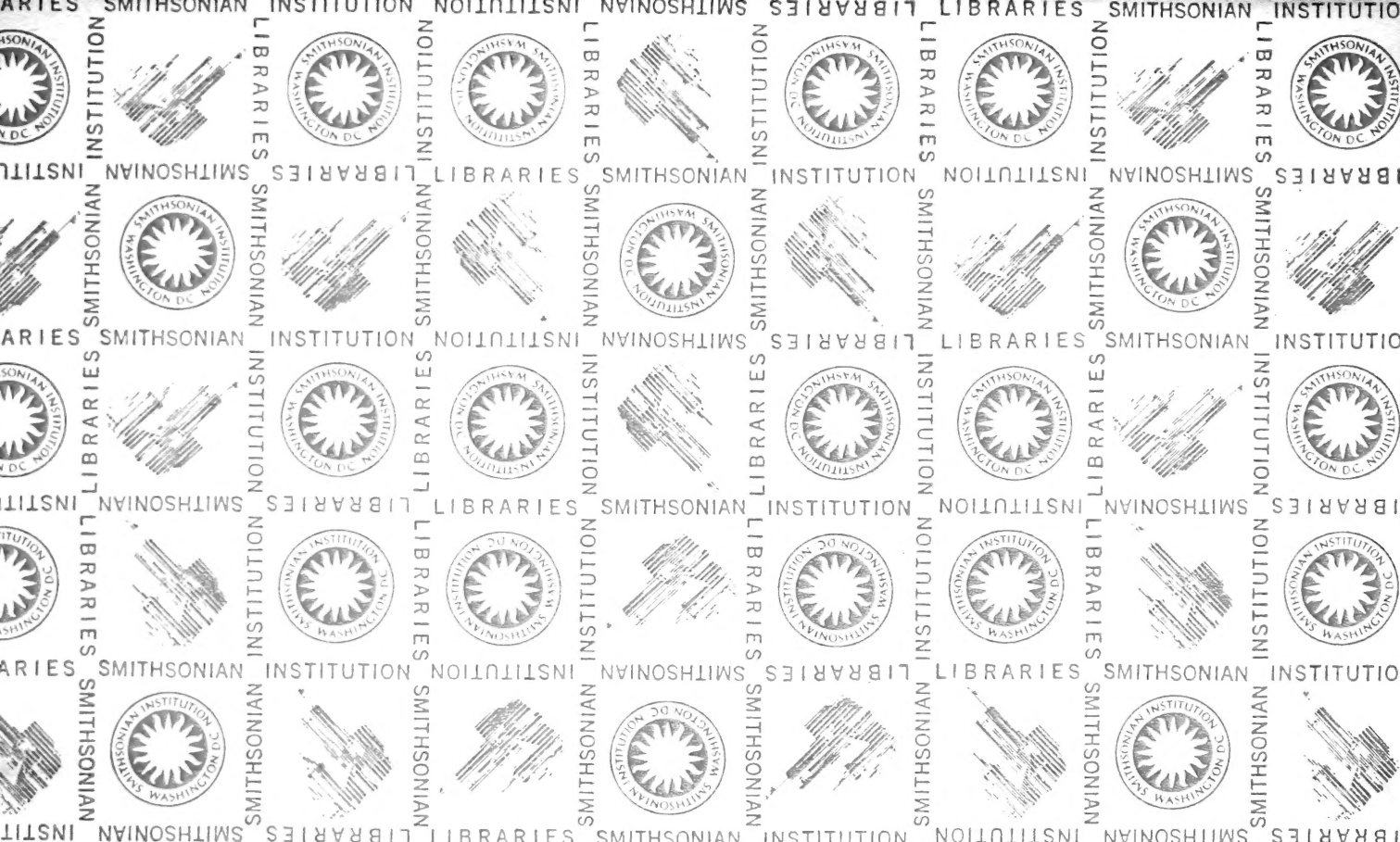
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